POST-KEYNESIAN ESSAYS FROM DOWN UNDER

VOLUME IV: ESSAYS ON THEORY

Theory and Policy in an Historical Context

Joseph Halevi
G. C. Harcourt
Peter Kriesler
J. W. Nevile

"The openness to new policy ideas in the wake of the crisis needs a different theoretical understanding of the economy from the prevailing mainstream. That such an alternative is available in post-Keynesian economics is evident from this impressive collection of essays from four leading Australian political economists. Joseph Halevi, Geoff Harcourt, Peter Kriesler and John Nevile bring together a selection of their contributions to post-Keynesian theory, built on the work of theoretical pioneers. While each of the four brings their own perspective, the collection displays an unusual degree of cohesion resulting from their shared influences and collaborations."

—**Sheila Dow**, *Emeritus Professor of Economics, University of Stirling, UK*

"The essays in this volume exude the importance of economic theory and, in particular, the importance of a truly *alternative* theory that transcends patched-up amendments of orthodoxy. Uncoupling the theories of value and distribution from the straitjacket of marginal productivity theory, and recognising the limits of equilibrium theorising (and the importance of path dependency) are two important items on the agenda. The book could well be subtitled 'Theory Done Right.' Its contents demonstrate that as regards economic theory, there is much to be admired about, and much to be learned from, the view from Down Under."

—**Mark Setterfield**, *Professor of Economics, New School for Social Research, USA*

"A valuable collection to inspire some and remind others how little they know."

—**James Forder**, *Balliol College Oxford, UK*

Post-Keynesian Essays from Down Under Volume IV: Essays on Theory

Theory and Policy in an Historical Context

Joseph Halevi
Center CRIISEA of the Universit é de Picardie, Amiens, France, Senior Lecturer, University of Sydney, Australia, International University College, Turin

G. C. Harcourt
Visiting Professorial Fellow in the School of Economics, University of New South Wales, Australia

Peter Kriesler
Associate Professor, University of New South Wales, Australia

and

J. W. Nevile
Emeritus Professor, University of New South Wales, Australia

palgrave
macmillan

© Joseph Halevi, G. C. Harcourt, Peter Kriesler and J. W. Nevile 2016

All rights reserved. No reproduction, copy or transmission of this publication may be made without written permission.

No portion of this publication may be reproduced, copied or transmitted save with written permission or in accordance with the provisions of the Copyright, Designs and Patents Act 1988, or under the terms of any licence permitting limited copying issued by the Copyright Licensing Agency, Saffron House, 6–10 Kirby Street, London EC1N 8TS.

Any person who does any unauthorized act in relation to this publication may be liable to criminal prosecution and civil claims for damages.

The authors have asserted their rights to be identified as the authors of this work in accordance with the Copyright, Designs and Patents Act 1988.

First published 2016 by
PALGRAVE MACMILLAN

Palgrave Macmillan in the UK is an imprint of Macmillan Publishers Limited, registered in England, company number 785998, of Houndmills, Basingstoke, Hampshire RG21 6XS.

Palgrave Macmillan in the US is a division of St Martin's Press LLC, 175 Fifth Avenue, New York, NY 10010.

Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

Palgrave® and Macmillan® are registered trademarks in the United States, the United Kingdom, Europe and other countries.

ISBN 978-1-137-47528-2 ISBN 978-1-137-47529-9 (eBook)
DOI 10.1057/978-1-137-47529-9

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

A catalogue record for this book is available from the British Library.

A catalog record for this book is available from the Library of Congress.

Typeset by MPS Limited, Chennai, India.

Contents

List of Figures and Tables

Figures

Tables

Preface

Geoff Harcourt intended to put together one more volume of selected essays in order to reach double figures. But then Peter Kriesler reminded him that since he joined the School of Economics at the University of New South Wales in August 2010 as a Visiting Professorial Fellow, they, sometimes with John Nevile, had published several joint papers. Moreover, Peter and John, and Peter and Joseph Halevi, had also been publishing joint articles for many years. All their works, whether as sole author or jointly, had important common themes. The underlying theoretical framework was essentially post-Keynesian.[1] They all stressed the importance of the underlying institutional framework, of the economy as an historical process and, therefore, of path determinacy. Money and finance were an integral part of the economy, with monetary variables affecting real variables and vice versa at all stages of analysis. In addition, all the works saw the ultimate goal of economics as being a tool to suggest policy – even the theoretical works were motivated by the desire to make the world a better place, with better being defined by an overriding concern with social justice.

So arose the proposal we made to Taiba Batool that we put together four volumes of selected essays by "Post-Keynesian Essays from Down Under," subtitled "Theory and Policy in an Historical Context." She enthusiastically accepted the offer, ably assisted by Ania Wronski. We therefore set about putting the selections together. When Taiba left Palgrave Macmillan for pastures new, she passed the project onto Laura Pacey and Rachel Sangster who, just as enthusiastically, oversaw the bringing together and publication of the four volumes. Laura, in particular, has been extremely helpful and patient in our journey from idea to manuscript.

Our grateful thanks go to Joan Harcourt for forgiving Geoff for breaking the promise never again to undertake a major research project, witnessing yet again her love and support of over 60 years; to Teresa, Peter's wife, for her continual love and support; and to Fay, John's wife, who, in the absence of a secretary, typed much of his introductions to chapters (and commented that the names had not changed much since the last time she did this when, as a young wife, she typed drafts of John's PhD thesis).

We would also like to thank Roni Demirbag for his help in getting Joseph's papers in order, and Jason Antony for his gracious and good-natured multi-dimensional expert help in assembling the volumes.

Note

1. For an overview of what we consider to be post-Keynesian economics see Harcourt, G. C. and Kriesler, P. 2015 "Post-Keynesian Theory and Policy for Modern Capitalism," *Journal of Australian Political Economy,* No. 75, Winter 2015, 27–41.

Acknowledgements

The authors and publishers wish to acknowledge with thanks the following for either previously publishing their articles, or granting permission to reproduce copyright material:

Taylor and Francis LLC for permission to reprint "The crisis in mainstream economics" in H.M. Kramer, H.D. Kurz and H-M. Trautman (eds) *Macroeconomics and the History of Economic Thought. Festschrift in Honour of Harald Hagemann*, 2012, pp. 183–190.

Routledge for publishing "On the concepts of period and run in economic theory" in C. Gehrke, N. Salvadori, I. Steedman and R. Sturn (eds) *Classical Political Economy and Modern Theory. Essays in Honour of Heinz Kurz*, 2011, pp. 257–265.

Gale for permission to reprint "Partial equilibrium analysis" in *International Encyclopedia of the Social Sciences*, 2E, pp. 151–153. © 2008 Gale, a part of Cengage Learning, Inc. Reproduced by permission. www.cengage.com/permissions

Gale for permission to reprint "Exchange value" in *International Encyclopedia of the Social Sciences*, 2E, pp. 40–41. © 2008 Gale, a part of Cengage Learning, Inc. Reproduced by permission. www.cengage.com/permissions

Edward Elgar Publishing for permission to reprint "Expectations and unemployment" in R. Wray and M. Forstater (eds) *Keynes and Macroeconomics After 70 Years: Critical Assessments of The General Theory*, 2008, pp. 309–320.

Palgrave Macmillan for publishing "Aggregate demand and supply analysis: a story in the wrong language" in B.B. Rao (ed.) *Aggregate Demand and Supply: A Critique of Orthodox Macroeconomic Modelling*, 1998, pp.155–175.

John Wiley and Sons for permission to reprint "The use and abuse of aggregate demand and supply functions" (co-authored with B.B. Rao), *The Manchester School*, Vol. 64, No. 2, 1996, pp. 189–207.

M.E. Sharpe and Craig Freedman for permission to reprint "Has the long-run Phillips curve turned horizontal?" in G. Mongiovi, G. Argyrous and M. Forstater (eds) *Growth, Distribution and Effective Demand: Essays in Honour of Edward Nell*, 2004, pp. 144–162.

John Wiley and Sons for permission to reprint "Some notes on classical political economy and the rise to dominance of supply and demand theories," *Australian Economic Papers*, Vol. 20, No. 36, 1981, pp. 96–103.

Rivista di Politica Economica for publishing "Accumulation, breakdown crises, disproportionality, and effective demand," *Rivista di Politica Economica*, Vol. 89, Nos. 4–5, 1998, pp. 77–95.

Institut de Sciences Mathématiques et Economiques Appliquées for permission to reprint "Structure and growth," *Economie Appliquée*, Vol. 47, No. 2, 1994, pp. 57–80.

The International Journal of Applied Economics and Econometrics for permission to reprint "Capital and growth: its relevance as a critique of neoclassical and classical economic theories," *Indian Journal of Applied Economics — Special Issue in the Respectful Memory of John Hicks*, Vol. 7, No. 4, 2001, pp. 79–98.

Palgrave Macmillan for publishing "Marx or Hicks? Structural proportions and crisis: the transition from the first to the third volume of capital" in R. Bellofiore (ed.) *Marxian Economics: A Reappraisal*, Volume 2, 1998, pp. 194–205.

John Hopkins University Press for permission to reprint "Employment and planning," first published in *Social Research*, Vol. 50, No. 2, pp. 345–358. Copyright © 1983 New School for Social Research.

Banca Nazionale del Lavoro Quarterly Review for publishing "The composition of investment under conditions of non-uniform changes," *Banca Nazionale del Lavoro Quarterly Review*, No. 137, 1983, pp. 213–232.

Edward Elgar Publishing for permission to reprint "Structural analysis of development and underdevelopment" in H. Hagemann and H. Kurz (eds) *Political Economics in Retrospect. Essays in the Memory of Adolph Lowe*, 1998, pp. 164–194.

Palgrave Macmillan for publishing "Lowe, Dobb and Hicks," *Eastern Economic Journal*, Vol. 10, No. 2, 1984, pp. 157–167.

Taylor and Francis LLC for permission to reprint "Harcourt, Hicks and Lowe: incompatible bedfellows?" in C. Sardoni and P. Kriesler (eds) K*eynes, Post-Keynesianism and Political Economy: Essays in Honour of Geoff Harcourt*, Volume 3, 1999, pp. 400–417.

Oxford University Press for publishing "The traverse, equilibrium analysis, and Post-Keynesian economics" (co-authored with Neil Hart) in G.C. Harcourt and P. Kriesler (eds) *The Oxford Handbook of Post-Keynesian Economics Volume 2: Critiques and Methodology*, 2013, ISBN 978-0-19539075-9, pp. 175–197. Reproduced by permission of Oxford University Press.

The History of Economic Thought Society of Australia for permission to reprint "The structure of Post-Keynesian economics: the core contributions of the pioneers," *History of Economics Review*, No. 45, Winter, 2006, pp. 95–105.

Cambridge University Press for publishing "Luigi Pasinetti: the senior living heir of the Cambridge School of Economics and the last of the great system-builders" in R. Arena and P.L. Porta (eds) *Structural Dynamics and Economic Growth*, 2012, pp. 137–144. Reprinted with permission.

Elsevier for publishing "The significance of the theory of vertically integrated processes for the problem of economic development" in *Structural Change and Economic Dynamics*, Vol. 7, 1996, pp. 163–171.

John Wiley and Sons for permission to reprint "Ronald Meek's 'magnificent' review article of Piero Sraffa's 1960 classic: top hit in decade 1954–63," *The Scottish Journal of Political Economy*, Vol. 60, No. 5, 2013, pp. 478–480.

Global and Local Economic Review for publishing "The importance of HUMBUG in the Cambridge-Cambridge controversies in capital theory," *Global and Local Economic Review*, Vol. 17, No. 1, 2013, pp. 11–21.

Palgrave Macmillan for publishing "Switching and employment," *Eastern Economic Journal*, Vol. 11, No. 3, 1985, pp. 229–234.

Cheshire for publishing "Multiplier theory with tax rates as policy instruments," *Fiscal Policy in Australia: Theory and Practice*, 1970, pp. 52–71.

SAGE Publications for publishing "Capacity utilization, inflation, and monetary policy: the Dumenil and Lévy macro model and the new Keynesian consensus" (co-authored with Marc Lavoie), *Review of Radical Political Economy*, Vol. 39, No. 4, 2007, pp. 586–598.

Taylor and Francis Online and Marc Lavoie for permission to reprint "The new view on monetary policy: the new consensus and its Post-Keynesian critique," *Review of Political Economy*, Vol. 19, No. 3, 2007, pp. 387–404. http://www.tandfonline.com/doi/full/10.1080/09538250701453097

John Hopkins University Press for permission to reprint "Comment on Professor Lerner's paper: a Marxist view," first published in *Social Research*, Vol. 46, No. 2, pp. 240–254. Copyright © 1979 New School for Social Research.

Institut de Sciences Mathématiques et Economiques Appliquées for permission to reprint "Observations on Kaldorian and Post-Keynesian approaches to inflation," *Economies et Sociétés*, No. 8, December 1991, pp. 33–46.

Oxford University Press for publishing "Theorizing about Post-Keynesian economics in Australasia: aggregate demand, economic growth, and income distribution policy" (co-authored with Paul Dalziel) in G.C. Harcourt and P. Kriesler (eds) *Oxford Handbook of Post-Keynesian Economics Volume 2: Critiques and Methodology*, 2013, ISBN 978-0-19539075-9, pp. 412–435. Reproduced by permission of Oxford University Press.

The History of Economic Thought Society of Australia for permission to reprint "Marxism and post-Keynesian economics," *History of Economics Review*, No. 8, Summer, 1992, pp. 46–58.

Institut de Sciences Mathématiques et Economiques Appliquées for permission to reprint "Effective demand, sectoral capacity utilization and the sectoral distribution of investment: some reflections along a Kalecki-Sweezy approach," *Economies et Sociétés*, Vol. 28, No. 8, 1994, pp. 25–45.

About the Authors

Joseph Halevi, alma mater University of Rome La Sapienza, began teaching economics at the New School of Social Research in New York and later at Rutgers University. He has a permanent appointment at the University of Sydney. He was Visiting Professor at the University of Connecticut and regularly in France at the Universities of Grenoble, Nice and Amiens. He has authored many books and contributed to the first edition of *The New Palgrave Dictionary of Economics* in 1987 and co-edited *Beyond the Steady State* with Macmillan in 1992, among others.

G. C. Harcourt is a graduate of the Universities of Melbourne and Cambridge. He has worked mainly at Adelaide (1958 to 1985) and Cambridge (1964 to 1966; 1972 to 1973; 1980; 1982 to 2010). He is now Visiting Professorial Fellow at UNSW Australia. He is Emeritus Reader in the History of Economic Theory at Cambridge University; Emeritus Fellow of Jesus College at Cambridge; and Professor Emeritus at the University of Adelaide. He has authored or edited 29 books and over 380 articles, notes, chapters in books and reviews. His books include *Some Cambridge Controversies in the Theory of Capital* (1972), *The Structure of Post-Keynesian Economics* (2006), (with Prue Kerr) *Joan Robinson* (2009) and (jointly edited with Peter Kriesler) *The Oxford Handbook of Post-Keynesian Economics*, 2 vols (2013).

Peter Kriesler currently teaches in the School of Economics at the University of New South Wales. He organises the Annual Australian Society of Heterodox Economists Conference, which is now in its fourteenth year. Peter's main publications are in the areas of history of economic thought, heterodox economics, the Australian economy, labour economics, and economic perspectives on human rights.

J. W. Nevile is Emeritus Professor at the University of New South Wales in Sydney, Australia. He has published extensively on fiscal policy, macroeconomic policy in general, economics and ethics, and the history of economic thought. He has served on a number of statutory authorities and government enquiries. He was the Recipient of the Economic Society of Australia Distinguished Fellow Award for the year 2000.

Introduction

Joseph Halevi

The essays contained in this volume represent the bulk of my thoughts on theory, crucially developed with Peter Kriesler. Before proceeding to synthesise them I would like to express a point of view regarding economic theorising in general. Theory cannot be practical, in other words, it cannot reproduce or justify the obvious. In my university life I found that practicality and reality is a much sought after argument by radical left-wingers. And yet if there was a person who would cherish abstract thinking above everything else, it was Marx himself. This attitude of the radical left-wingers has done serious damage, more than what we think. It has left most of the theoretical debates in economics in the hands of those who do not want any debate but just discussions about the properties of this or that model. Ask any of the most renowned mainstream critics of social injustices, unemployment, wealth inequalities, how should economics be taught. The likely reply will be that in the first instance you ought to start from supply and demand equilibrium, then you complicate things. Yet even the more complex framework will still depend upon its equilibrium premises. In this context Chapter 9 of this volume argues that it is supply and demand equilibrium theory that must be abandoned.

The essay, written in 1980 on Heron island on the Barrier Reef in the marine biology laboratory of the island, was published in the 1981 volume of the *Australian Economic Papers* as a review article of an important book by the late Krishna Bharadwaj of JNU in New Delhi. Her book is titled *Classical Political Economy and the Rise to Dominance of Supply and Demand Theory* (1978). Starting from both Sraffa's contributions, namely, the critique of the relation between costs and quantities produced carried out in the 1920s, and the 1960 book, *Production of Commodities by Means of Commodities*, Bharadwaj elegantly and gently unpacks the Supply and Demand apparatus. Her endeavour was not to search for errors, but to show the philosophical and epistemological implications of the dominance of supply and demand.

These amount to the elimination of all structural interdependencies. The only ones allowed are those between atomistic agents through a contrived entity called the "market", which has nothing to do with actual markets, where production and sectoral relations matter a great deal. Indeed, even today, nearly 40 years after the 1976 R.C. Dutt lectures forming her book, Bharadwaj's text is a valuable contribution. It dismantles the individualistic approach to economic agency thereby providing a solid critique of representative agent models that have infested economics till the financial crisis of 2008.

I studied Piero Sraffa's 1960 classic in two rounds. The first was with Paolo Sylos-Labini who stressed the difference between theories where production is based on a one way avenue from given natural resources to final demand, and theories based on circular input–output relations. In the second round, having migrated from Rome to New York City, I was by myself, completely alone, but not quite. I am now convinced that in the Unites States, with the exception of a handful of people, those who wanted to exit the theoretical orbit of Neoclassical economics, simply did not understand Sraffa. This was due to the fact that, when campus radicalism grew in response to the Vietnam war and official economics was seen as part of the ideological justification of the war, many took an activist issue oriented road. Hence on the plane of deep theory I was essentially alone. However, there appeared in 1975 in Italy at the Bologna publishing house il Mulino a formidable book by Luigi Pasinetti: *Lezioni di teoria della produzione*, translated in 1977 by Columbia University Press as *Lectures in the Theory of Production*. That did it: It never left my bag. Beyond the issues of reswitching and capital reversal, it became absolutely clear that it is perfectly possible to have a coherent price system without any relation to Supply and Demand; that in a production system non-scarce commodities are not free goods; that the distribution of income is socially determined. All that was required to obtain such a system, notwithstanding the complexities involved in building it up, was a set of input–output relations where commodities are needed to produce other commodities.

The Sraffa system does not say anything about levels of production and transitional paths. The Lowe system does. In our meetings Adolph Lowe told me that among the Neoclassical economists the credit to have started to think in terms of traverses should go to Hicks, especially to the chapter on Traverse in his 1965 book, *Capital and Growth*. I had read the Italian translation of the book several years earlier with mixed results as to clarity. This time I reread it with Adolph Lowe's structural model at the back of my mind, and with Pasinetti's Lectures as UV protection sunglasses. It became equally clear to me that John Hicks, the economist who with his 1939–46 *Value and Capital* rekindled the interest in General Equilibrium Theory, contributed to a Neoclassical absorption of Keynes's *General Theory*; Hicks then, was exiting equilibrium supply and demand theory. True, he did say

in a 1975 symposium organised by Ernie Bohm, then the review editor of the *Economic Record*, around G. C. Harcourt's review of Hicks's book (and three others) that he had become a new Hicks, no longer J.R., just John. But he referred to his *Theory of Economic History*, whereas I saw in *Capital and Growth,* a painstakingly laborious elaboration of the path out of equilibrium. This became more evident when in 1985 Hicks published an abridged version of the 1965 book with the new title *Methods of Dynamic Economics*. Hicks's merit consisted in spelling out at every step how and why he was quitting the established framework. With modern industry it is time to abandon instantaneous equilibration of supply and demand, he explained. With modern industry, he added, the role of prices is to cover the costs of production inclusive of a rate of profits. Indeed, as in Sraffa. Nothing more should be demanded from them. Prices are full cost prices, he observed. Just as in Sylos-Labini's 1962 *Oligopoly and Technical Progress*, I should add.

It is against this background, where the terrain has been cleared from predetermined price adjustments and smooth technical substitutions, that the bulk of the papers to which I have contributed in this volume should be read and critically evaluated. The essays appearing as Chapters 31, 15 and 14 are all applications of the Lowe approach. The 31st chapter is a debate over an article by Abba Lerner on how to control inflation by issuing wage permits in relation to productivity growth. I criticised that view by using Lowe's framework which irked Lerner quite a bit. I argued that it made no sense to talk about wage permits without first discussing the patterns of accumulation. My 1979 *Social Research* article was subtitled "A Marxist View". I realise now that the subtitle would have been understood only by Lenin, Luxemburg, Fel'dman, Maurice Dobb, Magdoff and Sweezy and people in India. Most of the radical political economists in the USA, UK and certainly in Australia, would not have seen the essay as expressing Marxist concepts. With few exceptions, like an old friend of ours, Bruce Mcfarlane, their notion of production, if they have any, is as fluffy as the most simple minded neoclassicist of the Piketty variety. Chapter 15 compares Lowe's model characterised by heterogeneity within the capital goods sector with both standard two-sector models and planning models. The purpose of the essay was to show that if one keeps the structure of circularity of production while augmenting the heterogeneity of capital goods, the case for central planning becomes stronger. In a Lowe Traverse, planning does not necessarily have to be based on investment priority in heavy industry, yet investment should remain centrally planned.

Chapter 14, also a *Social Research* essay of 1983, attempted to place the Baran-Sweezy-Magdoff notion of monopoly capital within Lowe's framework. It then brings in a part of Keynes's *General Theory* Chapter 16, where a Traverse like process is sketched out and it is evaluated both in relation to Lowe and to Sweezy. The 17th chapter is a paper given in Washington at a special session of the Eastern Economic Association in honour of Adolph

Lowe and published in 1984. It is the first brief but direct comparison between Hicks's *Capital and Growth* and Lowe's *Path of Economic Growth*. Maurice Dobb's planning model is included in the comparison because the distinguished British Marxist used an earlier version of Lowe's approach. Perhaps I was too critical of Hicks on that occasion. I did modify my position in a later essay where I showed the multiple ramifications of Hicks's own Traverse (Chapter 12).

Meanwhile in 1981 Luigi Pasinetti published with Cambridge University Press his seminal book, *Structural Change and Economic Growth*. The book's importance manifested itself immediately on several accounts. The method of vertical integration seemed to run against the process of circularity of production. Yet I think that Marc Lavoie was essentially correct when he observed that in Pasinetti circularity still exists but it is short-circuited. The method of vertical integration does not allow for any surreptitious reintroduction via the backdoor of Neoclassical choice of technique procedures. The expression of all productions as a series of vertically integrated labour coefficients turns out to be, at the most basic natural level, the proof of the superiority of labour over capital, since both the natural rate of profits and the natural rate of interest depend upon the value of labour productivity. A central feature of Pasinetti's theory is the presence of per capita demand for a variety of consumption goods ranked on the basis of Engel-type curves. This was a complete innovation relatively to all the previous growth models where consumption is always Ricardian, i.e. consisting of a single commodity, "corn". Consumption remains Ricardian even with multiple capital goods. I felt therefore the need to get hold of the differences between Pasinetti's and Lowe's theories. In practice the jury is still out and I do not think it will issue a verdict. I like both approaches as I can appreciate the contributions of each and can elaborate upon them. Some would call this situation a case of horses for courses. Let's settle for that, although my Italian Liceo education tends to reject the horses/courses trade off: il faut bien que tout soit logiquement cohérent.

I first approached Pasinetti's contribution in a paper given at the Eastern Economic Association meeting in Pittsburgh in 1984. It appears as Chapter 26. The two crucial evaluations are, however, contained in a lengthy essay published in 1994 in France on structure and growth (Chapter 11) and in an article published in 1996 (Chapter 23). The structure and growth chapter leans heavily in favour of Pasinetti's contribution. It argues that Pasinetti's theory of growth and structural change is theoretically complete rather than conceived *ad hoc* as in earlier growth models. Il est bien cohérent donc. Chapter 23 is in the same mode as Chapter 11. It is fully concentrated on the theory itself, especially in relation to development issues. On development I definitely use Pasinetti. For the conceptual explanation of the growth of China as compared to other underdeveloped countries his theory is excellent. Yet for certain issues on how sectors are interrelated the Lowe-type

approach regains its relevance. Evidence to that effect comes from a paper prepared with Peter Kriesler for a conference on the Third Volume of *Capital* organised by Riccardo Bellofiore in Bergamo, Italy, in 1993. Our paper dealt with the Marxian issue of structural proportions and we used a Hicks-Lowe approach to argue that disproportionalities between sectors are deeper causes of crises than the Reserve Army induced cyclical accumulation process outlined in the First Volume of *Capital*.

In the light of the terminal crisis of the USSR, Pasinetti's theory seemed to offer elements analytically relevant for broaching an explanation of that crisis, yet in relation to issues in Marxian theory the Lowe and Hicks approaches appeared to be valid.

Between 1993, after the Bergamo Conference, and 2000 I was offered a number of opportunities to revisit the whole structural approach. In the first half of the 1990s Harald Hagemann and Heinz Kurz began to plan a book in honour of Adolf Lowe who in 1993 reached 100 and was back living in Germany. He died in 1995 before the completion of the book that went to press in 1998 with Edward Elgar. Chapter 16 is my contribution to the book in the memory of Adolph Lowe. It subjects his approach to a complete scrutiny from the Marxian debates over automation and the lack of crises (Tugan Baranovski), to the Fel'dman model of Soviet planning, to the Dobb-Sen choice of techniques view of planning. I then expanded the part on the Tugan Baranovski debate over automation and the breakdown of accumulation into a fully-fledged essay published in Italy in memory of Claudio Napoleoni, in a special issue of *Rivista di Politica Economica* edited by Riccardo Bellofiore (Chapter 10). In the same period the *Indian Journal of Applied Economics* organized a special issue on Hicks which was in part repeated in 1999 at the Sorbonne in Paris. My essay, Chapter 12, tried to show how in *Capital and Growth,* Hicks attempted to address the Cambridge questions in a framework based on Sraffa, hence Cambridge, prices. He addressed Joan Robinson's question of how to get into equilibrium and he found that, by and large, the economy will not get into equilibrium in a reliable manner. Importantly, Hicks's conclusion applies also to Kaldor's model.

That Kaldor's growth model had internal problems had been pointed out by Geoff Harcourt in two essays, one published in 1963 in *Australian Economic Papers* and the other in 1965 in the *Economic Record*. Kaldor's models are based on the notion of the representative firm. Harcourt built a capital goods/consumption goods model with two firms. He then showed that firms cannot be on an equal footing. One firm, that in the capital goods sector, is the leading firm. In a couple of papers I have taken up Harcourt's approach in order to show that also Kaldor is subjected to a disequilibrium process (Chapter 33). I then extended the analysis to examine the relation between Marxism and post-Keynesian economics as well that between post-Keynesian economics and capitalism (Chapter 35). I concluded that Kaldor's post-Keynesian theory of distribution fares better at the theoretical level

when compared to the basic approach taken by Marx in the First Volume of *Capital*. Kaldor was right in reversing the determination of the residual from the rate of profits to the wage rate. He explained the reversal in a lucid lecture given at the University of Beijing in the mid 1950s. However, it is the behavioural interpretation of the actual adjustment, via the distribution of income through price flexibility in relation to wages, that leaves much to be desired. On this Kalecki was on more solid grounds.

Geoff Harcourt

Jan Toporowski invited me to give a Valedictory Lecture at SOAS in May 2010 as Joan and I were returning permanently to Australia at the end of July (actually on our 55th Wedding Anniversary). I chose "The crisis in mainstream economics" as my topic, pinching the title from John Hicks's 1970s book, *The Crisis in Keynesian Economics*, Hicks 1974. With the help of Bob Rowthorn, Paul Omerod, Joe Stiglitz and others, I set out what I thought the sources and nature of the crisis were, setting the tenor of my arguments in between Joan Robinson's despairing last paper, "Spring cleaning" (1980) and the apocryphal story of "Sunny Jim" Callaghan, then the Labour Prime Minister of the UK, returning sun-tanned from holiday in the late 1970s and proclaiming "Crisis, what crisis?" That is to say, I tried to identify why modern theory was often inapplicable to vital issues in the real world as we know it but did not suggest, as Joan did, that we should scrap the lot and start anew.

I have long had a bee in my bonnet about the difference between two important concepts in economic theory, "period" and "run". They are now used interchangeably as being the same. The invitation by Christian Gehrke to contribute to a *Festschrift* volume for my long-time, dear friend, Heinz Kurz, reproduced in Chapter 2, allowed me to set out how I saw difference: that "period" was a theoretical concept whereby the economic theorist was in command, deciding what was and what was not locked up in the *cet par* pound. "Run", though, was an historical concept set in calendar time so that what was changing and what was not were specific historical events, not controlled by the theorist. I believe that Marshall and Keynes made this distinction in their analysis though I must confess that they were not always true to themselves.

Chapter 20 is an article originally published in *History of Economics Review* in 2007, in which I outline the contents and arguments of my 2006 book with Cambridge University Press, *The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers*. (John King pointed out to me that it should have been titled Cambridge Pioneers just as he told me that an earlier volume, *50 Years a Keynesian*, 2001, should have been 50 Years a post-Keynesian. On both counts I stand corrected.) The volume and the article bring together over 50 years of research and teaching, first, at Adelaide and

then at Cambridge in the 1980s and 1990s. Along with the biography of Joan Robinson (2009) that Prue Kerr and I wrote, our many other essays on Joan Robinson and her circle and *The Oxford Handbook of Post-Keynesian Economics*, jointly edited with Peter Kriesler and published in 2013, the essay bears witness to the principal intellectual task I set myself when I returned to Cambridge in 1982: to document the contributions of those working in the Cambridge tradition. I am delighted that Nuno Martins has now more than complemented our efforts with his magnificent volume, *The Cambridge Revival of Political Economy* (2014).

Chapter 21 was published in the volume on structural economic dynamics edited by Richard Arena and Per Luigi Porta (2012). It is a tribute to my long-time friend and sometime fellow graduate student and colleague at Cambridge, Luigi Pasinetti, the senior living heir to Cambridge tradition and possibly the last great system-builder we shall ever have in our "miserable subject". I examine the makeup of his comprehensive system which arises out of the classical economists, Marx, Keynes and the Cambridge Keynesians' contributions, together with his own original and illuminating views.

The *Scottish Journal of Political Economy* turned 60 in 2013. To celebrate, they asked a number of authors to write short comments on the articles that received most hits in each decade of the journal's existence. The article that received most hits in the journal's first decade was Ronald Meek's remarkable review article of Piero Sraffa's 1960 classic, Meek 1961. Meek, unlike most of the other reviewers, really brought out the essence of Sraffa's aims by stressing that the volume was not only "prelude to a critique of [mainstream] economic theory" but also provided the basis for a magnificent rehabilitation of classical political economy (read Marx as well as Smith and Ricardo). In my comment, reproduced in Chapter 24, I document this view and spell out some of its applications to recent occurrences in advanced capitalist economies.

My last essay on theory in the volume, Chapter 25, is an article that was commissioned by the *Global and Economic Review* for a celebration of Anwar Shaikh's incisive article, "Laws of production and laws of algebra: the Humbug production function" (1974). Shaikh's article was an outstanding critique of the neoclassical production function both as a theoretical concept and as the basis for econometric specification of models with which to estimate the relative contributions of deepening and technical progress to changes in productivity over time, as presented in Solow's 1957 article. I document Shaikh's argument, the ill-tempered (and atypical) response by Solow, and Shaikh's definitive reply in Ed Nell's 1980 volume in honour of Joan Robinson, published by Cambridge University Press. Anwar was one of the first to see how different are the "visions" behind neoclassical economists, on the one hand, and classical, Marxian and Keynesian/Kaleckian economists, on the other, differences which reflect differences in the meaning of capital as well as its measurement.

Peter Kriesler

My first two chapters in this volume are both contributions to *The International Encyclopedia of the Social Sciences*. One of the recurring themes in my work on economic theory, particularly in the collaborations with John Nevile, is a rejection of Walrasian general equilibrium analysis – including the IS-LM framework – for a method of analysis which is more Marshallian, based on mutual determination with an emphasis on causal factors. This is the method used by Keynes, Kalecki and Harrod, and is discussed in greater length in our Introduction and essays in Volume 1. Chapter 3 considers a particular aspect of this method, namely, the factors that are being held constant at any point of time, and the implications of this for the analysis, Chapter 4, on exchange value, also considers one of the underlying themes of all my work, namely, the path-dependant nature of economic analysis – in this case, in the determination of values.

Chapter 8 represents a collaboration between myself, Craig Freedman and Geoff Harcourt which looks at the logic of Friedman's critique of the Keynesian policy position. Friedman argued that if policy makers target unemployment, then inflation would continually accelerate – making the price of low levels of unemployment ever increasing inflation rates. Using the logic of his argument, we point out that it is symmetric, so that if policy makers target inflation then the cost of low inflation would be ever increasing unemployment. In effect, Friedman's logic means that, whichever of unemployment or inflation was targeted, the cost would be ever increasing levels of the other. This means that, when lower inflation became the main policy goal, the Phillips curve essentially became horizontal.

Joseph Halevi was an extremely important influence on the development of my ideas on economic theory. Among many other important ideas he introduced me to the concept of the Traverse, and of path-determinacy which have played a fundamental role in all my writing. In my earlier studies I realised that Kalecki has eschewed equilibrium analysis in favour of dynamic disequilibrium analysis in the form of business cycle and trend. Of particular importance to his work was the way in which the structure of the economy influenced effective demand – with a special role assigned to investment. As a result, the distribution of income was of fundamental importance in determining the level of employment and the subsequent dynamics of the economy. Due to his concern with dynamic disequilibrium, Kalecki was always dubious about long-period theory, believing that the long run has no independent identity, but is the result of a series of short-run positions. Joseph introduced me to the work of Adolph Lowe on the Traverse. It is the combination of Lowe, Hicks and Kalecki which provide the most meaningful analysis of the dynamic path the economy takes, and which is the focus of Chapters 13, 18 and 19 – the latter co-written with Joseph and Neil Hart.

In 2004, I was fortunate to spend my study leave in Ottawa with my family. There I enjoyed the warm hospitality of Marc Lavoie and Mario Seccareccia, two of the most thoughtful and intellectual economists I have known. During that time, Marc and I collaborated on a number of papers which explored the implication of the new consensus emerging in mainstream theory, with its emphasis on monetary policy through appropriate rules. In Chapters 28 and 29 we consider the implications of the new consensus model, and offer a post-Keynesian critique of the model in both the short-run and the longer-run growth variant.

John Nevile

My PhD thesis was on growth theory: analysing what happened when the short-period assumptions, especially the constant stock of capital, that Keynes made in *The General Theory* no longer held. It was inspired by my mentor at the University of California at Berkeley, Aaron Gordon (father of both David and Robert Gordon). Aaron Gordon's Presidential address to the American Economic Association was entitled "Rigour and relevance in a changing institutional setting". While I doubt that particular phrase was in my mind so many years ago, the thesis tried to be rigorous, using mathematics when appropriate, but usually in the spirit of Alfred Marshall. I certainly thought it was relevant, not for policy recommendations, but for understanding the nature of longer-run change in capitalist societies in the middle of the 20th century.

The thesis both reviewed what others had written, very critically in places, and contributed my own insights. The best chapter in the thesis was the one on Harrod, and the best part of that chapter was published in my 1962 *Economic Journal* article. In this series, that article is reproduced in the volume on Keynes, Kalecki and Harrod and my introduction to it is in that volume. However, the approach to theory I used in my PhD thesis sets the tone for my subsequent theoretical papers, including those included in this volume. Collaboration with Peter Kriesler helped to strengthen and deepen this approach.

To a large extent the papers I wrote before 1970 were about theory. I certainly engaged in significant applied work in this period, most notably in producing the first econometric model of the Australian economy. However, this applied work was in the service of theory and in particular to increase understanding of the underlying characteristics of the post-World War II Australian economy. The conclusion warned against making policy recommendations based on the results. It took me time as a young economist to gain the confidence necessary to make pronouncements about economic policy. In passing, it is worth mentioning my view that economics would be a discipline more respected by the population at large if young neoclassical economists showed similar restraint.

A turning point in my development as an economist came in 1970 with the publication of my book, *Fiscal Policy in Australia: Theory and Practice*. This was a great success, at least by my standards. However, everyone seized on the "practice" part. Then, and now, I was, and am, equally proud of the theory side, and relish the opportunity to publish the extract from it in Chapter 27 of this volume. The algebra it contains is simple, some would say over-simple, but, although it ignores many of the qualifications that would usually be made in an academic paper, nevertheless it proved successful in predicting the results of federal budget changes (unless of course I was just very lucky in doing this).

Be that as it may, all my papers in this volume published after 1970 have direct relevance for policy. Chapter 6 was written in response to my colleagues' complaints about the difficulties of finding a suitable textbook for first year macroeconomics. It was deliberately written in an heuristic style in the hope that it would be read by dissatisfied students as well as by their teachers. While it contains other material, at its heart is its analysis of the shortcomings of textbook analysis based on an ISLM general equilibrium approach and its praise for the benefits of a Marshallian particular equilibrium approach such as Keynes used in *The General Theory*. This and related issues are discussed in more detail, and, if I dare say it, more rigorously, in the paper entitled "What Keynes would have thought of the development of ISLM?" in Volume 1 of this series.

At the beginning of the 1980s there was widespread concern among post-Keynesian economists at the growing fashion among first year macro textbook writers to use a version of ISLM that was a Walrasian comparative static model to determine the equilibrium position for output and often also prices, but then assume an exogenous shock displaces the economy from its equilibrium position and describing the return to equilibrium by a dynamic process foreign to the theory previously taught. Nevile and Rao in Chapter 7 of this volume strongly support this concern but argue that it pales into insignificance with the emergence later in the 1980s of analysis that argued that the supply curve in the ISLM diagram was a focus of equilibrium points in a competitive labour market and then combining it with a demand curve that assumes all prices including that of labour are exogenous.

The paper written with Paul Dalziel was commissioned by Geoff Harcourt for *The Oxford Handbook of Post-Keynesian Economics*. While Paul was the primary author for the New Zealand section, as I was for the Australian one, the whole paper was a joint enterprise. For my part, I particularly enjoyed the part tracing what looks very like Keynesian economics back to the early years of Australia as a country.

Like Chapter 5, written jointly with Peter Kriesler, the final paper of mine in this volume was commissioned. William A. Darity Jnr invited me to contribute the major article and two subsidiary articles on the rate of interest in the second edition of *The International Encyclopedia of the Social Sciences*.

These have been integrated into one article in Chapter 31. Thus, this chapter was not written primarily for economists. However, it may be useful as a brief, and I hope easily read, overview for those who do not work in the field of interest rate theory.

As other chapters in this volume show, Peter and my ideas have developed significantly since Chapter 5 was written. Nevertheless, this chapter sets out two foundations stones of our later work: the importance of expectations in determining the level of private sector investment in an economy and the fact that where the economy is at any point in time depends, often crucially, on how it got there. It also contains another important insight. Despite the self-evident truth that what one can say about the determination of the exchange rate rates depends on institutions and policies which may change rapidly, for some time speculation has overwhelmed other motives for transactions in the Australian foreign exchange market.

References

Hicks, John (1974), *The Crisis in Keynesian Economics,* Oxford: Basil Blackwell.

Meek, R. L. (1961), Mr Sraffa's rehabilitation of classical economics. *Scottish Journal of Political Economy*, 8(2), pp. 119–36.

Nell, Edward J. (ed.) (1980), *Growth, Profits and Property. Essays in the Revival of Political Economy*. Cambridge: Cambridge University Press.

Robinson, Joan (1980, 1985), "Spring cleaning", mimeo, Cambridge; published as "The theory of normal prices and the reconstruction of economic theory" in G. R. Fiewel (ed.) (1985), I*ssues in Contemporary Macroeconomics and Distribution*, London: Macmillan.

Shaikh, Anwar (1974), "Laws of production and laws of algebra: The Humbug production function", *Review of Economics and Statistics*, 54, 115–20.

Shaikh, Anwar (1980), "Laws of production and laws of algebra: Humbug II", in Nell (ed.) (1980), 80–95.

Solow, R.M. (1957), "Technical change and the aggregate production function", *Review of Economics and Statistics*, 39, 312–20.

Part I
Economic Theory

1
The Crisis in Mainstream Economics

G. C. Harcourt

In preparing this chapter I have been greatly helped by hearing and then reading Bob Rowthorn's speech to the King's Economists on 17 April; Paul Omerod's dissection of modern macroeconomics in the February 2010 issue of *21st Society, the Journal of the Academy of the Social Sciences*; Heinz Kurz's paper, "On the dismal state of a dismal what?", on the deficiencies of mainly Lucasian theory in the light of the current prolonged crisis, together with his careful gathering together of Lucas's more outlandish and extraordinary claims for his approach and contributions and those of his tribe of admiring followers, especially when Keynes's contributions as they see them and which Keynes never claimed to have made, are used as his and their *numeràire;* Lance Taylor's "tome for our times", *Maynard's Revenge* (2010), published by Harvard University Press; Robert Skidelsky's, *The Return of the Master* (2009); Joe Stiglitz's many criticisms of the extreme versions of modern theory which served to justify the Washington Consensus and its implications for universal policy proposals, see, for example, *Freefall* (2010); Ben Friedman's review of recent books by John Cassidy and John Lancaster; Tony Judt's article, "Ill fares the land", in a recent issue of the *New York Review of Books*, April-May 2010; and John Quiggin's *Zombie Economics* (2010). I would also like to mention a most effective critique-from-within by Ricardo Caballero (2010).

My title is pinched from John Hicks, *The Crisis in Keynesian Economics* (1974), his Yrjö Jahnsson Lectures; but let us also remember the apocryphal story of "Sunny Jim" Callaghan returning, sun-tanned, to strife-torn UK at the end of the 1970s and responding "Crisis, what crisis?"

In his book Hicks saw Keynesian economics in crisis on three fronts – the multiplier (because of the role of stocks); liquidity preference theory

Revised from *Macroeconomics and the History of Economic Thought. Festschrift in Honour of Harald Hagemann*, 183–190, 2012, 'The Crisis in Mainstream Economics,' by Harcourt, G. C. With kind permission from Taylor and Francis LLC. All rights reserved.

(because of complex portfolios of financial assets rather than a simple choice between money and bonds, coupled with concentration on the long-term rate of interest[1]); and wages (Keynes's "failure" to provide an economic theory of the possible relationships between money wages, their levels and rates of change, and employment, its level and rate of change). So Hicks was tackling what he saw as deficiencies in a past theory when confronted with a (present day) reality. In my view Hicks rather overdid it because his view of Keynes was too much influenced by his own version of *The General Theory – IS/LM* – which by the 1970s dominated the profession, rather than how Keynes himself had presented his theory in terms of his aggregate demand and supply functions. This provides yet another example of the tragedy that Lorie Tarshis's 1947 textbook did not dominate the post-war teaching of the economics of Keynes in the United Kingdom, the USA and elsewhere.[2]

There are similarities between this 1970s episode and what has happened in the last 30 years or more, now brought into sharp relief by the ongoing crisis in the capitalist world. Despite its great technical sophistication, in its conceptual essence, mainstream economics, now argued by its proponents to be increasingly converging on agreement and uniformity, is what Joan Robinson dubbed (as early as 1964) "pre-Keynesian theory after Keynes". Dominant figures in this transformation include Friedrich Hayek, Milton Friedman, Robert Lucas and Eugene Fama, with Lucas and Fama currently the patron saints of Chicago, and modern macroeconomics (real and financial) and macroeconomists, including Michael Woodford and John Cochrane. Now that it is put to its first really challenging test in "the great recession", following the period of "the great moderation", let us examine whether its explanatory power and relevance have been found wanting.

Though there are several variants of modern macroeconomics, they all have their roots in (Irving) Fisherian Walrasian models of the process of accumulation in modern societies. In these, the consumer queen attempting to maximise her expected life time utility is the core actor and decision-maker, with all other actors and institutions subject to her whims and desires, especially within a competitive environment.[3]

Fisher's basic vision and construct in theoretical terms was spelt out most fully and rigorously in the Arrow-Debreu model of general equilibrium. Subsequently, in the hands of Lucas and others, it was simplified in order to analyse the macroeconomic economy and to be the basis of stochastic general equilibrium models which at a practical level came more and more to serve policy makers in both central banks and treasuries. (At the same time Fisher's perceptive analysis of the consequences of debt deflation has largely been ignored.)

Concomitant with these developments was the development of the rational expectations hypothesis and its implications for views on how the economy functions. Though the rational expectations hypothesis by itself is no more than a hypothesis about expectations formation, something to be

adopted until found wanting, when it is integrated with views of how the economy works, it becomes in its simplest and most stark form the proposition that the world may be viewed *as if* perfect competition and perfect foresight ruled in all markets, what Willhem Buiter aptly dubbed many years ago, "The macroeconomics of Dr Pangloss" (1980). For example, Lucas's policy ineffectiveness result follows not from rational expectations as such but from its use with a vertical aggregate supply curve. If a first-year student were to be asked what would be the impact on price and quantity of a rise in the demand curve in a market with a vertical supply curve, he/she would of course answer, price is higher, quantity is the same. As Joan Robinson once remarked (in another context), "After putting the rabbit into the hat in the full view of the audience, it does not seem necessary to make so much fuss about drawing it out again" (1966, 308).

Increasingly, in one strand of these developments, macroeconomic issues came to be analysed in terms of one representative agent models (Lorie Tarshis regarded this as the major heresy of (all) modern economics). This meant the rejection of any role for the fallacy of composition, a vital strand of the economics of Keynes. In turn this meant that the determination of the rate of interest could no longer be seen as the outcome of an uneasy truce at the margin between bulls and bears in financial markets; nor the role of sustained inflation as establishing disappointed but not worsening aspirations between the capitalist accumulating and employing class and the wage-earning class. It also rejects another core Keynesian insight that the whole is often greater than the sum of the parts, now re-established in modern economics by Wynne Godley and Marc Lavoie's remarkable new book, *Monetary Economics* (2007).[4]

Another development, which on the face of it (and when examined more deeply, even by reading the original article), is the inappropriate use of Frank Ramsey's benevolent dictator model to represent the essential workings of the economy. Ramsey's 1928 model of optimum saving was never so intended and it is salutary to reread or even read for the first time both it and its author's own evaluation of the article. When he submitted the article to the *Economic Journal*, he wrote to Keynes (28.6.1928): "Of course the whole thing is a waste of time ... [It was distracting him from] a book on logic ... [because] it [was] much easier to concentrate on than philosophy and the difficulties that arise rather [obsessed him]".

What of the New Keynesians? In his Marshall Lectures of some years ago (on a theorist looks at policy and a policy maker looks at theory), delivered when he was an advisor to President Clinton, Joe Stiglitz chose the New Keynesians as the modern development that most provided a rationale for Keynes-type results and policies. He also said that as a graduate student in Cambridge (UK) in the 1960s, he learnt most from the Cambridge Keynesians, especially Nicky Kaldor[5], and that it was their analysis and policies he drew on in his advice to Clinton. Nevertheless, he never once mentioned the

post-Keynesians, even though many of their ideas and insights were attributed by him to the other more fashionable "schools" he named.

The New Keynesians have made considerable contributions, not least when *internally* criticizing mainstream macroeconomics – think Hahn and Solow (1995). Yet, even though their theories do produce Keynes-like results, these are traced back to imperfections in the working of market processes. This has the implication that the removal of such imperfections in real world happenings would usher in the world of Dr Pangloss – which is exactly the claims that the other strands make for their analyses. In particular, there is the major claim made that if competitive pressures were allowed freely to operate in all major markets – goods, labour, financial (national and international, long-term and short-term), foreign exchanges – for most of the time we would get near optimum workings of economies. Moreover, if there were exogenous shocks such institutional set ups would be the best way of allowing systems to adjust and quickly remove their effects. The high priest of these views is/was Alan Greenspan (though his mentor is the appalling Ayn Rand).

As is now well known, in the laundry basket at Tilton, Keynes's drafts of the differences between the cooperative, neutral and entrepreneur economies were discovered after volumes XIII and XIV of the *Collected Writings* had been published, resulting in a supplementary volume XXIX. These contrasts figured prominently in Keynes's lectures at Cambridge prior to the publication of *The General Theory* and their omission was the event that most surprised and distressed Tarshis (who had been to the lectures) when he read *The General Theory*. Why? Because he thought them the best base on which to place Keynes's critique of the (non-) operation of Say's Law in an unregulated capitalist economy, see Harcourt (1995, 1246). Rather like an Evangelical Christian asking "Brother, are you saved?", Joan Robinson would ask what could or could not be determined directly by the actors most critically affected by the decision – the money wage or the real wage (the money wage, of course)? And Lorie Tarshis's litmus paper test for acceptance intellectually was which way does causation run – from the goods market to the labour market or the other way around? The entrepreneur economy was one of Keynes's ways of showing how and why monetary and financial matters must be integrated with real factors from the start of the analysis of a monetary production economy.[6]

It is this insight that is missing from virtually all strands of modern mainstream theory. They have not taken on board the fundamental criticism that Frank Hahn made many years ago (and Colin Rogers, 2006) has revived recently in his criticism of Cochrane and Woodford), that there is no place for anything recognizable as money in general equilibrium models. Thus both the cycle and the trend (which, in Post-Keynesian analysis, are regarded as indissoluble), in mainstream theory are taken to be operating independently of monetary and financial matters. Real business

cycle theory, which has some similarities with 1930s Hayekian conjectures (though Hayek certainly understood about the role of money) is exactly what it calls itself. And Lucas argues that the world operates for most of the time near enough to a steady-state rate of growth as to use the latter as a short cut in his explanations. "The balanced growth path will be a good approximation to any actual path "most of the time" ... exactly the reason why the balanced path is interesting to us", Lucas (1988, 11). Jean-Baptiste Kaldor of 1950s–1960s vintage could not have put it better.

Then there is the hoary old question of the essential difference between risk and uncertainty, so essential to the economics of Keynes, how they can be analysed and what their effects are on systemic behaviour. Bob Rowthorn (2010) makes the point that while microeconomic theories of risk have been systematically and usefully advanced, systemic spill over effects have been badly neglected in the analysis of a modern world characterised by wide-ranging networks of financial markets. Thus the possible malfunctionings of the latter and the feedbacks into real sectors, so prominent in the happenings of the last three years and more, have not been analysed in any fundamental ways in mainstream economics. Omerod (2010) adds to this insight by pointing out that the analysis of risk in financial markets rests on the assumption that underlying distributions usually approximate to the normal distribution and in particular "fat tails" are assumed away. He directs us to a long-established literature on the possible chaotic effects of the existence of fat tail distributions and relates this to recent happenings.

I have mentioned Lucas's arguments concerning the applicability of steady-state analysis usually associated with the theory of the long period (though Post-Keynesians would say, *correctly*, that it should not ever be thought to apply to the actual long run). But there is an element of wanting to have it both ways present when at the same time the short period and the long period are collapsed into one and all markets are taken to be clearing all the time.[7] The Lucasians also argue that if we do not start from an assumption of utility maximising individuals, we are inevitably guilty of *ad hockery*. In doing so they ignore Kaldor's critique, that this approach leads to begging the question about the world being observed, that the observed happenings must have been thrown up by such behaviour in an equilibrating setting in which the factors responsible for existence (unique or otherwise) may be separated from those responsible for stability (local and global). Though path-dependence and multiple equilibria have taken increasingly conspicuous roles in the most sophisticated versions of mainstream theory, they have had little systematic effect on its more down-to-earth and more used versions. Certainly the possibility of cumulative causation processes operating in many important markets and indeed in systems as a whole is rarely if ever discussed, let alone countenanced.

Moreover, the mainstream has increasingly argued as if saving led and investment followed, seemingly refuting, possibly in ignorance of, James

Meade's take on the Keynesian revolution: "Keynes's intellectual revolution was to shift economists from thinking normally in terms of a model of reality in which a dog called *savings* wagged his tail labeled *investment* to thinking in terms of a model in which a dog called *investment* wagged his tail labeled *savings*", Meade (1975), 82, emphasis in original. Meade's insight should be coupled with the Keynes-Kalecki process, finance → investment → saving.

Nor is there ever much use made of the distinction between the investment goods sector and the consumption goods sector, or between the capitalist class (all three) and the wage-earning class when analyzing processes at work in modern capitalism. A person from Mars would be hard put to find much if any resemblance between the theory with which he/she was presented and the world with which he/she/it was confronted.

To sum up, there is a crisis in mainstream economics, in the teaching of it and in its application to theory and policy. For, by and large, it neither makes sense of what has happened or of what should and could be done about it. I would not go anywhere as near as far as Joan Robinson in "Spring cleaning" (1980, 1985) – scrap the lot and start again. Rather I am somewhere in between discerning a crisis and "Sunny Jim's" supposed response. We do need a thorough rethink and regrouping in order to back up the tentative measures being taken at the moment to tackle the present crisis (they are very much a curate's egg approach, often more bad than good in parts[8]), to better explain how our modern world functions and malfunctions and what may be done about it by people of goodwill who are humane, progressive and pragmatically practical. Immodestly, I hope I may be regarded a member of this band; I certainly regard Harald as a leading member of it.

Notes

This chapter originated in a Valedictory Lecture I gave at SOAS, University of London, on 12 May 2010. I have revised it for the present volume in honour of Harald Hagernann, whose deep scholarship combined with independence of mind and a sunny temperament, should have kept mainstreamers on their toes, if only they had had the wit and open-mindedness to absorb his criticisms and positive contributions.

1. Hicks must have forgotten the important article by Richard Kahn (1954) and book by Joan Robinson (1952), which tackled these issues.
2. For the story of why this was so, see Harcourt (1995).
3. The major alternative view has ruthless, swash-buckling capitalists – industrial, commercial and financial – as the core actors, with accumulation and profit-making a way of life, ends in themselves, and all other components of capitalism, including national governments, subservient to their decision-making.
4. May I pay here a heartfelt tribute to my old and much admired and loved friend, Wynne Godley, who died on 13th May 2010?
5. Stiglitz had been sent to Cambridge by Paul Samuelson and Bob Solow while still a graduate student at MIT. He went first to Joan Robinson, but they did not get on – principally Joan's fault – so he went to Frank Hahn who always defended Keynes's ideas even when he put them in inappropriate contexts.

6. An excellent discussion of why this is so is Rogers (2010).
7. Such a collapse is an unacceptable feature of the specification of neoclassical models in much econometric practice, see Harcourt (2007).
8. Decision makers in many European economies seem determined to create a double dip recession by their own efforts, not least in the UK.

References

Arestis, Philip, Michelle Baddeley and John S. L. McCombie (eds) (2007), *Economic Growth. New Directions in Theory and Policy*, Cheltenham, UK, Northhampton, USA: Edward Elgar.

Buiter, W.H. (1980), "The macroeconomics of Dr Pangloss: A critical survey of the new classical macroeconomics", *Economic Journal*, 90, 34–50.

Caballero, Ricardo J. (2010), "Macroeconomics after the crisis: Time to deal with the pretense-of-knowledge syndrome", *Journal of Economic Perspectives*, 24, 85–102.

Cassidy, John (2009), *How Markets Fail: The Logic of Economic Calamities*, Farrar, Straus and Giraux.

Dimand, Robert W., Robert A. Mundell and Alessandro Vercelli (eds) (2010), *Keynes's General Theory after Seventy Years*, Houndmills, Hampshire: Palgrave Macmillan.

Fiewel, G.R. (ed.) (1985), *Issues in Contemporary Macroeconomics and Distribution*, London: Macmillan.

Friedman, Benjamin M. (2010) "Two roads to financial catastrophe", *New York Review of Books*, LVII, April–May, 27–29.

Godley, Wynne and Marc Lavoie (2007), *Monetary Economics. An Integrated Approach to Credit, Money, Income, Production and Wealth*, Houndmills, Basingstoke, Hants.: Palgrave Macmillan.

Hahn, F.H. and R.M. Solow (1995), *A Critical Essay on Modern Macroeconomic Theory*, Oxford: Basil Blackwell.

Harcourt, G.C. (1995), "Lorie Tarshis 1911–1993: An appreciation", *Economic Journal*, 105, 1244–55.

Harcourt, G.C. (2007), "The relevance of the Cambridge – Cambridge controversies in capital theory for econometric practice", in Arestis, Baddeley and McCombie (eds) (2007), 117–35.

Hicks, John (1974), *The Crisis in Keynesian Economics*, Oxford: Basil Blackwell.

Judt, Tony (2010), "Ill fares the land", *New York Review of Books*, LVII, April–May, 17–19.

Kahn, R.F. (1954), "Some notes on liquidity preference", *Manchester School of Economic and Social Studies*, 22, 229–57.

Keynes, Milo (ed.) (1975), *Essays on John Maynard Keynes*, Cambridge: Cambridge University Press.

Kurz, Heinz (2010), "On the dismal state of a dismal what?", mimeo, University of Graz, now published in *Homo Oeconomicus*, 27, 2010, 369–89.

Lancaster, John (2009), *I. O. U.: Why Everyone Owes Everyone and No One Can Pay*, Simon and Schuster.

Lucas, R.E. (1988), "On the mechanics of economic development", *Journal of Monetary Economics*, 22, 3–42.

Meade, J.E. (1975), "The Keynesian revolution" in Milo Keynes (ed.) (1975), 82–88.

Omerod, Paul (2010), "The current crisis and the culpability of macroeconomic theory", *21st Society. Journal of the Academy of Social Sciences*, 5, 5–18.

Quiggin, John (2010), *Zombie Economics. How Dead Ideas Still Walk Among Us*. New Jersey, USA: Princeton University Press.
Ramsey, F.P. (1928), "A mathematical theory of saving", *Economic Journal*, 38, 543–59.
Robinson, Joan (1952), *The Rate of Interest and Other Essays*, London: Macmillan.
Robinson, Joan (1964), "Pre-Keynesian theory after Keynes", *Australian Economic Papers*, 3, 25–35.
Robinson, Joan (1966), "Comment on Samuelson and Modigliani", *Review of Economic Studies*, 33, 307–8.
Robinson, Joan (1980, 1985), "Spring cleaning", mimeo, Cambridge; published as "The theory of normal prices and the reconstruction of economic theory" in Fiewel (ed.) (1985), 157–65.
Rogers, Colin (2006), "Doing without money: A critical assessment of Woodford's analysis", *Cambridge Journal of Economics*, 30, 293–306.
Rowthorn, R.E. (2010), "King's Speech 17 April 2010", mimeo, Cambridge.
Skidelsky, Robert (2009), *Keynes. The Return of the Master*, London: Allen Lane.
Stiglitz, Joseph E. (2010), *Freefall. Free Markets and the Sinking of the Global Economy*. USA: W.W. Norton and Co.; London: Allen Lane.
Tarshis, Lorie (1947), *The Elements of Economics. An Introduction to the Theory of Price and Employment*, Boston: Houghton Mifflin, 2nd Edition, 1966.
Taylor, Lance (2010), *Maynard's Revenge*, Cambridge, Mass: Harvard University Press.

2

On the Concepts of Period and Run in Economic Theory

G. C. Harcourt

2.1

Heinz Kurz has made major contributions to our understanding of long-period production—interdependent models inspired by Piero Sraffa's classic writings (see, for example, Kurz and Salvadori, 1995). In doing so he has, on the whole, sided with the view of Pierangelo Garegnani, John Eatwell and Murray Milgate (see, for example, Eatwell, 1997) that, traditionally and necessarily, rigorous economic theory can only be long period in the sense of analyzing relationships between dominant, persistent forces at work in the economy. This implies that there is no place, or at least little fundamental place, for a theory of the short period in its own right: this is so, despite Richard Kahn's superb, path-breaking 1929 Fellowship Dissertation for King's College, Cambridge, "The economics of the short period"[1], and the dominant view of Keynes scholars that the analysis of *The General Theory* itself is mainly placed in a short-period setting, as it is in Michał Kalecki's approach in his analysis of accumulation, the cycle and growth. The last occurred in Keynes's own as well as others' contributions, not least because of Kahn's key influence on the development of Keynes's thought as he moved from *A Treatise on Money* (1930) to *The General Theory* (1936) (see Harcourt, 1994; 1995, Ch 5).

In some ways Kurz's stand is reflected in the methodology of modern mainstream theory, not least as it is to be found in the dominant textbooks. Typically, students are introduced to the theory of long-term growth, a modern updated version of Roy Harrod's natural rate of growth, g_n (Harrod, 1939, 1948). g_n is now interpreted as the **actual** long-run path of the economy which needs explanation, rather than the supply-side potential of the economy, as Harrod had it. A perhaps extreme version of this is the

Revised from *Classical Political Economy and Modern Theory. Essays in Honour of Heinz Kurz*, 257–265, 2011, 'On the Concepts of Period and Run in Economic Theory,' by Harcourt, G. C. With kind permission from Routledge. All rights reserved.

following statement by Robert Lucas[2] 'The balanced growth path will be a good approximation to any actual path "most of the time" … exactly the reason why the balanced path is interesting to us" (Lucas, 1988, 11). In so far as the short period gets a hearing at all, it is in analysis of fluctuations around this long-period full-employment trend of the economy, often (but increasingly less so), in terms of the **IS/LM** interpretation of Keynesian theory. This dichotomy in the profession goes back at least to the unceasing debates between those two great friends, Thomas Robert Malthus and David Ricardo, who seldom saw eye to eye on analytical matters, yet greatly loved and respected each other. (Could this be said of the pairing in our trade now of any two 'heavies', who take diametrically opposing views?) Ricardo wrote to Malthus about their disputes: "It appears to me that one great cause of our difference of opinion … is that you have always in your mind the immediate and temporary effects of particular changes – whereas I put these … quite aside, and fix my whole attention on the permanent state of things which will result from them" (Ricardo to Malthus, 24 January 1817, in Sraffa with Dobb, vol. VII, 1952, 120).

One by-product of this long-established dichotomy has been the incoherence in the narratives about the medium term between the short period and the long period, an incoherence which has been stated most clearly by Bob Solow (1997, 231–32): "One major weakness in the core of macroeconomics … is the lack of real coupling between the short-run picture and the long-run picture."

I want now to mention a long-running distinction that I often stress, that between 'period' and 'run'. I argue that though they were not always consistent in their usage – would we have ever remembered Keynes saying "*In the long period*, we are all dead"? – Marshall and Keynes did have such a distinction in mind. 'Period' is a theoretical concept where what is and what is not confined to the *cet. par.* pound is decided by the theorist in question (and the issue being examined); whereas 'run' refers to actual historical episodes where what relevant determining factors change or do not change are products of that particular historical episode and are not decided by the theorist and/or historian analyzing it. Dennis Robertson clearly recognized this when in 1956 he distinguished between two concepts of the long period which Marshall had in mind, one of which I would argue is more akin to a run: "one in which it stands realistically for any period in which there is time for *substantial* alterations to be made to the size of the plant, and one in which it stands conceptually for the Never-never land of unrealized tendency" (Robertson, 1956, 16, emphasis is in original; see also Guillebaud, 1952, 126–7).

Finally I shall argue that a possible solution to the conundrums and incoherence thrown up by these issues is to be found in the approach (which occurred independently of each other) of Richard Goodwin and (late) Michał Kalecki. In their approach, the trend and cycle are regarded

as "indissolubly mixed" – "fused indissolubly" is Goodwin's expression (see Goodwin, 1982, 117) – and that the world we observe is exhibiting processes of cyclical growth. In such processes, the impact of long-term and short-term factors on decision-makers in the present provides the conditions to establish, not only what happens now but also what will happen next; and so on. Kalecki put it succinctly and with crystal clarity (so what is new?): "the long-run trend [is] but a slowly changing component of a chain of short-period situations … [not an] independent entity" (Kalecki, 1968; 1971, 165). For Goodwin's seminal contributions to the same approach, see Goodwin 1982 and Harcourt, 1985; Sardoni, 1992, Ch 21. Peter Kriesler has reminded me that the same considerations apply to the neglected but fundamental work on the concept of the traverse by, for example, John Hicks and Adolph Lowe (see Kriesler, 1999).

2.2

This view of the world provides a fundamental critique of the statistical procedure of breaking time series down into trend and cyclical components,[3] a procedure which assumes that the factors responsible for each component are overwhelmingly independent of one another. It also challenges the mainstream procedure of approaching economic issues by asking: is there an equilibrium out there to be found and, if so, is it unique or but one of a multiple set? And then asking, if there is an equilibrium (or a set), is it (or are they) locally and globally stable? This procedure also implies that the factors responsible for the existence of equilibrium (equilibria) are overwhelmingly independent of those responsible for stability. Keynes himself seemed to follow the traditional approach when, in response to a criticism of *The General Theory* by Ralph Hawtrey, Keynes wrote:

> "[Hawtrey] finds … the whole genesis of dynamic change, not in what I regard as the fundamental factors, but in what I think is better described as the higgling of the market.
>
> Entrepreneurs have to endeavour to forecast demand. They do not, as a rule, make wildly wrong forecasts of the equilibrium position. But they may not get it just right; and they endeavour to approximate to the true position by a method of trial and error …" (Keynes, *C.W.*, vol XIV, 1973, 182)

In his 1937 lectures he wrote:

> "If I were writing the book again I should begin by setting forth my theory on the assumption that short-period expectations were always fulfilled; and then have a subsequent chapter showing what differences it makes when short-period expectations are disappointed" (Keynes, *C.W.*, vol XIV, 1973, 181)

To be fair to Keynes, he contradicts himself later on when he outlines the method of shifting equilibrium, which by allowing for such feedbacks, takes him a long way towards a theory of path-dependent cyclical growth (see Keynes, 1936; *C.W.*, vol VII, 1973, 293–4).

Joan Robinson also clearly had such a set of criticisms in mind when, in explaining Harry Johnson's inability to understand *The General Theory*, at least as she did, because of his age, she wrote: "The short period is here and now, with concrete stocks of the means of production in existence. Incompatibilities in the situation will determine what happens next. Long-period equilibrium is not at some date in the future: it is an imaginary state of affairs in which there are no incompatibilities in the existing situation, here and now" (Joan Robinson, 1962, 690).

Historical circumstances help to explain the disjuncture between the approaches and the reality that the theory is meant to illuminate. First, it is not always properly taken into account that our founder, Adam Smith, wrote before the industrial revolution had taken off in the United Kingdom in an all-embracing manner and that he was influenced by Isaac Newton and the characteristics of classical physics. Thus, his distinction between market prices and natural prices, with the latter argued to be centres of gravitation, is clearly an expression of this intellectual background. Whether market prices are regarded as fluctuating around or converging on natural prices, the latter are seen as having the characteristics of the core of a magnetic field, as being the dominant attractor of actual prices, the principal determinant of their sizes. Moreover, in a world before the industrial revolution was generally established, reversibility was more easy to accept than in a world where the industrial revolution was emerging and technical advances, investment and dynamic competition became more and more the norms. In such a world, classical physics, the analogy of the pendulum always swinging around or returning to its state of rest, became less and less appropriate, yet the bulk of economic theory continued to be built on such an analogy.

As we saw, Ricardo concentrated on the long period and, while he became more and more aware of the possible disrupting effect of machinery on employment levels and wage-earners' well-being, he found little place in his formal analysis for that most characteristic feature of the capitalist environment, technical progress and its embodiment through accumulation in the stock of capital goods. Perhaps this overstates the case because he did liken the effects of free trade to being akin to technical advances in agriculture, staving off in real time, the inevitable approach otherwise to the classical stationary state (see Harcourt, 2006, Ch 7, the section on Ricardo's theory of distribution and growth).[4]

Marx, of course, did recognise all this and there is no doubt that his basic concepts and his schemas of production and reproduction could be adapted to allow incisive analysis of these phenomena. Marshall also was well aware

of these outstanding facts of life in the world around him, but his theoretical structure, static partial equilibrium analysis, using supply and demand curves in the market, short and long periods, was at odds with his deep insight that the development of the economy was better explained by biology in the form of an evolutionary organic system.[5]

2.3

Many years ago I wrote a "speculative and exploratory" essay entitled, "Marshall, Sraffa and Keynes: incompatible bedfellows?" in which I examined the use by these authors of the concept of a centre of gravitation (see Harcourt, 1981; Sardoni, 1992, Ch 12). In contrast to the vision of the person being honoured in this volume, I had more faith in the operational nature of the concept in the analysis of Keynes's short period than I did in its use in Sraffa's system and Marshall's long period. I argued that it was more reasonable to take the short cut of using the short-period equilibrium values of saving, investment and income associated with the point of effective demand to illuminate actual values in the national accounts from period to period (quarterly and annually) than to explain observed price patterns by underlying natural prices, prices of production or normal prices. I also identified (with the help of John Eatwell, Pierangelo Garegnani, Bertram Schefold and Ian Steedman) four different definitions of centre of gravitation, all of which have been implied in economic theories using the concept.[6] Since I wrote the essay, I have been persuaded by Ajit Sinha (Sinha, 2010, Ch. 4) that Sraffa's system does **not** require the concept of a centre of gravitation in the sense of Smith and Ricardo's natural prices and Marx's prices of production. Marshall's use of the concept in a long-period context seems to me to be more and more problematic, no doubt a sign of yet another senior moment.

As Robertson pointed out (see above), in the Never-never land of theory, the Marshallian long-period equilibrium is the final outcome of a series of short periods (short-period equilibria?) converging on it, stations on the way to this long-period cross. But it is a Never-never land because once the analysis starts, no change in methods of production (ie., there is no further technical progress or innovations) are allowed by the theorist to impinge on the convergence process. Clearly this is a serious limitation on the depiction of what actually happens in real world processes. (Heinz Kurz is, of course, explicit about this limitation, see, for example, Kurz and Salvadori, 1995, Chs 1 and 12). Yet this 'vision' not only underlies Marshall's analysis, it is also in essence the specification implied when applying co-integration techniques in modern econometric studies (see Granger, 1993; Harcourt, 2007). It is also the procedure that Stephen Marglin followed in his 1984 Marshall lectures (Marglin, 1984a and big book, 1984b) (see Harcourt, 2006, Ch. 8).

2.4

The person who most successfully overcame Marshall's self-imposed limitations was, of course, Wilfred Salter (Salter, 1960, 1965), who successfully brought together Marshall's methods and concepts, short period and long period, in his pioneering analysis of the embodiment through accumulation of the latest technical advances in additions to the existing stocks of capital goods. Salter did not require that the economy or industry or firm actually reach the position where the entire stock of capital goods consisted of the latest "best-practice" technique chosen under the influence of the expected relative prices of the services of the factors of production at the beginning of the period of analysis; only that, in a competitive environment, accumulation would proceed until actual prices allowed only the ruling competitive rate of profits to be received on new investment. Previous vintages in the stock of capital goods continued to contribute to total output as long as their quasi-rents were positive (strictly, non-negative). The abstractions needed to make this theory precise, to use a period to illuminate a run, are not nearly as far removed from the actual real world processes present in the run, as to lead us to query the illuminations provided.

The long-period method abstracts from these factors just as it illogically in terms of its own approach ignores in its analysis, the effect of another dominant and persistent force – the presence of inescapable, fundamental uncertainty in the environment in which all important economic decisions have to be made.

2.5

While I have been critical of some aspects of the approach to which Heinz has made such outstanding contributions, it would be wrong to deduce that there is not a substantial place in economic theory for this approach and these contributions. That is a major reason why I have always fought the attempts to remove them from their rightful place, both historically and analytically, under the rubric of post-Keynesianism. Moreover, even Joan Robinson, who was the most persistent and sustained expositor of the criticisms I have been making, acknowledged in her final evaluation of Piero Sraffa's influence, their essential place in the critique of the conceptual foundations of the mainstream and in the provision of viable and persuasive alternative approaches to economic theory. Thus in her 1980 article with Amit Bhaduri, she coupled together Marx, Sraffa and Kalecki as compatible bedfellows (each in their own place) in the way forward.

Richard Kahn in 1959 set out very clearly the nature, role and limitations of Golden Age analysis, of which the long-period theory of production is surely a species of this large genus. And in his positive endorsement of Kurz and Salvadori, the late Paul Samuelson noted that he would be buying new

copies of it (or subsequent new editions) at regular intervals, so great would be the depreciation of the current vintage in his possession from much use.

2.6

As I argued above, Goodwin's and late Kalecki's approach overcomes the incoherence located in the gap between the short period and the long period in the approach of mainstream economics, and in Marshall's attempts to close it. Goodwin and Kalecki also use centres of gravitation in the short-period Keynesian sense I discussed above. But that is not to say that there are not major difficulties associated with the analysis of cyclical growth itself. These have mainly to do with the transfer of the short period from the analysis of the individual firm or industry to the economy as a whole. It is probably not too far from actual happenings to take the capital stock (and the supply of skilled labour) as given for the firm's and the industry's short period (especially in a period of recession or depression as Kahn pointed out). But the assumption that all short periods in the economy are of the same length and start and end on the same dates are heroic assumptions of a completely different order of abstraction. One way in which this problem has been, or can be, tackled is to use rates of change at an instance in time. I think Joan Robinson may have had this in mind when she argued (Joan Robinson, 1971, 17–18) that "short period" was an "adjective, not a substantive", for which she was robustly criticised by Tom Asimakopulos, always a definite period of stretch of time person himself (see Harcourt and Kerr 2009, 93–94). He argued for the use of the macroeconomic short period being a definite length of historical time and so must have, at least implicitly, incorporated the assumptions mentioned above.[7]

An instance of time is also not without its difficulties, for actions occurring concurrently at an instance in time and which together determine current aggregate activity and its composition, are themselves outcomes of individual decisions spread out over past time and applying to periods in the future of different expected lengths – they do not occur simultaneously. That is why Keynes when writing *The General Theory* eventually despaired of ever finding an appropriate unit of time to handle these puzzles and so he set them to one side (see Keynes, 1973, 184–85; Harcourt, 1981; Sardoni, 1992, 258–59). But the same sorts of issues plague long-period analysis too.

2.7

To sum up, cyclical growth models, for all their limitations and unfinished business, have removed one major obstacle to the analysis of processes occurring in historical time. That is why I have come to regard them as the most promising way forward (though, alas, I lack the technical skills to be of much use in this exciting task). I do not, of course, expect Heinz to agree

with the first part of the last sentence though I am sure he would agree with the second part! Moreover, in writing this chapter I am conscious that I have drawn on views I have set out in other places over a long period (sic). But as I move through my 80th year, perhaps I may be indulged as I bring them together in one place in grateful homage to a great and good friend.

Notes

I thank but in no way implicate Christian Gehrke, Raja Junankar, Peter Kriesler, Prue Kerr and John Nevile for their comments on a draft of this chapter.

1. Kahn's Dissertation was only published in English in 1989, shortly after Kahn's death (see Kahn, 1989; Harcourt, 1994; 1995, Ch 5).
2. Needless to say (as I always advise Heinz not to write!), I am most grateful to Heinz for bringing the quote to my attention in a draft of Kurz (2010) at p.9. Alas, in the published version he has removed this quote.
3. It does not affect the impact of either seasonal or the existence of residuals on the magnitudes of variables in time series.
4. Peter Kriesler also reminded me that I had written about these puzzles in Harcourt, 1981; Sardoni, 1992; see Kriesler (1999, 400–401).
5. In his PhD dissertation (Hart, 2009), Neil Hart has written an incisive account of Marshall's dilemma and the more successful attempts to overcome it in the decades after Marshall's death in 1924 by the insights and contributions of modern evolutionary economists. See also the two books based on the dissertation, Hart, 2012, 2013.
6. Three were analogies drawn from physics, the fourth was drawn from meteorology. The first was a frictionless pendulum, the second, a pendulum which eventually stopped swinging because of frictions, the third, a dog always running towards its master, who is riding a bike. The fourth relates to the average values of the principal variables determining the average values of temperature over the year, (see Harcourt, 1981; Sardoni, 1992, 251–2).
7. I was glad to find that I had set out these limitations clearly at the beginning of an article I wrote in 1963 and published in 1965 (see Harcourt, 1965; Sardoni, 1992, 83–84).

References

Arestis, Philip, Michelle Baddeley and John S.L. McCombie (eds.) (2007), *Economic Growth. New Directions in Theory and Policy*, Cheltenham, UK, Northampton, MA, USA: Edward Elgar.

Arestis, Philip, Gabriel Palma and Malcolm Sawyer (eds.) (1997), *Capital Controversy, Post-Keynesian Economics and the History of Economics. Essays in honour of Geoff Harcourt, volume one*. London and New York: Routledge.

Bhaduri, Amit and Joan Robinson (1980), "Accumulation and exploitation: an analysis in the tradition of Marx, Sraffa and Kalecki", *Cambridge Journal of Economics*, 4, 103–15.

Eatwell, John (1997), "History versus equilibrium" in Arestis, Palma and Sawyer (eds.) (1997), 386–97.

Goodwin, R.M. (1982), *Essays in Economic Dynamics*, London: Macmillan.

Granger, Clive (1992), "What are we learning about the long-run?", *Economic Journal*, 103, 307–17.

Guillebaud, C.W. (1952), "Marshall's *Principles of Economics* in the light of contemporary economic thought", *Economica*, 19, 111–30.
Harcourt, G.C. (1965), "A two-sector model of the distribution of income and the level of employment in the short run", *Economic Record*, 41, 103–17, reprinted in Sardoni (ed.) (1992), 83–98.
Harcourt, G.C. (1981), "Marshall, Sraffa and Keynes: Incompatible bedfellows?", *Eastern Economic Journal*, 5, 39–50, reprinted in Sardoni (ed.) (1992), 250–64.
Harcourt, G.C. (1985), "A twentieth-century eclectic: Richard Goodwin", *Journal of Post Keynesian Economics*, 7, 410–21, reprinted in Sardoni (ed.) (1992), 379–87.
Harcourt, G.C. (1994), "Kahn and Keynes and the making of *The General Theory*", *Cambridge Journal of Economics*, 17, 11–23; reprinted in Harcourt (1995), 47–62.
Harcourt. G. C. (1995) *Capitalism, Socialism and Post-Keynesianism: Selected Essays of G.C. Harcourt*, Cheltenham,Glos.: Edward Elgar.
Harcourt, G.C. (2006), *The Structure of Post-Keynesian Economics*. *The Core Contributions of the Pioneers*, Cambridge: Cambridge University Press.
Harcourt, G.C. (2007), "The relevance of the Cambridge – Cambridge controversies in capital theory for econometric practice" in Arestis, Baddeley and McCombie (eds.) (2007), 117–35.
Harcourt, G.C. and Prue Kerr (2009), *Joan Robinson*, Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.
Harrod, R.F. (1939), "An essay in dynamic theory", *Economic Journal*, 49, 14–33.
Harrod, R.F. (1948), *Towards a Dynamic Economics: Some Recent Developments of Economic Theory and Their Application to Policy*, London: Macmillan.
Hart, Neil (2009), *Marshall's Equilibrium and Evolution: Then and Now*, unpublished Ph.D Dissertation, School of Economics, University of New South Wales, Sydney, Australia.
Hart, Neil (2012), *Equilibrium and Evolution: Alfred Marshall and the Marshallians*, Basingstoke, England: Palgrave Macmillan.
Hart, Neil (2013), *Alfred Marshall and Modern Economics: Equilibrium Theory and Evolutionary Economics*, Basingstoke, England: Palgrave Macmillan.
Kahn, R.F. (1929; 1989), *The Economics of the Short Period*, Fellowship Dissertation for King's College Cambridge, published in 1989 in London: Macmillan.
Kahn, R.F. (1959), "Exercises in economic growth", *Oxford Economic Papers*, 11, 143–56.
Kalecki, M. (1968), "Trend and business cycles reconsidered," *Economic Journal*, 78, 263–76; reprinted in Kalecki (1971), 165–83.
Kalecki, M. (1971), *Selected Essays on the Dynamics of the Capitalist Economy, 1933–1970*, Cambridge: Cambridge University Press.
Keynes, J.M. (1930), *A Treatise on Money*, 2 vols., London: Macmillan, *C.W.*, vols V, VI, 1971.
Keynes, J.M. (1936), *The General Theory of Employment, Interest and Money*, London: Macmillan, *C.W.*, vol VII, 1973.
Keynes, J.M. (1973), *The General Theory and After, Part 11: Defence and Development, C.W.*, vol XIV, London: Macmillan.
Kriesler, P. (1999), "Harcourt, Hicks and Lowe: incompatible bedfellows?" in Sardoni and Kriesler (eds) (1999), 400–417.
Kurz, Heinz D. (2010), "On the dismal state of a dismal science?", *Homo Oeconomicus*, 27, 1–21.
Kurz, Heinz D. and Neri Salvadori (1995), *Theory of Production. A Long-Period Analysis*, Cambridge: Cambridge University Press.
Lucas, R.E. (1988), "On the mechanics of economic development", *Journal of Monetary Economics*, 22, 3–42.

Marglin, S.A. (1984a), "Growth, distribution and inflation: a centennial synthesis", *Cambridge Journal of Economics*, 8, 115–44.
Marglin, S.A. (1984b), *Growth, Distribution and Prices*, Cambridge, MA: Harvard University Press.
Robertson, D.H. (1956), *Economic Commentaries*, London: Staples Press.
Robinson, E.A.G. (ed.) (1965), *Problems in Economic Development*, London: Macmillan.
Robinson, Joan (1962), Review of H.G. Johnson, *Money, Trade and Economic Growth* (1962), *Economic Journal*, 72, 690–2; reprinted in *CEP,* vol III, 1965, 100–2.
Robinson, Joan (1971), *Economic Heresies: Some Old-Fashioned Questions in Economic Theory*, London: Macmillan.
Salter, W.E.G. (1960), *Productivity and Technical Change*, Cambridge: Cambridge University Press.
Salter, W.E.G. (1965), "Productivity and accumulation as historial processes" in E.A.G. Robinson (ed.) (1965), 266–91.
Sardoni, C. (ed.) (1992), *On Political Economists and Modern Political Economy. Selected Essays of G.C. Harcourt*, London: Routledge.
Sardoni, C. and P. Kriesler (eds) (1999), *Keynes, Post-Keynesianism and Political Economy. Essays in honour of Geoff Harcourt, Volume Three*, London: Routledge.
Sinha, Ajit (2010), *Theories of Value from Adam Smith to Piero Sraffa*, London, New York, New Delhi: Routledge.
Solow, R.M. (1997), "Is there a core of usable macroeconomics we should all believe in?" *American Economic Review, Papers and Proceedings*, 87, 230–32.
Sraffa, P. with the collaboration of M.H. Dobb (eds.) (1951–73), *Works and Correspondence of David Ricardo*, 11 vols., Cambridge: Cambridge University Press.

3
Partial Equilibrium Analysis

Peter Kriesler

With the publication of the first edition of his *Principles of Economics* in 1890, Alfred Marshall developed partial equilibrium analysis as a method for turning economic theory into a form that could be used to formulate policy and aid in the analysis of actual problems. He wanted economics to be "an engine for the discovery of concrete truth" (Hausman 1992, p. 152). In partial equilibrium each market or section of the economy is considered as a separate entity, and so its interdependence with other markets is not considered. This often is described as *ceteris paribus*, that is, other things do not change. To bring some order and understanding to an extremely complex world in which everything affects everything else, partial equilibrium concentrates on key relations, holding the rest constant (Hausman 1992). It is not that these factors are believed to be unchanging but that they are held in the ceteris paribus "pound." As Marshall stated in 1922:

> The forces to be dealt with are however so numerous, that it is best to take a few at a time: and to work out a number of partial solutions.... Thus we begin by isolating the primary relations of supply, demand and price in regards to a particular commodity. We reduce to inaction all other forces by the phrase "other things being equal": we do not suppose that they are inert, but for the time being we ignore their activity.... In the second stage more forces are released from the hypothetical slumber that had been imposed on them. (Marshall 1922, pp. xiv–xv)

Marshall suggested that, in each stage of the analysis, more factors could be allowed to vary.

> The element of time is a chief cause of those difficulties in economic investigations which make it necessary for a man with limited powers

Revised from *International Encyclopedia of the Social Sciences*, 2E, 151–153, 'Partial Equilibrium Analysis,' by Kriesler, P. With kind permission from Gale. © 2008 Gale, a part of Cengage Learning, Inc. www.cengage.com/permissions. All rights reserved.

> to go step by step; breaking up a complex question, studying one bit at a time, and at last combining his partial solutions into a more or less complete solution of the whole riddle. In breaking it up, he segregates those disturbing causes, whose wanderings happen to be inconvenient, for the time in a pound called *Ceteris Paribus*. The study of some groups of tendencies is isolated by the assumption *other things being equal*.... With each step more things can be let out of the pound. (Marshall 1922, p. 366, emphasis in original)

3.1 Interdependence in Prices and Markets

Marshall was fully aware of the interdependence between most markets and prices in the economy, as is apparent from notes XIV and XXI of the Mathematical Appendix to his *Principles*, where he outlined the basis of a general equilibrium system. However, he realized that attempting to analyze that interdependence would render the economic problem so complex that the main causal factors could not be isolated. Hence he regarded partial equilibrium analysis and the use of ceteris paribus as important approximations that allow casual inferences to be made and real-world problems to be studied.

In particular Marshall concentrated on the role of price in individual markets as the main determinant of the quantities supplied and demanded. To illustrate this, one can examine the demand for oranges (D_0), which will depend on their price (P_0), all other prices in the economy (P_1, ..., P_n), the income of all individuals in the economy (Y_1, ..., Y_m), the weather, people's tastes, international factors, and so forth:

$$D_0 = f(P_0, P_1, \ldots, P_n, Y_1, \ldots, Y_m, \text{weather, tastes, etc.}).$$

Some of these factors, such as weather and tastes, are not economic variables, and so they normally are considered exogenous. This does not mean that it is assumed that they do not change but that their changes cannot be explained within economics, and so they are unlikely to be influenced significantly by economic variables. What is left is the general equilibrium demand function for oranges in terms of all prices and incomes in the economy. Clearly this is extremely complex because in general equilibrium everything affects everything else. Therefore it is difficult to use the theory to make meaningful statements about policy or causality.

In partial equilibrium analysis each market is considered in isolation. When each market is concentrated on individually and when part of the economy is broken off and relations within that part are considered, causal inferences can be made. In addition it is assumed that demand and supply are separable and can be represented as independent curves, with price determined as the balance of those forces. To calculate the partial equilibrium demand function for oranges, the price of oranges is considered as the main determinant, other things being equal. In other words, all variables

that are not determined within that market, particularly all other prices and incomes, are assumed for the analysis to be given and constant. This leaves the partial equilibrium demand curve for oranges:

$$D_0 = f(P_0)$$

3.2 Marshall's Four Time Periods

According to Marshall, the question of which factors are left in the ceteris paribus pound depends on the time allowed for those factors to respond to changes in the market. In particular the length of time that is allowed for supply to respond to changed conditions will exert an important influence on the operation of the market. Accordingly Marshall distinguished four time periods that are appropriate for economic analysis, determined on the basis of which factors are held constant in each situation. The first is the very short run, or the market period in which it is assumed that goods are already at market and must be sold, so that supply cannot vary and price is determined mainly by demand. In the short period, quantity supplied is allowed to vary as a result of variations in production through changes in the variable factors, but the quantity and structure of fixed capital goods cannot be varied. As plants are fixed, firms can neither enter or exit the market, and so a supernormal profit can be made even in competitive industries. In the long period, plants can be varied, and firms can enter or exit from the market, and so all factors are variable. In this case no supernormal profit can be sustained in a competitive market. Finally, in what Marshall referred to as the "secular long period" knowledge, population, technology, and tastes all can vary.

3.3 Applications and Problems

Clearly, in evaluating partial equilibrium it is not relevant to consider the question of whether the underlying assumptions are realistic. As approximations, they are intended to focus on key relations, intentionally abstracting from secondary ones, which are held constant in the ceteris paribus pound. Demand and supply are determined by more than just the price of a commodity. However, in evaluating assumptions it is necessary to look at whether they capture the key aspects of any relationship, whether what is assumed away is as important as what is included, whether the variables that are assumed to be constant vary systematically with the variables included in the analysis, and whether the variables that are assumed to be independent, in this case supply and demand, are in fact interdependent.

As a result of these considerations, partial equilibrium can be applicable only to commodities that are relatively unimportant in terms of household budgets and that have neither close substitutes nor complements. If a

commodity has close complements or substitutes, changes in its price will lead to changes in demand conditions in other markets, which will lead to changes in prices in those markets. This means that the variables that are being held constant will change as a result of changes in the endogenous variables. This contradicts the ceteris paribus clause because ceteris are not paribus. Any change in price will lead, through its effect on other markets, to a shift in the demand curves in the market that is being considered. The things that are being held constant vary systematically with the ones being looked at, and this undermines the basis of partial equilibrium. In addition if the commodity was an important part of the household budget, changes in its price would lead to changes in the household's real income, thus changing another of the variables that have been held constant. In other words, for partial equilibrium it must be assumed that the income effect of a price change is very small. This means that the partial equilibrium framework is relevant only for goods on which only a relatively small proportion of the household budget is spent and for which there are no close substitutes or complements.

Further problems arise when the partial equilibrium framework is utilized to determine prices and outputs in competitive industries. A competitive industry will produce at that price for which aggregate demand for its output is equal to aggregate supply. In a partial equilibrium framework supply and demand must be independent of each other. The individual firm is assumed to face a U-shaped cost curve, and in perfect competition it faces an infinitely elastic demand curve. In long run equilibrium, price will cover costs exactly so that there are no economic profits.

In 1926 Piero Sraffa published an article that showed that there are severe logical problems in the use of the partial equilibrium framework for the analysis of perfectly competitive industries. He demonstrated that some elements of the analysis are inconsistent with partial equilibrium analysis and other elements are inconsistent with perfect competition.

Also, there are the standard problems associated with partial equilibrium analysis, specifically, the fact that demand and supply are often interdependent rather than independent and that the analysis is relevant only for unimportant markets. In other words, it is rare that one can break away part of the economy and assume that the interdependencies between it and the rest of the economy are negligible. Nevertheless, partial equilibrium analysis remains important in macroeconomics, particularly the distinctions between the short period, the long period, and the secular long period.

References

Hausman, Daniel M. 1992. Supply and Demand Explanations and Their Ceteris Paribus Clauses. In *Essays on Philosophy and Economic Methodology*. Cambridge, U.K., and New York: Cambridge University Press.

Marshall, Alfred. 1922. *Principles of Economics: An Introductory Analysis*. 8th ed. London: Macmillan.
Persky, Joseph. 1990. Retrospectives: Ceteris Paribus. *Journal of Economic Perspectives* 4 (3): 187–194.
Sraffa, Piero. 1926. The Laws of Return under Competitive Conditions. *Economic Journal* 36: 535–550.

4
Exchange Value

Peter Kriesler

Exchange value refers to "the power of purchasing other goods which the possession of [an] object conveys" (Smith [1776] 1960, p. 32); in other words, it expresses the relative price of a good in terms of other goods. Although the concept of exchange value has always played an important role in economic thought, the analysis of how it is determined has been the subject of much controversy.

For Adam Smith, David Ricardo, and Karl Marx it was important to distinguish *exchange value* from *use value*. Use value was the utility or the value in the use of a commodity, and was seen as necessary but not sufficient for a commodity to have exchange value. This is illustrated by the paradox of value, whereby things that had the greatest use value, such as air and water, had the lowest exchange value compared to (for example) diamonds, which had a low use value but high exchange value.

According to David Ricardo, commodities derive their exchange value from two sources. First, "from their scarcity," where commodities cannot be reproduced (e.g., rare paintings, coins, pictures, etc.). These commodities are, by their very nature, a very minor part of what is exchanged in any economy. Second, the majority of commodities are produced by "the exertion of human industry: and these commodities have their exchangeable value determined by the quantity of labour embodied in their production" (Ricardo [1817] 1951, p. 12). This labor theory of value, which was present in a more ambiguous form in Adam Smith's writings, played an important role in the works of both Ricardo and Karl Marx. The relationship between labor values and prices has been a source of much controversy.

In discussing these three economists, it is also important to distinguish between values that are determined in this way, that is, natural values or

Revised from *International Encyclopedia of the Social Sciences*, 2E, 40–41, 'Exchange Value,' by Kriesler, P. With kind permission from Gale. © 2008 Gale, a part of Cengage Learning, Inc. www.cengage.com/permissions. All rights reserved.

prices and market prices. Market prices may diverge from their natural values owing to "accidental" or "temporary deviations" (Ricardo [1817] 1951, p. 89). However, competition in the form of capital seeking the most profitable activity will ensure that the deviation is temporary and will establish a long-run tendency toward uniform profit rates through the economy. "The natural price, therefore, is, as it were, the central price, to which the prices of all commodities are continually gravitating" (Smith [1776] 1960, p. 65).

It is important to note that the factors that determine the natural price are different from the factors that bring market price toward natural prices. This is important because it means that the natural prices will not be influenced by the path taken by market prices as they adjust to their natural levels (Kriesler 2003).

For Marx, the essence of a commodity is that it is produced for its exchange value; in other words, it is produced specifically in order to be sold. It is the generalization of commodity production into all spheres of society that he saw as one of the important results of capitalism. According to Marx, exchange value reflects the underlying social relations and "is in reality only an outward form of the *social* relation between the … producers themselves" (Sweezy 1968, p. 27, emphasis in original). So the market expression of exchange values reflected deeper social relations. This view should be compared with that of John Stuart Mill, for whom exchange value did not arise "from the nature of things," but was "created by social arrangements" (Mill [1848] 1994, p. 54).

From the 1870s a new version of economics, sometimes referred to as "neoclassical theory," came into favor, and has since become the dominant orthodoxy. The essence of this new theory was a subjective theory of value, where exchange value is determined by utility at the margin. In neoclassical economics, the distinction between use value and exchange value is abolished, as exchange value is now determined by use value at the margins, and the distinction between market and natural prices also disappears. In place of the latter is a distinction between short-run and long-run price determination, with both involving the determination of equilibrium values by the same forces—supply and demand. However, as the forces of supply and demand both determine the equilibrium position of prices in the short and long runs, and push the economy to those equilibria if it deviates, the problem of path determinacy arises. As a result, equilibrium exchange values cannot be determined, in neoclassical theory, independent of the adjustment path of the economy.

References

Kriesler, Peter. 2003. The Traverse. In *The Elgar Companion to Post-Keynesian Economics*, ed. John Edward King, 355–359. Cheltenham, U.K.: Edward Elgar.

Marx, Karl. [1867] 1990. *Capital, Volume 1*. London: Penguin.

Mill, John Stuart. [1848] 1994. *Principles of Political Economy*, ed. Jonathan Riley. Oxford: Oxford University Press.
Ricardo, David. [1817] 1951. *On the Principles of Political Economy and Taxation*, ed. Piero Sraffa with the collaboration of M. H. Dobb. Cambridge, U.K.: Cambridge University Press.
Smith, Adam. [1776] 1960. *An Inquiry into the Nature and Causes of the Wealth of Nations*, Vol. 1, ed. Edwin Cannan. London: Methuen.
Sweezy, Paul. 1968. *The Theory of Capitalist Development*. New York: Monthly Review Press.

5
Expectations and Unemployment

J. W. Nevile and Peter Kriesler

5.1 Introduction

Expectations have had a prominent role in macroeconomics ever since the publication of Keynes's *General Theory*. In that book, the word 'expectation' appeared in the title of two chapters, and the concept was used throughout. Expectations were central to the determination of both the interest rate and the level of investment and the trade cycle in the longer run. This is most clearly illustrated in chapter 5, 'Expectation as determining output and employment', where Keynes identifies the importance of expectations in determining the level of employment: 'To-day's employment can be correctly described as being governed by to-day's expectations taken in conjunction with to-day's capital equipment' (1936 [1973], p. 50).

By contrast, in Milton Friedman's version of monetarism, mistaken expectations explain the short-run trade-off between unemployment and inflation, while the correction of these mistakes leads to the long-run vertical Phillips curve. In the late 1980s and early 1990s new classical macroeconomics, with its emphasis on rational expectations, became very influential and the policy ineffectiveness theorem was widely accepted. However, neither of these two forms of monetarism lasted long as widely accepted theories useful for explaining short-run phenomena, though their conclusion that money was neutral and the Phillips curve vertical in the long-run remained widely accepted.

This is well documented in a symposium in the May 1997 issue of the *American Economic Review*, where five eminent macro economists, Robert Solow, John Taylor, Martin Eichenbaum, Alan Blinder and Oliver Blanchard, addressed the topic 'Is there a core of practical macroeconomics that we

Revised from *Keynes and Macroeconomics after 70 Years: Critical Assessments of the General Theory*, 309–320, 2008, 'Expectations and Unemployment', by Nevile, J. W. and Kriesler, P. With kind permission from Edward Elgar Publishing. All rights reserved.

should all believe?'. They all agreed that not only was money neutral in the long-run and that the long-run Phillips curve was vertical, but also that the long-run equilibrium position, or rate of economic growth, was not affected by the effects of short-run macroeconomic policy on real variables. They also all agreed that there was a short-run trade-off between unemployment and inflation, due, in varying amounts, to price and wage inflexibilities and other frictions in the system such as incorrect expectations. However, what they did not agree on was equally important. Two of the five, Solow and Blinder found it hard to say a good word about rational expectations, Eichenbaum thought it was useful but did not always apply and only Taylor generally accepted it. Blanchard said very little about expectations at all. Not one of them set out a coherent explanation of how the economy moved from disequilibrium in the short-run to long-run equilibrium. Solow explicitly said that this lack was one of the big weaknesses in generally accepted theory (Solow, 1997, pp. 231–2) and Blanchard made the point that we know very little about what determines the long-run equilibrium (1997, pp. 244–5). Yet despite this, no one thought that the changes brought about by short-run macroeconomic policy affected the long-run equilibrium position. In general, expectations were considered in the context of inflation and monetary variables. Their effect on real economic variables was not discussed.

This chapter agues that the consensus reached by the five economists and reflected in the textbooks is wrong, both with respect to the long- and the short-run situations. The long-run equilibrium positions of real variables are influenced by the short-run positions of both nominal and real variables. 'In fact, the long-run trend is but a slowly changing component of a chain of short-period situations; it has no independent entity', (Kalecki, 1968, p. 65). The reasons for this emerge when the weaknesses in the consensus position pointed out by Solow and Blanchard are addressed. The role of expectations, or lack of such a role, is important in the difference between the consensus view and that argued in this chapter. Moreover, this chapter argues that the effects of expectations on real variables are more important than their effect on prices.

5.2 The Conventional Textbook View

According to the conventional view, the two most important and generally accepted results of macroeconomic theory are first that the long-run rate of unemployment is unaffected by macroeconomic economic policy, and second that money is neutral in the long-run, unable to have any effect on real variables:

> There is substantial evidence demonstrating that there is no long-run trade-off between the level of inflation and the level of unused resources in the economy – whether measured by the unemployment rate, the

> capacity utilization rate, or the deviation of real GDP from potential GDP. Monetary policy is thus neutral in the long-run. An increase in money growth will have no long-run impact on the unemployment rate; it will only result in increased inflation. (Taylor, 1999, pp. 29–30)

In other words, according to this theory, unemployment tends towards the non-accelerating inflation rate of unemployment (NAIRU) in the long-run, irrespective of government (or other) macroeconomic intervention. Expectations, within this analysis, have no operational role in the long-run, except as part of the definition of long-run equilibrium, that is, when inflationary expectations are fulfilled. Expectations are assumed to be 'rational' in these models, in the sense that economic agents do not make systematic errors.

However, most commentators, although accepting that there is no trade-off in the long-run, allow for a trade-off between unemployment and inflation in the short-run, and hence allow for macroeconomic policy to have a short-run influence. Although economists should be neutral between policies, monetary policy, usually according to some rule, is often favoured (Kriesler and Lavoie, 2005).

Although the reasons given for the existence of the short-run trade-offs vary between economists, one of the most important is price and wage stickiness: 'The trade-off is due largely to temporarily sticky prices and wages' (Taylor, 2000, p. 90) so, even with rational expectations, such rigidities will allow some types of trade-offs, but only in the short-run. As a result, macroeconomic demand policies can have a short-run impact in pushing the economy towards its long-run position.

It is important to note that, within this analysis, the main type of expectations considered are inflationary expectations. These serve the role of allowing economic agents to disentangle nominal price changes from real price changes. Where inflationary expectations are incorrect, agents will be fooled into non-maximising actions. However, as soon as these expectations are revised to the correct level of inflation, real activity will return to its natural level, albeit with a different level of inflation built into the economy.

Even with rational expectations, similar mechanisms may operate if there are menu costs to price changes, or contracts setting prices or for labour services.

5.3 Critique of the Textbook View

First it is vital to note that the reason for these results is the specific shape of the long-run Phillips curve, and the underlying assumptions about the nature of markets, particularly the labour market, which is assumed to clear, except in the short-run where rigidities may prevent the market-clearing wage being achieved. In other words, if the long-run Phillips curve's existence is either

denied, or has another shape, such as being horizontal, then the long-run ineffectiveness of policy and of expectations no longer holds, and many of the conclusions of the textbook view need to be revisited (Freedman et al., 2004; Kriesler and Lavoie, 2005).

Second, the modern textbook account errs in focusing on inflationary expectations. Expectations about output and future demand (in real terms) are not even mentioned. For example, in a typical Australian textbook – Gans et al. (2002) – there are a few lines about how expected prices affect demand and supply curves at the micro level, but the only extended discussion of expectations is in the context of the Phillips curve. Some principles textbooks are more sophisticated than this. Hall and Lieberman (2005) discuss expectations in four places: consumer expectations of future income in the chapter on the consumption function; expectations and the money market (that is, in the discussion of the determination of interest rates); some brief remarks about expectations in the discussion of the determinants of foreign exchange rates; and the role of expectations in ongoing inflation and the Phillips curve. However, neither book mentions expectations in relation to investment. Consumer confidence affects consumption, at least according to Hall and Lieberman, but business confidence is irrelevant to investment decisions. In the discussion of the determinants of investment, it is implicitly assumed that those who buy capital goods know in advance the actual stream of future returns from the goods so no discussion of expectations is necessary.[1] However, empirical evidence clearly shows that expectations and uncertainty play a major role in the determination of investment (Baddeley, 2003).

Of course, in the real world, expectations about future levels of economic activity undergird most investment decisions and are often of crucial importance in both the short and the longer runs. A simple example from Australian economic history illustrates this nicely. In the first 30 years after the Second World War, it was generally believed that the Australian government would ensure that any lapses of economic activity from the full employment level would be short-lived. There are no official quarterly estimates of national income and output for most of this period, but there was only one year, 1952–53, in which gross domestic product (GDP) was lower than in the previous year. In 1952–53, the government acted quickly and successfully to stimulate the economy, reinforcing the prevailing view that it could and would cut short any departures from full employment. Because any such departure was expected to be short-lived, it did not have a large effect on investment and became a self-fulfilling expectation.[2]

Third, in the event of path determinacy, where the short-run path of the economy influences its long-run position, expectations will play a vital role in determining both the path and destination of the economy with respect to the key variables of investment and income. Today's capacity and level of demand are the result of previous investment decisions, which were crucially

dependent on expectations of future income, prices and demand. In other words, the current state of the economy is dependent on past expectations, both because previous investment decisions played a key role in determining current capital, costs and capacity, and because current investment decisions determine effective demand and, therefore employment and output. So, for example, if there is an improvement in animal spirits, so that a wave of optimism spreads throughout financial and investment markets, this will initially lead to increased investment, which, in turn, increases effective demand and the level of capacity utilisation. This validates the initial bout of confidence, influencing the economy's growth path. Self-fulfilling expectations of this sort can lead to expanding growth paths similar to Gunnar Myrdal's virtuous cycles of cumulative causation, or they can lead in the opposite direction to vicious cycles, where pessimistic expectations become self-fulfilling (Kriesler, 1999, 2003). However, it is important to stress that price expectations play a secondary role in these decisions, as it is output and demand expectations that are fundamental.

Fourth, the reason for the acceptance of the rationale expectations model is due to the underlying view of the economy as being inherently stable and relatively simple to model. In the light of these considerations, it is not surprising that the expectations process is also seen as relatively straightforward:

> A related determining factor in modelling expectations is the presumption, or otherwise, of market stability. If the theoretical framework is built on the premiss that parameters have values which ensure dynamic stability, it is natural to model individual behaviour as being based on the same presumption. But without the presumption of stability, i.e. if the theoretical framework allows for indeterminacy of outcomes, it is natural to model individual behaviour as reacting to that indeterminacy. Within a stable general equilibrium system, the nature of a new equilibrium state can be known from existing information combined with information about the exogenous shock which displaced the economy from its original equilibrium state. Thus individuals who acquire this information can in principle know what the equilibrium values of variables are. If, however, existing information is insufficient to determine the outcome of a shock to the system, because behaviour is creative, because there is no shared perception as to the stability of the system or its likely resting-place following the shock, or because expectations formation itself is indeterminate, then the actual outcome of the shock cannot be predicted deterministically. (Dow, 1996, p. 132)

However, if the underlying economy is seen as not tending to a stable equilibrium at full employment, then, *per se*, this would lead to major complications in the formation of expectations. If the underlying model is a

simple one, then the formation of expectations can be relatively simple and quick. However, the more complex the underlying vision of the economy, the less likely it is that expectations can be as simply described as in the neoclassical model.

5.4 Inflationary Expectations

According to the conventional wisdom, the danger associated with inflationary expectations is that they are self-fulfilling. If economic agents expect inflation to rise, for example, then they will act on those beliefs. Workers will demand higher wages in anticipation of these price increases, while employers will, in view of their expectations, be more willing to grant them:

> Private agents' expectations about future monetary policy actions affect their current decisions. . . . For example, suppose that, for some reason, private agents come to expect future inflation. This expectation leads them to raise wages and prices immediately. (Eichenbaum, 1997, p. 238)

This view of the relation between inflationary expectations and the inflation rate is a key factor in the argument for the independence of central banks. This is due to the belief that independent central banks will be seen as being more credible anti-inflationary institutions, and therefore will have stronger inflationary dampening influences on expectations.

Despite the general acceptance of this view, it should be regarded as seriously deficient as no transmission mechanism from expectations to actual price changes is specified. If we accept that prices, particularly in the industrial sector, are a mark-up on costs, then, unless inflation has some impact on mark-ups, which is unlikely,[3] it must operate through costs, in particular wages. What the analysis requires, therefore, is that labour's wage demands are in terms of expected inflation. However, as far as we are aware, this has not been the case in any known labour bargain. Where inflation is explicitly acknowledged, it is usually the previous period's inflation, so that the negotiation is an attempt to recover real wages to the pre-inflation level, rather than to have them anticipate inflation. There does not appear to have been a significant instance of successful wage negotiations on the basis of expected inflation. In other words, because wage demands usually represent an attempt to regain previous losses caused by inflation, they do not attempt to anticipate inflation. If this is correct, then inflationary expectations play little role in wage bargaining. In this case, although inflationary expectations may influence other variables indirectly, there does not appear to be any direct channel of influence whereby they can affect inflation, and so the idea that they are self-fulfilling must be significantly revised. Although more work needs to be done on the 'inflationary expectations transmission mechanism', it appears that to simply assume that such

expectations are self-fulfilling, without a detailed account of exactly how, is extremely problematic, to say the least.

5.5 Exchange Rates

The foreign exchange rate is one of the most important prices in the economy. It directly affects the prices of exports and imports, and, therefore, the price of all goods and services which either use imports as inputs or which compete with imports and exports. From the point of view of employment, it is particularly export industries and import-competing industries that are important, though importers also create employment. Expectations about the exchange rates are crucial to the investment plans, and hence to the long-run health, of these industries.[4]

In this section, various ways in which expectations can and frequently do affect exchange rates are described. As many Post Keynesian economists have argued, the major influence on the determination of exchange rates, certainly since the last decade of the twentieth century, is expectations (see, for example, Harvey, 1999, 2003 and Taylor, 2004). However, no systematic theory about the relationship between the two is set out. While various theories have been put forward, none can be used confidently to predict or even consistently explain movements in actual exchange rates.

Elsewhere (Kriesler and Nevile, 2006), we examine the determinants of the exchange rate, concluding that 'exchange rates are, in the current international environment, mainly determined by expectations, which are not based on anything real' (p. 145). This view is reinforced by the well-known result within the mainstream showing that no model of exchange rate determination performs better than a random walk model (Meese and Rogoff, 1983). The beauty contest analogy Keynes used to describe the determination of prices in stock exchanges (Keynes, 1936 [1973], p. 156) fits today's foreign exchange markets very well.

Hicks's distinction between flex-prices and fix-prices is well known. He made a further distinction between two types of flex-prices which is helpful in this context. One type are those where prices are largely determined by producers and consumers of goods and services and the other those where prices are largely determined by the demand and supply of traders who hold large stocks of the goods and services (or financial assets). When prices are determined by traders who hold large stocks, the stocks must have a life long enough for expectations about their future value to be important, though with liquid assets this could be a very short period of time. The exchange rate is a prime example of this later type of flex-price. Capital transactions dominate the foreign exchange market and most of the capital account transactions are made by traders who usually have very short time horizons.[5]

Some trades are reversed more or less instantaneously through hedging and some are arbitrage, but the major influence on the rate of exchange

in the short run is the positions taken by speculators. The very short-run expectations of these traders determine the exchange rate. The Bank for International Settlements (BIS, 2005) identifies two types of speculation as being important in recent years. One, which is called 'carry trading', has a rationale in economic factors. If a country has a high interest rate relative to other countries, textbooks suggest that this goes with an expectation of depreciation in its rate of exchange, but this is not always the case. When traders believe that no change or an appreciation is likely, carry trading occurs 'with investments in high interest rate currencies financed by short positions in low interest currencies' (ibid., p. 5).[6]

The other type of speculation, called 'momentum trading' has no economic underpinning. It occurs when a short-run trend is expected to continue and this becomes a self-fulfilling expectation. An example par excellence is the Australian experience in the year 2000. The Australian dollar was worth US$0.65 in December 1999 and US$0.51 in October 2000. The fall in the value of the Australian dollar of 20 per cent against the US dollar (and 15 per cent against the trade weighted index) was at a time when the economic fundamentals that the foreign exchange markets supposedly give weight to, were sound. The budget was in surplus. Apart from a one-off effect of the introduction of the GST (goods and services tax, a value-added tax), the rate of inflation was 2 per cent and not expected to rise significantly. Even the current account deficit was relatively low. There can be no doubt that the fall had little to do with economic fundamentals.[7]

When not ruled by the herd instinct in momentum trading, it is unclear exactly what speculators pay attention to. Some economists believe that expectations are based on 'economic fundamentals', which then are seen as playing a key role in the determination of exchange rates through these influences on expectations. However, this need not be the case. Harvey (2001) and Taylor (2004) question the existence of any such fundamentals, suggesting that, in fact, they represent nothing more than an *ex post* justification for actual movements, having no independent existence and, therefore, explanatory power: 'For all practical purposes fundamentals do not exist – except when market participants convince themselves that one or another of the many candidates truly matter' (Taylor, 2004, p. 307). This reinforces our earlier conclusion that there seems to be nothing real behind the determination of exchange rates.

There is not a great deal that can be said to sum up this discussion of expectations and the exchange rate. We have focused on expectations and the exchange rate in the short-run. This is because the long-run position of the exchange rate is strongly path determined. For example the depreciation–inflation vicious circle which is sometimes a feature of exchange rate crises can also take place slowly and determine the long-run trend. As far as the short-run is concerned, we can be confident about two points: exchange rate expectations are both important and volatile. However, the factors that

determine them from day to day are far from clear. It is the reactions of speculators in the foreign exchange markets to events that directly affect exchange rates. Keynes's comparison of the determinants of share prices with those of the winner of a beauty contest is probably the most helpful analogy to use. It is not possible to give a convincing account of any systematic determination of exchange rate expectations.

Given the importance of exchange rates for domestic economic activity and employment, this discussion highlights another clear link between expectations and employment.

5.6 Conclusion

Rather than being concerned with the determinants of expectations, this chapter has concentrated on the role of expectations in determining economic activity. Except in discussions of the consumption function, consideration of expectations in today's conventional macroeconomics is confined to their influence on monetary variables and often goes no further than the Phillips curve. In particular, the role of inflationary expectations as being a key determinate of actual inflation is stressed. However, this analysis is lacking a coherent story of the expectations transmission mechanism whereby the influence of expectations on inflation is spelt out. In fact, it seems unlikely that inflationary expectations will have a significant impact on actual inflation rates. In the conventional story, long-run equilibrium is quickly reached with a vertical Phillips curve and the values of real variables unaffected by monetary influences. This chapter argues that this is an incorrect view of the role of expectations. Rather we have argued for a Keynesian vision where expectations are not only an important influence on real variables in the short-run, but that the effects of expectations on real variables in the short-run can have a major effect on long-run equilibrium which is path determined and not reached all that quickly.

The conventional focus on monetary variables when expectations are discussed is misplaced. Expectations about output and economic activity have a significant effect on investment and hence unemployment in the short-run. The very act of investment affects supply in the longer run and given the path-determined nature of long-run growth, the increase in employment associated with it also affects demand in the longer run.

A second major channel of the influence of expectations is through the exchange rate. This important price is largely determined by expectations and its value has major effects on the economy, sometimes benign when changes in the exchange rate help an economy adjust to external shocks and sometimes adverse as movements in it in effect produce external shocks or at least magnify their effects. Again the trend in the exchange rate is in part at least path determined so that short-run movements can have long-run effects.

Expectations, therefore, play a major role in the determination of the levels of output and employment in both the short and long-runs. As a result, more serious attention needs to be paid both to this role, and to the determination of expectations themselves.

Notes

We would like to thank Geoff Harcourt and an anonymous referee for their helpful comments. The chapter was first presented at the 9th International Post Keynesian Conference: A Celebration of the Impact of Keynesian Economics and we would like to thank the participants for their helpful comments.

1. It would be harder to find a more stark contrast to Keynes's view that '[t]he outstanding fact is the extreme precariousness of the basis of knowledge on which our estimates of prospective yields have to be made' (Keynes, 1936 p. 149).
2. For a more detailed discussion of the role of macroeconomic policy in this period, see Nevile (2000).
3. According to Fred Lee, the author of a number of important studies on prices and the determination of the mark-up, expected inflation has not played any role in any theoretical or empirical study of the determination of the mark-up (in conversation with the authors).
4. The importance of the exchange rate can be gauged by the fact that, for example, currently, in Australia, employment in actual or potential export and import competing industries (tradables) is estimated to be about two-thirds of total employment.
5. Total sales of the Australian dollar in traditional foreign exchange markets on a single trading day in April 2004 were, on average, nearly 20 per cent of the total annual value of Australia's GDP. This is a striking figure, but it does not contain much information except that the volume of daily foreign exchange transactions is great. There are not 365 trading days in a year, though there is trading on some Australian public holidays since nearly half of foreign exchange transactions involving the Australian dollar occur in markets abroad, notably in London; a conservative estimate of the number of trading days in a year is 250. The most meaningful comparison is not with GDP but with exports plus imports. Assuming that there are 250 trading days a year, the ratio of total annual foreign exchange transactions in the Australian dollar to exports plus imports is about 115, that is 11,500 per cent.
6. The Australian dollar was mentioned by the BIS as an example of a target currency in recent years with the US dollar as the funding currency example.
7. Some fall could be explained by an expected slowdown in the world economy and hence a fall in commodity prices, but the fall was much greater than can be explained by this factor.

References

Baddeley, M.C. (2003), *Investment: Theories and Analysis*, London: Palgrave Macmillan.
Bank for International Settlements (BIS) (2005), *Triennial Central Bank Survey: Foreign Exchange and Derivatives Market Activity in 2004*, Basel: BIS Press and Communications.

Blanchard, O. (1997), 'Is there a core of usable macroeconomics?', *American Economic Review*, May, 244–6.
Blinder, A. (1997), 'Is there a core of practical macroeconomics that we should all believe?', *American Economic Review*, May, 240–43.
Dow, S. (1996), *The Methodology of Macroeconomic Thought*, Cheltenham, UK and Brookfield, USA: Edward Elgar.
Eichenbaum, M. (1997), 'Some thoughts on practical stabilization policy', *American Economic Review*, May, 236–9.
Freedman, C., G.C. Harcourt and P. Kriesler (2004), 'Has the long-run Phillips curve turned horizontal?', in G. Argyrous, M. Forstater and G. Mongiovi (eds), *Growth, Distribution and Effective Demand: Alternatives to Economic Orthodoxy*, Armonk, NY: M.E. Sharpe, pp. 144–62.
Gans, J., S. King, R. Stonecash and N. Mankiw (2003), *Principles of Economics*, Southbank, Vic.: Thompson.
Hall, R. and M. Lieberman (2005), *Economics: Principles and Applications*, International Student edn, Mason, OH: Southwestern.
Harvey, J. (1999), 'Exchange rates' in P.A. O'Hara (ed.), *Encyclopedia of Political Economy*, vol. 1, London and New York: Routledge, pp. 302–4.
Harvey, J. (2001), 'Exchange rate theory and "the fundamentals"', *Journal of Post Keynesian Economics*, **23**, 3–15.
Harvey, J. (2003), 'Exchange rates', in J. King (ed.), *Elgar Companion to Post Keynesian Economics*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar pp. 131–5.
Kalecki, M. (1968), 'Trend and the business cycle', reprinted in J. Osiatynski (ed.), (1990), *Collected Works of Michał Kalecki. Volume 1: Capitalism: Business Cycles and Full Employment*, Oxford: Clarendon Press, pp. 65–108.
Keynes, J.M. (1936), *The General Theory of Employment, Interest and Money*, London: Macmillan, reprinted 1973 in *The Collected Writings of John Maynard Keynes*, Vol. VII, London: Macmillan.
Kriesler, P. (1999), 'Harcourt, Hicks and Lowe; incompatible bedfellows?', in C. Sardoni, and P. Kriesler (eds), *Themes in Political Economy: Essays in Honour of Geoff Harcourt*, London: Routledge, pp. 400–417.
Kriesler, P. (2003), 'The traverse', in J. King (ed.), *Elgar Companion to Post Keynesian Economics*, Cheltenham, UK and Northampton, MA, USA: Edward Elgar, pp. 355–9.
Kriesler, P. and M. Lavoie (2005), 'A critique of the new consensus view of monetary policy', *Economics and Labour Relations Review*, **16** (1), July, 7–15.
Kriesler, P. and J. Nevile (2006), 'Does the foreign exchange rate constrain full employment policy in Australia?', in G. Wrightson (ed.), The Constraint to Full Employment or Work Choices and Welfare-to-Work Conference, University of Newcastle, December 7–8, proceedings, refereed papers, Newcastle, Australia: Center of Full Employment and Equity, University of Newcastle, pp. 142–9.
Meese, R.A. and K. Rogoff (1983), 'Empirical exchange rate models of the seventies: do they fit out of sample?', *Journal of International Economics*, **14**(1), 3–24.
Nevile, J. (2000), 'Can Keynesian policies stimulate growth in output and employment?', in S. Bell (ed.), *The Unemployment Crisis in Australia: Which Way Out?*, Cambridge: Cambridge University Press, pp. 149–70.
Solow, R. (1997), 'Is there a core of usable macroeconomics we should all believe in?', *American Economic Review*, May, 230–32.
Taylor, J. (1997), 'A core of practical macroeconomics?', *American Economic Review*, May, 233–6.

Taylor, J.B. (1999), 'Monetary policy guidelines for employment and inflation stability', in R.M. Solow and J.B. Taylor (eds), *Inflation, Unemployment, and Monetary Policy*, Cambridge, MA: MIT Press, pp. 29–54.

Taylor, J.B. (2000), 'Teaching modern macroeconomics at the principles level', *American Economic Review*, **90** (2), (May), 90–94.

Taylor, L. (2004), *Reconstructing Macroeconomics: Structuralist Proposals and Critiques of the Mainstream*, Cambridge, MA: Harvard University Press.

6

Aggregate Demand and Supply Analysis: A Story in the Wrong Language

J. W. Nevile

6.1 Introduction

As Colander (1995) has reminded us, undergraduate teaching in economics is largely a matter of telling stories. We present highly simplified models to students and use them as a peg on which to hang our stories. The models are not just to show students that economics is an analytical subject. Their main purpose is to help students remember the major features of the stories we tell. Thus, in microeconomics it is usual to present a typical Marshallian picture of the market for a particular good, with the demand curve sloping downwards and the supply curve sloping upwards, and then use this to talk about what happens if there is a demand shock or a supply shock. For example, if the price of raw materials rises, the supply curve will shift upwards, prices will rise and the quantity sold will fall. The relative importance of each of these changes will depend on the slope of the demand curve. We know that the model is grossly oversimplified: that the competitive market it assumes may not exist in the industry in question and that part of the reaction may be a shift in advertising to try to change the slope of the demand curve. We know that strictly speaking it is a purely static model and if a shock moves the amount bought and sold away from equilibrium, the market may never reach a new equilibrium (for example, when the cobweb theorem holds) and so on. But the story and the model are consistent and capture what we think is usually important in the real world. There is widespread consensus that the model and related story is a useful teaching tool which is rarely misleading.

In macroeconomics the situation is not so happy. This is only partly because there is less consensus about the essential features of the story we

Revised from *Aggregate Demand and Supply: A Critique of Orthodox Macroeconomic Modelling*, 155–175, 1998, 'Aggregate Demand and Supply Analysis: A Story in the Wrong Language,' by Nevile, J. W. With kind permission from Palgrave Macmillan. All rights reserved.

want to tell. It is more because economists' simple models are essentially comparative statics. Comparative statics theory is useful for analysing many micro problems. It is far less useful in analysing macro problems, which are generally dynamic in nature. As the better macro textbooks make clear, the models that they present are equilibrium models. In microeconomics, comparing two equilibrium positions is usually helpful by itself. In macroeconomics the interest is often in how to get from *A,* say a current situation with unemployment at 10 per cent, to *B* a desired situation where unemployment is much lower. Comparing the equilibrium conditions necessary to remain at either *A* or *B* may be interesting, but it gives no reliable information about an economy that is not in equilibrium. This point is widely recognised in the literature. If challenged, textbook authors would no doubt argue that they tell intuitutively appealing stories about economies that are not in equilibrium and since the conditions for the new equilibrium position are based on their theoretical model the story of how the economy gets there need not be all that rigorous.

This chapter argues that fudging the difference between comparative statics and dynamic analysis can lead to error and that the intuitive stories told in macroeconomic textbooks are not only formally incorrect but may well be seriously misleading. The shock that moves an economy from equilibrium or what happens when the economy is not in equilibrium may change the conditions for equilibrium. These issues are discussed in section 2 of the chapter. The use of misleading stories about the paths of an economy after a policy change or other shock is encouraged by the general equilibrium nature of macroeconomic textbook models. Microeconomic textbooks start with Marshallian particular[1] equilibrium models which are not quite so rigorous, but which allow the model, and the story it supports, to fit together better. Perhaps macroeconomic textbook writers could learn from this. This point is discussed in section 3.

This chapter argues that the issues covered in section 2 encompass the most fundamental problems in the use of aggregate demand and aggregate supply analysis, and that these problems are aggravated by use of general equilibrium models rather than the Marshallian approach adopted by Keynes. Nevertheless a wide variety of criticisms have been made of textbook models of aggregate demand and aggregate supply.[2] One that is not generally acknowledged is set out in section 4. To extend the metaphor in the title of the chapter, not only do the textbooks choose the wrong language, but in addition they speak in dialect unfamiliar to students.

In section 5 an alternative to the approach criticised in previous sections is sketched. Then a brief conclusion draws the threads together.

6.2 Language of General Equilibrium Comparative Statics

The demand curve for fresh fish tells us how much fish will be demanded in a market at each possible price, assuming other things are equal. It is a

behavioural relationship. It tells us how people would behave in various hypothetical situations. The aggregate demand curve is completely different. It tells us nothing about how people will behave. It tells us how they must behave if equilibrium is to be achieved. In the words of one, particularly careful, textbook, the aggregate demand curve

> shows all the possible crossing points of a single *IS* commodity market equilibrium curve with all the various *LM* money market equilibrium curves drawn for each possible price level. Everywhere along the curve *both* the commodity and money markets are in equilibrium (Gordon 1990, p. 159, italics in the original).

This definition is for the common case in which the aggregate demand curve is derived from *ISLM* analysis. But even when it is based on the simpler Keynesian cross, or 45 degree diagram, the aggregate demand curve is still a locus of points in which both the goods market and money market are in equilibrium. The difference is that *ISLM* assumes that the money supply is fixed exogenously and the interest rate is endogenous, whereas the Keynesian cross assumes that the interest rate is exogenous and that the money supply is endogenous and of no great importance for the analysis in question.[3] However, either way the aggregate demand curve traces out those combinations of the general price level and the aggregate amount demanded that are consistent with equilibrium in both the goods market and the money market.

Similarly, the aggregate supply curve is the locus of points that are consistent with equilibrium in the labour market. Keynes (1936) spent a lot of time discussing his aggregate demand function but very little discussing his aggregate supply function, perhaps because he thought it was only a reconcoction of our friend the [Marshallian] supply function (1973, p.513). Modern textbooks typically spend much more time deriving the aggregate demand curve than the aggregate supply curve, but their aggregate supply curve is just as different from the traditional supply curve as their aggregate demand curve is from the traditional demand curve. On occasion some textbooks gloss over this and speak of the aggregate supply curve as analogous to a Marshallian supply curve for a single industry.[4] Nevertheless, the derivation of the aggregate supply curve makes clear that it is a curve giving the conditions for equilibrium in the labour market. Thus, the point where the aggregate curves intersect is the one point that is consistent with equilibrium in all three markets; goods, money and labour.

The equilibrium nature of aggregate demand and supply analysis leads naturally to comparative static analysis, and indeed is only suited to answer comparative static questions. Comparative statics compares the states of two different economies (or parts of economies). Because the two different economies are in equilibrium, expectations are fulfilled. Since expectations are fulfilled, either both the economies are relatively stable with little change

occurring or a fairly long period must be under consideration to allow for uncertainties to be overcome and mistakes to be corrected. Or perhaps expectations are never completely fulfilled, but the focus is on the average performance of the economy over a long period and what, in this context, are relatively minor divergences from equilibrium do not matter. As Hicks puts it in his discussion of comparative statics:

> By the *state* of a given economy one would appear to mean its average performance over a fairly long period, short run fluctuations being cancelled out (1985, p.8, emphasis in the original).

This sort of comparative equilibrium analysis can be applied to dynamic states of an economy as well as to stationary states. It does have a role to play in macroeconomics e.g., in answering questions such as why did the German economy grow faster than the American economy in the 1950s and 1960s, or why did the Australian economy grow faster in the 20 years before 1973 compared to the twenty years after that date. However, by its nature, it is not suitable for answering questions about short term fluctuations. It is about conditions which must be fulfilled if an economy is to be in equilibrium and can tell us nothing about what happens when an economy is not in equilibrium. Hence, it cannot be used to describe what happens in an economy when a shock displaces it from an equilibrium position. It may be able to give valuable clues about the effects of different monetary or fiscal policies that are kept in place over decades but is not helpful as a tool to analyse stabilisation policy or to describe how to get from point *A* to point *B* in a relatively short period of time.

Of course macroeconomic textbooks are interested in the effects of external shocks on the economy and in stabilisation policy. They tell stories about what happens when there is a change in the money supply, in government expenditure, in various other exogenous variables or in parameters such as the marginal propensity to consume. They describe how such a change puts the economy out of equilibrium and how it will return to a new equilibrium position.

Nevertheless, this is illegitimate. As we have seen, general equilibrium comparative statics gives no information about what will happen when an economy is out of equilibrium. It only tells us the conditions for equilibrium before and after a change in an exogenous variable. Thirtyfive years ago there was unease among textbook writers about the stories they told describing what happened when an economy was not in equilibrium. To quote Ackley, in this sort of pedagogy

> We tread perilously close to misleading statements ... as well as being forced to bring dynamic considerations into what is supposed to be static analysis (1961, p.372).

This unease has not stopped the continuing use of this sort of pedagogy, and the unease seems to have diminished as the years have passed. To give just one example from a recent book, Hall and Taylor (1993) go to the other extreme. Their aggregate demand curve is derived in the usual way from *ISLM* analysis as a curve of the locus of points of equilibrium in both the goods and money markets. Despite this, they assert that this aggregate demand curve tells how much people will demand at a given level of prices (p. 200). Hence, they argue that, when a demand shock occurs, e.g., a fall in aggregate export receipts, not only does the aggregate demand curve shift, but also the economy is initially at the point on the new aggregate demand curve corresponding to the equilibrium price before the shock, and that it moves down the new aggregate demand curve until equilibrium is reached at the point where the new aggregate demand curve cuts the aggregate supply curve (p. 233).[5]

Hall and Taylor are no doubt aware that their description of the aggregate demand curve is incorrect and that their story about what happens after a demand shock cannot be deduced from static equilibrium analysis. Presumably they feel that the invalid use of equilibrium theory is justified in order to get across the way they believe a demand shock will affect output and prices.

Teaching students things that they will later have to unlearn, if they proceed with the study of economics, can be challenged. In my view the use of simplifying assumptions, even gross oversimplification, is justified if the simplifying assumptions are made explicit. But the use of invalid analysis is not. Even if students do not notice the logical flaws, teaching invalid analysis may sweep important problems under the carpet without their being acknowledged and lead to ways of thinking which give misleading conclusions in many contexts.

Underlying the example from Hall and Taylor is an important problem. Comparative static general equilibrium analysis assures that expectations are fulfilled, since this is one of the conditions of equilibrium. Hence expectations largely drop out of the picture and in many text books are not even mentioned in aggregate demand and supply analysis. However, a revival of Keynes (1936) emphasis on expectations is a mark of macroeconomics over the last twenty years. The Hall and Taylor analysis outlined above ignores the fact that a fall in export income may affect expected returns from investment. A fall in the terms of trade may well lead to the postponement, or even cancellation of investment projects. General equilibrium comparative statics does not consider the effect of a shock to one exogenous variable on other exogenous variables or that the equilibrium position may in part be path determined. Thus, it is not a suitable basis for describing the effects of shocks to an economy or how monetary and fiscal actions can reduce short run fluctuations. But these are at the heart of the problems teachers and students want to discuss in introductory and intermediate macro classes.

6.3 Marshallian Analysis Versus General Equilibrium

The previous section uses the lengthy phrase general equilibrium comparative statics to classify aggregate demand aggregate supply analysis. The significance of the words equilibrium and comparative statics has been discussed but the fact that it is general equilibrium rather than the Marshallian particular equilibrium analysis used by Keynes is also significant. The use of general, rather than particular, equilibrium analysis aggrevates the problems that occur when a comparative static model is used in a relatively short run disequilibrium situation. Microeconomic textbooks start with Marshallian particular equilibrium analysis and Keynes used this method in *The General Theory*.[6] Perhaps we should learn from those examples.

Clearly macroeconomic analysis cannot use Marshallian particular equilibrium models unchanged. A macro model cannot be for a particular industry. It can be for a particular country, as opposed to the whole world, but that is not the point. The distinction that I want to make is not between the coverage of the models, but the methods of analysis. On the one hand general equilibrium analysis treats all variables not determined by the model as exogenous. They are either policy determined variables (Tinbergen's instruments) or variables assumed to have constant values irrespective of what happens to the instruments or the variables determined by the model (Tinbergen's data). On the other hand, Keynes's Marshallian particular analysis proceeds on the basis that the values of a number of variables can be assumed to be constant, or approximately constant, for the purpose in hand.

Tinbergen's use of the term "data" is revealing. Calling variables exogenous leads to a different mode of thought than does the assumption that for the purpose in hand the variables are at least approximately constant. Exogenous variables can be changed at will and an examination made of the effects of a change of a single exogenous variable on the conditions for equilibrium. Textbooks universally engage in this practice. As we have seen, the disequilibrium story of what follows a change in an exogenous variable does not follow from aggregate demand and supply analysis and may be misleading. Moreover, the implication, or often explicit statement, that the change in the exogenous variable will cause a change in the economy, rather than a change in the equilibrium conditions is incorrect.[7] These errors are encouraged because there is nothing inherently illogical in assuming that an exogenous variable can be changed at will.

It is far less easy to vary at will the values of variables that are assumed to remain approximately constant, locked for the time in a pound called ceteris paribus as Marshall put it (1920, p.366). The assumption that a number of variables remain approximately constant does not imply that one variable can change significantly while all the others remain the same. When discussing the demand for an individual commodity, say soap, microeconomic textbooks commonly assume that money income and the prices of all

other commodities are held constant. They certainly do not imply that it is useful to consider the effects of a large increase in money income on the demand for soap, while keeping the assumption that the prices of all other commodities remain the same.

The difference between the general and particular equilibrium approaches can be highlighted by comparing modern textbook analysis of an increase in the nominal money supply with that of Keynes. The textbook analysis is well known. As a result of the larger money supply, the interest rate is lower, and investment and hence output are greater, if the aggregate supply curve is horizontal. If the aggregate supply curve is vertical output remains the same, but the general level of prices rises to such an extent that the real money supply is unchanged and equilibrium is restored at the same level of output. If the aggregate supply curve is neither flat nor vertical but upward sloping both output and prices rise to some extent.[8]

Contrast this with Keynes's discussion about whether an increase in the money supply will increases output and employment. Keynes thought that

> A moderate increase in the quantity of money may exert an inadequate influence over the long-term rate of interest, whilst an immoderate increase may offset its other advantages by its disturbing effect on confidence (1936, pp.26–7).

Keynes was alert to the possibility that changing one of the variables in the ceteris paribus pound could bring about a change in another variable in that pound. The textbook analysis ignores the possibility of an increase in the money supply affecting expectations and the marginal efficiency of capital.

It is ironic that expectations are treated as exogenous in aggregate demand and supply analysis and are often completely ignored. Almost all the shades of thought in modern macroeconomics consider expectations very important. The implications of rational expectations on the effectiveness of policy on the one hand, and the post Keynesian complaints that the neo-classical synthesis neglects the important role of time in a capitalist economy on the other,[9] are alike not considered in the textbook analysis set out above.

A second advantage of Keynes's Marshallian particular equilibrium theory is that while it is still static analysis it leads more naturally to dynamic analysis than does general equilibrium comparative statics. As Hicks puts it, it gets very close to dynamics (1985, p. 51). Keynes used a Marshallian particular equilibrium framework in *The General Theory*. This led naturally to a dynamic theory based on Keynes work quickly being produced by Harrod.[10]

Marshall stressed that the assumptions that other things are equal was only provisional (1920, p. 380). This often prompts a dynamic story. If profits are very high (or quasi rents are large in Marhsalls terminology), it is natural to suppose that this will lead to net investment and an increase in the capital stock. This is not a rigorous argument. A well formulated dynamic

model would have to bring expectations into the analysis since high profits will not necessarily lead to investment if they are thought to be temporary. But the lack of complete rigour enables the story to flow naturally from the model. Similarly, in *The General Theory* the assumption of a constant capital stock cannot be combined with positive net investment without some lack of rigour. The capital stock can only be approximately constant. This leads to a consideration of what happens when the change in the capital stock is too large to be considered even approximately constant. The teaching model set out in section 5 is designed to be interpreted as a particular equilibrium model with a number of things assumed to be locked in Marshall's ceteris paribus pound. As an example, one important dynamic story is told which involves things in the pound changing in a systematic way when a shock moves the economy from an equilibrium position.

6.4 Not Only the Wrong Language but an Unfamiliar Dialect

The most common derivation of the aggregate demand curve is from *ISLM* analysis. A fixed nominal supply of money is assumed so that when the general level of prices is lower the real money supply is greater. Hence the equilibrium interest rate is lower and output greater giving a downward sloping aggregate demand curve. But students do not read in their newspapers articles speculating on whether or not the central bank will increase the nominal money supply. They do not, any more, even read articles about how the nominal money supply is growing too rapidly and that the central bank should take actions to lower its rate of growth. If they read the financial sections of their newspapers, what they will see are articles discussing whether the central bank is likely to raise interest rates, or lower them as the case may be. They will see articles arguing that the central bank should take action on interest rates, or should have taken action on interest rates some time ago, but nothing on the money supply as an instrument of monetary policy.

In this case the journalists are more correct than the textbook writers. In today's world of deregulated financial markets, not only is the money supply endogenous but changes in it have little correspondence with changes in interest rates. Substantial rises in interest rates may be accompanied by a large rise in the money supply. For example, it is generally agreed that the prolonged recession in Australia in the early 1990s was precipitated and made more severe by very tight monetary policy.[11] Short term interest rates rose from June 1988 to December 1989 and then remained constant for the first few months of 1990. Yet over the year to December 1989 *M3* increased by 22 per cent and broad money by 14 per cent. Over the same period nominal gross domestic product increased by 9 per cent.[12]

Some textbooks derive the aggregate demand curve from the Keynesian cross. This can be drawn assuming a constant volume of money in nominal terms, a constant marginal efficiency of capital schedule and a given general

level of prices, but the assumption that, along with the marginal efficiency of capital, the interest rate is exogenous and the money supply endogenous is a more straightforward justification of the assumption that the level of investment in fixed capital is constant. In this latter case the weakness discussed in this section obviously does not hold. Instead there is the problem of explaining why the aggregate demand curve slopes downwards to the right.

While various justifications are presented in textbooks, which do not base their analysis on ISLM, none are likely to have a large effect on the slope of the aggregate demand curve. It is perhaps not a matter of great moment whether the aggregate demand curve is vertical or just fairly close to vertical. However, it is helpful not to use models that depend on a constant exogenous money supply.

6.5 A Possible Alternative

Critics of teaching models have more credibility if they can suggest an alternative approach. If one rejects the conventional aggregate supply aggregate demand analysis is there a simple alternative? The Keynesian cross, as taught in the 1950s and 1960s, worked well then, but returning to it alone would mean once again ignoring the supply side as well as, in practice, expectations. At the intermediate level I would recommend a recursive historical model.[13] The algebra of elementary difference equations is not all that difficult and in any case students can be given a feel for more difficult cases (e.g., those which involve complex numbers) by numerical examples. However, at the principles level it is desirable to have a simple diagram on which to hang the exposition. The following is not meant to be prescriptive, but just an outline of one possible approach.

The basic diagram is set out in Figure 6.1. On the vertical axis can be measured either P, the general level of prices, or ΔP or the rate of inflation. This may seem like a fairly formal choice. Certainly, the difference between P and ΔP is merely where one puts the origin and changing from ΔP to the rate of inflation is only a matter of the scale used on the vertical axis. Each choice has some advantages, but I prefer the rate of inflation.

Despite large falls in typical inflation rates in many OECD countries, the rate of inflation is still usually positive and significantly different from zero.[14] Putting the rate of inflation on the vertical axis accords with students' perceptions about what is the actual policy issue and leads naturally into Phillips curve analysis if that is the way a textbook writer wishes to proceed. However, the diagram is simpler and the exposition easier with the general level of prices on the vertical axis and some may prefer this.

The aggregate supply curve is defined analogously to a Marshallian supply curve in a particular industry, in that it shows what expected level of prices (and hence rate of inflation) is necessary to elicit each level of

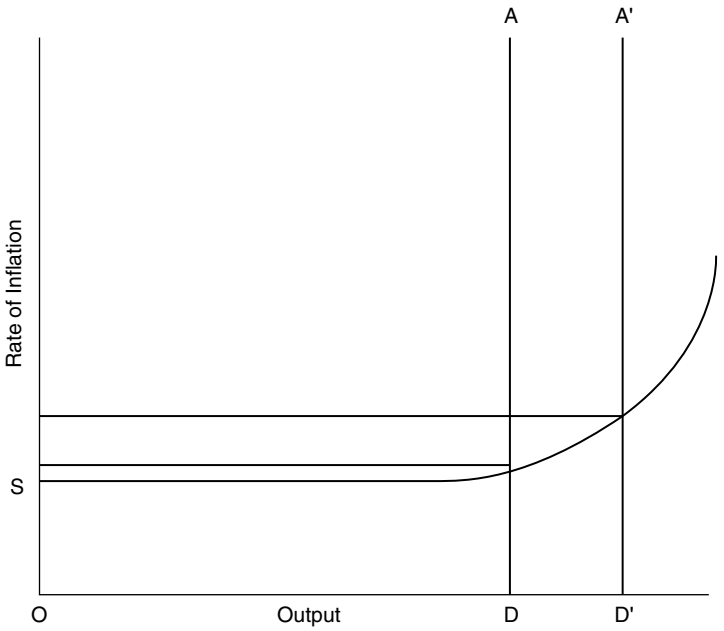

Figure 6.1 Income inequality in various countries: ratio of richest 20 per cent of households to poorest 20 per cent: latest year available

output. In a world of perfect competition it could be obtained by aggregating the marginal cost curves of the individual firms, but it is not necessary to assume all, or even most, industries are perfectly competitive. One can postulate that, in the short run, monopolistic firms assume a constant elasticity of demand for their product but allow for shifts in the whole demand schedule. Hence, there will be a specific expected price associated with each level of output of their product. This price is a constant multiple of marginal cost.[15]

The left hand portion of the aggregate supply curve can be drawn horizontal, or rising slightly and it must finish with a vertical section at the extreme right of the diagram. In between there should be a section with an upward slope which increases noticeably as one moves to the right. It would be possible to use a right angled supply curve, but that throws away realism without any great gain in a simpler analysis. It also limits the use of the diagram in the analysis of inflation.

The aggregate supply curve is a Marshallian short run curve based on the assumption that the capital stock is more or less constant. Once one takes into account the effect on the capital stock of investment in fixed

capital, the analysis moves into growth theory. This is a different ballpark altogether. The upward slope of the supply curve occurs because of rising marginal costs that are not the result of rises in factor prices. In addition to conventional diminishing returns, costs may rise as output increases because less efficient labour is used, even if it is only less efficient because it does not have valuable firm-specific experience and skills. The aggregate supply curve is drawn assuming that short-run expected wage rates (or wage rate rises) do not change as output increases.

The aggregate demand curve *DD*' is based on a Keynesian cross that is set out in real terms. Hence it is a vertical line in Figure 6.1. Because of this it is necessary to explain that analysis based on the diagram only holds when the aggregate demand curve is to the left of the vertical section of the aggregate supply curve. This is not a problem since it is easy to give a verbal description of what happens if the aggregate demand curve is so far to the right that it does not intersect the aggregate supply curve.

Where the aggregate demand curve and the aggregate supply curve intersect is at least a temporary equilibrium position. It may only be a temporary equilibrium because, in the exposition of the aggregate demand and supply curves, the point is made that they assume a large number of other things are equal, and that this may only be the case for a relatively short period of time. Also the exposition should point out that, if something in the ceteris paribus pound changes, one must be alert to the possibility that this may cause changes to other things in this pound.

The analysis of shocks to the economy is straightforward. If there is a change in autonomous expenditure the aggregate demand curve shifts by the size of the autonomous expenditure change times the multiplier, e.g., from *AD* to *AD*' in Figure 6.1. The story to explain how the economy shifts from an output level of *OD* to one of *OD*' can be that as aggregate demand increases stocks are run down, firms realize that demand has increased and raise both production and prices until equilibrium is reached at the new intersection point. This could be the end of the story but it would be possible to continue with the *NAIRU* type story sketched later in this section. Supply shocks are treated in a similar manner, e.g., an increase in input prices (say an oil price shock) will raise the whole supply curve including the horizontal section, so that output level *OD* now is associated with a higher level of prices or rate of inflation.

If one wishes to tell a story about inflation that is focussed on the *NAIRU*, this can be done using the diagram in Figure 6.1. While the *NAIRU* does not appear in the figure it is easy to introduce the concept by designating some level of output as the one corresponding to the *NAIRU* for a given suply curve. If output is above this level wage inflation increases, and if output is below the designated level wage inflation falls. The inflation story starts by making explicit that, when the aggregate supply curve is drawn, one class of things locked in the ceteris paribus pound is expectations about the rate

of growth of factor prices, including wages. Assume that an economy is in equilibrium with output equal to *OD* and that *OD* is the level of output corresponding to the *NAIRU*. A shock shifts the aggregate demand curve *to A'D'*. The new equilibrium position is at a higher level of output and a higher rate of inflation (for final output). Before long wage inflation will rise causing a rise in the expected rate of wage inflation. This will shift the supply curve upwards leading to a higher rate of inflation again and the process will continue indefinitely. To halt the acceleration in inflation either the aggregate demand curve must be shifted to the left, say by a cut in government expenditure, so that it is again at a level of output corresponding to the *NAIRU,* or the supply curve must be shifted to the right in a way that increases the level of output corresponding to the *NAIRU,* for example by an increase in the supply of employable labour through labour market programs. In the first case the equilibrium rate of inflation will be higher than that before the demand shock (unless output is held for a time below the level corresponding to the *NAIRU)*. In the second case, involving a shift in the supply curve, the new equilibrium rate of inflation depends on the exact nature of the shift in the supply curve. More generally, the diagram is more useful in suggesting the ongoing inflationary consequences of demand shocks rather than of supply shocks, since with a supply shock one has to determine arbitrarily the size of the effect has on the *NAIRU*.

One final point: much of aggregate demand and aggregate supply analysis has been criticised for combining in the one model two inconsistent models of supply. The aggregate demand curve is often based on an analysis which assumes a horizontal aggregate supply curve, but the aggregate supply curve drawn in the diagram is not horizontal (Rao, 1991, Colander 1995, Nevile and Rao 1996). Can this criticism be applied to the approach set out in this section? Certainly the Keynesian cross normally implies a horizontal supply curve and the aggregate supply curve in Figure 6.1 is not horizontal for much of its length including the section around the point of intersection with the aggregate demand curve. The question is not really about the slope of the aggregate supply curve, but about the assumption regarding price determination which underlies that slope. The analysis underlying the derivation of the aggregate demand curve in most textbooks, and in the model pictured on Figure 6.1, assumes that the labour market is a fixprice market, to use Hicks convenient terminology. A fixprice market is not one where prices never change but one in which in the presence of a difference between the amount demanded and the amount supplied price does not change rapidly to equate demand and supply, so that the assumption demand equals supply is not a useful one. An aggregate demand curve based on a fixprice labour market cannot be combined with an aggregate supply curve which assumes a flexprice labour market in which price changes adjust supply and demand to maintain full employment.

The aggregate supply curve in Figure 6.1 is compatible with the assumption of a fixprice labour market. Except when the curve becomes vertical rises in the price level necessary to call forth increased output are because of diminishing returns and because inherently less productive labour must be drawn into the productive process as output rises. If a story is told about inflation which implies a Phillips curve situation where lower unemployment increases the bargaining power of workers and raises wage levels in the near future, this does not imply a flexprice labour market. There can still be involuntary unemployment when wages are rising. Like most models in the general Keynesian tradition, that in Figure 6.1 escapes the criticism of inconsistent assumptions about supply.

6.6 Conclusion

Aggregate demand and supply analysis as presented in textbooks is general equilibrium comparative statics analysis which gives the conditions for an equilibrium position but provides no reliable information about an economy out of equilibrium. It ignores the possibility that a shock to one exogenous variable may cause changes to other exogenous variables and that the equilibrium position may be, in part, be path determined. However, textbooks base on it stories about what happens after a shock to the economy and how an economy moves from point *A* to point *B*. These stories can be very misleading.

Moreover most expositions of aggregate demand and supply analysis assume constant nominal supply of money determined by the central bank. This conflicts with the actual situation and with what students read in the financial sections of their newspapers which discuss the central banks using interest rates as the instrument of monetary policy and assume that the money supply is endogenous.

An alternative exposition is suggested in which the interest rate is a policy instrument and the money supply endogenous. This exposition is Marshallian in character and emphasises that, if one thing assumed to be constant changes, this may cause changes in some of the other things assumed to be constant. This approach is faithful to the analysis in *The General Theory* changed only to incorporate institutional changes since 1936.

Notes

This chapter benefited from discussions with Bill Rao and Trevor Stegman, but as I did not always follow their advice, the normal caveat is more than usually important. This paper was originally published in B. Bhaskara Rao (ed.) *Aggregate Demand and Supply*, Macmillan Press, 1998. The version here has been slightly modified.

1. The rather oldfashioned term "particular" (see Boulding, 1948, p. 638) is used deliberately, as it can also mean the equilibrium that holds for particular values of the variables assumed to be constant.

2. See Nevile and Rao (1996) for both criticisms and a list of references. See next the chapter.
3. There is more that can be said on this and the matter is discussed at greater length in section 4.
4. See, for example, Parkin and Bade, '1988', p. 149.
5. This is not an isolated example of aggregate supply and demand analysis being used to analyse what happens out of equilibrium. Hall and Treadgold (1982, p.40) list many other examples in various textbooks.
6. Nevile (1999) discusses this point in more detail.
7. Strictly speaking there are no causal relationships in general equilibrium comparative statics. One should not say that a change in g causes a change in h. All that the theory states is that if an economy is thrown out of equilibrium by a change of so much in g then h will have to change by a specified amount, other things being equal, if the economy is to again be in equilibrium.
8. Telling this as a causal story is appealing but not correct. Many textbooks talk about the increase in the money supply shifting the *LM* curve, and hence the aggregate demand curve to the right. If the aggregate supply curve is flat, the equilibrium level of output increases, if it is vertical that of the general level of prices rise and if it is upward sloping a bit of both occurs. For the moment the point is not the nature of the path from one equilibrium point to another but the effect on the economy of a change in an exogenous variable.
9. In a formal sense time has a large role to play in aggregate demand and aggregate supply analysis. The past is important as the determinant of the capital stock, the state of technology and other factors which affect the shape and position of the aggregate demand and aggregate supply curves. The future is important since expectations determine both the marginal efficiency of capital and liquidity preference. However, time and exceptions of future real demand are rarely mentioned, though expectations about price level changes do play a part in the analysis in some textbooks.
10. Harrod's 1937 exposition of the essence of *The General Theory* finished with suggestions about dynamic extensions of the theory and a year later Harrod published a full blown dynamic Keynesian model.
11. The 1990 annual report of the Reserve Bank of Australia stated "Financial conditions were tight throughout 1989/90" (p.21) and the previous years annual report had described monetary policy as tight since the June quarter of 1988.
12. I owe this example to Reimers (1996).
13. The term historical model is used in the sense of Joan Robinson (1962, pp.24–25) to describe a model which begins with a set of data (actual or hypothetical) about where an economy was yesterday and predicts where it is today and will be tomorrow.
14. In the last 25 years the annual rate of growth of the consumer price index in Australia has never been zero or negative. Over the same period there have only been four occasions when it was zero or negative in any of the 26 countries for which statistics are given in the OECD Economic Outlook. These four rare exceptions were Germany in 1986, The Netherlands and Luxembourg in 1987 and Japan in 1996.
15. Economists are used to summing marginal cost curves to obtain aggregate supply curves when perfect competition prevails. However, the necessary condition is not perfect competition, but that each firm assumes a (firm specific) constant

elasticity of demand, which does not change with short-run shifts in the demand curve. If this is the case, since

$$MR = P\left(1 + \frac{1}{\eta}\right) \text{ or } P = \frac{\eta}{(\eta + 1)} MR$$

when profits are maximized

$$P = \frac{\eta}{(\eta + 1)} MC \text{ or } P = a_i \ MC$$

where a_i is a firm specific constant and the other variables have the usual meanings.

As marginal cost is a function of output, for each firm there is a specific price associated with each level of output, and these individual supply relationships can be summed across firms to obtain an aggregate supply curve.

References

Colander, D.C. (1995) *Macroeconomics*, Burr Ridge, IL.: Irwin Publishers.

Gordon, R.J. (1990) *Macroeconomics*, Boston: Little Brown and Co.

Hicks, J.R. (1985) *Methods of Dynamic Economics*, Oxford, Clarendon Press.

Keynes, J. M. (1936) *The General Theory of Employment, Interest and Money*, reprinted in Keynes, J. M. (1973) *The Collected Writings of John Maynard Keynes, Vol. XIII*, London, Macmillan.

Nevile, J.W. (1999) "Just and Unjust Macro-economic Policy" Discussion Paper, first published in *Post-Keynesian Essays from Down Under Volume III: Essays on Ethics, Social Justice and Economics: Theory and Policy in an Historical Context* Palgrave Macmillan J. Halevi, G.C. Harcourt, P. Kriesler and J. Nevile, Chapter 3.

Nevile, J.W. and Rao B.B. (1996) " The use and abuse of aggregate demand and supply functions", *Manchester School*, LXIV, 189–207.

Rao B.B. (1991) "What is the matter with aggregate demand and supply?", *Australian Economic Papers*, Vol 30, December, 264–277.

7

The Use and Abuse of Aggregate Demand and Supply Functions

J. W. Nevile and B. Bhaskara Rao

7.1 Introduction

Aggregate demand and supply analysis is the basic paradigm presented to students in virtually all modern textbooks. This chapter aims to show that, as presented in the textbooks, aggregate demand and supply analysis has several weaknesses, the most serious of which is the use of contradictory assumptions or inconsistent modes of thought.

The modern textbook aggregate demand and supply analysis is the grandchild of the analysis which Keynes used in the *General Theory*. Keynes's model was largely replaced by Hicks's ISLM analysis, a different model but a recognizable offspring. Now in its turn ISLM has been combined with other ideas to produce modern aggregate demand and supply analysis. The transformation of Keynes's analysis into this modern version is of interest in its own right. More importantly, from the point of view of this chapter, understanding the reasoning underlying the algebra of Keynes, and how it was changed in ISLM analysis, helps one to see the weaknesses in modern textbook aggregate demand and supply analysis. Thus, before discussing modern textbook analysis we will consider its progenitors.

7.2 Aggregate Demand and Supply in the *General Theory*

Aggregate demand and aggregate supply are at the heart of the *General Theory*. As its title states, the *General Theory* is concerned more with the determination of employment than output, and for Keynes "the volume of employment is given by the point of intersection between the aggregate demand function and the aggregate supply function." (*GT*, p. 25). (Page references denoted *GT* are to any Macmillan edition of the *General Theory*.)

Revised from *The Manchester School*, 64(2): 189–207, 1996, 'The Use and Abuse of Aggregate Demand and Supply Functions,' by Nevile, J. W. and Rao, B. B. With kind permission from John Wiley and Sons. All rights reserved.

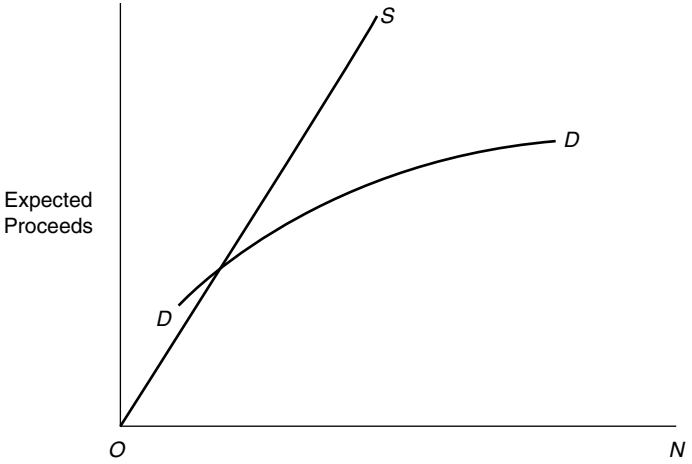

Figure 7.1 Aggregate demand and supply functions

Both these aggregate demand and aggregate supply functions relate strictly to the Marshallian short period, in which both the capital stock and the number of firms are fixed. Also they are both defined net of user costs.

In his exposition Keynes did not use a diagram but it is convenient to do so. Figure 7.1 follows aggregate demand and supply diagrams used by the minority of authors in the late 1940s and 1950s who put the same variables on the axes as those that Keynes used in his functions (e.g., Dillard, 1948; Stonier and Hague, 1953; and Weintraub, 1956).[1] On the x axis is measured the total number of labour units employed and on the y axis the amount of dollar proceeds (or revenue) expected by entrepreneurs, either in current value terms or sometimes deflated by wage units.[2] As is well known, Keynes eschewed the concept of the general level of prices and the level of real output. Hence, he could not use price in aggregate analysis but had to use price times quantity, or total proceeds, which has just as clear-cut a meaning when aggregated as it has for a single firm.

The curve *OS* in Figure 7.1 is the aggregate supply function, showing for each level of employment, *N*, what Keynes called the aggregate supply price. This he defined as follows: "the aggregate supply price of the output of a given amount of employment is the expectation of proceeds which will just make it worth the while of entrepreneurs to give that employment." (*GT*, p. 24).

There is some ambiguity in the words "just make it worth the while of entrepreneurs". This, plus one inconsistency in interpretation by Keynes himself in a footnote on p. 55 of the *General Theory*, has led to a voluminous literature on what Keynes really meant. (See, e.g., De Jong, 1954, 1955, 1956; Robertson, 1955, 1956; Weintraub, 1957, 1958; Vandenborre, 1958;

Marty, 1961; Wells, 1962; Davidson, 1962; Patinkin, 1976; Roberts, 1978; Asimakopulos, 1982; and Chick, 1983.) We will not outline here that often confused debate but simply accept the majority view put forward by Robertson (1955). This is that the phrase "just make it worth the while" must be interpreted in a marginal sense. It is what will just make it worthwhile to increase employment from $N - 1$ to N.[3] Not only is this consistent with Keynes's statement that the point of intersection of the aggregate supply and demand curve is the profit maximization point, but Robertson states that Keynes stressed in correspondence with him that his aggregate supply function was "only a reconcoction of our friend the supply function" (quoted in Robertson, 1955, p. 474, now published in Keynes, 1973a, p. 513).

While Keynes was careful to allow for the possibility of any degree of competition (*GT*, p. 245), he appears generally to have thought in terms of Marshallian pure competition in which it is worthwhile for firms to expand employment until marginal cost equals price. Since the analysis is short-period, average cost may or may not equal price. However, the greater, or less, than normal profits which result when price does not equal average cost will only lead to a change in production decisions if long-run expectations change, and even then only after an adjustment in the capital stock. With imperfect competition the analysis is more complex (see Chick, 1983, Ch. 5, or Tarshis, 1977) but in any case it is possible to construct a schedule showing the volume of employment that each firm will give at each expected price for its output. The aggregate supply curve is constructed by multiplying the output resulting from each volume of employment with its associated price and aggregating over all firms.

As Weintraub (1957) points out, in going from individual firms and industries to the whole economy it is necessary to make some assumption about how the composition of output changes (or does not change) as output in total increases. While this is necessary to construct the aggregate supply curve, the assumption is actually about aggregate demand. Asimakopulos (1982) lists various possible assumptions. Keynes tended to assume that each level of aggregate demand had a given composition of demand associated with it (see, e.g., *GT*, pp. 43, 280, or 286). He was aware that this would not always be valid (*GT*, p. 43n) but commented that such details were "no part of my immediate purpose to pursue" (*ibid*).

The curve *DD* in Figure 7.1 is the aggregate demand function. Keynes defined this as follows: "Let D be the proceeds which entrepreneurs expect to receive from the employment of N men, the relationship between D and N being written $D = f(N)$ which can be called the *Aggregate Demand Function*." (*GT*, p. 25, italics in the original).

It is clear from this that aggregate demand is a magnitude that is expected by entrepreneurs, not one that is observable. This immediately raises the question of the determination of entrepreneurs' short-term expectations. When setting out a theory of short-term expectations Keynes argued that

they are largely determined by recent outcomes "so that expected and realized results run into and overlap one another" (*GT*, p. 50). Given this, Keynes felt it was often "safe to omit express reference to *short-term* expectation" (*ibid*, italics in original) and in turn this belief became an implicit assumption that short-term expectations were largely correct, so that Keynes tended to substitute actual aggregate expenditure for expected aggregate demand. Keynes was aware that he did this (see 1973a, p. 512, and 1973b, p. 180) and often used the one term, aggregate demand, to cover both expected proceeds and actual expenditure or income, sometimes even in succeeding sentences (see, e.g., *GT*, p. 89).[4]

Keynes's analysis was designed to show the level of employment in the economy in any short period (*GT*, p. 313) but he also wanted to demonstrate that a continuing equilibrium position with substantial unemployment was possible. A necessary condition for an unemployment equilibrium position to be stable is that the aggregate supply curve cuts the aggregate demand curve from below. However, if one assumes diminishing (or constant) returns to labour in the short run when the capital stock is fixed, the aggregate supply curve has a slope greater than (or equal to) one. Given a marginal propensity to consume of less than one, the aggregate demand curve has a slope of less than one. With a constant term in the short-run consumption function it has a positive intercept and is cut from below by the aggregate supply curve.

All this implicitly assumes that investment is determined at the beginning of the period and does not change during the period. How important is this assumption? If it is relaxed and the rise in the rate of interest that occurs as N rises is allowed to reduce investment in the same period, this will further reduce the slope of the aggregate demand curve. However, if an increase in N increases the marginal efficiency of capital and this is allowed to increase investment in the same period, the analysis may come unstuck, as Robertson (1955) points out.

This highlights the importance of Keynes's method, which recognizes that production takes place over time and that fixed investment and production decisions made at the beginning of the period cannot be changed until the beginning of the next period. There can be unintended inventory investment and disinvestment but, as far as the short period is concerned, (fixed) investment is predetermined and is not affected by what happens during the period. This could be because firms cannot change expenditure on fixed investment quickly, but more likely it is because in Keynes's mind the marginal efficiency of capital was constant in the short run and finance was arranged, through borrowing, at the beginning of each period at the rate of interest prevailing at that time (i.e., the rate determined by conditions in the previous period and ruling at the end of that period).

Unlike modern economists with a pervasive Walrasian spirit underlying their training, Keynes did not think in terms of simultaneous determination

of the dependent variables. For him it was a process and the process was as follows (*GT*, pp. 248–9). Start with an assumed marginal efficiency of capital schedule and a predetermined rate of interest. These determine investment and hence consumption and aggregate demand. This in conjunction with aggregate supply determines employment (and hence output), price, and income for the period. If there is unintended inventory investment this leads to downward revision of expectations and a lower income in the next period (and *vice versa* for unintended inventory disinvestment). However, Keynes often thought of the period as long enough for desired investment and consumption to be equal to actual investment and consumption. Once income is determined, given the stock of money and the liquidity preference function, this will determine the rate of interest. If this is the same as the rate of interest at the end of the previous period, the economy is in equilibrium. If the rate of interest is higher than this, in the next period investment and income will be lower, leading to a fall in the interest rate and *vice versa* when the rate of interest is lower at the end of the period than at the beginning. There could be oscillations but the system quickly converges to the equilibrium position in which the rate of interest, investment and income are constant from one period to the next. Keynes did not argue that the volume of employment was necessarily stable. The marginal efficiency of capital could fluctuate dramatically, causing changes throughout the economy. But he was concerned to prove that a stable equilibrium position with substantial unemployment was possible.

7.3 ISLM

As is well known, for most of the economics profession the *General Theory* was soon replaced by ISLM as providing the core of Keynesian economics. Although when it first appeared (Hicks, 1937), Keynes had few criticisms of ISLM as a means of increasing understanding of his theory (1973b, p. 79), it is more limited in its aims than is Keynes's analysis and rests on a particular assumption which enables it to neglect the supply side. Even more importantly for the future direction of macroeconomics, it changed Keynes's sequential analysis into a general equilibrium system.[5] When, after the shocks in the 1970s, the profession wanted to refocus attention on aggregate supply as well as on aggregate demand, ISLM was, and still is, retained as the basis for the aggregate demand curve in the new aggregate supply and demand analysis. Thus, an understanding of the nature of ISLM analysis is important not only because it is the analysis from which modern demand and supply analysis developed, but also because it is still an essential part of modern analysis and some weaknesses in the modern analysis stem from the use of ISLM.

Figure 7.2 is a typical ISLM diagram. Real income, or nominal income deflated by a general price index, is measured on the x axis and the rate of

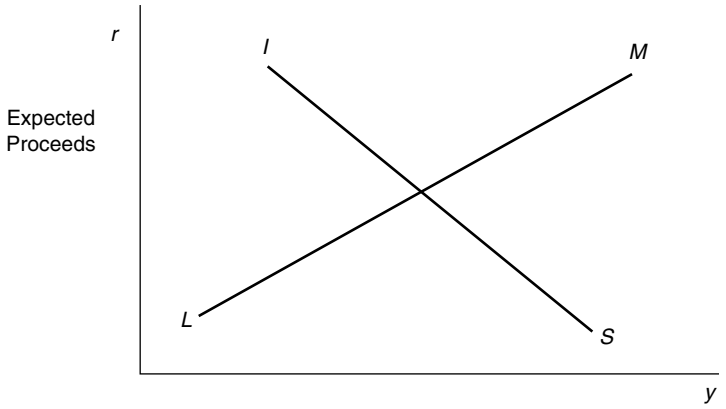

Figure 7.2 A typical ISLM diagram

interest on the *y* axis. The curve marked *IS* is the locus of the points that satisfy both the identity consumption plus investment equals income and the equations showing consumption as a function of income and investment as a function of the rate of interest, respectively.[6] These two equations represent desired consumption and investment so that points where they are satisfied are equilibrium points in the product market. The curve marked *LM* is also a curve showing equilibrium positions, in this case equilibrium in the money market. It is the locus of positions which satisfy the equation for the demand for money, as a function of income and the interest rate, and the equation for money demanded equals money supplied. The latter variable is assumed to be exogenous.

There is a major potential problem in using the *LM* curve, which describes a relationship between nominal variables, with the *IS* curve, which pictures a relationship between real variables. Hicks overcame this by making prices exogenous. In 1937, he assumed that the money wage was fixed and he emphasized this assumption in later life (1982, p. 100). The jump from fixed money wages to exogenous prices is made by an assumption of mark-up pricing (1982, p. 323). With exogenous prices, the analysis can be carried out in real or nominal terms. In most textbooks the *LM* curve is translated into real terms before being combined with the *IS* curve to find the point of effective demand.

As a result of the assumptions about wages and prices, ISLM implies that over the relevant range the aggregate supply curve, drawn in price and output space, is horizontal at the exogenously given price level. This is not controversial and is pointed out in most of the better textbooks (see, e.g., Parkin and Bade, 1988, p. 239, or Dornbusch and Fischer, 1987, p. 24).

The point where the *IS* and *LM* curves cross is the point of effective demand which determines the level of real output and the rate of interest

consistent with equilibrium in both the product market and the money market. As noted above, not only are the labour market and the product market assumed to be fix price markets,[7] but it is assumed that the supply of labour, and other inputs, is such that entrepreneurs are able and willing to sell as much as is demanded at the going price so that demand alone determines output.

ISLM is a model in the Walrasian tradition in which everything is determined simultaneously (Hicks, 1984, pp. 219–220) and which can only depict an economy in equilibrium. It is a common complaint of the opponents of ISLM that it banishes time from the analysis. In one sense this is not strictly true. History, including recent past history, influences many of the exogenous factors which determine the equilibrium position, and exogenous expectations about the future also enter into the analysis (Hicks, 1984, p. 222). But in an important sense the complaint is correct. Nothing takes place over time in the analysis. It is a system of simultaneous equations which gives us the necessary conditions for equilibrium. It does not describe what happens, it tells us what must be the case if equilibrium is to be achieved.[8]

This is a limitation of the model but it becomes more than that when the analysis is used to describe processes in time in an economy not in equilibrium (although perhaps moving towards one). Consider the statement: "Now suppose that the price level rises. The *LM* curve shifts to the left, raising the interest rate, lowering investment and ultimately lowering GNP." (Hall and Taylor, 1986, p. 98).

The authors would probably justify this loose style of writing as a useful pedagogical device. However, it is best avoided as it blurs the important distinction between equilibrium models, which set out the necessary conditions for equilibrium, and historical models, which describe processes and can describe what happens in an economy which is not in equilibrium.

ISLM assumes that the nominal money stock is fixed by the central bank. If instead the central bank targets the rate of interest, so that the interest rate is exogenous and the money supply endogenous, the *LM* curve becomes horizontal. When the money supply is endogenous, ISLM cannot be used to derive an aggregate demand curve in the way that is shown in modern textbooks. ISLM itself can be adapted to fit the case where the money supply is endogenous. Hicks himself did this in 1937. However, as we shall see in the next section, the way that modern textbooks derive an aggregate demand curve from ISLM depends critically on the assumption of an exogenous money supply that is constant in nominal terms.

The case of a horizontal *LM* curve is not unimportant in the world today as it effectively occurs whenever a relatively small country fixes its exchange rate by tying its currency to that of a much larger economy. Then the interest rate in the small country will be determined exogenously by the interest rate in the larger country. More generally, whenever a country

targets its exchange rate, the rate of interest will have to become an instrument and the money supply will become largely endogenous, and the aggregate demand curve used in modern textbooks becomes invalid.

Thus, as put forward by Hicks, ISLM makes the point that output and employment depend on effective demand and provides a useful device for distinguishing the effects of monetary policy from those of fiscal policy on income and the interest rate, giving an understanding of what is meant by neutral monetary policy. On the other hand, since it is a simultaneous equation general equilibrium model, it has lost Keynes's insight that a modern economy is not only an exchange economy, but also a production economy with time involved in the production process, so that expectations are important. Although exogenous expectations lie behind both the *IS* and *LM* curves, the complaint that Keynesian economics, with ISLM as its theoretical core, neglected expectations is justified. The role of expectations is not brought out. Moreover, because it is a general equilibrium model, ISLM cannot be used to analyse the path which an economy takes, over time, to move from one equilibrium situation to another. Hicks himself remarked that it was perhaps too successful because "it is no more than a part of what Keynes was saying or implying ... and it was easy to take it as a whole." (1982, p. 100).

7.4 Aggregate Demand and Supply in Modern Textbooks

The curves *AD* and *AS* in Figure 7.3 represent aggregate demand and supply curves as presented in most modern textbooks (see, e.g., Parkin and Bade, 1988, p. 148, and Dornbusch and Fischer, 1987, p. 23).[9] The level of real output is measured on the *x* axis and the general level of prices on the *y* axis. The aggregate demand curve is obtained from ISLM analysis. A constant stock of money in nominal terms is assumed so that with each different price level there is a different stock of money in real terms and different *LM* curve. The aggregate demand curve plots the resulting equilibrium level of income corresponding to each price and its related *LM* curve. In the words of the very careful definition in one textbook, the aggregate demand curve "shows all the possible crossing points of a single *IS* commodity market equilibrium curve with all the various *LM* money market equilibrium curves drawn for each possible price level. Everywhere along the curve *both* the commodity and money markets are in equilibrium." (Gordon, 1990, p. 159, italics in original).

The aggregate demand curve is usually drawn sloping downward to the right, as in Figure 7.3. The reason for this is because with a constant stock of money in nominal terms, a lower price means a larger stock of money in real terms and hence a lower interest rate and a greater volume of investment.

As Gordon stresses, the aggregate demand curve is a locus of equilibrium positions derived from ISLM analysis. Therefore, although Gordon may not

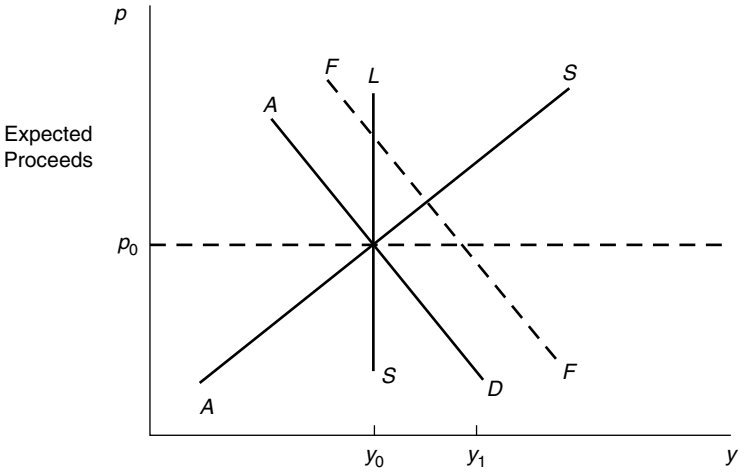

Figure 7.3 A modern textbook ISLM diagram

have remembered this, each point on this aggregate demand curve is an intersection with a horizontal supply curve associated with that price (see Section 3 above). It is logically inconsistent to have this aggregate demand curve intersected by another, far from horizontal, aggregate supply curve. Given this major logical inconsistency, there may seem little point in examining modern demand and supply analysis any further. However, this is necessary to show whether it is possible to overcome the inconsistency by a simple modification of ISLM. Also, there are other problems associated with the modern textbook analysis which deserve discussion. These are not so much logical inconsistencies as matters of judgement about whether the analysis highlights the important macro features of an economy.

While most textbooks derive aggregate demand curves as set out above, there is not the same unanimity in the case of aggregate supply. However, there is agreement that the upward-sloping curve depicted by *AS* in Figure 7.3 is a short-run aggregate supply curve and in the long run the aggregate supply curve is vertical, like the curve *LS* in Figure 7.3. This vertical curve is at the level of income corresponding to full employment output, or to potential output, or to the level of output which occurs when there is no involuntary unemployment and employers can obtain as much labour as they wish at the going wage.

There are two different reasons, given in various textbooks, why the short-run aggregate supply curve has a slope less than vertical or a price elasticity greater than zero. One is that prices generally, including wages (or at least money wages), are either fixed or sticky in the short run, and the other is that expectations about prices may be incorrect in the short run and when, or

if, they are, this will make the slope of the aggregate supply curve less than vertical. The latter of these two explanations is the more common and we will discuss it first.

Parkin and Bade (1988), used as the example of this approach, define the aggregate supply curve as "the amount of output that the economy will supply at each different price level" (p. 308) and in much of the analysis in this book it is drawn as vertical at the level of income corresponding to full employment output. Parkin and Bade think that this is the correct shape, both in the long run when, by definition, price expectations are correct, and also when changes in prices are fully anticipated so that price expectations are correct in the short run. It is assumed that both the product market and the labour market are flex price markets and that nominal wages will adjust to any price level so that the demand and supply of labour are equal. "If the price level doubled then the money wage would also have to double to preserve labour market equilibrium" (p. 309). Output is determined solely by aggregate supply, as it is always at the level that obtains when there is equilibrium in the labour market. Postponing for the moment the case with mistaken expectations, this corresponds to full employment and gives rise to a vertical aggregate supply curve at this level. Aggregate demand is left to determine the price level, and hence the nominal wage level. Parkin and Bade have produced a very classical result with supply determining output and demand prices, but with a model which apparently incorporates a Keynesian aggregate demand curve based on ISLM.[10]

Strictly speaking, everything is determined simultaneously, but logically the labour market has priority in the sense that it determines the level of employment and real output irrespective of what happens elsewhere in the model. Equilibrium is where the consequently vertical aggregate supply curve cuts the aggregate demand curve and thus determines prices. This, according to Parkin and Bade, is the only point that can be sustained. Consider point y_1, p_0 on Figure 7.3. At such a point, say Parkin and Bade, "there is an excess demand for labour, there is also an excess demand for goods. Such a situation would produce higher prices and higher wages" (p. 478). This does not follow from the model which, as Parkin and Bade acknowledge elsewhere (p. 149), can only describe equilibrium positions. However, the statement that the point cannot be sustained is correct, even if the justification of it is unsubstantiated. By definition, the points that are sustainable are equilibrium points and the point in question does not satisfy the necessary conditions for an equilibrium position.

Parkin and Bade follow this discussion of the classical vertical aggregate supply curve with an "expectations-augmented" aggregate supply curve. This is based on the assumption that, in any firm, employers have a good knowledge of their costs and the price of the firm's output, but employees often do not have a good knowledge of the price of wage goods in general. Hence, employees must make decisions on the basis of an expected real wage.

It is assumed that both employers and employees know the money wage, so for employees the expected real wage is this money wage deflated by the expected price level. If employees expect a lower level of prices than actually occurs, they will work for a lower actual real wage and employment and output will be higher than in the case when their expectations are correct. This last part follows because employers know the money wage, their costs and the price of their product so that "the aggregate demand for labour depends on the *actual* economy-average real wage" (Parkin and Bade, 1988, p. 327, italics in original). The result is an upward-sloping supply curve with output increasing as prices increase, as long as prices expected by employees are held constant. Parkin and Bade call this the expectations-augmented supply curve and define it as showing "the maximum amount of output that the economy will supply at each different price level but with a fixed expected price level" (p. 332).

One may question the pedagogical value of this approach. Having been taught, when going through ISLM analysis, that the level of real output is determined by aggregate demand, students then discover, when they reach aggregate demand and supply analysis, that output is determined on the supply side and demand determines the price level. They may wonder how ISLM analysis, in which price only appears as an exogenous variable, ends up determining the general price level. A similar difficulty is involved in the presentation of aggregate supply. When this concept is first introduced, Parkin and Bade (p. 149) treat it as analogous to a Marshallian supply curve for an industry with output responding (or not responding when the curve is vertical) to a change in price. When the aggregate supply curve is derived later in the book, it turns out to be the curve that gives the conditions for labour-market equilibrium. While there is, of course, a close connection between the labour market and supply, the aggregate supply curve in this analysis is no longer analogous to a Marshallian industry supply curve.[11]

These pedagogical concerns are minor compared with the logical inconsistency relating to the aggregate supply curve that was discussed earlier. It is not possible to remove this inconsistency by any modification of ISLM. ISLM rests on assumptions about the labour and product markets that are diametrically opposed to those used in the rest of Parkin and Bade's analysis and this is the underlying reason for the logical inconsistency. The aggregate demand curve assumes that the labour market and the goods market are fix price markets. The aggregate supply curve is derived from an analysis which assumes that both these markets are flex price markets. A market cannot be both fix price and flex price. Oversimplification in a teaching model may be allowable; different models may use different assumptions; but contradictory assumptions in the same model should not occur, whether in a textbook or anywhere else.

One solution to the clash of assumptions in neoclassical textbooks is to use a thoroughgoing classical analysis to derive both aggregate demand

and supply curves. Barro (1990) does this. Price then disappears from the diagram and real output is plotted against the rate of interest on the *y* axis. The aggregate demand curve slopes downwards to the right in the usual way because a higher rate of interest "deters the desire to buy goods [today]" (p. 112), or increases the propensity to save. The aggregate supply curve slopes upwards to the right, because a higher rate of interest stimulates work effort and "the desire to produce and sell today" (p. 112). This overcomes the inconsistency discussed in the previous paragraph, but this thoroughgoing classical solution has not been widely used in modern textbooks. The majority of the profession does not seem to want to jettison ISLM analysis and many are doubtful about the value of the assumption that a higher rate of interest induces people to work for a lower real wage today, because of the greater value in the future of today's earnings.

The alternative solution, adopted in "Keynesian" textbooks, is to base the aggregate supply curve on something other than a flex price labour market. The simple solution is to assume that, in the short run at least, both prices and wages are fixed so that the aggregate demand curve is cut by a horizontal aggregate supply curve. This is done, for example, in Hall and Taylor (1986). This involves no logical inconsistency, but is no different (in assumptions or equations) to standard ISLM analysis; and presenting ISLM as aggregate supply and demand analysis adds no further insight or information. The reason it is done is because Hall and Taylor wish to contrast the short-run aggregate supply curve that they obtain in this fashion with a long-run aggregate supply curve, which they believe to be vertical, since they argue that in the long run price adjustments will move the economy towards potential gross national product. However, in discussing this type of presentation we will use as an example an even better-known textbook, namely Dornbusch and Fischer.

The aggregate demand curve in Dornbusch and Fischer (1987) is derived from ISLM analysis in exactly the same way as it is in Parkin and Bade, and indeed in almost all modern textbooks. The horizontal aggregate supply curve is considered a special case, the Keynesian one, and the vertical aggregate supply curve is considered another special case, the classical one. Dornbusch and Fischer argue that, even in the short run "the aggregate supply curve is in practice positively sloped in between the Keynesian and classical cases" (p. 225).

Dornbusch and Fischer start the analysis of aggregate supply by considering the case of a flex price labour market resulting in the classical vertical aggregate supply curve. This is rejected as not in accord with the facts on two grounds: unemployment fluctuates far more than this model suggests that it will, and the wage rate appears to shift slowly in response to shifts in aggregate demand, casting doubt on the assumption of a flex price labour market (pp. 465–6). The Phillips curve is introduced as a description of the process of slow changes in wage rates which lag behind changes in output.

First, the traditional Phillips curve is discussed, then the expectations-augmented version.[12] Two additional equations are used to transform the Phillips curve from a relation between nominal wage rates and unemployment to one between prices and output. The production function is used to move from unemployment to output and wage rates are changed to prices through the assumptions of mark-up pricing plus an explicit assumption that average labour productivity does not vary as output changes (pp. 477–480). The aggregate supply curve is then obtained from a Phillips curve relating price changes (this period's price minus last period's price) to output changes by transposing last period's price to the other side of the equation, leaving this period's price a function of this period's output and last period's output and price.

Two things follow from this. First, the equilibrium position where the aggregate demand and supply curves intersect is usually only a temporary equilibrium. Unless output is equal to potential output (defined at the level at which unemployment is at its inflation stabilizing level), the equilibrium position will be different each period from its position in the previous period. Secondly, although called an aggregate supply curve, the Dornbusch and Fischer function is one where the causation runs explicitly from the level of output to the price level.[13] It is easy to forget this and even Dornbusch and Fischer themselves tend to think of it as a traditional supply function with causation running from price to output. Consider, for example, this statement that the "aggregate supply curve show[s] the price level at which firms are willing to produce different levels of output" (p. 501).

Dornbusch and Fischer's model appears to suffer from the same inconsistency as that of Parkin and Bade in that they also have an upward-sloping aggregate supply curve intersecting with an aggregate demand curve which is a locus of equilibrium points, each of which has a horizontal aggregate supply curve passing through it. However, they do not assume that the labour market is a flex price market, so that fundamental inconsistency is not present. Certainly the derivation of their aggregate demand curve is incorrect, since it rests on a standard presentation of ISLM analysis including the assumption of a supply curve that is horizontal at an exogenously fixed price. However, ISLM can be modified so that price is not exogenous but depends on the level of output (given last period's output and price). When this is done the modified ISLM cannot be represented in a two-dimensional diagram; a three-dimensional diagram is necessary, but Dornbusch and Fischer's aggregate demand curve can be validly derived from such a modified ISLM analysis.

However, while this removes the logical inconsistency, it creates another problem. The Dornbusch and Fischer model is one in which a large number of things are determined simultaneously. While the Phillips curve version of the aggregate supply curve determines the price level, it does have some effect on output as well since the general level of prices determines the

level of the real money stock. The period must be long enough for the various adjustments to occur, which must take place before the conditions for even a temporary equilibrium can be established, but short enough so that the things assumed to remain constant do not vary enough to vitiate this assumption. Keynes's period was "the shortest interval after which a firm is free to revise its decision as to how much employment to offer" (*GT*, p. 47n). For most firms a month or, at the most, a quarter meets this criterion. However, in Keynes's period the various adjustments that had to occur to establish the values of the endogenous variables at the end of the period were relatively few; e.g., as we saw above, in Keynes's sequential analysis the rate of interest and the level of investment were assumed to be fixed throughout the period, as defined above, and only changed, if they were to change, at the beginning of the next period. But Dornbusch and Fischer are presenting a model in which everything is determined simultaneously and equilibrium is reached in a single period, whereas in Keynes it could take several. It is a more complex model than ISLM with more adjustments to take place before equilibrium is reached. Yet even ISLM by itself requires a substantial period for the various equilibrating forces to work. Hicks insisted "that the period in question is a relatively long period, a 'year' rather than a 'week'" (1984, p. 223). Dornbusch and Fischer's period must be at least as long as this and may well be longer. Yet, in an environment of changes in the general price level, their period must not only be short enough to satisfy the assumption that wages and prices are "constant", but also short enough so that expectations about demand as well as prices do not change. If inflation is low, a year may not be too long a period to vitiate the assumption of constant prices and price expectations, but even then it may be a long period for short-run demand expectations to be constant. One can only be confident that Dornbusch and Fischer's *ceteris paribus* assumption is valid when the economy is very stable.[14] In other circumstances it is important to know how short-run expectations are formed and hence how long a time is likely to elapse before they are changed. Dornbusch and Fischer do not discuss this question. Apart from a reference to the effect of inflationary expectations on the rate of interest, the only reference to expectations in the index is to the expectations-augmented Phillips curve. There is no reference to expectations of demand.

7.5 Conclusions

ISLM is an integral part of aggregate demand and supply analysis in modern textbooks. While it is close enough to Keynes's analysis to cause severe problems when incorporated into a model with a long-run full employment equilibrium, it has lost some of the valuable insights in Keynes's own analysis. Hicks himself stated that "as time has gone on, I have myself become dissatisfied with it" (1984, p. 216). The article from which this quotation

comes reveals that Hicks's reasons for dissatisfaction are subtle and complex but they revolve around the Walrasian general equilibrium nature of ISLM. This general equilibrium analysis has been carried over into the analysis of aggregate supply and demand in modern textbooks, where it is often used without regard to the limitations of general equilibrium analysis.

The most frequent form of this is to describe as a process things that the model determines simultaneously and this has already been discussed in Section 3 above. As well as this, statements are sometimes made about the quantity of excess demand or supply in a situation where the economy is not in equilibrium. Consider the following statement in which Branson (1989) is using static aggregate supply and demand analysis to discuss demand-pull inflation and assumes that an economy in a situation of equilibrium, e.g., at p_0 and y_0 in Figure 7.3, experiences an autonomous increase in aggregate demand so that the aggregate demand curve shifts to *FF* on Figure 7.3. "This creates excess demand measured by $y_1 - y_0$ and prices begin to rise" (p. 474). Not only is this statement using a static equilibrium model to describe a dynamic process but it measures excess demand by the distance between the two curves at a price other than the equilibrium price.[15] Since the model does not tell us anything about situations out of equilibrium, this is invalid and gives the wrong answer.

However, a more serious problem is the use of textbook aggregate demand and supply analysis to discuss policy questions. In this context, to quote Hicks again, "the use of equilibrium methods is still more suspect" (1984, p. 228). But policy questions are a very large part of macroeconomics. Its *raison d'être* is about the possibility of policy getting an economy from where it is to some preferred position, not about static equilibrium positions. Macroeconomists, including teachers and textbook writers, want to talk about situations in which an economy is out of equilibrium and about how an economy moves from one (equilibrium) position to another. Many textbook writers use the neo-Walrasian model to do this, which is illegitimate. More careful authors discuss policy issues informally without any model or explicit theory underpinning their discussion, which is also likely to lead to errors as well as leaving students wondering why it is necessary to learn the theory in the first place. The point is that, even ignoring other weaknesses, the general equilibrium nature of aggregate demand and supply analysis in modern textbooks makes it unsuitable to analyse many of the problems that any macroeconomics textbook author wants to discuss.

In the neo-Keynesian model, and also in the neoclassical expectations-augmented model, temporary equilibrium analysis is used which raises the further problem of the length of the period. This is aggravated by the supply curve which needs an additional set of adjustments to be made before equilibrium is reached. As is well known, Walrasian systems require a functionary to announce all the equilibrium prices. In reality, in the absence

of a functionary, equilibrium is reached through a trial and error iterative process which takes time. In ISLM there is only one price that must be set by this process, the equilibrium rate of interest. In Dornbusch and Fischer there is also the general price level and the level of output, which interact with the rate of interest, so that these three key variables cannot be set independently. Except in a very stable economy, the time required to reach equilibrium may well take such a long period that the things Dornbusch and Fischer's model assume to be constant will have changed significantly during the period.

The neoclassical case with the vertical aggregate supply curve is a true comparative static model, which gives a continuing, not a temporary, equilibrium position. Hence, the problem of length of the period does not arise. However, the focus on labour market equilibrium introduces an even greater problem in this model. The aggregate demand curve is based on ISLM which assumes that the labour market is a fix price market, but the aggregate supply curve is based on a labour market analysis which assumes that the labour market is a flex price market. A valid model cannot rest on contradictory assumptions.

Finally, it is worth noting that both the neo-Keynesian and the neoclassical models in the textbooks depict an economy in which there is a strong tendency to a long-run equilibrium at something like full employment. It is very much a matter of judgement, but we think it unfortunate that Keynes's insight that there can be a continuing equilibrium at less than full employment has been lost. Contemplation of Western European experience in the 1980s might strengthen belief in the usefulness of a theory which does not result in a tendency to full employment equilibrium.

Notes

Our thanks are due to John Lodewijks, two anonymous referees and the editor of this journal for their comments on an earlier version of this paper. However, the usual caveat applies.

1. We are indebted to John King for drawing the Stonier and Hague reference to our attention.
2. Because wage relativities change only very slowly, Keynes thought that it was possible to use wage units to deflate proceeds or income when this became necessary in aggregate demand analysis.
3. The alternative view, put forward most trenchantly by Patinkin (see, e.g., 1976), views the aggregate supply curve as, in effect, a total variable cost curve. This interpretation is the only one that makes sense of note1 on p. 55 of the *General Theory* but is inconsistent, as Patinkin points out with the statement that the point of intersection between aggregate supply and demand maximizes profits. It is also inconsistent with many other statements in the *General Theory*, and in particular with Keynes's view that, because of the declining marginal product of labour, if employment is to increase in the short period the real wage must fall and profits increase (*GT*, p. 17).

4. Short-term expectations are important from the point of view of the micro foundations of the aggregate demand curve. Weintraub (1957) provides micro foundations, but they are for the case in which entrepreneurs' short-term expectations are always correct. If a more sophisticated theory of short-term expectations is incorporated into the analysis, this will require more attention to be given to the micro foundations of the aggregate demand function.
5. Darity Jr. and Young (1995) show that in the late 1930s five papers set out models similar to ISLM, but, while perhaps drawing ideas from the others, only Hicks produced a Walrasian model. Many would consider it ironic that Hicks's pedagogic skill and ability to synthesize won the day.
6. Hicks also set out a case in which investment was a function of both interest and income. In later life (Hicks, 1982, p. 101) he was critical of this assumption, but it is not implausible. The higher the level of income, the higher the level of profits is likely to be and this may lead to a greater marginal efficiency of capital, since this is an expectational variable. Keynes (1973b, p. 80) was critical of including income in the investment function as he thought it focused attention on current as opposed to expected income. Most modern textbooks do not include income in the investment function.
7. In Hicks's convenient terminology a fix price market is not necessarily one where prices never change, but one in which in the presence of a difference between the amount demanded and the amount supplied the price does not change to equate demand and supply. Conversely, a flex price market is one where in the presence of such a difference, prices change rapidly to equate demand and supply so that the assumption that demand equals supply is a useful one.
8. Nor is there anything in ISLM itself to tell us whether the equilibrium position is a stable one. Chang and Smyth (1972) show that the intersection of the *IS* and *LM* curves may not be a stable equilibrium position even with the plausible assumptions that "income changes at a rate proportional to excess demand in the goods market and ... the rate of interest changes at a rate proportional to excess demand in the money market" (p. 372).
9. These two books are discussed as representative of works with a neoclassical and a Keynesian emphasis respectively. They are chosen not to pillory them but because they are among the most widely used and because they are both marked by very clear and careful exposition.
10. Parkin and Bade's aggregate demand curve adds one extra endogenous variable, the general level of prices, to standard ISLM analysis. It also adds one extra equation: output equals the level of output determined by equilibrium in the labour market. Aggregate demand thus has no influence on output, but does determine price.
11. Leijonhufvud (1974) elaborates on the differences between the Marshallian-type aggregate supply curve and the derived demand for labour curve of the type that underlies Parkin and Bade's aggregate supply curve.
12. This is a very bald summary. Dornbusch and Fischer enrich the understanding of the Phillips curve with a discussion of the overlapping contracts theory of wages. They also present a version of their aggregate supply curve with the rate of inflation rather than price on the y axis, but this does not change the essentials of their analysis.
13. The causation underlying the Phillips curve can be interpreted as running in either direction (see, e.g., Nevile, 1979) but there is no doubt from the discussion in Chapter 13 that Dornbusch and Fischer interpret the Phillips curve in the usual Keynesian way (see, e.g., p. 468).

14. This general criticism could also be applied to Parkin and Bade's expectations-augmented aggregate supply curve. It does not apply to their vertical aggregate supply curve. In that case, price expectations are not important and the economy is very stable on the quantity side.
15. This is only one example. Hall and Treadgold (1982, p. 40) list many more in various textbooks.

References

Asimakopulos, A. (1982). "Keynes' Theory of Effective Demand Revisited", *Australian Economic Papers*, Vol. 21, No. 38, pp. 18–36.

Barro, R. (1990). *Macroeconomics*, New York, John Wiley and Sons.

Branson, W. H. (1989). *Macroeconomic Theory and Policy*, New York, Harper and Row.

Chang, W. and Smyth, D. (1972). "Stability and Instability of IS-LM Equilibrium", *Oxford Economic Papers*, Vol. 24, No. 3, pp. 372–384.

Chick, V. (1983). *Macroeconomics After Keynes: A Reconsideration of the General Theory*, Oxford, Philip Allan.

Darity, W., Jr. and Young, W. (1995). "IS-LM: An Inquest", *History of Political Economy*, Vol. 27, No. 1, pp. 1–41.

Davidson, P. (1962). "More on the Aggregate Supply Function", *Economic Journal*, Vol. 72, No. 326, pp. 452–458.

Davidson, P. and Smolensky, E. (1964). *Aggregate Supply and Demand Analysis*, New York, Harper and Row.

De Jong, F. J. (1954). "Supply Functions in Keynesian Economics", *Economic Journal*, Vol. 64, No. 253, pp. 3–24. (See also responses to comments in *Economic Journal*, Vol. 65, No. 259, pp. 474–484 and Vol. 66, No. 263, pp. 482–492.)

Dillard, D. (1948). *The Economics of John Maynard Keynes: The Theory of a Monetary Economy*, Englewood Cliffs, N.J., Prentice Hall.

Dornbusch, R. and Fischer, S. (1987). *Macroeconomics*, New York, McGraw-Hill.

Gordon, R. J. (1990). *Macroeconomics*, Boston, Little, Brown and Co.

Hall, P. H. and Treadgold, M. L. (1982). "Aggregate Demand Curves: A Guide to Use and Abuse", *Australian Economic Papers*, Vol. 21, No. 38, pp. 18–36.

Hall, R. E. and Taylor, J. B. (1986). *Macroeconomics: Theory, Performance and Policy*, New York, W. W. Norton.

Hicks, J. R. (1937). "Mr Keynes and the 'Classics': A Suggested Interpretation", *Econometrica*, Vol. 5, No. 2, pp. 146–159.

Hicks, J. R. (1977). *Economic Perspectives*, Oxford, Clarendon Press.

Hicks, J. R. (1980). *Causality in Economics*, Oxford, Basil Blackwell.

Hicks, J. R. (1982). *Money, Interest and Wages. Collected Essays on Economic Theory*, Oxford, Basil Blackwell.

Hicks, J. R. (1984). "IS-LM: An Explanation" in *The Economics of John Hicks*, Oxford, Basil Blackwell.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*, London, Macmillan.

Keynes, J. M. (1973a). *The Collected Writings of John Maynard Keynes, Vol. XIII*, London, Macmillan.

Keynes, J. M. (1973b). *The Collected Writings of John Maynard Keynes, Vol. XIV,* London, Macmillan.

Leijonhufvud, A. (1974). "Keynes' Employment Function: Comment", *History of Political Economy*, Vol. 6, No. 2, pp. 164–170.

Marty, A. (1961). "A Geometrical Exposition of the Keynesian Supply Function", *Economic Journal*, Vol. 71, No. 283, pp. 560–565.
Nevile, J. W. (1979). "How Voluntary is Unemployment? Two Views of the Phillips Curve", *Journal of Post Keynesian Economics*, Vol. 2, No. 1, pp. 110–119.
Parkin, M. and Bade, R. (1988). *Modern Macroeconomics*, Oxford, Philip Allan.
Patinkin, D. (1976). *Keynes' Monetary Thought: A Study of Its Development*, Durham, N. C., Duke University Press.
Roberts, D. L. (1978). "Patinkin, Keynes and Aggregate Supply and Demand Analysis", *History of Political Economy*, Vol. 10, No. 4, pp. 549–576.
Robertson, D. H. (1955). "Keynes and Supply Functions", *Economic Journal*, Vol. 65, No. 259, pp. 474–477. (See also his comment in *Economic Journal*, Vol. 66, No. 263, pp. 485–487.)
Stonier, A. W. and Hague, D. C. (1953). *A Textbook of Economic Theory*, London, Longmans.
Tarshis, L. (1977). "Keynes as seen by his Students in the 1930s" in D. Patinkin and J. Leith (eds.), *Keynes, Cambridge and the General Theory*, London, Macmillan.
Vandenborre, H. (1958). "An Integration of Employment Economics within the Keynesian Theory of Money Flows", *Oxford Economic Papers*, Vol. 10, No. 2, pp. 205–219.
Weintraub, S. (1956). "A Macroeconomic Approach to the Theory of Wages", *American Economic Review*, Vol. 46, No. 5, pp. 835–856.
Weintraub, S. (1957). "The Micro-Foundations of Aggregate Demand and Supply", *Economic Journal*, Vol. 67, No. 267, pp. 455–470.
Weintraub, S. (1958). *An Approach to the Theory of Income Distribution*, Philadelphia, Pa., Chilton.
Wells, P. (1962). "Aggregate Supply and Demand: An Explanation of Chapter III of the *General Theory", Canadian Journal of Economics and Political Science*, Vol. 28, No. 4, pp. 585–590.

8

Has the Long-Run Phillips Curve Turned Horizontal?

Craig Freedman, G. C. Harcourt and Peter Kriesler

> Any statistical relationship will break down as soon as it is relied upon for policy purposes.
>
> —Charles Goodhart, articulating Goodhart's Law[1]

We all look for patterns to make sense out of life. Economists are no different in this respect from anyone else. It is the location of that search rather than the process itself that distinguishes them from other sifters of data. The danger is that the need to order that environment may lead to creating and preserving tools well past their usefulness. Even worse, we may come to believe that our own constructs, these very same tools, represent some inherent and invariant natural relationship. By doing so, we blind ourselves to the ever changing pattern of economic relationships.

Starting in the 1970s, most developed countries experienced a rising trend of inflation. After each economic downturn, inflation remained higher than at its previous trough. In contrast, the 1980s saw an ever rising trend of unemployment in those same countries. After each upturn, unemployment was higher than at the previous economic peak (OECD data, 1970–90). Moreover, the long-term portion of this rising unemployment was itself increasing (Figure 8.1). It is interesting that in the US, where monetary policy over the relevant period was generally less stringent than in corresponding European countries, the growth of the long-term unemployed was far less dramatic. At its height, long-term unemployment in Italy accounted for nearly 70 percent of total unemployment (*The Economist*, December 2, 1995: 85).

This should arouse the interest of any economist. Judging from the literature that is rapidly accumulating on this topic, many economists have

---

Revised from *Growth, Distribution and Effective Demand: Essays in Honour of Edward Nell*, 144–162, 2004, 'Has the Long-Run Phillips Curve Turned Horizontal?,' by Freedman, C., Harcourt, G. C. and Kriesler, P. With kind permission from M.E. Sharpe and Craig Freedman. All rights reserved.

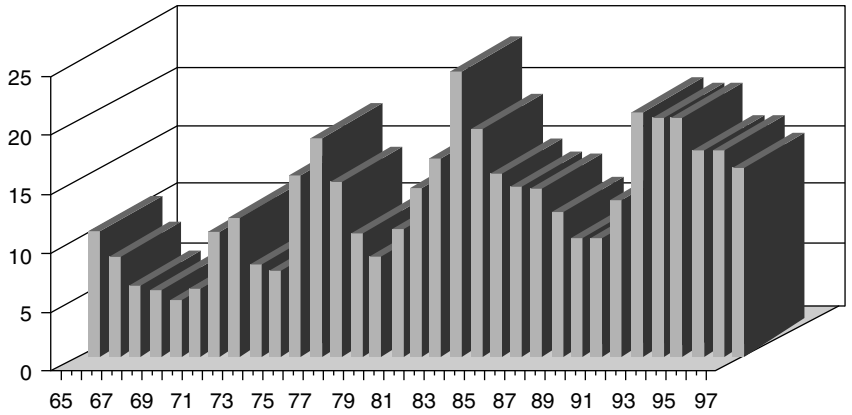

Figure 8.1 Long-term unemployment in the US as a percentage of total unemployment (1965–97)

been intrigued by these two disparate trends. A shift this fundamental must reflect significant changes in some underlying essential causal factor. If we examine the two decades from 1970 to 1990, we see a clearly discernible shift in macroeconomic policy. Monetary authorities in OECD countries moved from targeting unemployment through expansionary fiscal policy to constricting accelerating inflation by means of restrictive monetary policy. It is our thesis that the observed trend alterations in both unemployment and inflation are connected to the concomitant policy switch. We can look to the cause of the former in the latter decision. Macroeconomic policy generates and changes underlying economic relationships in ways that we only selectively understand. The profession seems to relearn the validity of this proposition at periodic points of theoretical disarray.

Keynesian economics came to grief when its theory, ballasted by the inflation–unemployment trade-off articulated in the Samuelson–Solow (1960) Phillips curve model, proved to be floated more by the desires of its fabricators than by any empirical sea of data. The "menu choice" that economists promised to policymakers proved to be ephemeral. The optimism underlying the model was superseded by the pessimism represented by its long-run relative. Our claim is that the expectations-augmented Phillips curve, the standard model in the economics profession since the 1980s, has in turn become obsolete for the very same reason that the simple Phillips curve was vanquished. The parallels here are intriguing. In both cases the generators and defenders of these models insisted that they had specified an inherent natural relationship. A heuristic model was elevated to an undeserved level of generality. In a sense, belief in the generality of the model destroyed its applicability.[2]

The trade-off between unemployment and inflation depended on assuming reversibility as a defining characteristic of the Phillips curve.[3] This is what Friedman (1968) and Phelps (1967) successfully undermined. They failed to realize that the model they devised to replace the garden variety Phillips curve is itself irreversible. The trade-off implicit in the long-run Phillips curve makes any given stable inflation rate obtainable if policymakers are willing to pay the opportunity cost in the coin of rising unemployment. In other words, having argued that a naive belief in the efficacy of the original Phillips curve had pushed policymakers into implementing policy which propelled the economy up the long-run Phillips curve, they then argued that the procedure was reversible, and that "coming down" was symmetric to "going up," involving the reverse trade-off. This is exactly the trade-off that we claim does not exist. The long-run Phillips curve had a specific unemployment policy as its midwife. Changing policy to target inflation generates irreversibilities. We enter the parallel universe of the long-run horizontal Phillips curve and a significantly new framework for analysis.[4]

Irreversibility characterizes all inflationary models, including the one we propose. Traditional macro policies that aim to target unemployment and/or inflation, must necessarily undercut themselves; none are economically sustainable. Although we may accept that Keynes successfully identified the problem behind any resigned acceptance of the business cycle,[5] nevertheless it is also true that he failed to supply the solution. Subsequent policy attempts to resolve underlying economic problems through macro policy have in turn come to grief.[6] The profession's brief intoxication with the Phillips curve best demonstrates this unfortunate tendency.

8.1 A Search for Order Where None Existed

> We might then reason as follows: the near chaos is only apparent, there must be some order here ... let us try dating the points and observe the sequence in which they occur—when we do this we observe the most remarkable phenomenon.... Now our original chaos has resolved into truly remarkable order ... one is left, at the end of all this, with a feeling of the possibility of a truly scientific study of human behaviour in the economic sphere, and with an attitude of optimism about the long-term development of such a science.
>
> —Robert Lipsey, quoted in Leeson 1994: 19

Phillips's original work (1954, 1958) was not met with anything approaching universal acclaim. Aspects of the statistical foundation of his work were questioned by Knowles and Winsten (1959), Routh (1959), Kaldor (1959), Reynolds (1960), Pechman (1960), Nourse (1960), Schultze (1959), Conrad

(1959), Dicks-Mireaux and Dow (1959), Ozanne (1959), and Turner (1959). As Leeson (1994: 1) notes:

> Phillips had uncovered an interesting nineteenth-century relationship, but after 1913 his curve did not describe the data at all well. The inter-war period was clearly a disaster for the curve; the post-war fit was the product of Phillips' innocence with respect to data analysis—he had geared, without adjustment, two unemployment series which were measured in quite different ways. The econometric evidence in the post-1962 period was also very mixed.

Adoption of the curve seems most of all to have been policy driven, an experience that was to recur with its successor. The empirical or theoretical arguments for adopting this particular piece of apparatus were, as mentioned, less than compelling. It filled a perceived need for a tool that could provide a clear-cut menu for decision makers. As always, precision provides the politician with the illusion of control. Faith in the Phillips curve spread so rapidly in influential corners of Washington and London exactly because it offered politicians what their preexisting predilections would have wished. Like everyone else, they are most impressed when they hear echoes of their own desires dressed up in technical attire.[7] The trade-off implied by the curve reduced economic policy dilemmas to a simple question: Inflation or unemployment?

Even those who were able to stop their ears to the siren call of political influence, of advising the mighty if not the wise, found the curve not without theoretical appeal. It quite nicely plugged a gap in the generally accepted IS–LM framework by allowing price changes to be endogenously incorporated. This eliminated the need to treat prices exogenously, which had added an unwanted ad hoc element to the theory.[8] It also undermined the danger of a Keynesian free lunch by assuring the profession that there was an opportunity cost to be paid for employment growth; to the ears of the assembled ranks of economists, it had the quiet but sweet ring associated with competitive markets. Perhaps the Phillips curve gained strength and was so heatedly defended because its ambiguity lent itself to multiple uses. In the marketplace of ideas it met the existing demands of the profession.

The underlying basis for this supposed correlation was left largely unexplained. Although the given data were also consistent with a simple business cycle relationship, it conveniently became transformed into a stable menu of choice. To have such a menu implied reversibility. The collapse of the Phillips curve became an event waiting to happen.

The introduction of a natural rate of unemployment (the long-run Phillips curve) banished any thoughts of a simple Keynesian trade-off. Market forces

once again triumphed. A natural rate allows economists to abdicate any role in reducing unemployment.[9]

> Since as shown by Osberg (1988), all unemployment suddenly became frictional (or voluntary), it followed that any existing level of unemployment, no matter how high it may be, is full employment according to this definition! However, to avoid some-what the tautological implications of their theory, neoclassical economists postulated the existence of a positive long-term or "natural" rate of unemployment that would be compatible with an equilibrium state in the economy in which there are no labour-market pressures for wages and prices to rise. Except for short-run deviations due to unexpected shocks, the tendency would thus be towards this equilibrium long-term level of voluntary unemployment. From this it follows that the only way of permanently reducing this "natural" rate of unemployment is to remove all institutional barriers and "imperfections" in the labour market that render wages inflexible downwards, such as unemployment insurance benefits, welfare payments, trade union activity and minimum wage laws. (Seccareccia 1991: 51)

The natural rate shock troops faced a choice following the overthrow of the simple Phillips curve standard. They could have eschewed causality, considering their model to be merely heuristic or operational.[10] Equating the natural rate with the nonaccelerating inflation rate of unemployment (NAIRU) avoids any commitment on the part of the theorist. There in fact seemed to be no compelling empirical reason to tie it into a general equilibrium model of market-clearing real wages, except for some given a priori theoretical predilections. By eschewing this chance, they would have let an opportunity slip out of their grasp. Thus the idea of a natural rate as the market-clearing rate of employment is an attempt to provide a particular microfoundation underpinning to the relationship in order to make it more than simply operational. Unfortunately, this left their position vulnerable once the natural rate appeared to slip its mooring.

It does seem a bit queer, if not unnatural, that the equilibrium rate should slyly trail the actual rate. It is hardly compatible with our notion of what constitutes an equilibrium. Nonetheless, the current debate, centering on hysteresis, tries to grapple with this observation.[11]

> The dynamic relation between short-term and total unemployment is in fact a complex dynamic relation, where the level of short-term unemployment depends both on changes in and the level of unemployment. An increase in the flow into unemployment initially sharply increases the fraction of short-term unemployment, but may eventually be associated with a decrease in this fraction as total unemployment rises. Even taking

> account of these complications, the general result remains that if the long-term unemployed exert little or no pressure on wages, an increase in long-term unemployment increases equilibrium unemployment for some time. Like the insider model, this implies that short sequences of shocks will have little effect on equilibrium unemployment, while long sequences will increase equilibrium unemployment for some time. (Blanchard and Summers 1987: 294)

The attempts by proponents of the long-run Phillips curve to shore up the model's preeminent position by resorting to structural and other institutional defenses is reminiscent of the rearguard battles fought by the retreating Keynesians facing the onslaught launched against their own model.[12] The similarity between these two situations seems to have escaped the notice of all of the protagonists.

The parallels are quite distinct. The Keynesian Phillips curve promised a tradeoff between unemployment and inflation, a matter of simply setting the policy control dials. The promise, as already stated, was based on the belief in the reversibility implicit in the model. The expectations-augmented Phillips curve also assumes a type of reversibility. A short-term willingness to pay in the currency of rising unemployment guarantees that inflation rates are the result of policy-setting. As it turns out, the observed hysteresis, or shifting of the natural rate, flows from the model's lack of reversibility. Just as stagflation represented the collapse of the Phillips curve standard in the profession (though vigorously defended by the ad hoc argument of curve shifting), the higher unemployment rates of the 1980s, associated with lower inflation, represent the collapse of the vertical Phillips curve, notwithstanding the equally ad hoc defense of hysteresis.

There is nothing natural about the natural rate. It is merely the artifact of policy-induced shocks, in this case, the postwar push to target unemployment. Prior to this, especially in the period before World War I, a trendless business cycle prevailed. The simple Keynesian Phillips curve was only an artifact of the business cycle in the pre-World War I era, with both price and unemployment sequentially rising and falling. The postwar decision to interfere with the business cycle created the long-run vertical Phillips curve. Demand management reduced the cost of job loss. The resulting upward trend of wages would ordinarily have created a profit squeeze dampening investment and ending prosperity. Ever increasing debt inflation perpetuated the boom. It is thus no coincidence that sustained, accelerating inflation was not a feature of the prewar business cycle. Keynes, but more particularly his self-appointed apostles, convinced policymakers that blind obedience to the unfolding of business cycles was slavery and, even more important, unnecessary.

The blind spot of many current theorists is not to see that the issues now surrounding the natural rate arose as policymakers changed their focus from unemployment to inflation.[13] Targeting inflation requires the discipline

of the business cycle. The mechanism for doing so is a series of sharp and extended recessions. Rising unemployment dampens wage claims. Almost as a side effect, this cycle of induced recessions yields rising levels of the long-term unemployed. Subsequent economic growth fails to spur employment sufficiently. Firms move toward staffing patterns that reflect the discipline of the business cycle, even if the cycle itself has been deliberately manufactured and guided. The era of large numbers of protected, permanent employees is the natural child of unemployment targeting. In demand-dominated economies, interrupted production flows are prohibitively costly. In contrast, business cycles bring increased price competition, a greater need for flexibility, and a smaller level of core employees.

Given the acknowledged shift in target policy, we would expect to see a corresponding shift in the economic model needed to comprehend this clear break with the past. We in fact conclude that the long-run Phillips curve has turned horizontal, indicating a given economy's natural rate of inflation or nonaccelerating unemployment rate of inflation (NAURI).[14]

8.2 Through the Looking Glass: Living with a Long-Run Horizontal Phillips Curve

> The Red Queen shook her head. "You may call it 'nonsense' if you like," she said, "but I've heard nonsense, compared with which that would be as sensible as a dictionary!"
>
> —Carroll 1871: 27

For a selected group of OECD countries starting in the late 1970s or early 1980s, the policy switch to inflation fighting led to the deliberate creation of recessions. Government spending and tax cuts removed automatic stabilizers. A lower social wage increased the cost of job loss. A rising cost of job loss kept wage inflation in check. While targeting unemployment had created a vertical Phillips curve, the imposition of an artificial business cycle, as a way of reducing inflation, transformed this hypothetical long-run relation from vertical to horizontal.

As a consequence of this policy shift, new layers of unemployed have to be sequentially created in order to reduce inflationary pressure, since it is presumably a rising level of short-term unemployment that best keeps inflation falling by keeping wage demands in check (Layard and Nickell 1986). This implies that not only the level, but also the rate of change, of unemployment affects inflation by encouraging wage restraint (see, e.g., Romer 1996). Employed workers worry not only about the probability of finding another job if fired, but also the probability of losing their current job. Without the fear of being laid off, workers could adjust to different sustained levels of unemployment, given that labor markets are not intrinsically regulated via a price auction.

During recessions, quantity adjustments in the labor market mean that laid-off workers will boost the ranks of the short-run unemployed (Akerlof et al. 1966). Even with no subsequent increase in long-term unemployment, due to offsetting job creation, the visible increase in layoffs should temper wage demands. In the last half of the 1990s, large-scale job creation operated simultaneously with significant numbers of layoffs as major corporations continued to restructure.[15] Wage demands, despite tightening labor markets, remained moderate. Wage restraint is not simply the result of creating fewer new jobs or vacancies but of increasing the number of people losing their jobs.

The newly unemployed compete against others in the same situation. The long-term unemployed are not equal competitors for job vacancies. Employers consider the very fact that they have failed to find work to be a signal of their inherent inferiority or to reflect a decay of human capital.[16] In other words, effective downward pressure on wages does not come from the total pool of the unemployed, but from that proportion of the pool which is not part of the long-term unemployed.[17] A rising short-term unemployment rate will be more effective in reducing wage pressure than a simple high unemployment rate, since it both increases the probability of losing one's job and reduces the probability of finding another. However, since not all of those in this residual short-term pool are likely to find employment, the pool of long-term unemployed must also subsequently increase. Governments wishing to keep pressure on prices have no other option than to generate increased short-run unemployment by tightening monetary policy. An unintended consequence of such measures must be an ever deepening pool of the long-term unemployed.

This is essentially a stock/flow problem. From the current stock of short-term unemployed, a proportion will reenter employment, while the residual will join the ranks of the long-term unemployed. To keep downward pressure on the inflation rate, the stock of short-term unemployed workers must steadily increase (see Blanchflower and Oswald 1995). The slow rate of job creation, which makes this possible, means that an increasing proportion of the short-term unemployed become long-term unemployed. Since correspondingly fewer of the long-term unemployed rejoin the work force, their stock should rise. The rate at which it rises will depend on the determination of the monetary and fiscal authorities to bring down inflation. Such a policy has lingering effects. The absolute and relative numbers of long-term unemployed increase. Once the authorities ease policy enough to allow for economic growth, unemployment will drop at a slower rate than in previous periods (see Koretz 1995).

Just as full employment does not mean 0% unemployment, so price stability need not mean 0% inflation. Price stability means minimizing the cost of any price effects. Pushing inflation below what we term the economy's natural rate requires ongoing, costly policy shocks.[18] These shocks keep inflation low by causing short-term unemployment to rise continually.

The unemployment rate is stabilized at the natural rate of inflation. This natural rate is consistent with any nonaccelerating rate of unemployment, short-term as well as total. Maintaining inflation rates below the natural rate leads to increasing both short- and long-term unemployment.

Our general thesis, then, is that if short-term unemployment remains constant, inflation will be stable at a level given by its previous history. This stability will be associated with what Blanchard and Summers call "fragile equilibria":

> A physical analogy is useful here. Consider a ball on a hilly surface. If the surface is bowl-shaped, there will be a single uniquely and sharply determined equilibrium surface—at the bottom of the bowl.... If the surface contains two pronounced valleys, or is extremely flat or contains many mild depressions, the ball's position will depend sensitively on just how the ball is shocked. We use the term "fragile equilibrium" to refer to situations of this type—where outcomes are sensitive to shocks and may be history dependent. (Blanchard and Summers 1988: 184)

Reducing inflation below any fragile equilibrium combination of unemployment and inflation requires accelerating the level of short-term unemployment. A subsequent fragile equilibrium at the natural rate of inflation will consist of the equilibrium level of short-term unemployment added to a higher stock of long-term unemployment. An increasing proportion of the unemployed must necessarily be long-term.[19] Therefore we would expect a perceived hysteresis to develop when calculating the natural rate of unemployment given a policy shift to inflation targeting. The shifting natural rate of unemployment represents succeeding fragile equilibria along the long-run horizontal Phillips curve. Each observed natural rate of unemployment, under these circumstances, is dependent on the existing natural rate of inflation.

Like the natural rate of unemployment, the corresponding natural rate of inflation is characterized by short-run downward stickiness. There is an increasingly weaker correlation between rising unemployment and the rate of change of money wages at very high levels of unemployment. As evidenced in the Great Depression, workers will resist reductions in money wages despite high unemployment.

Graphically, the long-run horizontal Phillips curve specifies a family of short-run curves (see Figure 8.2). Each short-run curve is associated with an underlying level of long-term unemployment.[20] Pushing inflation below its natural rate will initially increase short-term unemployment, which permits the lower level of inflation. Over time, the increased stock of short-term unemployed will flow into a higher proportion of long-term unemployed. We then move to a new short-run Phillips curve that is to the right of our starting point. An unwavering determination to reduce inflation below its

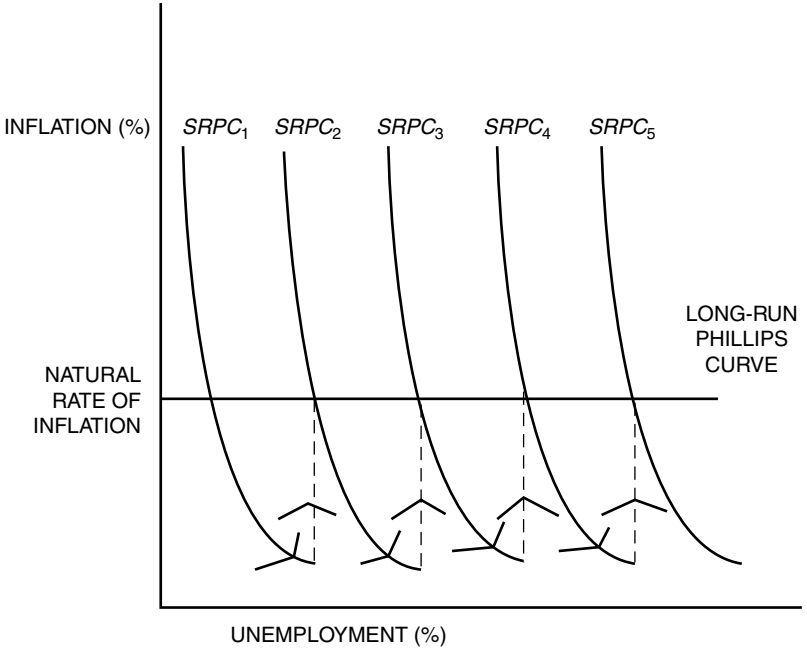

Figure 8.2 The horizontal long-run Phillips curve

natural rate will push the economy out to succeeding short-run Phillips curves that lie ever more rightward along the horizontal long-run curve. Inflation will continue to return to its natural rate as employment responds to the lifting of monetary constraints.

The cost of attempting to reduce inflation below its natural rate will be accelerating increases in the level of unemployment. The move from one short-run Phillips curve to the next along the horizontal long-run curve parallels the upward movement along the traditional vertical long-run Phillips curve. It is important to note that the natural rate of inflation is not associated with a single stable level of unemployment. Rather, because it depends on historical circumstances, unemployment can stabilize at any rate. The natural rate of inflation is taken by us to be an operational construct, though this is only our point of departure. Institutional factors, such as the previously mentioned reduction in the number of permanent employees, can cause both the nature of jobs and the level of competition to change. Institutional rigidities should also influence the observed results.[21] These factors are intensified by the heterogeneous nature of firms and the wage contracts that distinguish them.[22] Or, taking the lead from Irving Fisher (1926), we could see this rate as providing a necessary amount of flexibility

to the economic system. A lower rate of inflation fails to keep the system buoyant because firms are too tightly price constrained, working under an inadequate margin for error.

Any rate of inflation incorporates some prices that are increasing faster than the inflation rate, encouraging expansion, while others, lagging behind, act as a brake on growth. A critical ratio between the two yields stable employment growth. Newly created jobs balance job losses, thus stabilizing the short-term unemployment rate. In other words, at this level the rate of change of short-term unemployment is zero. This weighted average defines the natural rate of inflation. We might point out that any construct of this sort is speculative. Whatever combination of causal links applies, the operational model is itself unaffected.

The essential feature of the model is a basic nonsymmetry in the responsiveness of inflation and unemployment to policy shocks. If the target is the unemployment rate, we are in a world of the vertical long-run Phillips curve. Expansionary policy can only induce a short-run trade-off between unemployment and inflation. In the long run there is no trade-off, and the expansionary policy is associated with ever increasing rates of inflation. Inflation is stable only if unemployment is at the NAIRU. Any attempts to reduce unemployment below that level will increase inflation. We believe that a symmetric argument can be applied to the analysis of contractionary policy aimed at reducing inflation. By targeting inflation, we move to the world of the horizontal Phillips curve. Contractionary policy may induce short-run trade-offs, but in the long run there is no trade-off. Contractionary policy is associated with an ever increasing rate of unemployment. Unemployment will stabilize only if inflation is at its natural rate. Finally, if government abandons the attempt to target either inflation or unemployment by macroeconomic policy, then an apparent trade-off will arise. Periods characterized by economic booms will be associated with low unemployment and a potential for an eventual rising level of wages, and vice versa, without any causal link established. The entire relationship is then driven purely by the business cycle.

This argument can be described by the following equation:

$$\frac{1 + D_p(au)}{1 + D_u(bp)} = \delta, \tag{1}$$

where

a, b, and δ are constants ($a>0$, $b<0$, $\delta>1$);
D_u is a dummy variable, 0 if policy targets unemployment and 1 otherwise;
D_p is a dummy variable, 0 if policy targets inflation and 1 otherwise;
u is the unemployment rate; and
p is the inflation rate.

In the situation before the government used macroeconomic policy to target either inflation or unemployment, both D_u and D_p were equal to 1, so equation (1) became[23]

$$1+au-kp=\delta, \tag{2}$$

where k is a constant equal to δb. Equation (2) implies an inverse trade-off of the type suggested by the original Phillips curve.

When policy is driven by a belief in equations of the type depicted in equation (2), expansionary policy leads to the targeting of unemployment. In this case, D_u is set equal to 0, while D_p = 1. Equation (1) becomes

$$u=\frac{\delta-1}{a}. \tag{3}$$

Equation (3) is simply the equation for the vertical long-run Phillips curve, as advocated by Friedman et al. When policy is driven by a belief in equations of the type depicted in equation (3), then contractionary policy leads to the targeting of inflation. In this case, D_u is now equal to 1, and D_p is equal to 0. In this case equation (1) becomes

$$p=\frac{1-\delta}{k}. \tag{4}$$

Equation (4) represents the horizontal long-run Phillips curve resulting from the targeting of inflation. It extends Friedman's policy ineffectiveness hypothesis beyond the inability of macro policy to reduce unemployment below the "natural" rate. We include a parallel inability to reduce inflation below its "natural rate." Moreover, equations (1)–(4) demonstrate that there is nothing "natural" about the natural rates. Both NAIRU and NAURI are determined by past policy shocks, that is, by history. The attempted use of policy to target either of these variables determines which of the long-run curves is operative.

We can see a number of correspondences between these two long-run Phillips curves. Long-term unemployment forms the determining baseline of our natural rate in much the same way that price expectations do for the vertical curve. Targeting inflation via contractionary policy increases the flow of short-term unemployment (equivalent to the demand pull of unemployment targeting). Of course there is room for exogenous shocks to the employment rate, just as there is room for exogenous shocks to the inflation rate given a vertical curve. Like the expectations-augmented Phillips curve, the horizontal curve is irreversible. It, too, is the creation of extended policy shocks. Continued applicability must be contingent on governmental targeting policy. We would not be surprised, therefore, to find that our horizontal curve is also characterized by hysteresis if targeting policy switches

to unemployment. As previously stated, we characterize both natural rate models as the creations of these two types of definitive policy shocks.

8.3 The End of Targeting

> Oh East is East and West is West and never the twain shall meet,
> Till Earth and Sky stand presently at God's great Judgement seat.
> —Kipling 1929: 231

Targeting must inevitably fail to accomplish its stated goals. In our model, switching the target from inflation to unemployment, or vice versa, simply switches the currency in which the policy price is paid. Wobbling from one to the next would simply repeat the stop–go calamities of the 1950s.[24] What possibilities then remain open?

Some will draw the conclusion, consistent with their existing predisposition, that any interventionist policy is by definition not only irrelevant but positively harmful.[25] The best—indeed the only, rational—alternative is to allow the business cycle to reign free. With government withdrawing from any active role, both the vertical and the horizontal curves become irrelevant. But leaving the economy to the tender mercies of the business cycle is to willingly abdicate all responsibility. In effect Keynes may have unwittingly led governments down the wrong track. The basic thrust, though certainly not the content of Pigou's economic program, may in the end provide a more fruitful direction. Governments need to think macroeconomically but act microeconomically.

Notes

1. In correspondence with us, the author of this eponymous law said that he could not quite remember where he had first stated it. He thought that perhaps he might have made such a statement at a Reserve Bank of Australia conference sometime in the mid-to-late 1970s and that "the quotation may well be in a footnote" in the paper printed from the conference proceedings. Attempts to locate this paper have so far failed.
2. Although this has strong parallels with Keynes's critique of Tinbergen's econometric work on investment functions in the late 1930s, it is the thrust of what has become known as the Lucas critique (1976). It is worth noting, though, that Lucas uses this idea for different ends than we have in mind. Lucas would describe government policy as incapable of changing underlying economic relations. We maintain that policy is capable of creating those relations.
3. See Sawyer (1991) and Leeson (1994) for analyses of the political and theoretical arguments that by 1962 steamrollered all opposition to the adoption of the Phillips curve standard. Leeson refers to this loss of perspective by the economics profession as "new frontier auto intoxication" (1994: 20).
4. According to Nell, the Phillips curve's treatment of labor markets is inadequate: "Yet amazingly, since his account of the Phillips's curve is based on it, Friedman

has simply ignored the labor market!" (Nell 1992: 622–23). One of the consequences of this is that changes in the labor market, resulting from governments attempting to implement policy on the basis of the supposed Phillips curve relation, have been ignored. It is here that irreversibilities are of particular importance.

5. "Yet in the United States and, especially, in Europe, those in authority often accept high unemployment with an air of resignation, as if it stemmed from acts of nature rather than from acts of man. This is an attitude conducive to paralysis: and so we wind up with an excess supply of excess supply" (Blinder 1988: 7).
6. The current preoccupation with inflation tempered by a nagging worry about rising unemployment has led governments to attempt to mimic the patterns created by the normal unfettered business cycle. They aim to ameliorate rather than eliminate unemployment. This policy was effectively ridiculed by Keynes:

> It may appear extraordinary that a school of thought should exist which finds the solution for the trade cycle in checking the boom in its early stages by a higher rate of interest. The only line of argument, along which any justification for this policy can be discovered, is that put forward by Mr. D.H. Robertson, who assumes, in effect, that full employment is an impracticable ideal and that the best that we can hope for is a level of employment much more stable than at present and averaging, perhaps, a little higher . . . such an outlook seems to me to be dangerously and unnecessarily defeatist. It recommends, or at least assumes, for permanent acceptance too much that is defective in our existing economic scheme. (Keynes 1936: 326–27)

7. "All we can say, with any confidence, is that this period represents the high water mark of 'liberal' faith in the efficiency of government to produce desirable, even spectacular, outcomes. . . . The trade-off interpretation of the Phillips Curve was a representation of this confidence in macroeconomic policy manipulation" (Leeson 1994: 5).
8. Nell, among others, has shown that this assumption of price level exogeneity is not necessary for non-neoclassical formulations (see Nell 1992: ch. 18; Harcourt 1980).
9. Perfect competition pulls an economy along a single optimal path allowing no room for alternatives. Policy forays, or even attempts to resist these immutable laws, are useless, thus reinforcing Carlyle's barb in christening economics the "dismal science." As Marshall (1923: 175) wrote:

> Even thoughtful men are still in some measure under the dominion of the old notions that the changes which are general, are probably irresistible and that to resist them is flying in the face of nature. But subordination to natural tendencies when pushed to its extreme logical issue is blind fatalism.

10. Using the vertical Phillips curve in a purely operational sense makes pinning a causal link to the natural rate contradictory:

> One can always define the unemployment rate to be below the natural rate whenever inflation is accelerating. But then it is vacuous to say that inflation is accelerating because unemployment is below the natural rate. (Solow 1986: S32)

11. "Strictly speaking, the word hysteresis should be used only in the case where there is path dependence of steady-state equilibrium unemployment. We shall use it more loosely to denote cases where actual unemployment affects equilibrium unemployment for a long time. The idea that the macroeconomy may exhibit hysteresis is not new. Hysteresis effects were for example discussed in Phelps (1972). An analysis of their implications for policy may be found in Sachs (1985)." (Blanchard and Summers 1987: 314n)
12. It is well-known that the response of many to a break-down of the original Phillips formulation . . . was a search for alternative measure of excess demand for labour (e.g., vacancies, modification to measured unemployment), the introduction of additional variables (e.g., profits, trade union activity) and modification (notably the introduction of inflationary expectations). One honest statement of this was Thirlwall (1975) who wrote that "for two years after the traditional inverse relation between wage-rate changes and unemployment first went awry in 1967, Jim Taylor saved us from rewriting our lecture notes on the Phillips curve (at least, I didn't rewrite mine) by adding hoarded labour to the registered unemployment and rehabilitating the Phillips relation" (p. 139). (Sawyer 1991: 123)
13. Kaldor (1980) claims that monetarism is nothing but wage policy. Balogh maintains that "monetarism is the incomes policy of Karl Marx" (1982: 178). Money supply changes do appear to be more a reflection of a policy stance than a causal mechanism. Certainly a distinct causal relation between money supply and inflation has been difficult to establish for the 1980s and 1990s, when economists repeatedly predicted bouts of inflation that never eventuated. More recently, empirical work by Blanchflower and Oswald (1995) indicates a strong relationship between unemployment and wages in many developed and developing economies. This empirical wage curve would seem to validate the logic behind efficiency wage models—unremarkable, given that there is a simple dependence on opportunity cost implicit in all versions of these models.
14. The idea that the long-run Phillips curve may alternate between different vertical and horizontal positions is implied by Tobin:

    > The [wage] floor phenomenon can preserve a Phillips tradeoff within limits, but one that becomes more fragile and vanishes as greater demand pressure removes markets from contact with the zero floor. The model implies a long-run Phillips curve that is very flat for high unemployment and becomes vertical at a critically low rate of unemployment. (1972: 11)

15. See Harris (1996) for a stock/flow analysis of the contemporaneous inflows to and outflows from the unemployment pool. Note that rising long-term unemployment affects the outflows, indicating that short-run and long-run unemployed do not compete for jobs equally (nor can they compete with those currently employed).
16. This is part of what is termed the duration effect and is often difficult to distinguish empirically from a more general insider/outsider relationship. Besides the signaling effect and a possible deterioration of skills, it is also feasible that the long-term unemployed may reduce their search intensity. See McGregor (1978), Heckman and Smith (1999), and Arulampalam and Stewart (1995) on the employment prospects of the long-term unemployed.
17. This is difficult to demonstrate empirically. Current studies are not conclusive, but the weight of evidence tends to suggest that the long-term unemployed act

differently and are viewed differently by employers. We might expect this group to exert significantly less influence on wages than do the short-term unemployed. An empirical study by Pierre (1998) supports this view. See also Layard and Nickell (1987), Nickell (1987), Graafland (1988), Jackman and Layard (1991), Jones and Manning (1991), and Lever (1995). It seems clear that the long-term unemployed do not reject job offers but simply receive relatively fewer, which supports the idea of duration effects exemplified by signaling or skills deterioration (Jones 1989; van den Berg 1990; Heath and Swann 1999).

18. The cost of increased long-run unemployment must be balanced against the cost of inflation. Work from the mid-1990s suggests that the costs associated with low-level inflation are negligible; see Barro (1995), Sarel (1996), and Cameron et al. (1996).
19. 'Once it is acknowledged that the numbers structurally unemployed rises, then the actual number of unemployed who pose a job threat to those employed at each aggregate level of unemployment is decreasing. But, it is the actual number of potentially employable unemployed workers whose presence acts to discipline wage demands. . . . [I]f the structural component of the unemployed is rising, then it will require an increasing overall level of unemployment to generate this number of potentially employable unemployed workers'. (Hargreaves Heap 1980: 615)
20. The slope of the short-run curves depends upon structural factors within the economy, the responsiveness of prices to wage changes, and inflation expectations. This will determine in the short run, how much increased unemployment will be needed to constrain prices.
21. Akerlof et al. (1996), for instance, claim that low rates of inflation allow for more flexible wages. This work is very much in tune with an older tradition in which moderate inflation was seen as a grease lubricating the economy. Tobin provides a useful summary of this position: "Price inflation. . . is a neutral method of making arbitrary money wage paths conform to the realities of productivity growth, neutral in preserving the structure of relative wages" (1972: 13). Jacob Viner (1933: 122) had pointed out four decades earlier that wage rises lag price increases; this tended to boost profits and increase production.
22. See Tobin (1972) for a clear presentation of the consequences of assuming such heterogeneous firms. Akerlof et al. (1996) model this in terms of monopolistic competition.
23. Since there is a short-run trade-off between inflation and unemployment (the slope of the short-run Phillips curve is negative), the constants must be constrained so that $au \leq (\delta - 1)$.
24. With sufficient information, ideally both objectives could be given equal weight. In reality, monetary authorities would be facing a moving target. Given the changing economic environment in which such policy must operate and the rate at which new financial instruments are developed, a central bank's strategy may in turn affect the underlying structural components as financial markets modify their behavior in response to policymakers. See the Lucas (1976) critique in this regard.
25. While central bankers have not withdrawn from active duty, for most of the 1990s they were more cautious in their approach. For the most part there has been the occasional tap on the brake or the accelerator. Though not on the public level, where their influence has continued to be trumpeted, in practice they have been less ambitious and overall more modest. Where this has not been the case (as in New Zealand in 1998, when a rigid inflation targeting policy was followed), the results have been noticeably deleterious.

References

Akerlof, G.A., Dickens, W.T., and Perry, G.L. 1996. "The Macroeconomics of Low Inflation." *Brookings Papers on Economic Activity* 1: 1–76.

Arulampalam, W., and Stewart, M.B. 1995. "The Determinants of Individual Unemployment Durations in an Era of High Unemployment." *Economic Journal* 105: 321–32.

Balogh, T. 1982. *The Irrelevance of Conventional Economics*. London: Liveright.

Barro, R.J. 1995. "Inflation and Economic Growth." *Bank of England Quarterly Bulletin* 35: 166–75.

Blanchard, O.J., and Summers, L.H. 1987. "Hysteresis in Unemployment." *European Economic Review* 31: 288–95.

_____. 1988. "Why Is Unemployment So High in Europe?" *American Economic Review* 78: 182–87.

Blanchflower, D.G., and Oswald, A.J. 1995. "An Introduction to the Wage Curve." *Journal of Economic Perspectives* 9: 153–68.

Blinder, A.S. 1988. "The Challenge of High Unemployment." *American Economic Review* (Papers and Proceedings) 78: 1–15.

Cameron, N., Hum, D., and Simpson, W. 1996. "Stylized Facts and Stylized Illusions—Inflation and Productivity Revisited." *Canadian Journal of Economics* 29: 152–62.

Carroll, L. 1871. *Through the Looking Glass*. New York: Macmillan [1957].

Conrad, A.H. 1959. "The Share of Wages and Salaries in Manufacturing Incomes 1947–56." *Harvard Economic Research Project, Study Paper No.* 9.

Dicks-Mireaux, L.A., and Dow, J.C.R. 1959. "The Determinants of Wage Inflation: United Kingdom 1946–56." *Journal of the Royal Statistical Society* ser. A, 122 (pt. 2): 278–82.

Fisher, I. 1926. "A Statistical Relation between Unemployment and Price Changes." *International Labor Review* 13(6): 185–92.

Friedman, M. 1968. "The Role of Monetary Policy." *American Economic Review* 58: 1–17.

Gordon, R.J. 1997. "The Time-Varying NAIRU and Its Implications for Economic Policy." *Journal of Economic Perspectives* 11:11–32.

Graafland, J.J. 1988. "Can Hysteresis Explain Different Labour Market Operations between Europe and the United States?" *De Economist* 136: 508–23.

Harcourt, G.C. 1980. "A Post-Keynesian Development of the 'Keynesian' Model." In *Growth, Profits and Property,* ed. E.J. Nell. Cambridge: Cambridge University Press.

____. 2000. "A Left Keynesian View of the Phillips Curve Trade-Off." In *A.W.H. Phillips Collected Works in Contemporary Perspectives,* ed. R. Leeson. Cambridge: Cambridge University Press.

Hargreaves Heap, S.P. 1980. "Choosing the Wrong 'Natural' Rate: Accelerating Inflation or Decelerating Employment and Growth?" *Economic Journal* 90: 611–20.

Harris, R.I.D. 1996. "Estimating Unemployment Inflows, Outflows and Long-Term Unemployment in Britain Using the Cointegration Approach." *Applied Economics* 28: 1199–1212.

Heath, A., and Swann, T. 1999. "Reservation Wages and the Duration of Unemployment." *Research Discussion Paper* (Reserve Bank of Australia) RDP1999–02.

Heckman, J.J., and Smith, J.A. 1999. "The Pre-Programme Earnings Dip and the Determinants of Participation in Social Programme. Implications for Simple Programme Evaluation Strategies." *Economic Journal* 109: 313–48.

Hines, A.G. 1964. "Trade Unions and Wage Inflation in the United Kingdom 1893–1961." *Review of Economic Studies* 31: 221–22.

Jackman, R., and Layard, R. 1991. "Does Long-Term Unemployment Reduce a Person's Chance of a Job? A Time Series Test." *Economica* 58: 93–106.
Jones, D., and Manning, D. 1991. "Long-Term Unemployment, Hysteresis and the Unemployment–Vacancy Relationship: A Regional Analysis." *Regional Studies* 26: 17–29.
Jones, S.R.G. 1989. "Job Search Methods, Intensity and Effects." *Oxford Bulletin of Economics and Statistics* 51: 276–96.
Kaldor, N. 1959. "Economic Growth and the Problem of Inflation Part II." *Economica* 26: 287–98.
____. 1980. *The Scourge of Monetarism.* London: Macmillan.
Keynes, J.M. 1936. *The General Theory of Employment, Interest and Money.* London: Macmillan.
Kipling, R. 1929. "The Ballad of East and West." In *Rudyard Kipling's Verse.* London: Hodder & Stoughton.
Knowles, K., and Winsten, C. 1959. "Can the Level of Unemployment Explain Changes in Wages?" *Bulletin of the Oxford University Institute of Statistics* 21: 113–20.
Koretz, G. 1995. "Need Work, Won't Travel." *Business Week International,* November 13, p. 12.
Layard, R.G., and Nickell, S.J. 1986. "Unemployment in Britain." *Economica* 53: S121–71.
____. 1987. "The Labour Market." In *The Performance of the British Economy,* ed. R. Dornbusch and R.G. Layard. Oxford: Oxford University Press.
Layard, R.G., Nickell, S.J., and Jackman, R.A. 1991. *Unemployment: Macroeconomic Performance and the Labour Market.* Oxford: Oxford University Press.
Leeson, R. 1994. "How Did Macroeconomics Get on the Phillips Curve Standard?" *Department of Economics Working Papers* (Murdoch University) no. 106.
_____, ed. 2000. *A.W.H. Phillips' Collected Works in Contemporary Perspective.* Cambridge: Cambridge University Press.
Lever, M.H.C. 1995. "Insider-Outsider Effects in Wage Formation: An Empirical Survey." *Bulletin of Economic Research* 47: 258–74.
Lucas, R.E., Jr. 1976. "Econometric Policy Evaluation: A Critique." In *Carnegie Rochester Conference Series on Public Policy,* vol. 1. Amsterdam: North-Holland.
Marshall, A. 1923. *Industry and Trade.* London: Macmillan.
McGregor, A. 1978. "Unemployment Duration and Re-Employment Probability." *Economic Journal* 88: 693–706.
Nell, E.J. 1992. *Transformational Growth and Effective Demand.* New York: Macmillan.
Nickell, S.J. 1987. "Why Is Wage Inflation in Britain So High?" *Oxford Bulletin of Economics and Statistics* 49: 103–28.
Nourse, E.G. 1960. "Some Questions Emerging Under the Employment Act." *American Economic Review* 50: 130–44.
Osberg, L. 1988. "The 'Disappearance' of Involuntary Unemployment." *Journal of Economic Issues* 22: 707–27.
Ozanne, R. 1959. "Impact of Unions on Wage Levels and Income Distribution." *Quarterly Journal of Economics* 23: 177–96.
Pechman, J.A. 1960. "The Problem of Stable Prices—Discussion." *American Economic Review* (Papers and Proceedings) 50: 218–22.
Phelps, E.S. 1967. "Phillips Curves, Expectations of Inflation and Optimal Unemployment." *Economica* 34: 254–81.
_____. 1972. *Inflation Theory and Unemployment Policy.* London: Norton.
Phillips, A.W.H. 1954. "Stabilisation Policy in a Closed Economy." *Economic Journal* 64: 290–323.

_____. 1958. "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957." *Economica* 25: 283–99.
Pierre, G. 1998. "Does a Higher Proportion of Long-Term Unemployment Really Increase Wage Pressure?" Paper presented at the Royal Economic Society Annual Conference, Warwick University.
Reynolds, L. 1960. "Wage-Push and All That." *American Economic Review* (Papers and Proceedings) 50: 195–204.
Romer, CD. 1996. "Inflation and the Growth Rate of Output." *Working Paper* 5575. Cambridge, MA: National Bureau of Economic Research.
Routh, G. 1959. "The Relations between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957: Comment." *Economica* 26: 299–315.
Sachs, J. 1985. "High Unemployment in Europe: Diagnosis and Policy Implications." Mimeo. Cambridge, MA: Harvard University.
Samuelson, P., and Solow, R. 1960. "Analytical Aspects of Anti-Inflation Policy." *American Economic Review* 50: 177–204.
Sarel, M. 1996. "Nonlinear Effects of Inflation on Economic Growth." *IMF Staff Papers* 43: 199–215.
Sawyer, M. 1991. "The Political Economy of the Phillips Curve." In *Theory and Policy in Political Economy,* ed. P. Arestis and Y. Kitromilides. Aldershot, UK: Edward Elgar.
Schultze, C. 1959. *Prices, Costs and Output for the Post-War Decade 1947–57*. Washington, DC: Committee for Economic Development.
Seccareccia, M. 1991. "An Alternative to Labour-Market Orthodoxy: The Post-Keynesian/ Institutionalist Policy View." *Review of Political Economy* 3: 43–61.
Solow, R. 1986. "Getting the Questions Right." *Economica* (Supplement) 53: S23–S34.
Taylor, J. 1975. "Wage Inflation, Unemployment and the Organised Pressure for Higher Wages in the United Kingdom, 1961–1971." In *Contemporary Issues in Economics,* ed. J.M. Parkin and A.R. Nobay. Manchester: Manchester University Press.
Thirlwall, A. 1975. "Discussion of Taylor (1975)." In *Contemporary Issues in Economics,* ed. J.M. Parkin and A.R. Nobay. Manchester: Manchester University Press.
Tobin, J. 1972. "Inflation and Unemployment." *American Economic Review* 62: 1–17.
Turner, H.A. 1959. "Employment Fluctuations, Labour Supply and Bargaining Power." *Manchester School of Economic and Social Studies* 27: 175–202.
van den Berg, G.J. 1990. "Search Behaviour, Transitions to Nonparticipation and the Duration of Unemployment." *Economic Journal* 100: 842–65.
Viner, J. 1933. "Inflation as a Possible Remedy for the Depression." In *Proceedings of the Institute of Public Affairs*. Athens: University of Georgia Press.

9

Some Notes on Classical Political Economy and the Rise to Dominance of Supply and Demand Theories

Joseph Halevi

In a paper delivered at an IEA conference at S'Agaro in April 1975, Professor Koopmans presented a growth model with an invariant capital stock, that is to say, an economy where the initial capital stock is optimal and remains so through time [7]. In his analysis the growth rate itself can be expressed by an input intensity vector. An increase in the latter would "swell up" all quantities in the required proportion.

In the discussion that followed, Professor Nell asked whether the model could tell where the additional capacity necessary to sustain a higher growth rate would come from, assuming two or more heterogeneous capital goods.

Koopmans' answer was disarmingly short, simply acknowledging that the question raised serious analytical as well as computational difficulties.[1] However, since the nature of the latter was not mentioned, we shall suggest that these can be taken as referring to the specific neoclassical framework of the model itself.

In fact both in crude neoclassical and activity-analysis models the fundamental framework of linear processes is retained, which means that economic activity is seen as a one-way avenue moving from primary resources ("capital" and land) to consumption goods. Connected with this view is the treatment of resources, including the capital stock, as parametric to final demand so that the ensuing factor prices can be said to represent scarcity indices. This approach does not undergo any significant change once growth is introduced; it simply appears as a phenomenon added on top of a pure exchange static economy.

The salient characteristics of linear production models are the following; (a) the production of capital goods is a mere stage problem in the production of final consumption goods, which amounts to considering the output

Revised from *Australian Economic Papers*, 20(36): 96–103, 1981, 'Some Notes on Classical Political Economy and the Rise to Dominance of Supply and Demand Theories,' by Halevi, J. With kind permission from John Wiley and Sons. All rights reserved.

of capital goods as working capital,[2] and as a consequence, (b) accumulation does not appear as the outcome of a process involving reproduction, nor does accumulation appear as the leading element in the formation and expansion of the very economic phenomenon which neoclassical and general equilibrium theories are more concerned with, namely, the market.

In this context, therefore, the difficulties alluded to by Koopmans emerge as a crucial theoretical inability in dealing with the formation (and liquidation) of productive capacities in a framework where capital stock is treated as a natural resource, *i.e.* parametrically to final demand.

It is the merit of Professor Krishna Bharadwaj's recent publication [1] to have confronted, in an extremely lucid way, the above approach with the Classical, especially Marxian, theories where the interdependence between production and consumption takes the well known form of circular flows as expressed in Marx's version of the Tableau Economique.

Bharadwaj's main endeavour, if we understand her correctly, consists in pointing out the crucial conceptual differences between the Classical school, which views consumption as functionally related to accumulation, and the Equilibrium schools, where production (one cannot quite speak of accumulation) is in fact determined by subjective consumption preferences, that is, by the "Minds, Opinions and Appetites, Passions of Particular Men". [14, quoted in [1. p. 30]

Bharadwaj's taking the link between subjective preferences and the rise of supply and demand theories as the principal source of methodological complications within the theory makes her criticism valid for both neoclassical and general equilibrium models, since the assumptions about preferences and their interactions with supply conditions are the same in both.

Her book is based on three R.C. Dutt lectures on political economy given in 1976 at the Centre for Studies in Social Sciences, Calcutta. The first lecture constitutes an attempt to trace the historical context of the theories of supply and demand, the second deals with the methodological implications of the utility based approach and the third discusses the shift to relations of circulation brought about by supply and demand theories.

Bharadwaj's reasoning rests on two pillars; the critique of the supply and demand approach is carried out along the lines of Sraffa's 1926 paper [15]. while the more general validity of the Classical, especially Marxian, system is argued on the basis of *Sraffa's Production of Commodities by Means of Commodities*.[16]

It must be said at this point that the connections between Sraffa's two contributions has not been stressed sufficiently in economic literature, whereas in the book under review both emerge as necessary elements for the understanding of the limitations of neoclassical and general equilibrium theories.

In analysing the structure of equilibrium theories Bharadwaj points out that, in a framework determined by a set of feasible technological

transformations between given supplies of factors of production, on one hand, and by a set of feasible consumption choices of individuals, stemming from an autonomously given scale of preferences, on the other, the notion of potential change becomes a requisite of equilibrium theories.

It is in fact only in a context of potential change that it is possible to derive from the supply and demand apparatus the symmetry between production and consumption and that between wages and profits. This part of the analysis is particularly relevant because it opens the way to an understanding of Sraffa's 1926 contribution.

The author notes that in supply and demand theories the concept of an equilibrium position "is tied up with postulates concerning the behaviour of the system under 'change' even though these variations may be considered hypothetical or *theoretically* confined to the infinitesimally small" (pp. 42–43). These alternative states are therefore imputed ones and not observed ones.

The ranking of the possible alternative positions came to be expressed on the demand side by a utility function, taken as a self evident, fundamental and universal, principle. On the supply side, the same operation was performed by ordering all possible combinations of variable with fixed factors according to their return. Very aptly Bharadwaj reminds us that the ordering of the alternative uses "does not arise from material or technical *necessities* owing to which the uses must necessarily follow in that sequence. It is an arrangement arrived at by the producer seeking maximum return" (p. 52). The implication of the above statement is twofold; the descending order in which production possibilities are expressed cannot be likened, as wrongly done in text books, to a "technical" relation showing physical diminishing returns because it is an outcome of the profit-maximizing postulate. Consequently, it raises right from the outset the question of valuation since (alternative) returns cannot be fixed independently of prices.

The symmetry between production, and consumption is therefore the mirror image of the symmetry between the profit-maximizing and the utility-maximizing postulates. Both. require a descending order of production alternatives and consumption preferences. The curious tail end of the story is that diminishing returns on factors and diminishing consumption utilities are two heterogeneous elements bringing about the same results. In fact one might argue (as Wicksteed did [17]) that a coherent theory based on subjective preferences requires the scrapping of the supply function altogether.

It is in analysing the contradictions in the construction of the supply function that the author brings in Sraffa's 1926 contribution in such a way as to make the reader aware that, once the inconsistencies in the partial equilibrium framework are uncovered, the solution cannot be found in general equilibrium models.

To be sure, however, supply and demand theories can be attacked efficaciously also from the demand side. The utility-maximisation assumption lies

in the framework of what a leading political theorist Professor MacPherson, called the Theory of Possessive Individualism and there is by now an ample and well thought out critical literature on the subject [9]. Moreover, Marx's views of the determinants of consumption have an unambiguously devastating effect on. the postulates of "utility" theories. The following passage from the *Grundrisse* quoted by Bharadwaj gives the scope and depth of Marx's materialistic conception of history and thus of the relationship between economic categories; "Hunger is hunger; but the hunger that is satisfied by the cooked meat eaten with knife and forks differs from hunger that devours raw meat with, help of hands, nails and teeth, Production thus produces not only the object of consumption but also the mode of consumption not only objectively but also subjectively." [11, quoted in [1], p. 61]

Yet Sraffa's internal critique of the assumed relationship between costs and quantities produced in a Marshallian framework should still retain a preliminary priority because it shows that, in order to make the supply and demand functions operate symmetrically, it is necessary to treat the former with suppositions that rule out the study of fundamental economic phenomena such as increasing returns to scale for the firm. Moreover, both "Laws of Returns Under Competitive Conditions" and *Production of Commodities by Means of Commodities* show that no such restrictive conditions are necessary in Classical Political Economy.

Bharadwaj presents Sraffa's critique very clearly and succinctly, thus providing an excellent stimulus to students and the too many academic economists who have not read or refuse to read Sraffa's works.

She starts from the proposition advanced by Sraffa along Classical lines that the causes of increasing returns are to be seen in terms of the interconnection existing between different industries, whereby the unit cost (hence the supply function) in any given industry cannot only be related to the levels of output in that particular industry.

The Marginalists' attempt to confine such interconnectedness to the notion of externality is rightly viewed by the author as similar to solving the slum problem in a city by simply redrawing its boundaries. Moreover the presence of technical changes immediately raises the question of their irreversible character.[3] In this case one could not move freely on the same supply curve as required by the conditions determining equilibrium.

Finally, another form of inter-relationship mentioned by Sraffa is brought to the reader's attention; namely, that unless a producer uses the whole of a fixed factor, an increase in the price of that factor will affect all the other producers so that equilibrium can no longer be confined to the case in which every single producer faces a set of constant prices.

This last observation may indeed be seen as a strong point in favour of theoretical systems where equilibrium is simultaneously determined all around and where a given set of factors is fixed in relation to the economy as a whole. Therefore an increase in output in any given industry would

generate an increase in costs *via* the price effect following the change (increase) in the demand for the factor used by the said industry, in this way increasing costs and diminishing returns are once more introduced. The above case is typical of linear programming models with constant returns to scale; the industry experiencing an excess demand will have higher a profit rate leading to an expansion of its output, with a positive demand effect on its inputs. Conversely, the industry experiencing a decline in demand (note how the analysis of change remains with the comparative static framework) will release its inputs. Insofar as inputs combinations differ, the demand-induced price increase in the more intensively used inputs will raise unit costs in the expanding industry. The opposite will happen with the more intensively used inputs in the industry whose output shrinks. A tendency towards the equalization of the rate of returns under competitive static conditions thus occurs.

Bharadwaj immediately observes that this process need not take place, since what is involved is "the direct and indirect demands generated through the entire interdependent system of production so that the net effects on factor demands and prices could be contrary to what one would presume merely from looking at the direct means of production of the two industries experiencing change in demand." (pp. 55–56).

The reader will not fail, to see that Bharadwaj's critique of general equilibrium is centred, along Sraffian lines, on the inadequate analysis of the interdependences characterizing an industrial, economy.

What emerges out of Bharadwaj's treatment of Sraffa's 1926 contribution is that the problems raised by Sraffa constitute general cases of production activities, whereas in the partial and general equilibrium framework they have been given the status of special cases (externalities) or perverse ones (non-substitution).

The author does not forget to mention that in the subsequent and most recent developments of equilibrium theory not only have the above impeccable objections not been considered, but strict convexity, absence of externalities, absence of direct interaction among the participants in economic activities (except through the medium of prices) have been raised to the level of axiomatic requirements for the unfolding of the theory. Furthermore, given the difficulties involved in producing a uniform rate of profits in Walrasian models, equilibrium theorists have confined themselves to short-period and momentary equilibria. (Incidentally the Italian school of general equilibrium was quite aware of the problems connected with ensuring a uniform rate of return. This is because in Vilfredo Pareto's *Corso d'Economia Politica* the problem was very neatly formulated. According to Pareto, uniform rates of return strictly apply only to the newly produced capital goods, but not between these and the capital goods produced in the past. In Walras the formulation of the question is extremely vague; in Lecture 28 of *Elements d'economie politique pure* Walras does refer to the

possibility that the equalization of the rates of return might take some time but, unlike Pareto, he omits the crucial analytical distinction between rates of return on newly produced and past capital goods.)[4]

The conclusions which Bharadwaj arrives at in her discussion of both partial and general equilibrium theories are thus the following; supply and demand theories constrained changes in a direction postulated by the theories themselves, limiting their ability to explain actual changes and finally getting bogged down in logical problems or in a mere static framework. In what sense therefore is it possible to claim generality for the classical analysis? The answer given by the author stems in this case too from Sraffa's 1926 article. More specifically, the answer is sought in Sraffa's observation that, while classical political economy singles out the cost of production as the main factor in the determination of value, it "does not lead us astray when we desire to study in greater details the conditions under which exchange takes place in particular cases; for it does not conceal from us the fact that we cannot find the elements required for this purpose within the limits of the assumption". [15, quoted in [1], p. 66]

The classical system took as given the determinants of social consumption and of the level of output as far as the explanation of value is concerned. In so doing, classical political economy "does not commit itself through its theoretical structure to any form and direction of change; in other words, the classical theory is not constrained to permit only some specific changes of the many possible ones as alone consistent with theory. Thus it does not have to presume more than is necessary for the limited objective of determining relative values at one observed position of the economic system" (p. 67). In this context Sraffa's anatomy of the classical system, which he carried out in *Production of Commodities by Means of Commodities* under the assumption of a given output, is not a special case, that is, it is not a point on the production function.

I would like at this stage to mention an important analytical result arrived at by Pasinetti because its constructive character strengthens Bharadwaj's comment referred to above.

Comparing a linear programming model, with given resources, with a Sraffian model, where all commodities are produced, Pasinetti arrives at the following conclusion (among others); in a system where all commodities are produced their prices cannot represent relative scarcities. Moreover, in such a context, the prices are positive without the goods being scarce. Hence the important observation that "non scarce commodities are not the same thing as free goods". [13]

As Pasinetti himself has observed elsewhere, in a production framework prices do not emerge as scarcity indices relatively to consumer preferences. They are determined, rather by technology (costs of production in the classical sense), while demand determines the relative quantities to be produced [12]. It is not difficult to see that Keynes' and especially Kalecki's

propositions about the economics of effective demand are logically consistent with the above approach.

We can now move towards the close of our discussion and we shall do so by taking up the comments made on Koopmans at the beginning of this review.

First, however, it is helpful to present Bharadwaj's interpretation of why the supply and demand approach gained immediate acceptance and an appearance of generalizability.

The quick acceptance is linked to two elements; the market appears, to the individualistic perception, as the locus in which agents come into contact as free and equal traders. Connected with this is that, in a system of pure exchange, the specific role of social classes as the backbone of any socio-economic formation is obliterated, though the role of individual transactors is not, of course. This is best exemplified in the general equilibrium framework, where the stage is populated by homogeneous agents. Since all transactions take place simultaneously, it is impossible to determine who starts the production process (capitalists and entrepreneurs) and who has to wait for the (production) decisions to be taken in order to offer his/her labour services. Only *ex post* will it be possible to decide who has become a capitalist and who has ended up being a worker, and in any case the association with one group or another is the outcome of personal decisions (determined by the individual's resource endowment).[5] The existence of social classes has not, however, been denied but has been seen as alien to economic analysis.

From what is said above, the generalizability of the supply and demand approach immediately follows. Bharadwaj notes that when building is done on the obvious phenomenon of exchange, the process goes from barter to the incorporation of capitalist production *i.e.* the production, of capital goods. To criticise this procedure the author refers to Marx's observation according to which "If we are acquainted with nothing but the abstract categories of circulation, which are common to all modes of production, we cannot possibly know anything of the specific points of difference of these modes nor pronounce any judgement on them." [10, quoted in [1]. pp. 79–80]

By contrast, in the classical system, and especially in Marx, the basic macroeconomic exchange flows stem from the characterization of the production process in terms of reproduction conditions.

Thus Marx's exchange equilibrium conditions for expanded reproduction is the outcome of a concept of production based on dividing up production between activities aimed at capital accumulation (capital goods industries) and activities aimed at generating the level of consumption necessary to support accumulation, where the determinants of individual consumption are historically given.

This scheme can be extended to give a positive answer to Koopmans' puzzled, response.

In a production model with input complementarity, and where inputs (capital stock) are reproducible, the additional capacity for expansion will come, initially, from a rise in the capital stock allocated in the capital goods industries at the expense of that allocated in the consumption goods industries. Only after capacity in the former has increased will the latter be brought back into line.

The complexities of such a process have been analysed by Professor Lowe in his superb work *The Path of Economic Growth.* To achieve this it was necessary to make full use of the classical method of reproduction and to drop the method of linear processes based on a one-way avenue running from given factors to consumption demand.

Bharadwaj's work is, in this context, necessary reading for the student and the teacher who wishes to grasp the fundamental methodological differences between the two approaches and who wish to avoid confusing, electicism.

Notes

1. E.J.Nell, [5], pp. 177.
2. The clearest identification of the production of capital goods with working capital can be found in the Austrian School. In fact, however, that identification creeps into every linear model of production. An excellent discussion of the issue is provided by A. Lowe [8], and D. Clark [2].
3. It is in fact by considering changes irreversible that John Hicks in his *Capital and Time,* does away with the problem of reswitching. This does not eliminate, however, the fact that changes were always considered by traditional theory and in *Value and Capital* as *reversible.* But Hicks now acknowledges this. See J. Hicks [6].
4. This point has been stressed by A. Graziani [4].
5. An excellent discussion of the above points has been provided by A. Graziani in his introduction to [3].

References

1. Krishna Bharadwaj, *Classical Political Economy and the Rise to Dominance of Supply and Demand Theories* (Calcutta: Orient Longman Co., 1978).
2. D. Clark, *Studies in the Origin and Development of Growth Theory*, unpublished Ph.D. thesis, Sydney, 1974.
3. R. Convenevole, *Processo Inflazionistico e Redistribuzione del Reddito* (Turin: Einaudi, 1977).
4. A. Graziani, *Equilibria Generale ed Equilibrio Macroeconomico* (Naples: ESI. 1965).
5. G.C. Harcourt (ed.), *The Microeconomic Foundation of Macroeconomics* (London: Macmillan. 1977).
6. J. Hicks, "Revival of Political Economy: The Old and The New", *Economic Record,* vol. 51, 1975.
7. T.C. Koopmans, "Examples of Production Relations Based on Microdata", in [5].
8. A. Lowe, *The Path of Economic Growth* (Cambridge: Cambridge University Press, 1976).

9. C.B. Macpherson, "The Myth of Maximization" in *The Real World of Democracy* (Oxford: Oxford University Press, 1966).
10. K. Marx, *Capital,* vol. 1, (Chicago: H. Regenery, 1970).
11. K. Marx, *Grundrisse* (London, Macmillan, 1971).
12. L. Pasinetti, *A New Theoretical Approach to the Problems of Economic Growth* (Vatican City: Pontificiae Academiae Scientiarum Scripts Varia, 1965).
13. L. Pasinetti, *Lectures on the Theory of Production* (New York: Columbia University Press, 1977).
14. W. Petty, "Political Arithmetik", in *Economic Writings,* vol. 1, C.H. Hull, ed., (London: 1899).
15. P. Sraffa. "The Laws of Returns under Competitive Conditions". *The Economic Journal,* vol. 36, 1926.
16. P. Sraffa, *Production of Commodities by Means of Commodities* (Cambridge: Cambridge University Press, 1960).
17. P. Wicksteed, "The Scope and Method of Political Economy in the Light of the 'Marginal' Theory of Value and Distribution", *The Economic Journal,* vol. 24, 1914.

10

Accumulation, Breakdown Crises, Disproportionality, and Effective Demand

Joseph Halevi

10.1 Introduction

Claudio Napoleoni created a highly original strand of thought both in relation to Marxian theory as well as in connection to the interpretation of contemporary capitalism. He was also the main intellectual force behind the introduction of Classical Marxian economics in Italy. Up to Napoleoni's full engagement with Classical and later mostly Marxian topics, the major work discussing Marx's economics was Paolo Sylos-Labini's article on economic growth in Marx and Schumpeter (Sylos-Labini [22]).

That article dealt mostly with the expansionary aspects of Marxian growth and in many respects anticipated by more than a decade the cyclical growth model of Richard Goodwin. In Sylos-Labini's essay the crisis is not treated as an integral part of Marx's model for reasons which now appear to be almost self-evident. The cyclical theory outlined in Chapter 25 of the first volume of *Capital* is very strictly connected with Ricardo's pure corn theory. Thus if output can be *ipso-facto* transformed into either capital or consumption goods the objective basis for economic crises would disappear. Cyclical variations in output growth would, however, persist due to the hypothesis that the share of investment over output depends upon the share of saving and the latter upon the distribution of income. If accumulation causes the Reserve Army to dwindle, the share of wages over national income will rise engendering a decline in the share of profits, saving and investment.

It was Napoleoni who brought to Italy the whole debate over both the dynamics of capitalism and the question of its growth or collapse. By the end of the 1960s Napoleoni was working on the systematisation of Marx's

---

N.B., the numbers in square brackets refer to the Bibliography at the end of the paper.

Revised from *Rivista di Politica Economica*, 89(4–5): 77–95, 1998, 'Accumulation, Breakdown Crises, Disproportionality, and Effective Demand,' by Halevi, J. With kind permission from *Rivista di Politica Economica*. All rights reserved.

position within Classical thought, on the development of modern Marxian analyses and on the great debate on growth and breakdown. These efforts were crowned by three books, which at the time had a wide readership. Outside Italy the better known of these is *Smith, Ricardo, Marx* (Napoleoni [16]). Yet in relation to the crisis debate the other two books are perhaps more important. One consists in the reprinting, with a long *Introduction*, of Sweezy's *Theory of Capitalist Development* (Sweezy *et* al., [21]). However the Napoleoni edition contained only the first part of Sweezy's book. The second, which dealt with the rise of monopolies, was replaced with translations of articles dealing with value and crisis in Marxian theory. The third book was a two volume set, co-edited with Lucio Colletti, containing the best original collection to date of the ideas about the future of capitalism of the Classics, of Marx and of the Marxists of the turn of the century (Colletti and Napoleoni [1]; Napoleoni [17]).

In *Il futuro del capitalismo: crollo o sviluppo*? (*The Future of Capitalism: Collapse or Growth*?) Napoleoni wrote the *Introduction* dealing with the economic theories involved (Colletti and Napoleoni [1]; Napoleoni [17]). The essay focused on the notion of economic crises and argued, quite convincingly, that none of the approaches developed by either Malthus or Sismondi as well as by Marx himself are robust enough to account for a satisfactory theory of crises. By the same token, those who denied that underconsumption would be a cause of crisis (Tugan Baranovski) misunderstood the possibility of such a state of affairs with the actual process required to implement it.

Napoleoni viewed Marx's problematique about the crisis of capitalism as formed by three layers. The first layer is represented by a critique of both Sismondi and Malthus. According to Napoleoni these authors' concern with the sources of consumption demand led them—and Sismondi in particular—to exclude the demand for means of production from the determination of the level of output. Hence Sismondi, by imputing demand only to consumption, arrived at the paradoxical conclusion that capitalist accumulation is impossible in practice. It is then argued that Marx's merit lay precisely in showing that accumulation is quite a coherent process. Napoleoni pointed out that Marx's demonstration of the rationality of accumulation stems from the equilibrium results contained in his schemes of expanded reproduction. Thus it is not the lack of consumption demand which is the source of capitalist crises but something more fundamental, more endogenous to system itself.

The second stratum of Marx's problematique revolves around this question and finds its expression mostly in the first and third volumes of *Capital*. According to Napoleoni's *Introduction*, Marx sought to evince from the endogeneity of accumulation the seeds of its crisis. It is this concern that led Marx to develop a theory of the trade cycle culminating in a long-run theory of the falling rate of profits. Yet, Napoleoni maintains that these two components of Marxian dynamics could not be married successfully.

Cyclical growth does not imply a tendency towards crises, while the falling rate of profits theory is not well grounded. Hence Marx's attempt to show how the technological transformations generated by capitalists' struggle to recover profitability after a downturn lead, ultimately, to a falling rate of profits—lacks conceptual robustness.

Having therefore discarded the first two layers of Marx's *problematique*, Napoleoni directs his attention to the post-Marx debate over the question of whether the capitalist system was capable of sustained accumulation or was bound to break down. The break-down controversy is seen as one of the richest contributions made by Marxian analysis to the understanding of the dynamic of accumulation. Although no clear theoretical verdict came out of the controversy, the debate revolved exactly around the twin issues of systemic growth guaranteed by proportionality conditions, and crises determined by lack of effective demand and over-accumulation (Sweezy [20]). To a very large extent that discussion anticipated the analysis of the stability of growth models which followed the publication of the works of Harrod and Domar. The difference vis à vis the Marxian debate consisted in that the postwar discussion focussed on the formal properties of the models, whereas the Marxists (Luxemburg, Tugan, Kautsky) tried to infer from their examples the actual tendencies of accumulation.

It must be observed at this point that when Napoleoni wrote the *Introduction* to *"Il futuro del capitalismo"* post-Keynesian economic thought was still in its infancy. In particular it still relied heavily on the ideas of Kalecki, Kaldor and Robinson and on the developments put forward by Pasinetti. Since that period post-Keynesian economics has travelled quite a bit and has become significantly more diversified. As far as the issues raised by Napoleoni are concerned it is the structural component of the evolution of post-Keynesian thought which is relevant here. This strand of contemporary post-Keynesianism combines sectoral analyses of Hicks-Lowe variety and Pasinetti type of vertical integration with the Kalecki-Keynes principle of effective demand (Hagemann [3], [4]; Halevi [5], [6]; Lavoie [13], [14]; Lavoie and Ramirez [15]; Sardoni [19]). Thus the remainder of the paper will attempt to show that the breakdown controversy is superseded by the analyses developed within the framework of post-Keynesian economic thought.

10.2 Unlimited Accumulation and Post-Keynesian Constraints

Let us begin with the approach taken by Tugan Baranovsky. According to Napoleoni, the merit of the Russian (Ukrainian) economist lies in having seized upon a profound truth inherent in Marx's schemes of reproduction. After noting that for Sismondi and Malthus the working of a pure capitalist economy is impeded by the very existence of capitalistic surplus value, Napoleoni writes: "(T)he extraordinarily important role of Marx's scheme

consisted precisely in having shown how, from this perspective, capitalism creates, in effect, no difficulties at all. In other words, conditions may exist which allow for the realization of the whole value of the produced commodities" (Napoleoni [17], p. XLIX, my translation from Italian).

Tugan is therefore credited for exploiting to the maximum Marx's insight about the reproducibility of total capital, and is faulted for conflating equilibrium results with the actual process needed to reach them. Yet Tugan Baranovsky's analysis—and with him that of Bulgakov and of Lenin—is yet another manifestation of the difficulties encountered by Marxian thought to even approximate the question of effective demand. In this respect, Rosa Luxemburg was struggling very much against the stream of not just her Marxist colleagues but of the basic accumulation theory put forward by Marx in the first Volume of *Capital*.

In Chapter 25 of the first Volume of *Capital* Marx establishes a relation between accumulation and the Reserve Army of Labour. As argued elsewhere, this link does not allow for a meaningful introduction of the problem of effective demand (Halevi and Kriesler [7]). Just the same, Marx never jettisoned the role of the labour force in the process of production, of accumulation and of crisis. Instead this is precisely what happened in the breakdown controversy. For Tugan Baranovsky accumulation can proceed smoothly at a rising rate, if the regular reduction in labour inputs generated by technical change is compensated by an appropriate shift to the capital goods sector of a part of the constant capital produced by the economy. To check the range of validity of this proposition let us work with a physical two-sector model based on fully circulating machinery and uniform labour-machine ratios. In this way the two main ingredients of Marxian and Classical analysis remain unaltered. I will, however, introduce an explicit relation defining the level of employment and that of the real wage.

A two-sector economy will be characterised by a certain initial proportion λ_0 of the total stock of capital K_0 installed in the capital goods sector. Furthermore, when this part of the stock is multiplied by the output-capital coefficient a of the capital goods sector, we obtain the (end of year) total gross output of machinery. Hence we have a set of definitional relations, where upper case K stands for the stock of capital and subscript 'k' and 'c' stand for the capital and consumption goods sector respectively. Time is defined by numerical subscripts; M^t is the gross output of machines appearing at the end of the period. Thus:

$$K_0 = K_{k0} + K_{c0} \tag{1}$$

$$\lambda_0 = K_{k0}/K_0 \tag{2}$$

$$M^0 = \alpha\lambda_0 K_0 \tag{3}$$

It is clear that the gross rate of accumulation is:

$$\alpha\lambda_t \tag{4}$$

Whereas under the assumption of fully circulating capital the net accumulation rate is:

$$\alpha\lambda_t - 1 \tag{5}$$

At any one time the stock of capital will employ a given number of people provided its productive capacity is fully (normally) utilised. Marx, and the Marxists after him until Kalecki emerged on the scene, always thought in terms of full capacity output. For Marx the crisis does bring about unused capacity but this is just an occurrence. The long-run dynamics of the system, typified by the inverse relation between the rate of profits and the wage rate, does not depend on the degree of capacity utilization. In the case of Tugan conditions are even more stringent than in Marx's cyclical growth theory. Since his purpose was to demonstrate a boundless process of accumulation, capacity must always be fully utilized. Moreover, Tugan assumed a self-contained industrial system with no reservoir of labour. At any rate Tugan paid no attention to the level of employment as he assumed that automation will eventually eliminate virtually all the labour force—and the consumption demand related to it—without engendering any crisis in the accumulation process.

Let E_0 be the total number of people employed at the time t_0; given the initial uniform labour—capital ratio 'n_0', we have:

$$E_0 = n_0 K_0 \tag{6}$$

At this point we have all the elements to derive the real wage rate from the Marx-Robinson reproduction schemes. We know that the share of the stock of capital installed in the consumption goods sector is $(1 - \lambda_t)$, thus given the output-capital ratio β of the consumption goods sector, the total output of consumption goods within the period is:

$$C_0 = \beta\ (1 - \lambda_0)\ K_0 \tag{7}$$

Assuming that workers do not save, the given real wage ϖ is obtained dividing equation (7) by equation (6):

$$\varpi = \beta\ (1 - \lambda_0)/n_0 \tag{8}$$

We shall now move to the next period t_1 where the Tugan process is supposed to reduce the value of 'n' by a rate $\varepsilon°$ defining the discrete rate of

automation. It is assumed that the new value of '*n*' will be embodied only in the capital goods coming into being at the end of the period. Hence the value of n_1 will be:

$$n_1 = n_0(1 - \varepsilon^\circ) \tag{9}$$

The new labour-machine ratio will apply only to M^0 which is the gross output of machines forming the total stock of capital operating in period t_1. The new full capacity level of employment is therefore:

$$E_1 = n_0(1 - \varepsilon^\circ)\, M^0 = n_0(1 - \varepsilon^\circ)\ \alpha\lambda_0 K_0 \tag{10}$$

The continuation of the accumulation process is feasible only if machinery can be operated at full capacity. Thus if $E_1 > E_0$, the source of the extra labour force must come either from the non-capitalistic sectors or from within the capitalist sectors themselves. Since Tugan took the reproduction schemes to represent the whole economy, it stands to reason to work with the hypothesis that the additional labour comes from the supply generated by technical change. The necessity to guarantee an adequate supply of labour stems from the fact that a high rate of capital formation may lead to an expansion in the number of operatives (required to operate the new equipment) greater than the number eliminated by the rate of mechanisation. But if the whole economy is captured by the two sector schemes, it is not possible to find workers outside the system itself. Hence we must impose the condition that the new level of employment be no greater the initial one:

$$E_1 \leq E_0 \tag{11}$$

Substituting (6) and (10) into (11) we obtain:

$$n_0\,(1 - \varepsilon^\circ)\ \alpha\lambda_0 K_0 \leq n_0 K_0 \tag{12}$$

which reduces to:

$$(1 - \varepsilon^\circ)\ \alpha\lambda_0 \leq 1 \tag{13}$$

From (13) we obtain the rate of automation consistent with the Tugan Baranovsky theory of boundless capital formation:

$$\varepsilon^\circ \leq (\alpha\lambda_0 - 1)/\alpha\lambda_0 \tag{14}$$

In other words, the rate of automation should not be smaller than the ratio of net to gross accumulation, a condition that must hold also for every subsequent period.

Within the framework of Tugan's analysis it is unlikely that the above condition will be satisfied as a matter of course. Tugan assumed that, in the wake of declining consumption demand due to automation, capital goods would be increasingly reinvested in the capital goods sector itself. It is therefore necessary to find the new value of λ describing the new proportion of capital goods installed in the machine-producing sector. In fact, finding the new value of λ is tantamount to finding the appropriate relations of proportionality between sectors.

Let us go back to equation (8) defining the real wage, which is assumed to be given. It is therefore immediately known that the new stock of capital installed in the consumption goods sector must supply a flow of commodities equal to the real wage multiplied by the number of people employed. Maximum accumulation requires that no unused capacity be in existence, as a consequence the level of employment is determined by equation (10). Recalling now that all capital is fully circulating, so that the stock operating in period $t + 1$ is $K_1 = \alpha\lambda_0 K_0$—the full capacity level of effective demand for consumption goods is satisfied when:

$$\varpi\, n_0\,(1 - \varepsilon^{\circ})\ \alpha\lambda_0 K_0 = \beta\ (1 - \lambda_1)\ \alpha\lambda_0 K_0 \tag{15}$$

which reduces to:

$$\varpi\, n_0\,(1 - \varepsilon^{\circ}) = \beta\ (1 - \lambda_1) \tag{16}$$

Substituting the right hand side of equation (8) for ϖ in equation (16), the new value of λ emerges as:

$$\lambda_1 > \lambda_0 \tag{17}$$

On the basis of (17) momentary equilibrium proportions exist but the new net rate of accumulation will be higher and so will be the ratio of the net to the gross rate. According to relation (14) the higher the ratio of net to gross accumulation, the higher will have to be e for the strict inequality to be maintained. Alternatively, relation (14) can be reduced to equality. After that, however, the Tugan process of automation would require an abundant supply of labour! However, there are many reasons to believe that the inequality sign in relation (14) is likely to be reversed because of a slower rate of automation relative to the rise in the net rate of accumulation. This tendency is inherent in Tugan's own reasoning aiming to prove the eventual disappearance of the consumption goods sector in a fully industrialised economy.

To begin with, if the inequality sign in relation (14) is satisfied by the end of a given period, the ensuing unemployment will reduce the real wage rate which, therefore, can no longer be taken as given. In a Kaleckian-Keynesian

framework such an event will lead to unused capacity in the consumption goods sector. Workers will be fired with further falls in consumption demand and negatively affecting expectations about real investment demand. Mass unemployment and stagnation are the likely outcome. For Tugan, by contrast, the decline in consumption simply means that more equipment is made available for the production of capital goods. The decline in the real wage will help rather than hamper such a shift. Let us therefore rewrite equation (8) without subscripts where the real wage ω is no longer given. Solving for λ, we get:

$$\lambda = (\beta - n\omega)/\beta \tag{18}$$

With both *'n'* and ω falling, the upward pressure on λ will grow stronger causing further rises in the net rate of accumulation. A system which begins such a process with its workforce entirely absorbed by the industrial sectors, will quite soon find itself constrained by the scarcity of labour relative to available equipment. The sure way to guarantee the continuity of Tugan's process of complete automation is for the economy to have an abundant supply of labour. Automation and accumulation can feed each other while workers will always be found whenever the inequality sign in relation (14) is reversed. Yet such an economy is not the one envisaged by Tugan who thought of a fully industrialized system. But a fully industrialised system is not a Tugan economy either; it is in fact a Harrodian system. In other words, the nature of the economy studied by Tugan is more likely to be captured by post-Keynesian criteria.

10.3 From Marxian to Post-Keynesian Economics

The founders of post-Keynesian thought conceived the economic process as essentially spanning over two stages. In an initial phase, the quantity of labour exceeded the level of employment that could be absorbed by the existing stock of capital. The expansion of accumulation was then thought to give rise to a new stage where the full capacity stock of capital is more or less sufficient to employ the whole of the working population. According to my readings the first economist to have put forward this subdivision was Harrod [8], followed by Kaldor [9], Robinson [18], Kalecki [12]. We can easily see that Tugan's approach belongs to either case depending on the direction of the inequality sign in (14). Notice that if (14) is an equality, the case conforms to a Kaldor [10] situation.

In *Economic Stability and Full Employment,* Kaldor [10] pointed out that if in the short period the stock of capital suffices to absorb the whole of the working population, in the subsequent period full employment and full capacity can be maintained only if labour-saving innovations are so much labour-saving as not to alter the required distribution of income. In terms of the model

presented in the previous section—and neglecting population growth—this would mean that (14) becomes an equality and it is maintained overtime. For this to happen it is necessary that wages rise exactly by the same rate as productivity thereby offsetting the fall in '*n*' so that the stability of λ is ensured. By contrast if wages do not rise the system tends towards the same structural instability as that found in studying Tugan's approach.

It is worth noticing that instability comes, at the limit, not from disproportionalities as usually treated in the Marxian literature but from the growing gap between the warranted and the natural growth rates. Yet, the Marxian debate about growth and breakdown did not link the discussion about the possible dynamics of the reproduction schemes to the issue of the availability of labour. Thus, the Tugan process requires a steady rise in the warranted relative to the natural growth rate. A point will be reached where the propensity to save is too high relative to that required to maintain full capacity through time. Once unused capacity makes its appearance the Tugan problem vanishes from the scene, even from the capitalistic point of view.

The existence of unused capacity plunges the economy into short-period situations. There can be multiple reactions involving simultaneously a transition to a lower rate of accumulation and a higher share of the capital goods sectors capital stock over total capital. Nothing can really be said about long-term tendencies although each case can be mapped out quite rigorously (Lavoie and Ramirez [15]). The only propositions, which can be stated with a certain degree of confidence for the functioning of the economic system, are the following ones:

i. Saving out of wages have a negative impact on profits as they represent a reduction in proceeds from the sale of goods. It follows that for profits to be positive it is necessary that saving out of profit be relatively large (Kaldor, 1989, p. 30). This means that the marginal propensity to save out of profit must be greater than that out of wages and that the share of investment over national income must be smaller than the propensity to save out of profits and greater than the propensity to save out of wages. These are the two conditions needed for a capitalist economy to function.
ii. Nothing can be said with confidence about the objective determinants of investment. In the Classical and Marxian approaches investment is always endogenously determined via variations in the distribution of income. Once we recognize that the emergence of unused capacity constrains the economy within the short period we can only say that investment in the aggregate is propelled by external factors, such as budget deficits and/or exports. In the case of oligopolized systems investment can be pushed upward by higher wages which, through the reduction of unused capacity in the consumption goods sector, may initiate greater investment demand (Kalecki [11]).

iii. The above leads to a different conception of the determinants of employment and unemployment. For Marxian economics unemployment is a cyclical phenomenon linked to the dynamics of the inverse relation between the wage rate and the rate of profits. The Marxian debate about accumulation and crisis eschewed the issue altogether. In the post-Keynesian cum structuralist literature the economy is not governed by such systemic laws. The existence of unused capacity allows for endogenous wage growth as well as exogenously (institutionally) determined expansion of investment.

iv. Theorizing about growth and crisis does not make much sense if it is accepted that investment—or gross accumulation in Kalecki—is in the main exogenously determined. By contrast what matters is to grasp what is not likely to happen, i.e. monotonic substitution through price and investment through prior accumulation of savings. The actual pace of accumulation is determined by institutional and political factors, in the sense of polity, rather than by immanent long-run forces.

Bibliography

[1] Colletti L. – Napoleoni C. (eds.), *II futuro del capitalismo: crollo o sviluppo?,* Bari, Laterza, 1970.

[2] Del Monte A., "Grado di monopolio e sviluppo economico", *Rivista Internationale di Scienze Sociali,* vol. XLV, 1975, pp. 231–63.

[3] Hagemann H., "A Kaldorian Saving Function in a Two-Sectoral Linear Growth Model", in Nell E. – Semmler W. (eds.), *Nicholas Kaldor and Mainstream Economics: Confrontation or Convergence?,* New York, St. Martin's Press, 1991, pp. 449–68.

[4] ——, "Employment and Machinery", in Hagemann H. – Hamouda O. (eds.), *The Legacy of Hicks: His Contributions to Economic Analysis,* London and New York, Routledge, 1994, pp. 200–24.

[5] Halevi J., "Accumulation and Structural Disequilibriums", in Halevi J. – Laibman D. – Nell E. (a cura di), *Beyond the Steady State: A Revival of Growth Theory,* New York, St. Martin's Press, London, Macmillan, 1992, pp. 264–88.

[6] ——, "The Significance of the Theory of Vertically Integrated Processes for the Problem of Economic Development", *Structural Change and Economic Dynamics,* vol. 7, n. 2, 1996, pp. 163–71.

[7] Halevi J. – Kriesler P., "Marx or Hicks? Structural Proportions and Crisis: The Transition from the First to the Third Volume of Capital", in Bellofiore R. (ed.), *Marxian Economics: A Reappraisal,* vol. 2, London, Macmillan, 1998, pp. 194–205.

[8] Harrod R.F., "An Essay in Dynamic Theory", *Economic Journal,* 49, 1939, pp. 14–33.

[9] Kaldor N., "Alternative Theories of Distribution", *Review of Economic Studies,* 23, 1956, pp. 83–100.

[10] ——, "Stability and Full Employment", *Economic Journal,* 1938, reprinted in Kaldor N., *Essays on Economic Stability and Growth,* London, Duckworth, 1960, pp. 103–19.

[11] Kalecki M., *Selected Essays on the Dynamics of the Capitalist Economy 1933–1970,* Cambridge, Cambridge University Press, 1971.

[12] ——, "The Difference between Crucial Economic Problems of Developed and Underdeveloped Non-Socialist Economies", in Kalecki M., *Essays on Developing Economies,* Hassocks (UK), Harvester Press, 1976, pp. 20–7.
[13] Lavoie M., *Macroeconomie: Theorie et Controverses Postkeynesiennes,* Paris, Dunod, 1987.
[14] ——, *Foundations of Post-Keynesian Economic Analysis,* Aldershot (UK), Edward Elgar, 1992.
[15] Lavoie M. – Ramirez G., "Traverse in a Two-Sector Kaleckian Model of Growth with Target-Return Pricing", *The Manchester School of Economic and Social Studies,* vol. 65, n. 2, 1997, pp. 145–69.
[16] Napoleoni C., *Smith, Ricardo, Marx,* Torino, Boringhieri, 1973.
[17] ——, *Il futuro del capitalismo,* Bari, Laterza, 1975.
[18] Robinson J., *The Accumulation of Capital,* London, Macmillan, 1956.
[19] Sardoni C., *Marx and Keynes on Economic Recession: The Theory of Unemployment and Effective Demand,* New York, New York University Press, 1987.
[20] Sweezy P., *The Theory of Capitalist Development,* New York, Monthly Review Press, 1968.
[21] Sweezy – Pareto – Meek – Samuelson – Lange *et* Al., *La teoria dello sviluppo capitalistico, Discussione del pensiero economico marxiano,* ed. by Napoleoni C., Torino, Boringhieri, 1970.
[22] Sylos-Labini P., *Il problema dello sviluppo economico in Marx e Schumpeter,* 1954, "The Problem of Economic Growth in Marx and Schumpeter", in Sylos-Labini P., *The Forces of Economic Growth and Decline,* Cambridge (MA), MIT Press, 1984, pp. 37–78.

11
Structure and Growth

Joseph Halevi

The chapter presents and discusses the set of non-marginalist contributions to growth theory represented by sectoral models based on Classical circularity and by Pasinetti's new theory of structural change. It is shown that while models of Classical circularity led to Traverse type questions (Lowe and Hicks), they neglected the relations between sectoral growth and the composition of consumption demand. In this context, it is argued that Pasinetti's constribution has eliminated the capital goods bias inherent in the Classical approach. Pasinetti's approach is shown to be theoretically complete rather than conceived ad hoc as in earlier growth models.

11.1 Introduction

This chapter will discuss the theories of economic growth put forward by Adolph Lowe (1956, 1976) and by Luigi Pasinetti (1981)[1]. Their common elements consist in the sectoral characterization of production and in their complete independence from the traditional assumptions of marginal productivity theory. Yet, they differ as far as the objective of the structural analysis is concerned. Lowe's main preoccupation lies in the study of the conditions necessary to fulfil the transition from a given to a new growth rate. Pasinetti, on the other hand, concentrates his analysis on a system of production in which growth cannot be uniform in all the sectors of the economy because of technical progress and of changes in the coefficients of per capita demand resulting from a secular rise in incomes per head.

The two approaches can be viewed in sequential terms representing different stages in the maturation of a non-marginalist analysis. Lowe's structural Traverse belongs to a class of models where the whole emphasis on change

Revised from *Economie Appliquée*, 47(2): 57–80, 1994, 'Structure and Growth,' by Halevi, J. With kind permission from *Institut de Sciences Mathématiques et Economiques Appliquées*. All rights reserved.

is put on the capital goods sectors (Halevi, 1992a), while the consumption goods industry plays a purely passive role. These models can be called Marxian because of their affinity, quite explicitly stated in Lowe's book, with Marx's schemes of reproduction (Hagemann and Jeck, 1984). Pasinetti's construction pertains to a novel form of theorizing, developed by the author himself, based on multiple consumption goods produced by means of vertically integrated processes. In Pasinetti's theory, consumption is no longer a passive factor. The active role of consumption is due to the fact that, on one hand, as incomes per head rise demand for existing consumption goods tends towards saturation, thereby leading to a systemic slackening in the expansion of effective demand. On the other hand, the creation of new products and the formation of new wants generate a countertendency, which does not, however, ensure the full utilization of productive capacity and of employable labor. Technical change emerges as the crucial determinant in the dynamic process outlined by Pasinetti, since it contains both a demand and a supply aspect. On the production side the secular increases in the productivity of labor translate themselves into a decline in the set of coefficients expressing the quantity of labor needed to produce any given commodity. On the demand side the rise of labor productivity is chief cause of the expansion of percapita incomes which, in turn, generates the above-mentioned non symmetric variations in the composition of percapita consumption demand.

Both in Pasinetti's and in Lowe's constructions capital goods are treated as produced means of production, and the degree of development of productive activities is gauged on the basis of whether or not the stock of capital is at the level required to employ the whole of the working population, irrespectively of neoclassical substitution. In Lowe, substitution, in the Marginalist sense, is ruled out by assuming fixed and sector-wise uniform labor-machine ratios, whereas in Pasinetti's vertically integrated model it is shown to be irrelevant if referred to the traditional view while it acquires a different meaning in a dynamic setting. At this point, however, the two approaches diverge as to their objectives and analytical methods.

11.2 The Structure of Capital Formation

Lowe's analysis of the structural relations guiding each stage of capital formation contains an explicit purpose stemming from the historical phase in which the model was formulated, namely the period spanning from the early 1950s to the mid 1970s. Full employment and full utilization of productive capacity are taken by Adolph Lowe to be the main objectives of economic policies. He then criticizes the view that these can be attained only by means of aggregate demand management regardless of the sectoral composition of output. In particular, he argues, if full capacity and full employment are achieved in the short run with a given stock of capital, in

the longer run a change in any of the growth factors (technical progress and population) will require modifications in the sectoral composition of output.

The complexity of those changes is highlighted even in the simplest of all cases: a once-over expansion in the workforce. I will concentrate on this case, which absorbs the whole of the 1956 contribution and the first part of his book *The Path of Economic Growth* (1976). In fact, I do not think that the introduction of technical progress alters the passive role played by the consumption goods sector. Variations in production coefficients further complicate the traverse towards full employment only in terms of the sectoral distribution of capital goods (Hagemann, 1992). Under Lowe's assumption of uniform labor-machine ratios, a once-over increase in population (without technical change) gives us the new notional full employment terminal state. The productive apparatus will have to swell up exactly by the percentage in which population has increased, in order to settle afterwards into a state of zero growth rate with an unchanged per capita consumption. We can now rewrite Lowe's 1956 three sector model in a somewhat simpler form than the notation adopted by its inventor.

The economy is formed by three sectors, two of which produce capital goods, while the third one produces the single homogeneous consumption goods. The stock of capital of the two capital goods sector is homogeneous and thus shiftable within the two sectors. This stock is formed by machine tools which can reproduce themselves if installed in the K_m sector producing primary equipment. By contrast, the machine tools installed in the K_i sector produce secondary equipment which can be installed only in the consumption goods sector. Under conditions of simple reproduction, the output of the two capital goods sectors is equal to the wear and tear of the total stock of capital in the economy. Let us call K_k the sum of the homogeneous stocks in the two capital goods sectors, we then have in physical terms:

$$x = K_m/K_k \tag{1}$$

$$M = axK_k = uK_k \tag{2}$$

$$I = b(1 - x)K_k = uK_c \tag{3}$$

$$C = zK_c \tag{4}$$

The coefficient x is similar to Fel'dman's industrialization ratio since it represents the share of the stock of capital installed in the machine tools sector over the stock of capital of the two equipment producing sectors. M and I are the outputs of machine tools and of the investment goods going

to the consumption goods sector – equations (2) and (3) – so that a and b are the output-capital ratios of the primary and secondary equipment sectors respectively. The total output of consumption goods C is given by the level of the stock of capital in the consumption goods sector multiplied by its own output-capital ratio, equation (4).

Following Lowe's assumption of uniform labor-machine ratios, the employment capacity of each unit of capital stock can be taken as equal to one person. Hence, total employment is given by:

$$E = K_k + K_c \tag{5}$$

An effective demand condition can be established for the consumption goods sector, but its role will be purely passive during the Traverse. This is the Marx-Kalecki-Robinson (MKR) condition according to which the value of wage goods must be equal to the value of the wage bill:

$$p_c z K_c = w(K_k + K_c) \tag{6}$$

where p_c is the price of consumption goods.

From which:

$$p_c = (w/z)[1 + h(1 - x)]/h(1 - x) \tag{7}$$

where $h = b/u$

According to equation (7), if h and w are unchanged, the price of the single consumption good may be affected by variations in z, in the labor-machine ratios and in x, that is, in the proportion in which machine tools are distributed to the machine tool sector. Now, if we consider improvements in the value of z to be, within limits, endogenous, an increase in z will be matched by a fall in p_c and a rise in the real wage rate. The validation of the MKR condition would not call into question the structure of the economy, which, at any one time, is determined by the value of x. In fact, x enters also in the determination of the ratio between the aggregate capital stock in the capital goods sectors and the stock operating in the consumption goods sector, since:

$$K_k/K_c = u/b(1 - x)$$

In other words, endogenous changes in the value of z do not influence the sectoral distribution of equipment. This is not surprising, since the consumption good is homogeneous and the only way in which the effective demand condition for consumption goods can be satisfied is by using more (or less) quantities of the same item.

The shift in the primary equipment sector from a static simple reproduction situation to a dynamic state depends on the increase in the value of x. This is, in essence, the central concept underlying Lowe's traverse, which revolves around three themes.

The first consists in the expansion of the stock of capital from one static situation to a new equally static position. The objective justification for such a traverse is seen in either a sudden exogenous increase in the availability of labor, or in a once over change (fall) in labor capital ratios. This allows Lowe to establish an equivalence between a sudden increase in the supply of labor and certain forms of technical progress. In a sense the first theme deals with the transition between two Robinsonian states of bliss. The second theme, deals with changes in growth factors in which technical progress is the main lever of the structural traverse (Hagemann, 1992). Finally, the third treats the behavioral conditions required to implement the transition itself. This last theme introduces a sharp separation between the analysis of the technical-physical structure of the "economy" and the social relations sustaining it[2]. The distinction between technical-structural processes and behavioral ones constitutes an essential instrument for dismantling the "bastard Keynesian" argument according to which full employment can be attained in the short run by means of fiscal and monetary policies, while Solow type flexibilities will keep the system at its natural growth rate in the long run. Interestingly enough, Lowe's criticism of the simple mindedness of pragmatic American Keynesianism is already fully contained in his 1956 paper, *i.e.* independently of Solow's article (Solow, 1956). I will confine myself to this earlier contribution which analyses the traverse in terms of a once-over increase in the supply of labor. It will be seen that Lowe has anticipated Hicks's concept of the Traverse by about ten years (Hicks, 1965).

11.2.1 Sectoral Changes in the Static Traverse

Under conditions of full capacity-full employment, given the coefficients of production, an exogenous influx of labor can be absorbed only by increasing the total stock of capital in the same proportion as that of the labor force. Since the output of capital goods is identical to replacement, the expansion of the stock of capital can take place only by liberating capacity in the secondary equipment sector in order to allow the machine tools sector to build machinery for its own expansion. Structurally, this is achieved either by shifting some of the capital stock of the secondary equipment sector to the machine tools sector, or by withholding part of replacement equipment accruing to the secondary capital goods sector. The value of x will thus temporarily rise until the machine tools sector has reached its own target level. Afterwards, the sector's net output will be devoted to reconstituting and expanding the capital stock in the secondary equipment sector. The growth of the latter will eventually come to a halt when the influx of machinery from the stationary primary equipment sector will have matched replacement requirements. From the moment the machine tools sector has

attained the new stationary size, x will begin to descend to the value it had before the once-over rise in the availability of labor.

The entire structural dynamics is played out within the sectors whose capital stock is formed by a homogeneous machine tool. The shift in the allocation of machine tools from the secondary to the primary equipment sector, reduces the flow of capital goods delivered by the secondary equipment sector to the consumption goods sector. Its size will, initially, shrink in absolute terms whenever the traverse starts from simple reproduction conditions. The stock of capital in the consumption goods sector will embark on the path towards the new terminal size as soon as the secondary equipment sector has completed its own adjustment. Thus, the technical aspects of the traverse are always governed by the movement of the crucial variable x, *i.e.* by the percentage of the stock of capital in the primary equipment sector over the combined stock of capital of the two equipment producing sectors. Changes in the value of x are determined by variations in the sectoral distribution of the gross output of the primary equipment sector and/or by shifting to the latter part of the stock installed in the secondary equipment sector. This kind of shift is also used by Lowe to account for the case of accelerated accumulation based on the cannibalization of part of the existing stock of capital.

Up to this point there is little conceptual difference between Lowe's approach and the two sector model proposed by Feldman and Mahalanobis. Indeed, Lowe's model is strikingly similar to that of Naqvi (1963) who extended the Feldman-Mahalanobis approach to the three sector model of Raj and Sen (1961). Yet, if we accept Lowe's view that homogeneous capital goods must be treated as fully shiftable, a distinction between the two sector construction and the above tripartite scheme does emerge. In the two sector model, where capital goods are the same for both branches of activity, every unit of equipment withheld from the consumption goods sector is in principle *ipso facto* available to the capital goods sector. Formally, withholding equipment from the consumption goods sector is tantamount to raising the share of the capital stock accruing to the capital goods sector. Similarly, if the impact of an additional number of workers entering an otherwise stationary economy is to reduce the real wage rate, the ensuing unused capacity in the consumption goods sector means that, structurally, capacity is made available directly to the capital goods sector. In both instances the proportions between the two sectors are changed instantly.

Adolph Lowe's emphasis on structural specificity is aimed precisely at showing that if a situation of full employment and full capacity is altered by an exogenous influx of labor, the attainment of a new full employment-full capacity position requires a phase in which capacity has to be made available to the capital goods sector. For such a structural condition to be transformed into a process leading to a new full employment-full capacity position it is necessary that the behavior of individual units be "goal adequate". This term is used by Lowe to construct a special form of expectations

on the basis of which the sudden increase in the labor force signals the need for new capital requirements. Once the Lowe postulate of goal adequate behavior is accepted, the homogeneity of capital in a two sector model guarantees an immediate transfer of machinery from the consumption to the capital goods sector. In this way the MKR condition is quickly reestablished: whenever real wages fall in the wake of an increased supply of labor, the idle machines of the consumption goods sector can be transferred along with their workers to the capital goods industry. The value of consumption goods' output will be equal to the diminished monetary value of the total wage bill in the economy.

A somewhat different sequence is at work in Lowe's original three sector model. To begin with, a change (rise) in the value of x does not immediately modify the K_k/K_c ratio. This ratio will start to change only in the next period, when the machine tools withheld from the secondary equipment sector K_i will generate a decline in the amount of investment goods I flowing to the consumption goods sector. The difference vis-à-vis the two sector model is further highlighted if it is assumed that the increase in the availability of labor leads to a decline in real wages. Since the machines operating in the consumption goods sector are absolutely specific, the formation of unused capacity in the consumption goods sector does not liberate, in this case, equipment for the capital goods sectors. The impossibility of transferring machinery from the consumption to the capital goods sectors means that unused capacity will be met by firing the corresponding number of workers. Such a situation will lead to a negative multiplier in the consumption goods sector, as well as to a negative accelerator effect as far as the demand for the output of the secondary equipment sector is concerned. It is this latter factor which will permit the liberation of capacity from the secondary to the primary equipment sector.

Thus, the rule of a goal adequate behavior operates only within the two equipment sectors. Lowe's traverse is therefore marked by three distinct structural phases. The first occurs when real wages fall and an endogenously unchecked negative multiplier sets in the consumption goods sector. The second phase begins when the idle stock of the secondary equipment sector is transferred, along with its workers, to the primary equipment sector. At this point the primary equipment sector begins to expand its output beyond replacement requirements, thereby initiating the absorption of both the unemployed workers and of the newly arrived ones. The reestablishment of the MKR condition takes place from the second stage onward.

The target aimed at by the Traverse process is given by expression (8) which gives the new notional level of the stock of capital for a given set of labor machine ratios.

$$(K_k + K_c)(1 + g^\circ) \tag{8}$$

where g° is the once-over increment in the labor force.

The adjustment path is not necessarily unique. For instance, if the purpose is to shorten the adjustment period, the K_m sector may be subjected to a process of over-expansion with the objective of devoting later most of its output to the expansion of the K_i sector. In this case the possibility of overshooting the level of the stock of capital prescribed by equation (8) must be envisaged. It follows that for x to settle at its initial value it might be necessary to junk a part of the K_m stock. The analysis of the possible adjustment paths falls outside the scope of this chapter.

In relation to the dominant economic discourse prevailing during the 1950–1970 period, Lowe's method constitutes a radical counter-argument to a Solow type adjustment towards full employment. If full employment and, consequently, full capacity are taken as the primary goal of policy makers, structural relations acquire priority over aggregate demand management, since neither population growth nor technical progress can be considered constant over the longer period. In this context, the hypothesis of a goal adequate behavior highlights the extreme assumptions which have to be imposed on the action of individual units in order for the traverse process to be carried out spontaneously.

11.2.2 A Kaldorian Antecedent

Although Adolph Lowe must be credited for having developed the first structural model of the hypothetical Traverse, the view that different levels of economic activity must be characterized by different sectoral relations preexisted Lowe's contribution. In particular, a brilliant paper written by Nicholas Kaldor before WW2 can be straightforwardly linked to Lowe's approach (Kaldor, 1938), in Kaldor, 1960). In that essay Kaldor presented, verbally, a two sector model both for the short and the longer period. The implicit assumption of the model is that full capacity coincides with full employment. The short period analysis begins with the economy in a state of widespread unused capacity. It is also assumed that activity is stimulated by some kind of public expenditure policy. Two cases are then discussed. The case in which the first to reach full capacity is the capital goods sector, and the case in which capacity limits are attained first by the consumption goods sector. Kaldor then assumed the latter to be the standard case, arguing that in a depression the capital goods industries display much greater unused capacity than the other branches of the economy. Furthermore, he considered that in advanced industrial societies the growth rate of population is negligible vis-à-vis the productive capacity of the capital goods industries when these are fully utilized[3].

The hypothesis about weak population growth relatively to the full capacity output of the capital goods sector establishes a crucial link between the short and the long period. During the short period, whenever full capacity is attained in the consumption goods sector significantly earlier than in the capital goods sector, full capacity and full employment in the capital

goods sector can be obtained only on the basis of an increase in the prices of consumption goods relatively to money wages. This is obvious since full capacity in the consumption goods sector means that supply has become inelastic while there is still room for additional output and employment in the capital goods sector[4]. However, the greater is the economy's capacity to produce machinery relatively to consumption goods, the higher will be the probability that the full capacity output of the capital goods sector will generate an amount of real accumulation tendentially higher than the growth rate of population. Hence: "excess capacity in equipment will make its appearance, which in turn will lead to a breakdown in the demand for investment" (Kaldor, 1938, in Kaldor, 1960, p. 113).

Kaldor stopped short of developing a methodology of the traverse, but the manner in which he connected the short to the longer period can be easily adapted to Lowe's approach. At the same time Lowe's tighter conception of structure can be applied to the short period part of Kaldor's paper. In this way Lowe supplies what is missing in Kaldor – traverse analysis – while Kaldor provides what is lacking in Lowe, namely the movement from unused to full capacity with a given stock of capital.

The limitation of Kaldor's approach lies in the nature of the two sector model. His 1938 paper begins by emphasizing that in modern industry complementarity and specificity prevail. Thus, it would be absurd for Kaldor to start shifting to the consumption goods sector some of the equipment installed in the capital goods one while the economy moves towards full capacity. It is this sectoral rigidity which leads, if full capacity is reached much earlier in the consumption goods sector, to both a fall in real wages and to a potential overaccumulation of capital in the subsequent periods. Yet, if Lowe's scheme is applied to Kaldor's analysis, then the picture changes substantially.

As the economy moves towards full capacity, part of the primary equipment stock can be transferred to the sector producing secondary equipment. Since we are in the short period, where by definition the stock of capital is given, the inelasticity of supply of consumption goods will appear before full capacity is attained in the operation of the K_k stock ($K_k = K_m + K_i$). However, the shiftability during the short period itself of part of the K_m machines to the K_i sector will reduce, although not necessarily altogether eliminate, the danger of excessive accumulation in the subsequent periods. This is because in Lowe's model the long term growth rate is positively related to the ratio K_m/K_k and inversely related to the ratio K_i/K_k.

In some of the literature on growth theory the question of the sectoral specificity of equipment and of the complementarity between labor and machines has been viewed as a factor leading to an active role by the state in order to counteract the depressionary effects on investment activity inherent in the structural formation of unused capacity. In the aforementioned paper Kaldor argued that as mechanization expands, the role of the state will also

expand. A more clear cut statement can be found in a study by James Meade in the chapter dealing with growth under fixed coefficients of production (Meade, 1962, ch. 7). Proceeding via a different route, Meade obtained the same results as Kaldor's. He then maintained that the negative impact of overaccumulation on investment can be mitigated by taking the redundant machines off the market by means of public expenditure. Analytically, the role ascribed to the state as mopping up the excessive amount of machinery may be interpreted as a way to escape the study of sectoral changes under traverse conditions. The greater flexibility of the Lowe model allows, by contrast, for a process of sectoral adjustment to start within the short period thanks to the shiftability of the stock of capital between the two capital goods sectors. This means that the role of the state is not just that of absorbing equipment which otherwise would remain unused, but that of ensuring a goal adequate behavior of the individual units.

11.2.3 The Limitations of the Above Models

The main feature of the models discussed in the foregoing section consists in that all the sectoral adjustments depend upon the variation of the share in which machines can be reinvested in, or shifted between, the capital goods sectors. As a consequence, once the stock of capital is at such a level that no unit remains unused and no worker is unemployed, the effective demand condition for consumption goods is readily validated. Furthermore, the implications of technical change fall mostly on the capital goods sector. For example, assume that labor-machine ratios are halved. This means that to absorb the redundant workers it would be necessary to double the amount of the capital goods in the economy. Assume also that a goal adequate Loweian traverse does lead us to the desired outcome. When the new level of the stock of capital is attained, its composition will be exactly the same as in the old equilibrium while per capita consumption will have doubled.

The consumption goods sector enters into these kind of schemes only as a component of the total stock of capital. Its output level can be set arbitrarily without any loss of analytical insights as to the process of structural change. It is clear, therefore, that traditional sectoral models of reproduction and growth, whether of two or three sector variety, can be useful only in the short and medium term when changes in the composition of consumption can be neglected. Their conceptual validity may however be called into question when it comes to forces operating in the very long run, or when a society incurs into a rapid transformation in its economic structure which invariably implies a profound change in the composition of consumption demand.

11.3 From Sectoral Circularity to Vertical Integration

The models described hitherto are based on a tight circularity of production, the pattern of which is determined by the share of the capital goods'

output ploughed back into the capital goods sector. This circularity is best expressed by the flow relations between sectors in a Marx-Kalecki macroeconomic model. On one hand, the value of wage goods has to be equal to the value of the wage bill, whenever no wages and all profits are saved. On the other hand, the value of the capital goods sold to the consumption goods sector must be equal to the wage bill in the capital goods sector. The second relation remains valid also when the share of self-investment in the capital goods sector changes overtime. Yet, the relation is meaningful only if the consumption good is homogeneous or if the proportions between the different consumption goods remain invariant through time. Indeed, any change in the composition of demand for consumption goods will modify also the composition between the different capital goods sectors of the economy which is precisely the phenomenon captured in a dynamic setting by Pasinetti's contribution (Pasinetti, 1981).

In the case of Pasinetti's theory, structural change is an ongoing phenomenon, not tied to the analysis of the traverse engendered by a sudden change in the growth rate of population and/or of technical progress. For example, if population were to expand at a constant rate and even if productivity were to grow at a constant and sectorally uniform rate, structural change would still occur because the coefficients of *per capita* demand would not necessarily remain in the same proportions overtime. For some consumption goods per capita demand will expand faster while for other items it might even decline. The essence of Pasinetti's conception of structural change lies in the interaction between technical progress – which leads to a rise in income per head – and the increase in *per capita* consumption which does not spread itself evenly overall types of products. Technical progress implies the systemic decline in the direct and indirect quantity of labor needed to produce a given commodity. This factor opens up the possibility of the appearance of new production coefficients linked to the creation of new goods. At the same time, the fact that, as incomes rise, per capita demand does not expand uniformly over all the existing commodities allows for the economic expression of new wants. However, as we shall see later, there is no automatic tendency for the system to remain in dynamic full employment equilibrium. The question of the Traverse is here superseded by the continuous process of change in the technical as well as per capita demand coefficients. Certainly, a Traverse type adjustment can be introduced if, on top of the persistent changes in both sets of coefficients, we were to include a sudden and once and for all expansion (or contraction) of the labor force. Yet, once and for all variations are not Pasinetti's main topic of analysis. In fact, in spite of its complexities, the Lowe type Traverse belongs to a particular form of short period analysis, where the impact of technical change on the composition of final demand can be neglected.

The analytical procedure adopted by Pasinetti to establish the quantitative relations describing, but not guaranteeing, a dynamic equilibrium is based

on a radical departure from the circularity of classical production models. The necessity to make explicit the existence of many consumption goods, brings about the existence of many capital goods sectors since each consumption good sector has a capital goods sector attached to it. This description of the production of each consumption goods becomes the synthetic expression of Pasinetti's vertically integrated model. The role of the capital goods sector is exactly the same as in a Marx type two department scheme: it produces machines for itself as well for the attached consumption goods sector. The difference vis-à-vis Marx lies in that there are as many capital goods sectors as there are consumption goods sectors. Consequently, the quantity of labor needed to produce a given consumption good is formed by three components: direct labor, indirect labor which constitutes the amount of labor devoted to the production of replacement equipment and hyper-indirect labor, representing the amount of labor needed to produce the additional capital goods.

When each consumption good is produced by means of its own two sector model the reinvestment ratio of the output of each capital good sector still determines, at any point in time and for any given set of production coefficients, the growth of any of the many two sector systems. This ratio however has no economy-wide meaning, because the actual growth of a particular consumption good will depend on the evolution of the corresponding coefficient of per capita demand. The elements linking together the different consumption goods – and the corresponding capital goods sectors – are therefore the coefficents of per capita demand. Classical sectoral circularity is thereby replaced by vertically integrated sectors.

11.3.1 The Main Conceptual Features of the Pasinetti System

The differences between Pasinetti's theory of vertically integrated production and Classical circularity will turn out to be particularly significant when it comes to the analysis of the stages of economic growth. It can be already anticipated that the feasibility of a particular development strategy will depend on a strict hierarchy in which the production of consumption goods is carried out.

Like Marx's schemes of reproduction, Pasinetti's model is cast in terms of a natural economic system, where the objective requirements of production are so basic as to belong to any type of industrial society. This system has no capitalists' consumption and no saving out of wages. A uniform rate of profits prevails in the simplest case of proportional growth. At any point of time, the price structure is determined by the cost of production in a Sraffian sense. Technical progress causes production coefficients – given by the amount of direct and indirect labor inputs – to decline as time goes by. Hence, changes in the natural cost of production and, therefore, in the price structure, are determined by changes in the vertically integrated labor values necessary to produce a given commodity.

The quantity side of the system is given by population growth and the expansion of demand resulting from the rise in *per capita* income induced by the average growth rate of productivity (technical change). If, for a given growth rate of population, technical changes were uniform in all sectors and if *per capita* demand expanded at the same rate of productivity and in the same proportion for all consumption goods, the dynamic equilibrium of the model would be similar to Harrod's case of natural growth rate. The corresponding natural rate of profit would be equal to the sum of the growth rate of population and of productivity. In general, neither technical change nor variations in *per capita* demand will be uniform. This means that there will be a natural rate of profit for each commodity determined by the sum of the rate of growth of population and the growth rate of *per capita* demand for that particular good. The natural rate of profit can then be inserted into the price equations in lieu of the exogenously given uniform rate of profit, while the wage rate – which is assumed to grow in step with the average growth rate of productivity – remains ex-hypothesis uniform across all sectors. This allows prices to be unambiguously expressed as the sum of three unweighted physical quantities of labor: direct, indirect and hyper-indirect labor multiplied by the wage rate (Pasinetti, 1981, p. 131–133). The interesting property of the ensuing system of natural prices consists in that the principle of cost minimization reduces to choosing the method of production which minimizes the quantity of labor inputs (Pasinetti, 1981, p. 198).

Turning again to the quantity side of the model, it becomes clear that sectoral growth will not, as a rule, be uniform. It would not be uniform even if productivity were to grow evenly in all sectors simply because the coefficients of *per capita* demand will not remain the same as income per head expands. It follows that also the proportions in which the capital goods sectors stand vis-à-vis each other will be constantly changing for reasons which have little to do with the traverse type adjustment analysed by Adolph Lowe and Hicks (1965). At this point it is possible to introduce the two conditions which have to be satisfied in order to keep the system at full employment over-time. On one hand, at the sectoral level, productive capacity must expand by the amount required by the growth of *per capita* demand and of population. This is called the capital accumulation condition. On the other hand, total expenditure must be such that the proportions of total labor devoted to the production of consumption goods, to the replacement of the corresponding stocks of capital (each consumption goods sector is attached to its own capital goods sector), and to the production of new investments must add up to unity. This is the effective demand condition for the system as a whole. It emerges as a separate requirement from the necessity to endow, sector by sector, the whole of the labor force with the right amount of equipment to work with.

The two conditions also express the efficiency properties of the natural economic system but, this time, at the sectoral and macroeconomic levels. Indeed, if the capital accumulation condition is not satisfied, the sectoral

distribution of the stock of capital will turn out to be inefficient since there will be branches whose stock has over-expanded or under-expanded relatively to the sector-specific natural growth rate. By the same token, the non validation of the effective demand condition implies that the system will either produce less for the same available labor and machinery, or will be subjected to inflationary demand (Pasinetti, 1981, p. 150). The effective demand condition represents the weakest condition for the system to keep growing at the full employment rate without any form of central monitoring and intervention. This is due to the fact that the kind of demand theory inherent in Pasinetti's contribution excludes the possibility of an indefinite expansion of demand coefficients for each of the consumption goods produced. As *per capita* income rises, the demand for the existing set of consumption goods will eventually reach saturation levels. Thus, the immanent tendency of a dynamic industrial system is to underfulfil the effective demand condition. The creation of new goods accompanied by the formation of new consumption preferences due to the rise of per capita incomes, will act as a counter-tendency. But, in no way can such a counter-tendency be viewed as an automatic equilibrating mechanism. Thus, "if full employment is to be kept through time, it will have to be actively pursued as an explicit aim of economic policy" by means of "a central agency entrusted with the task of keeping full employment" (Pasinetti, p. 90–91). It should be pointed out that the effective demand condition emerges in even clearer forms from Pasinetti's most recent work, where the system is a pure labor economy and, therefore, has no physical capital in it (Pasinetti, 1993). In this case we still have many consumption goods each produced by pure labor. It follows, that for full employment to be maintained over time it is necessary that the proportions in which total available labor is employed in each sector add up to unity. This state of affairs cannot be taken for granted even in a pure labor economy. The implication is that effective demand problems can emerge independently from capital accumulation problems.

11.3.2 The Innovative Aspects of the Pasinetti Model

A number of observations follow from the above presentation of Pasinetti's theory. To begin with, the method of vertical integration allows to express the stock of capital in terms of a unit of productive capacity vertically integrated relatively to each final good, while labor inputs are expressed by means vertically and hyper-vertically integrated labor coefficients. The notion of a unit of productive capacity eliminates all ambiguity in the measurement of the stock of capital whenever new and different machines are brought into operation. Similarly, the procedure of expressing technical progress via variations in the direct and indirect labor inputs, means that the effects of technical change would manifest themselves without any ambiguity, via the decline in the very same coefficients of production.

A further central feature of the Pasinetti model concerns the different manner in which, as a direct consequence of the vertically integrated

coefficient matrix sustaining the price system, the wage rate and the rate of profit enter into the price equations. The two components of each relative price equation are the labor coefficient directly needed to produce the particular commodity, plus the labor coefficient required to produce the corresponding capital good which multiplies the summation of the rate of replacement and the rate of profit. In turn, these two components are multiplied by the wage rate, thereby yielding the solution for each price. This construction brings out the irrelevance of the marginalist principle of substitution. Relative prices will remain unaffected by a change in the (uniform) wage rate since the latter uniformly multiplies all the components entering into each price equation. As a consequence, a rise in the wage rate will not induce any change in the technique of production. Rather than static substitution, the increase in the wage rate may stimulate new inventions, thereby giving additional impulses to the changes in the set of vertically and hyper-vertically integrated labor coefficients. By contrast, the rate of profit – whether or not uniform – is multiplied by the labor coefficient necessary to produce the capital goods which, ultimately, enter into the production of consumption goods. Thus, a change in the rate of profit will affect the choice of technique but in an unpredictable direction because the proportions between indirect labor (producing capital goods) and direct labor (producing the final commodity) differ among sectors.

Such a result is not new in economic theory, only that in the past it has been shown in a context which excluded dynamic considerations. At a more fundamental level, Pasinetti's contribution breaks with an element common to previous growth theories which consisted in using the economy-wide capital/output and capital/labor ratios to describe the pattern of technical change. The attempt, in earlier theories, to establish a precise relation between the aggregate capital/output and the aggregate capital/labor ratios and the rate of profit stems logically from a purely technical treatment of those ratios. In Pasinetti's case the aggregate forms of the two ratios contain both the coefficients of production and the coefficients of demand. As a consequence, their variations through time depend on all the rates of change of both sets of coefficients. Hence, "the over-all ratios of capital to output and of capital to labour depend, not only on technology, but also on the composition of demand" (Pasinetti, 1981, p. 99). The introduction of demand coefficients, made possible by the existence of many consumption goods, alters the traditional technical roles ascribed to those ratios. It follows that the classification of technical change is possible only at the sectoral level but it would be illegitimate at the macroeconomic level (Pasinetti, *ibid*; p. 98–99).

11.3.3 A Comparison with the Traditional Sectoral models of Growth

The elements which have been selected from Pasinetti's contribution will now be used to compare it more closely with Lowe's and other sectorally

based growth models. In order of importance, a crucial difference is represented by the separation between the effective demand condition from the capital accumulation condition. In a Lowe or any other two sector model, if the economy can produce exactly the amount of machinery necessary to equip the whole of the workforce, including the workers displaced by technical change, the effective demand condition is automatically satisfied. All that is needed is that the value of the amount of the single consumption good produced be equal, and adjusted, to the value of the wage bill. More precisely, in a Lowe model if the technically defined employment capacity of the total stock of capital falls short of the available workforce, unemployment will result from a too low rate of real accumulation. On the opposite end of the spectrum, if the employment capacity of the capital stock exceeds the amount of available labor, unemployment will be the consequence of the creation of excess capacity due to a too high rate of real accumulation. In terms of Pasinetti's formulation, we could say that earlier growth theories contained the capital accumulation condition but not the effective demand condition. In the Pasinetti model, by contrast, even if we start with full capacity and full employment, the increase in *per capita* income induced by technical progress will not necessarily be accompanied by a level of expenditure necessary to keep the system at full employment. This is because the changes in the coefficients of per capita demand will rather reflect the tendency towards saturation in the consumption of any given set of consumption goods.

The introduction of the coefficients of demand for each single consumption good, implies the existence of a definite hierarchy in the production of consumption goods during the process of economic growth. This aspect can be best understood by considering the question of industrialization in an underdeveloped economy. In traditional two or three sector models (Feldman, 1928, Naqvi, 1963), the process of industrialization is expressed by choosing a particular value of the share of the capital goods' output reinvested in the capital goods sector. In this way, the economy will move towards the gradual absorption of the bulk of the labor force in its "modern" sectors. This general requirement for the attainment of the level of a developed economy is, in Pasinetti's case, specified in relation to the composition of the output of consumption goods.

At low levels of per capita incomes, per capita consumption demand is likely to be directed mostly towards a narrow range of essential goods. Low levels of per capita incomes mean, therefore, that the underdeveloped country, can avail itself only from a limited sub set, say 1/5, of the products, and of the methods of production available in the advanced countries. In this context, economic growth can take place by starting to produce some of the commodities of the advanced countries. If it is assumed that the prices of the commodities which are produced in both countries are the same, the process will occur without international trade but only by learning

the methods of production of the developed world. However, producers in the underdeveloped country "are not free to pick up any commodity they like from among the 4/5ths of all types which are not produced. They will have to start production only of those commodities for which demand is expanding." Thus: "there is a definite order in which the various production processes can be introduced, strictly fixed by the order in which demand for each commodity is expanding as income increases". (Pasinetti, 1981, p. 252). The conclusion is that in the underdeveloped country people "are not free to draw as they please from the existent pool of technical knowledge. They have to follow a very definite order. And if they do not follow this order, their increase of technical knowledge will simply have no effect on their incomes" (Pasinetti, 1981, *ibid.*).

The case of the underdeveloped country, which in Pasinetti's work is extended to include international trade and differential rates of productivity, is an excellent example of the insights which can be gained from the method of vertical integration. By taking as the point of reference the composition *per capita* demand at particular levels of income, it is possible, conceptually at least, to identify the succession in which consumption goods have to be produced as income rises. Given that each consumption good is attached to its own capital goods sector, it is possible to establish a hierarchy of capital goods to which priority must be given in each stage of development. This hierarchy is strictly related to the dynamics of the composition of consumption demand, whereas in the single consumption good model the hierarchy reduces to the determination of the aggregate share of investment in the capital goods sector.

Equally important insights can be obtained from the analysis of the question of the choice of techniques. Growth models à la Feldman-Naqvi-Lowe, are usually based on given coefficients of production. A neoclassical economist working in the field of development would, at the very most, consider these models valid for a closed economy. Indeed, for the neoclassical economist, if two countries, one poor and one rich, have access to the same technical methods, the optimal technique of production adopted, for the same rate of profit, by the underdeveloped country would have to be characterized by a lower wage rate. Many years ago Maurice Dobb attempted to tackle this question by assuming a socially given wage rate in an economy producing a limited surplus of consumption goods over and above workers' consumption. In this way, an increase in the – traditionally defined – capital intensity of production was made compatible with the objective of maximizing the growth rate (Dobb, 1960).

This result depends in a crucial manner on the assumption of a given wage rate. Furthermore, the maximization of the growth rate is obtained thanks to very strong assumptions such as no production lags and no depreciation. Even the choice of technique criterion is not a general one since it cannot be applied to the case in which machines are used for their

own reproduction (Johansen and Ghosh in Dobb, 1960; Halevi, 1987). Instead, Pasinetti's theory provides us with a clear theoretical solution. We have already seen that in the aggregate the capital/output and the capital/labor ratios do not allow for a classification of technical states because their changes depend on the coefficients of production as well as on the demand coefficients. Thus, the analysis must be confined to the sectoral level. In this case, the existence of a much lower (uniform) wage rate in the poor country will not entail a different choice of technique relatively to the operation of the same sector in the advanced country. As pointed out earlier, the wage rate multiplies all the components of the price equations. Therefore, it will equally multiply all the alternative methods available to both countries in a particular sector leaving their relative position unaffected. This means that if a machine can be produced with the same methods in the advanced and in the underdeveloped country, the best technique for the advanced country is also the best method for the underdeveloped one.

Having shown the irrelevance of the wage rate in the determination of the choice technique when the same alternative methods are available in both countries, Pasinetti goes on to explain why it might be better to produce less advanced machines in the underdeveloped country rather than importing them from the advanced one. In a vertically integrated model each unit of output is produced by a certain amount of direct and indirect labor. In this context, the international prices at which a machine is imported from the advanced country, might require an amount of exports from the underdeveloped country which contain, per unit, a quantity of direct and indirect labor greater than the quantity of labor (direct and indirect) necessary to produce the machine domestically, albeit with more primitive methods. In these circumstances, it makes perfect sense for the underdeveloped country to go ahead with its own production of capital goods (Pasinetti, 1981, p. 194–197). Also in this respect Pasinetti's construction provides us with a theoretical framework which was absent in virtually all sectoral models of growth and development.

Traditional growth models were in the end conceived for specific purposes, ranging from the conditions for industrialization in the Feldman-Mahalanobis-Dobb-Naqvi case, to the question of the Traverse in the Kaldor-Lowe-Hicks case. Each of them has represented a unique contribution generating new and unconventional sets of ideas. Just the same, they remained at the level of broad sketches in relation to fundamental questions of economic theory.

Pasinetti's approach takes the opposite route. It starts from a basic description of a system of multi-commodity production characterized, initially, by a set of direct labor coefficients and of demand coefficients. Subsequently, with the inclusion of capital goods for their own reproduction as well as for the production of the corresponding consumption goods, indirect and hyper-indirect labor coefficients are introduced. As long as growth is strictly proportional for all sectors, the rate of profit is taken as exogenous and

uniform. The system of relative prices is, therefore, based on labor equivalents, while relative quantities are determined by demand. The introduction of technical change on one hand, and of changes in the demand coefficients on the other, brings out a new, natural, rate of profit for each sector of activity. When the natural rate of profit – given by the growth rate of population and the expansion of demand for each good – is inserted into the price equations, the price of each consumption good becomes equal to the sum of the quantity of labor necessary to produce it (including the quantity of labor needed to replace worn out capital and guarantee the expansion of capacity consistent with equilibrium). This allows to evince all the efficiency properties of the, natural, system. As the model gets further specified it gains in flexibility. Indeed, it can account for the condition of capital accumulation and effective demand in a mature economic system, as well as for the basic questions concerning production and international trade between countries finding themselves at different levels of development.

One final characteristic of the Pasinetti model consists in that it can take into account the role of services without abandoning the terrain of production. The rise of the tertiary sector in modern systems, a phenomenon which cannot be captured by the traditional capital-consumption goods sector approach, is not the same thing as the transition from agriculture to industry. The statistically ambiguous and ubiquitous position of services is evidenced by the data concerning this sector in countries which recently have moved from an agricultural to an industrial status. In South Korea, for instance, the share of services over total employment was quite large in the early 1960s when the share of agricultural employment and output was also large. Today the share of the service sector has further grown in importance, while industry has expanded at the expense of agriculture. Given the productive transformations undergone by the Korean economy, the service sector of today has got very little to do with the (large) service sector of three decades ago when industry was in its infancy.

In other words, the statistical position of the service sector would not give much information about its role and real position in the process of structural change. As shown by a seminal empirical work undertaken in Italy, it is possible to use the method of vertical integration in order to gauge to what extent the service sector has, indeed, become industrialized and, conversely, the extent to which industrial processes include, in fact, a service component (Momigliano and Siniscalco, 1982; Pasinetti, 1986). Logically this should not come as a surprise. According to the Pasinetti method it is possible to inquire into the sectors contributing to the formation of a given final commodity at *any* stage of its production process. The most interesting finding of the research by Momigliano and Siniscalco lies in that the expansion of services in the Italian economy appears to be related both to the externalization of service activities previously carried out within industrial units, and by a process of internal creation of services. It is worth observing

that the conceptual and statistical identification of the service sector has, in this case, been the product of a pure theory of production and not of a theory of post-industrialism.

In conclusion, Pasinetti's contribution should be seen as marking a watershed in the development of growth theories. It marks the transition from a set of approaches in which the *composition* of consumption demand did not matter to one in which variations in such a composition become interwoven with the process of technical change and, indeed, define each stage of economic development. Remarkably Pasinetti's insights about the role of consumption demand are obtained on the basis of a model of pure production without any influence of marginalist principles, which are shown to be of limited significance.

Notes

1. I will not discuss Pasinetti's latest book which is based on a pure labor economy (Pasinetti, 1993). In traditional growth models the notion of structure revolves around the role played by the capital goods sector. Any comparison between these models and Pasinetti's theory of vertical integration should aim at pointing out the different analytical position of the capital goods sector. This is possible by using Pasinetti's earlier book where capital goods are explicitly introduced into his analytical framework. However, Pasinetti's 1993 book will be referred to, to highlight the importance of the condition of effective demand (I should thank Professor Pasinetti for a conversation with him based on an earlier draft of this paper).
2. When I started my research on structural relations I accepted such a separation (Halevi, 1981). However, after many years of reflection I think that it is impossibile to split the social from the technical aspects of growth and accumulation processes (Halevi, 1992b).
3. More specifically: in advanced industrial societies the potential employment capacity generated by the output of capital goods has a tendency to outstrip the size of employable population. There is no doubt that in his 1938 paper Kaldor was the first to point at a structural discrepancy between the warranted and the natural growth rates.
4. It should be pointed out that Kaldor's 1938 paper contains all the elements needed to dismantle Malinvaud's notion of (neo) classical unemployment. In Kaldor's paper, at full capacity of both sectors real wages may fall relatively to their initial level. This is not due to the Neoclassical tenet according to which unemployment is due to wages being above their equilibrium level. In Kaldor's case the fall in wages is the result of excess capacity being much higher in the capital goods sector than in the consumption goods industries. Kaldor's analysis is much more advanced than that of Malinvaud. In the latter an implicit two sector system is constructed without any life in it. Kaldor, by contrast, succeeds in providing the reader with ideas linking the short with the long period in a fully specified sectoral model.

References

Dobb M., *An Essay on Economic Growth and Planning*, London, Routledge Kegan and Paul, 1960.

Fel'dman G., "K Teorii Tempov Narodnogo Dokhoda", *Planovoe Khoiziastvo*, November and December 1928.
Hagemann H., and Jeck A., "Lowe and the Marx-Fel'dman-Dobb Model: Structural Analysis of a Growing Economy", *Eastern Economic Journal*, Vol. 10, 1984.
Hagemann H., "Traverse Analysis in a Post-Classical Model", *In*: Halevi, J., Laibman, D., Nell, E. (eds), *Beyond The Steady State*, London, Macmillan, 1992.
Halevi J., "The Composition of Investment under Conditions of Nonuniform Changes," *Banca Nazionale del Lavoro Quarterly Review*, n°137, June 1981.
Halevi J., "Investment Planning". In: Eatwell, J., Milgate, M., Newman P. (eds), *The New Palgrave*, London, Macmillan, 1987.
Halevi J., "Accumulation and Structural Disequilibrium," In: Halevi J., Laibman D., Nell E. (eds), *Beyond the Steady State*, London, Macmillan, 1992a.
Halevi J., "Asian Capitalist Accumulation: From Sectoral to Vertical Integration," *Journal of Contemporary Asia*, Vol. 22, n°4, 1992b.
Hicks J., *Capital and Growth*, Oxford, Oxford University Press, 1965.
Kaldor N., "Stability and Full Employment," *Economic Journal* (December), reprinted in Kaldor (1960), 1938.
Kaldor N., *Essays on Economic Stability and Growth*, London, Duckworth, 1960.
Johansen L., and Ghosh A., Appendix: Notes to chapters III and IV of Dobb (1960).
Lowe A., "Structural Analysis of Real Capital Formation," *In: Capital Formation and Economic Growth,* Princeton, Princeton University Press, 1956.
Lowe A., *The Path of Economic Growth*, Cambridge, Cambridge University Press, 1976.
Meade J., *A Neoclassical Theory of Growth,* London, George Allen and Unwin, 1962.
Momigliano F., and Siniscalco D., "The Growth of Service Employment: A Reappraisal," *Banca Nazionale del Lavoro Quarterly Review,* n°142, 1982.
Naqvi K. A., "Machine-Tools and Machines: A Physical Interpretation of the Marginal Rate of Saving," *Indian Economic Review*, Vol. 6, February 1963.
Pasinetti L., *Structural Change and Economic Growth*, Cambridge, Cambridge University Press, 1981.
Pasinetti L., (ed), *Mutamenti strutturali del sistema produttivo. Integrazione tra industria e settore terziario*, Bologna, Il Mulino, 1986.
Pasinetti L., *Structural Economic Dynamics*, Cambridge, Cambridge University Press, 1993.
Raj K. N., and Sen A. K., "Alternative Patterns of Growth under Conditions of Stagnant Export Earnings," *Oxford Economic Papers*, Vol. 13, February 1961.
Solow R., "A Contribution to the Theory of Economic Growth," *Quarterly Journal of Economics*, February 1956.

12

Capital and Growth: Its Relevance as a Critique of Neo-Classical and Classical Economic Theories

Joseph Halevi

This chapter argues that Hicks's Capital and Growth, *and its rewritten version* Methods of Dynamic Economics, *constitute a critique of both Neo-classical and Classical economics. The critique of the Neo-classical side is explicit: it appears in the series of explanations concerning the necessity to abandon the Temporary Equilibrium method of* Value and Capital. *Furthermore, the way in which Hicks argues against the assumption of a given aggregate saving ratio takes him straight into the Kaldor-Pasinetti Cambridge Equation. Having jettisoned both the Temporary Equilibrium and the Harrod type Fixprice methods, Hicks ends up with Sraffa type prices of production. By inserting those prices into the saving equation he obtains a model where any change in the natural growth rate implies a change in the distribution of income à la Kaldor with the underlying prices being determined à la Sraffa.*

Up to this point the analysis runs in terms of comparing alternative equilibrium positions. Nothing has been said about how the system can get into equilibrium. The chapter shows that Hicks' Traverse represents the analytical framework dealing with this specific Robinsonian preoccupation. The outcome of Hicks analysis is particularly inimical to the Neo-classical idea of convergence, yet it provides also all the elements for a critique of Classical economics. The essence of the Classical view on the basis of which a change in the wage rate implies an inverse change in the profit and growth rates, is criticised by using Hicks' own Traverse model. The difference vis à vis Hicks' lies in that it is assumed that investment is exogenously determined à la Kaldor and that the techniques of production are uniform across the two sectors. In this way we obtain a Kaidorian-Classical model where Kaldorian adjustment is not possible. It is then argued that Kaldor's theory of distribution is so rooted in Classical economics that the refutation of the Kaldorian

Revised from *Indian Journal of Applied Economics – Special Issue in the Respectful Memory of John Hicks*, 7(4): 79–98, 2001, 'Capital and Growth: Its Relevance as a Critique of Neo-classical and Classical Economic Theories,' by Halevi, J. With kind permission from *The International Journal of Applied Economics and Econometrics*. All rights reserved.

adjustment process is an indirect refutation of the Classical mechanism, in this context, the structural Traverse is used to show that Classical adjustments are derailed by the emergence of the problem of effective demand.

12.1 Introduction

In 1975 Geoff Harcourt organised a symposium on the old and the new political economy which appeared in the *Economic Record*, the journal of the Australian Economic Society (Harcourt, 1975). The participants were Maurice Dobb, Frank Hahn, John Hicks. The contribution of Hicks was most interesting. The author of *Value and Capital* argued that there were by now two Hickses to speak of: the J.R. Hicks of *Value and Capital*, and John Hicks of *A Theory of Economic History* (1969, 1975).

Just the same, a substantial change in Hicks' own outlook on the foundations of economics is found already in *Capital and Growth* (1965) which culminates in the chapter on the two sector disequilibrium Traverse. This was to be followed by a reappraisal of the neo-Austrian theory of production undertaken in *Capital and Time* (1973). The themes developed in *Capital and Growth* continued however to provide the foundations for Hicks' new approach to the issues of growth and equilibrium. Indeed in his last book on dynamic processes – titled *Methods of Dynamic Economics* (1985) – thirteen out of the fourteen chapters of the book are a revised version of chapters already included in *Capital and Growth*. The neo-Austrian Traverse appears in the last chapter in the guise of a concluding essay. Furthermore, in the paper, read by Casarosa, sent to the 'Sraffa Conference' held in Florence in the same year, Hicks argued that there was a basic similarity between his approach and Sraffa's, only that he started where Sraffa had ended (Hicks, 1990). The similarity can be evinced from chapter 12 of *Capital and Growth* where a Sraffa type price system is set up in order to build a growth model containing Kaldorian features.

It may be useful, at this preliminary stage, to remind the reader that Hicks' 1965 disequilibrium Traverse is nothing but the quantity dual of the reswitching case developed by Pasinetti (1966) and Garegnani (1970) in the context of capital theory. Just as in Marginalist theory the adjustment to full static equilibrium requires an inverse monotonic relation between capital per head and the rate of interest (profit), in Solow-Swan-Phelps models convergence to a growth equilibrium depends upon an inverse relation between capital per head and the growth rate. Hicks – using a two-sector model – then showed that such a convergence will not as a rule occur. The assumed inverse relation turned out to depend on a unique type of technological configuration requiring that the consumption goods sector be more capital intensive than the capital goods one. To be fair to the economic literature of the time, it was not Hicks who discovered this possibility. The non-convergence case emerged already in the two sector Neo-classical growth models developed by Shinkai, Inada and Uzawa in the 1960–62 period, as

well as in a little valued paper by Ronald Findlay (1963) which addressed Joan Robinson's theory of capital accumulation.[1]

Yet the attention paid to the stability properties of the models led to ignoring the significance of the non-convergence case.[2] It is in this context that Hicks' growth theoretic contribution acquires both a methodological and an epistemological significance. As will be argued in the second and third sections of this chapter, the intellectual project of *Capital and Growth* up to chapter 16 dealing with the Traverse, combines a critical rethinking of the method of *Value and Capital* with a dialogue with the theoretical evolution taking place in Cambridge. In so doing Hicks integrated Sraffa's approach to prices of production with the Kaldor-Pasinetti theory of growth and distribution. The adoption of the Cambridge theory of distribution and of Sraffa's prices represented only a stepping stone to build a model of structural disequilibrium. In this case imbalances cannot be corrected just by resorting to either a flexible distribution of income – à la Kaldor – or to flexible production coefficients – à la Solow.

Structural disequilibrium is nothing but the first Hicksian Traverse dealing with the relations between productive sectors. In this chapter I will try to show that the methodology of the structural Traverse can be developed in order to criticise also the Classical-Marxian process of accumulation. Interestingly enough, Keynes' concept of effective demand comes out not only unscathed but indeed strengthened. Thus, section four will sketch out the simple disequilibrium Traverse while section five will introduce the effective demand conditions. Finally section six deals with the implications concerning Classical-Marxian economics.

12.2 The Exit From Temporary Equilibrium

For the distinguished Oxonian economist Temporary Equilibrium constitutes the appropriate framework for the study of a flex-price system. In this case the problem of stock equilibrium would not arise nor, unlike the Intertemporal Equilibrium case, decisions would have to be taken once and for all for the entire life span of economic agents (Pasinetti, 1977). The *Value and Capital* model is exclusively concerned with perfect competition in which markets clear but no uniform rates of return are required. Hence its temporaryness relative to the Walras-Wicksell view of long run equilibrium characterised by the tendency towards a uniform rate of return. To use a term coined by Pierangelo Garegnani, Hicks' method of Temporary Equilibrium brought about a 'change in the notion of equilibrium' by delinking it from the requirement of a uniform rate of return (Garegnani, 1976).

In terms of analytical connections, the dialogue with the theoretical evolution taking place in Cambridge represented the most significant factor contributing to Hicks' departure from the method of *Value and Capital*. Two sets of observations can be marshalled in support of the above view.

The first concerns the absence of any influence stemming from the results obtained within the framework of Arrow-Debreu theory. In developing his own critical reflections on the limitations of the Temporary Equilibrium method Hicks made no reference to the problems which were found to beset the Intertemporal Equilibrium approach, such as existence, stability and uniqueness. In my opinion this is due to the fact that the Hicksian 1939 *Value and Capital* method is conceptually more flexible than the Intertemporal Equilibrium one. It does not require that decisions be made once and for all, it is not particularly damaged by the whole discussion concerning the issue of large and regular economies, typical of the existence and stability problems engulfing the Arrow-Debreu system. This last aspect is due to Hicks' clear view about the methodological role played by the notion of perfect competition for whom 'a universal adoption of the assumption of monopoly must have very destructive consequences for economic theory' (Hicks, 1939, p. 83).

The second set of observations concerns the construction of the model presented in chapter 12 of the 1965 book where Sraffa prices and the Cambridge equation form the core of the Hicksian growth model. But this will be discussed in the subsequent section. Before we do that it is necessary to show how Temporary Equilibrium was abandoned by its founder.

In both *Capital and Growth* and *Methods of Dynamic Economics* Hicks wrote:

> The fundamental weakness of the Temporary Equilibrium method is the assumption which it is obliged to make, that the market is in equilibrium – actual demand equals desired demand, actual supply equals desired supply – even in the *very* short period which is what its single period must be taken to be. This assumption comes down from Marshall, but even in a very competitive economy, such a short-run equilibration is hard to swallow; in relation to modern manufacturing industry, it is very hard to swallow indeed. It was inevitable that the time should come when it had to be dropped (1965. p. 76; 1985, p. 81).

The proposed new method is called *Fixprice* because prices are not determined by the equilibrium between supply and demand relations. It does not mean that prices will not vary, Hicks lists specifically the cost of production as a factor generating such a change. It simply means that prices do not move in the manner postulated by Mariginalist theory. What is required from prices is that they cover costs and, if competition prevails, that the rate of profit be the same across industries. In relation to the foregoing discussion it is worth observing that the *Fixprice* method does not lead to a Temporary Equilibrium of the kind developed by Clower, which is Walrasian all but in name, but to a Sraffa type system. As we shall see shortly, it is by merging Sraffa's prices of production with the Kaldor-Pasinetti Cambridge equation, that Hicks obtains his own particular growth model.

12.3 Sraffa Prices and the Cambridge Equation in *Capital and Growth*

The adoption of the *Fixprice* method has led Hicks onto the path of dynamic macroeconomic analysis. As long as we have unused capacity and unemployment, prices can be kept fixed and changes will occur via the standard procedures related to the stock adjustment principle, provided certain difficulties are taken into account (Hicks, 1965, chapters 8 to 11). In Harrodian dynamics, by contrast, the fixprice system can work as long as the warranted rate does not hit the ceiling of the natural growth rate. Alternatively fixprices rule in growth equilibrium, but if the latter undergoes a change the relative price structure must also change unless techniques are uniform across sectors. Thus Harrodian equilibrium constitutes also the limit to which the *Fixprice* method can be stretched.

Yet, to discuss changes in the equilibrium growth it is necessary first to set out the price and quantity relations. Having rejected the supply and demand approach to prices of the Temporary Equilibrium method, and having imposed only the condition that they cover costs, the price equations are identical to those of Sraffa. The only differences consist in that the uniform rate of profit is calculated without any depreciation and the model is reduced to a Marxian-Robinsonian two sector framework.[3] The quantity system is written in terms of the standard linear two sector model. Yet, here I prefer to think in terms of the Fel'dman-Mahalanobis version of the model where λ defines the ratio of capital stock installed in the capital goods sector over the total stock. When λ is multiplied by the output-capital coefficient α of the capital goods sector, the growth rate G of total capital is determined:

$$G = \alpha\lambda \tag{1}$$

Now, if the conditions for equilibrium undergo a change, such as an increase in population growth, then a necessary but non sufficient requirement is that λ should be increased as well.[4] The absolute level of total employment is not only determined by the higher value of λ but also by the employment capacity of each machine according to the sector where it is installed. A structural equation linking the equilibrium growth of capital to full employment must therefore be satisfied.

Consider the case in which the growth rate $\alpha\lambda_0$ was in equilibrium for some time when a new growth rate of labour came into being at time t_1 at the rate $g^* > \alpha\lambda_0$. Given the labour-machine ratios in each sector, say 'm' for the tractors operating in the capital goods sector and 'n' for those operating in the corn sector, the equilibrium structural equation is:[5]

$$g^* = [(1 + \alpha\lambda_0)(h\lambda_1 + n) - (h\lambda_0 + n)]/(h\lambda_0 + n) \qquad h = (m - n) \tag{2}$$

The value of '*h*' may be positive, negative or zero, each value having specific implications which will be dealt with subsequently. If the value of $h = 0$, the model displays uniform techniques of production. With $h = 0$, equation (2) admits a solution only when $\alpha\lambda - g^*$. Economically this is very interesting and will be used to build a Hicksian Traverse of a Keynesian – but un-Kaldorian – nature.

The real unknown in (2) is λ_1 and we do not know yet if it exists or whether it yields a stable solution. This is a matter of the Traverse and the Fel'dman-Mahalanobis formulation brings it out more sharply than Hicks' own construction. For the time being it suffices to assume that λ_1 exists, with $h \neq 0$. The new equilibrium growth rate of capital will then be $G^* = g^* = \alpha\lambda_1$, where $\lambda_1 > \lambda_0$. The identification of the appropriate level and composition of the capital stock required for the new growth equilibrium can be derived therefore entirely from the technical side of the system.

To each variation in λ there may or may not correspond a variation in the saving ratio and in the rate of profit. This is precisely the point where the Cambridge equation enters into the model of *Capital and Growth*. More specifically, in Hicks the Cambridge equation emerges from the junction of the Sraffa price system with the quantity system.

In *Capital and Growth* the chapters separating chapter 7, where the *Fixprice* system is presented, from chapter 12, where the quantities and price relations are outlined, deal with Keynesian and Harrodian dynamics. Thus in those chapters the saving ratio is taken as given. In chapter 12 a model is set up in order to examine changes in the equilibrium growth rate. This involves studying the behaviour of the saving ratio and the rate of profit relative to variations in growth conditions. The saving equation is given as follows.

Let '*p*' and '*q*' be the price of the capital and consumption goods respectively, while *M* is the output of capital goods and *C* that of consumption goods. *Y* is total money income. If we start from a give propensity to save '*s*' and set the standard equality between saving and investment, we have:

$$Y = pM + qC \tag{3}$$

$$s(pM + qC) = pM = S = I \tag{4}$$

$$(p/q)(M/C) = s/(1 - s) \tag{5}$$

The above equations are self-explanatory.

The ratio *M/C* contains the growth rate of the system allowed by the initial value of λ. If *K* is the total stock of capital and α and β are the output-capital coefficients in the capital and consumption goods sector, in terms of the Fel'dman-Mahalanobis formulation we obtain:

$$M = \alpha\lambda K = \Delta K \tag{6}$$

$$C = \beta(1 - \lambda)K \tag{6a}$$

$$(M/C) = \alpha\lambda/\beta\ (1 - \lambda) \tag{7}$$

We already know that $\alpha\lambda$ is the growth rate of the capital stock, thus without any loss of information we can set:

$$[\alpha\lambda/\beta(1 - \lambda)] = \sigma \tag{8}$$

Similarly the ratio $s/(1 - s)$ may be written as:

$$[s/(1 - s)] = \varphi \tag{9}$$

Lastly, the ratio between the price of the consumption good and the price of the capital good is defined as:

$$(q/p) = x \tag{10}$$

Substituting equations (8), (9), (10) into equation (5), and solving for σ we obtain the link between the growth rate and the saving ratio:

$$\sigma = x\varphi \tag{11}$$

The value of x is nothing but the relative price ratio, which in Hicks corresponds to a Sraffa system.[6] It is the presence of the rate of profit in the price equations which enables Hicks to establish a link between the growth rate, the saving ratio and the distribution of income. In so doing Hicks merged Sraffa's approach with the macroeconomic theory of distribution of Kaldor and Pasinetti. In fact, from footnote 6 we have the expression for x which when substituted into equation (11) yields:

$$\sigma = \varphi[(rz + d)/b] \tag{12}$$

According to equation (12) a constant saving ratio, i.e. a given φ, is compatible with an increase in the growth rate, i.e. with a rise in σ, whenever 'z' is positive or negative. If the value of 'z' is zero any change in σ would have to be accompanied by a parallel change in φ. The value of 'z' is the determinant, with an inverted sign, of the matrix of the Sraffa-Hicks price equations. It therefore bears a strict relation to the value of 'h' in equation (2). When 'z' is positive, negative or zero, so is 'h'.[7] Clearly with $z = 0$, an increase in the rate of growth can be met only by a rise in φ. With $z \neq 0$ and φ given, as in Solow's model, changes in the growth rate involve changes in the rate of profit 'r'. We should expect the rate of profit on capital to increase with the rate of growth, otherwise why should firms invest at

all? With a Solow type saving function, this is possible if $z > 0$; that is: $m > n$. Such a condition is consistent with a well behaved production function when applied to a linear two sector model (Spaventa, 1970).

The factor that brings Hicks to jettison the assumption of a given saving ratio and opt for the Cambridge equation is what, from the standpoint of Neo-classical capital theory, amounts to the well known case of reswitching of techniques. In Hicks' two sector model this happens when $z < 0$ which means that $m < n$. Under these circumstances, the sign of the derivative $d\sigma/dr$ is negative, implying that, with a given saving ratio, the rate of profit must fall when the growth rate rises. The result whereby the highest growth rate requires the lowest rate of profit, instead of being viewed as perverse, is used by Hicks to move towards the Cambridge equation. He writes:

> I think that several things have gone wrong (....). The simplest thing which has gone wrong is that we have carried the assumption of saving proportional to total income, over from the Harrod-type theory (where it belongs) to the present theory, where it is much less at home. As soon as we make the distinction between factor shares (as in the Harrod-type theory we did not have to do), the question must arise: will not the saving-income proportion be affected by income distribution? (Hicks, 1965, p. 145).

The suggested way out is 'to introduce a direct effect of income distribution on saving' (pp. 145–6). The assumption of all savings being out of profits, although judged extreme, 'is a very convenient assumption which simplifies things considerably, so that – purely in order exhibit the properties of the model – it is one that I shall largely use' (p. 146). The model is then reduced to two basic equations.

The first equation is the Sraffian wage rate-rate of profit equation (called by Hicks the wage equation) stating that the two distributive variables are inversely related:

$$w = (1 - ar)/(rz + d) \tag{13}$$

The second is the Cambridge equation, which Hicks calls the saving equation:

$$G = s_r r \text{ where } s_r \text{ is the saving ratio out of profit.} \tag{14}$$

It follows that:

> If the real wage (w) is given, the rate of profit is determined from the wage equation, and the rate of growth is then determined from the saving equation. The higher the real wage, the lower the rate of profit, and

> the lower (therefore) the rate of growth. If it is the rate of growth that is given, the same two equations work the other way round. The rate of profit (which is consistent with this rate of growth) is then determined by the saving equation, and the rate of real wage from the wage equation. The lower the rate of growth, the lower the rate of profit, and the higher the real wage. This is all that there is to be said (1965, pp. 146–7).

However once we know what should happen in order *to be* in the new equilibrium position, we know nothing about whether or not we can attain it. From this perspective issues of choice of techniques become secondary because, as Hicks noted in a fully Robinsonian flavour:

> in the real world changes in technology are incessant; there is no time for an economy to get into equilibrium (if it was able to do so) with respect to January's technology, before that of February is upon it. It follows that at any actual moment, the existing capital cannot be that which is appropriate to the existing technology; it inevitably reflects past technology; to existing technology it is more or less inappropriate (Hicks, 1965, pp 183–4).[8]

12.4 The Traverse

Any change in the equilibrium growth rate, i.e. in the Harrodian natural rate, requires an adjustment determined by the Cambridge equation independently from how and by what means it is achieved. The Traverse section deals precisely with the issue of how to get into the new equilibrium.

From Harrodian theory and the *Fixprice* method we know that an economy in long-run equilibrium can adjust to a change in its growth rate only if the average saving ratio varies via changes in the distribution of income. Yet the adjustment requirements are not to be confused with the process of getting into the new position:

> let us suppose that the Harrod difficulty has been got over: that a suitable change in the propensity to save, for whatever reason has occurred – will that be the end of the trouble? (Hicks, 1965, p. 185; 1985, p. 131).

It is well known that Hicks' answer is in the negative. It is based on the same analytical elements which brought him to discard the flexibility of prices as a means to attain a new equilibrium growth rate with a given saving ratio. It may be recalled that the compelling reason why a given saving ratio would not do when the long run equilibrium growth rate changes, lies in the technological structure of the economy inherent in equation (11):

$$\sigma = x\varphi$$

The relative price ratio '*x*' contains the technological structure of the system – '*z*' – as well as the rate of profit. A negative '*z*, i.e. a negative '*h*', would generate absurd results if the saving ratio remains unchanged. By the same token, a negative '*h*' would be incompatible with stable full employment. To see this let us reproduce equation (2):

$$g^* = [(1 + \alpha\lambda_0)(h\lambda_1 + n) - (h\lambda_0 + n)]/(h\lambda_0 + n)\ h = (m - n)$$

If we assume, with Hicks, that the composition of the stock of capital is at full employment equilibrium at time t_0, the growth of the stock of equipment from t_0 to t_1 will be $\alpha\lambda_0$. It may also be assumed that the growth of the labour force moves away from equilibrium and, between the two periods, grows at a rate

$$g^* > \alpha\lambda_0$$

In this context, a solution for λ_1 consistent with raising the growth rate of capital to g^* is possible only with a positive '*h*'. In other words, if we want the new proportion of the stock of capital allocated to the capital goods sector to emerge as a solution consistent with the new equilibrium growth, the capital goods sector must be less mechanised than the consumption good sector. Hence if we keep the Kaldorian hypothesis of $G = s_r r$, the adjustment to g^*, while requiring a change in the distribution of income à la Kaldor, still needs the technological condition that '*h*' be positive. This condition – being a special case – is rejected by Hicks who concludes that 'the chief lesson that we learn from these exercises is that smooth adjustment may not be possible'(1965, p. 195; 1985, p. 137).

For each configuration of '*z*' ('*h*'), the prices ruling during the Traverse are always the right ones. They are prices of production determined by Sraffa type equations. Yet they are not equilibrium prices, or, more specifically, the lack of smooth adjustment is not caused by the absence of price flexibility (Bhaduri, 1975; Halevi, 1992). The strict analogy between the quantity and the price Traverse is a very important aspect of Hicks' contribution since it shows that prices cannot give much guidance about production decisions in a macrosectoral framework.

12.5 From the Traverse to Effective Demand Conditions

Hicks' results have been obtained by finding the value of λ as the solution to the problem of how to distribute the stock of capital between the two sectors. This procedure is legitimate if we want to endogenously determine the adjustment path to the new equilibrium growth rate.

However, Hicks' procedure completely by-passes the question of effective demand. Take the case in which the technological configuration leads to

a state of disequilibrium. The level of effective demand never comes into the picture. Produced capital goods are allocated in such a way as to grope towards an equilibrium solution which, unfortunately, will turn out to be unstable.

It is preferable, therefore, to follow Kaldor more closely and set the full employment level of investment, exogenously. Obviously, in this case the shape of the technology would no longer be the main factor determining whether or not structural disequilibrium will emerge. The main threat to stability would come, instead, from unemployment due to a lack of effective demand.

Assume that at time t_1 the new long run growth rate of the labour force is $g^* > G$, where G is the equilibrium growth rate ruling until t_0. At time t_0 the stock of capital was in equilibrium and full employment prevailed. Depending on the value of 'h', for $h \neq 0$, any change in the composition of the stock of capital at t_0 would have led to structural unemployment, due either to too many machines relative to the available number of workers, or to too many workers relative to the number of machines. Consider now the case in which at time t_1 the transfer of the stock of capital to the capital goods sector is implemented by exogenous decisions, so that the value of λ_1 generates the full employment growth rate g^*. Yet, at the dawn of t_1 the stock of capital would have grown, in relation to t_0, by $\alpha\lambda_0 < g^*$. With $h = 0$, λ_1 would absorb an amount of labour exactly equal to the old growth rate. With $h < 0$, the intake of labour would be even less because the transfer to the capital goods sector implies a smaller crew per each unit of capital good installed there. Unemployment U would then be:

$$U = [(1 + g^*)(h\lambda_0 + n) - (1 + \alpha\lambda_0)(h\lambda_1 + n)\ K_0 \tag{15}$$

where: $h \leq 0$ and $\lambda_1 > \lambda_0$

The unemployment rate u is thus:

$$u = [1 - (1 + \alpha\lambda_0)(h\lambda_1 + n)/(1 + g^*)(h\lambda_0 + n) \tag{16}$$

This rate of unemployment cannot be absorbed unless λ is raised temporarily above the equilibrium level λ_1. However a value of λ greater than that required by the new equilibrium rate involves a higher growth rate of capital which will have to be lowered at a later stage. In a structural context with limited shiftability of capital, the reduction of the growth rate of capital cannot be obtained without the formation of unwanted unused capacity. At any rate with λ raised to the level of λ_1, the economy will start absorbing labour at the rate equal to full employment growth only from time t_2 onward. Indeed the stock of capital – being set at its fully adjusted composition at time t_1 – will have, by time t_2 – expanded exactly at the equilibrium rate g^*.

Barring the case of raising λ temporarily above the equilibrium value λ_1, the backlog of unemployment will stay for ever. Yet its proportion over the total labour force will decrease with time as the numerator of equation (16) remains unaltered, while the denominator gets larger and larger. Just the same, the progressive dwindling of the rate of unemployment can take place only if capacity remains normally utilised. In other words, raising λ to the level of λ_1 is a necessary but not sufficient condition for equilibrium growth to occur after t_2. The additional requirement is that at λ_1 both sectors keep operating at the normal capacity utilisation rate. In this context, it is the consumption goods sector to face a threat to its normal rate of capacity utilisation. If the unemployment rate ruling in the initial period of adjustment is such as to induce a fall in money wages, uncompensated by a fall in prices, then real consumption demand will decline engendering a reduction in the level of employment in the consumption goods sector. Unemployment will thus rise further with additional negative results for the state of consumption demand. At this point, it is likely that firms operating in the consumption goods sector will start revising their investment plans downward, thereby causing unused capacity to emerge also in the capital goods sector.

As a consequence the economy will find itself mired in Keynesian unemployment being, therefore, unable to get into the new equilibrium rate of growth. It must be pointed out that no over-accumulation of capital has occurred here since the value of λ was raised to the equilibrium level of λ_1 from the outset. The thrust towards disequilibrium comes entirely from the effective demand side, i.e. from the negative impact of unemployment on the level of money wages. Disequilibrium is due to the system's structural inability to absorb immediately into production the additional amount of labour stemming from the higher growth rate. Yet, the derailment of the economy from its long run growth rate is determined by the events happening within the short period. Under these new circumstances prices, which at the beginning were assumed to be of a Sraffian nature, have become Kaleckian prices in every respect. In fact, if consumption goods prices were to be perfectly flexible in relation to variations in money wages, employment in the consumption goods sector would remain unchanged. Hence, structural unemployment will not be reabsorbed. By contrast, if prices do not change in the light of a fall in money wages, the appearance Keynesian unemployment would be due to the rise in the mark up. Both cases are purely Kaleckian. Price flexibility does not eliminate unemployment, it simply prevents further rises in its level.

From a strictly analytical perspective, full employment can be positively ensured as of time t_1 whenever the economy is conceived in terms of only one commodity. In such a system any amount of consumption goods can be made into capital goods. It follows that if at t_1 the number of corn made machines does not suffice to employ all the available population of working

age, a part of the corn allocated for consumption can be switched to operate as 'corn machinery'. As long as the wage rate does not fall below subsistence, any amount of corn can be transformed into capital goods. This means that the share of corn functioning as investment can be reduced at a later stage just by raising the wage rate. In a one commodity world the adjustment to a higher or a lower growth rate can be attained without any danger of encountering the problem of effective demand.

It is indeed a pity that Hicks did not analyse this aspect of the Traverse because it would have, on one hand, strengthened his scepticism towards equilibrium adjustments, while tempering, on the other, his hostility towards the 'fanfare of the Keynesian orchestra' (1985, p. 131).

12.6 Conclusion: A Critique of Classical Economics

The application of the Traverse method to the one commodity case shows that the problem of effective demand cannot be taken into account by the theoretical framework of Classical and Marxian economics. In Classical theory growth and accumulation are guided by parsimony. The impossibility to introduce the level of effective demand into the Classical system was indeed seen very clearly by Hicks in the early stages of *Capital and Growth* and of *Methods of Dynamic Economics*, in the chapter devoted to Adam Smith and David Ricardo:

> There is no problem, in the Original Model, about the transmission of saving into investment, for in that model there is no money. Indeed there is hardly any exchange. One would be quite entitled to think of land owners (or capitalists) into whose possessions the harvest comes just piling it up in their store-houses; then doling it out to those whom they employ, productively or unproductively. If they are paid in money, then spend the money on their 'corn' consumption, the money just comes back where it was without making any difference (Hicks, 1985, pp. 34–5).

In relation to the Original Model, the method of the Traverse shows that Classical accumulation, whether analysed in terms of prices of production or labour values, is not compatible with Keynesian principles and breaks down as soon as heterogeneity is introduced into it. The formation of the money capitalist, as Marx pointed out in the third volume of *Capital*, is strictly connected to the emergence of separate sectors of production and, in particular, to the separation of the capital goods from the consumption goods sectors. But this very factor requires a different theory of output and of dynamic processes from the Classical one where a higher rate of profit (a lower real wage rate) unambiguously entails a higher growth rate.

To clinch the theoretical incompatibility between Classical dynamics and the structural dynamics of a Hicksian type, let us transform the case in

which λ is exogenously raised to λ_1 into a numerical example. Assume that at t_0 the stock of capital is made of 100 undepreciating machines, of which 10 are in the capital goods sector and 90 in the consumption goods sector. The coefficient λ is thus 0.1. Each of the 10 machines produces one machine. Hence by the end of t_0 the growth rate of capital will be 10%. Assume also that each machine, irrespectively of the sector where it is installed, employs one worker. Total employment is therefore 100 and, for balanced growth to be maintained, the labour force should grow by 10%. Within each period the equilibrium effective demand for consumption goods is ensured by the following Robinson-Harcourt equation (Harcourt, 1963):

$$w(N_i + N_c) = q^*C \tag{17}$$

Where q^* is the price of consumption goods which is no longer derived from a Sraffian procedure; w is the money wage rate, and N_i and N_c are the number of workers in the capital and in the consumption goods sectors respectively. On the basis of the assumptions made hitherto and substituting equation (6.a) into equation (17), we obtain:

$$wK = q^*\beta(1 - \lambda)K = q^*C \tag{18}$$

The real wage rate (w/q*) becomes:

$$(w/q^*) = \beta(1 - \lambda) \tag{19}$$

Thus if (19) is allowed to operate freely, there will never be an effective demand problem in the consumption goods sector.

At this point, if the growth rate of the labour force has turned out to be greater than that of the stock of machines, unemployment will emerge even if investment is raised to the equilibrium level. Assume that by the end of t_0 the growth rate of labour is – say – 12%. It follows that with the new equilibrium growth set at 0.12, it is necessary that at the beginning of period t_1 λ, be raised to 0.12. Assume it is; with α equal to unity the ensuing growth rate will be equal to 12%. But the new equilibrium growth rate will materialise only at the end of period t_1 and its persistence will be rather uncertain. The Kaldorian decision to increase the rate of investment to the full employment level at the beginning of t_1 only increases the proportion of the workforce employed in the capital goods sector, but it does not create additional employment at the outset. In our example, at the beginning of t_1 there are 110 employable workers ($n = 1$ and $K = 110$) while the labour force is 112 units. By raising λ to 0.12, we increase the number of workers in the capital goods sector to 13.2 out of a total of 110. Two workers have no other option but to remain unemployed.

Dynamic adjustment would involve more trouble under conditions of greater uncertainty. Indeed, if during period t_1 the unemployed workers start

affecting negatively the real wage rate, thereby altering the equilibrium relation (19), the consumption goods sector will be piling up unwanted inventories, while the capital goods sector keeps working at full capacity. Thus by the end of t_1 the firms operating in the consumption goods sector will have to find a way of getting rid of the unwanted inventories and of how to use the machines which produced them. A straightforward adjustment procedure would be to reduce the demand for new machines by an amount equivalent to that which produced the undesired level of inventories. In Keynesian terms, this is equivalent to a decrease in real investment demand. Unused capacity will appear also in the capital goods sector which – at time t_2 – will lay off a proportional number of workers. The ensuing decline in consumption demand will trigger a further round in the negative multiplier. The economy will be, by now, well and truly out of equilibrium growth.

The above case of the Traverse shows that the Kaldorian adjustment mechanism does not eliminate the problem of effective demand even if investment is initially raised to the full employment level of output. The source of the disequilibrium is structural and its evolution is of a Keynesian type. By contrast if output were homogeneous with capital, the adjustment to full employment would not involve any difficulty.[9]

The criticism of the Kaldorian process brings into sharp relief the shortcomings of the Classical, especially Marxian, view of accumulation. From an analytical perspective Kaldor's mechanism of income distribution is completely Classical only that it is tied to the hypothesis that investment is set at the level of full employment. Just the same, like the Classics and Marx, whenever the distribution of income shifts towards profits, the rate of growth should rise as long as unemployed labour is available. When the warranted rate hits the ceiling of the natural rate, the distribution of income should shift to wages, thereby enabling the system to stay, roughly, on a full employment path. Within the limits determined by the natural rate, the dynamic process is exactly as in Marx: share of profit up, rate of profit and rate of growth up!

In this context Kaldor thought that an economy with too little capital to employ the whole of the workforce would be characterised by Marxian unemployment; whereas an economy with too much capital would be affected by Keynesian unemployment. This definition, because of its simplicity, is very appealing indeed. Yet, it fails to capture the difference between the economics of effective demand (Kalecki and Keynes) and the economics of cyclical growth (Marx and Goodwin). The modified Hicksian Traverse presented above brings that difference to the surface in an equally simple way. At the beginning of period t_1 there are more workers than the number employable by the existing stock of capital, although investment has been fixed at a level allowing for an equilibrium expansion of the stock of capital. The mere existence of unemployed workers suffices to push the system out of its equilibrium path. The shift is due entirely to the negative

impact on the level of effective demand of a decline in real wages. In other words, even when the level of investment is secured by anchoring it to the full employment level, there is no guarantee that it will stay there. The decline in real wages, while bringing about a notional increase in the rate of profit, actually causes a rise in unused capacity in the consumption goods sector with negative consequences for the demand of capital goods.

It is not difficult to see that the criticism which, on a Hicksian basis, can be levelled against Kaldor's adjustment mechanism can be more forcefully directed against the Classical approach to income distribution and growth. In the Marx-Goodwin growth model effective demand plays no role at all. If we were to outline the Marx-Goodwin path in a two sector framework, we should be arguing as follows.

Whenever the Reserve Army of Labour brings down the real wage rate, the rise in unused capacity in the consumption goods sector should be interpreted by capitalists as a signal that notional profitability is rising. With perfect information and perfectly rational expectations in the dynamic properties of the Marx-Goodwin growth cycle, capitalists ought to shift investment towards the capital goods sector, giving rise to a new upward cycle. By contrast, it is far more likely that in the face of a fall in consumption demand, investment and accumulation will suffer as well. In a single good model the Classical story is not only credible but actually very powerful. It provides a firm belief in a set of objective laws sustaining the whole dynamic process over-time.

Keynes and Hicks, the latter perhaps unwittingly as far as Marxian growth is concerned, contributed – in different but not incompatible ways – to the demolition of the belief that economic systems are propelled by immanent and objectively identifiable forces.

Notes

1. Findlay proved that full employment (state of bliss) in Joan Robinson's theory of accumulation could be attained only upon satisfaction of the capital intensity condition (Robinson, 1956; Findlay, 1963).
2. The MIT produced what they thought would become the dominant graduate textbook on macrodynamics. It was written by Duncan Foley and Miguel Sidraaski (1971). In many respects it is still the best book on neoclassical growth. It is entirely based on a two sector model of the Inada-Uzawa type and right from the start the capital intensity condition is presented as the necessary requirement for the validity of the whole story told in the book. Overall, this means that capital per head will move inversely to changes in the steady state growth rate. The short lived nature of that book was not due to the impact of the capital controversies – which in the United States was minimal –but to the rise of Lucas' economics.
3. All this happens in chapter 12 of *Capital and Growth* – not included in the 1985 book – well before the discussion of the Traverse which takes place in chapter 16.
4. The sufficient conditions are examined in the chapter on the Traverse.

5. Equation (2) is derived in the following manner. Assume full employment and full capacity to prevail at period t_0, then the stock of capital in the same period will generate a level of employment equal to:

$$L_0 = K_0[(m - n)\lambda_0 + n], \quad \text{where } (m - n) = h.$$

For full employment to be maintained in the subsequent period t_1, it is necessary that:

$L_1 = K_1(h\lambda_1 + n)$. We also know that $L_1 = L_0(1 + g^*)$ and that $K_1 = (1 + \alpha\lambda_0)K_0$. Since we know the expression for L_0 we can solve for g^* and obtain equation (2).

6. Hicks used a Sraffian model where: $p = par + wb$, $q = pcr + wd$. Where a and c are the coefficients of machines necessary to produce one unit of machines and one unit of consumption goods; r and w are the profit and wage rates, while b and d are the labour inputs needed to produce one unit of the respective goods. Solving for q/p we get: $x = (rz + d)/b$, where $z = (cb - ad)$, which is nothing but the determinant (with an inverted sign) of the coefficients matrix forming the equations for q and p.
7. Since: $h = m - n$, where 'm' is the L_m/K_m (employment to capital ratio)ratio in the machine sector and 'n' is the the L_n/K_n ratio in the consumption goods sector, whenever 'z' is positive, negative or zero, $m > n$ and $h > 0$, $m < n$ and $h < 0$, $m = n$ and $h = 0$. This is because from the equation for 'z' given in footnote 6, $(b/a) = (L_m/K_m)$ and $(d/c) = (L_n/K_n)$.
8. This passage has been omitted in the 1985 book.
9. Consider a one good model of the following kind:

(i) $\alpha K_0 = Y_1$ and, because K is homogeneous with Y, we have:
(ii) $K_0 + Y_1 = X$. Furthermore:
(iii) $Y_1 = (1 + g)Y_0$. Where g is the growth rate of output from period t_0 to t_1. Now, if the growth rate of the labour force is $\gamma > g$, and n is the labour to capital coefficient, we have to find the proportion ε of X which is to become capital in order to employ the whole of the labour force at t_1. Hence:
(iv) $\varepsilon nX = L_1$ We know also that:
(v) $L_1 = (1 + \gamma)L_0$; and that
(vi) $L_0 = nK_0$, and, from (i) and (iii):
(vii) $K_0 = [(1 + g)/\alpha]Y_0$ Substituting and solving for ε in equation (iv), we obtain:
(viii) $\varepsilon = (1 + \gamma)/(1 + \alpha)$. The coefficient ε is nothing but the accumulation ratio calculated over X which includes K. As long as $\gamma < \alpha$, a meaningful solution for ε exists without any effective demand problem. Full employment is ensured. The Classics by treating capital as fully circulating worked, in fact, on the basis of equation (ii).

References

Bhaduri, Amit (1975). 'On the Analogy Between the Quantity and the Price Traverse', *Oxford Economic Papers*, 27(3): 455–61.

Findlay, Ronald (1963). 'The Robinsonian Model of Accumulation', *Economica*, 30(117): 1–12.

Foley, Duncan and Sidrauski, Miguel (1971). *Monetary and Fiscal Policy in a Growing Economy* (New York: Macmillan).

Garegnani, Pierangelo (1970). 'Heterogeneous Capital, the Production Function and the Theory of Distribution', *Review-of-Economic-Studies*; 37(3): 407–36.

Garegnani, Pierangelo (1976). 'On a Change in the Notion of Equilibrium in Recent Work on Value and Distribution', in Brown, Murray; Sato, Kazuo; Zarembka, Paul (eds.), *Essays in Modern Capital Theory* (Amsterdam and New York: North Holland).
Halevi, Joseph (1992). 'Accumulation and Structural Disequilibrium', in Halevi, Joseph., Laibman, David., Nell, Edward, (eds.), *Beyond the Steady State* (London: Macmillan).
Harcourt, Geoffrey C. (1963). 'A Critique of Mr. Kaldor's Model of Income Distribution and Growth', *Australian Economic Papers*, 1(1): 20–6.
Harcourt, Geoffrey C. (1975). 'Decline and Rise: The Revival of (Classical) Political Economy', *Economic-Record*, 51(135): 339–56.
Hicks, John R. (1939). *Value and Capital* (Oxford: Oxford University Press).
Hicks, John R. (1965). *Capital and Growth* (Oxford: Clarendon Press).
Hicks, John (1969). A *Theory of Economic History* (Oxford: Clarendon Press).
Hicks, John R. (1973). *Capital and Time* (Oxford: Clarendon Press).
Hicks, John R. (1975). 'Revival of Political Economy: The Old and the New', *Economic-Record*, 51(135): 365–67.
Hicks, John (1985). *Methods of Dynamic Economics* (Oxford: Clarendon Press).
Hicks, John R. (1990). 'Ricardo and Sraffa', in Bharadwaj Krishna and Schefold Bertram (eds.), *Essays On Piero Sraffa. Critical Perspectives on the Revival of Classical Theory* (London, Boston, Sydney, Wellington: Unwyn Hyman).
Pasinetti, Luigi L. (1966). 'Changes in the Rate of Profit and Switches of Techniques', *Quarterly Journal of Economics*, 80: 554–65.
Pasinetti, Luigi L. (1977). *Lectures in the Theory of Production* (New York: Columbia University Press).
Robinson, Joan (1956). *The Accumulation of Capital* (London: Macmillan).
Spaventa-Luigi. (1970). 'Rate of Profit, Rate of Growth, and Capital Intensity in a Simple Production Model', *Oxford-Economic-Papers*; 22(2): 129–47.

13

Marx or Hicks? Structural Proportions and Crisis: The Transition from the First to the Third Volume of *Capital*

Joseph Halevi and Peter Kriesler

13.1 Introduction

Two fundamental aspects of modern capitalist economies are not adequately treated in volume III of *Capital*. The first of these, the monopolistic stage of capitalism, is not discussed in any of the volumes. Instead there is an emphasis on competitive capitalism, governed by a tendency towards a uniform rate of profits, which, according to Marx, provides capitalism with its long-run dynamic. The second feature is the role of structural and sectoral adjustment in the dynamic growth process. Here the problem lies mainly with volumes I and III, as volume II embarks on an embryonic consideration of the issues in its treatment of the reproduction schemes.

The neglect of the monopolistic elements has been a continuing subject of controversy, and was already questioned by Engels in the preface to the English edition of volume I. There is an important school of Marxian scholarship, including Baran, Braverman, Hilferding, Kalecki, Lenin, Luxemburg, Steindl and Sweezy, which argues that under monopoly capitalism the laws of capitalist accumulation have been fundamentally changed. Elsewhere we have argued that the tendency towards a uniform rate of profits has been vitiated due to the changes in the structure of the economy, so that stagnationist tendencies have arisen (Halevi and Kriesler, 1991). This chapter will concentrate on the issue of the role of structural disproportionalities in the work of Marx, and the subsequent developments by Lowe and Hicks.

The role of the sectoral structure of the economy emerges from the discussion of reproduction schemes in volume II of *Capital*, where the nature of the flows between the capital-goods producing sectors and the consumption-goods producing sectors is analysed. In order to avoid disproportionality

Revised from *Marxian Economics: A Reappraisal*, 2: 194–205, 1998, 'Marx or Hicks? Structural Proportions and Crisis: The Transition from the First to the Third Volume of *Capital*,' by Halevi, J. and Kriesler, P. With kind permission from Palgrave Macmillan. All rights reserved.

crises, Marx showed that certain conditions must be fulfilled by these flows. However he also concluded that satisfaction of these conditions was extremely unlikely in a capitalist economy. That this prepared the space for the analysis by Lowe and Hicks of the structural traverse is the central proposition of this chapter. In the following section the importance of structural disproportionalities in early Marxist literature is noted, as well as the movement away from volume I of *Capital*. The third section compares the Lowe–Hicks analysis of the structural traverse with Marx's analysis.

13.2 The Change in Perspective in Marxian Thought

By the time of the publication of volume III of *Capital* the dominant theoretical component of Marxian and socialist thought, that is, German social democracy, was moving rapidly away from the analytical propositions put forward in volume I. This departure was further accentuated by Russian Marxism, which, with the contributions of Tugan Baranovski, Bulgakov, Lenin and Preobrazhensky, formed the most substantial body working on the theory of structural disproportionalities. In this context it is worth pointing out that the divergence from volume I is also evident in the notes written by Engels while editing Marx's main opus.[1]

For Engels, the issue at stake was Marx's general law of capital accumulation, expounded in chapter 25, volume I of *Capital*. This is the only part of *Capital* where Marx presented a theory of the global functioning of the capitalist economy based on the well-known cyclical interaction between accumulation and the 'reserve army of labour'. The importance of that chapter in providing Marx's vision of the totality of the capitalist process is evidenced by the fact that its content is virtually identical to that of *Wage, Price and Profit*. In both cases the process of capital accumulation is based on the belief that the competitive mechanism is constantly at work in a way that ensures a form of capital mobility entailing a persistent tendency towards a uniform rate of profits. Engels began to question the historical validity of this aspect of Marx's analysis already in the preface to the English edition of volume I of *Capital*, where he observed that crises might now imply chronic unemployment and a state of persistent stagnation. In this context, it is important to recall that chronic unemployment is not possible in Marx's theory of the business cycle. Whenever the rate of profits begins to rise as a result of the negative impact of the crisis on factory jobs, and consequently on the wage rate, accumulation and investment rise again, leading to an upswing in employment levels. Indeed the only chronic form of unemployment conceivable within Marx's theory of the reserve army is that constituted by workers whose skills are no longer needed in the production process. Yet these obsolete people have no bearing upon the inverse relationship between the rate of profits and the wage rate upon which Marx built the entire edifice of his growth cycle. Thus the idea that the capitalist economy

might become stuck in a situation of persistent stagnation is at odds with Marx's general law and foreshadows a different conception of accumulation, which Engels did not provide but hinted at in volume III of *Capital*.

Chapter 30 of volume III deals with the relationship between money and real capital. In particular, Marx developed there the view that at the onset of the crisis loan capital is short, because of the rise in the rate of interest due to the freezing out of credit, while real capital is plentiful because of the shutting down of factories resulting from a low rate of profits. The ensuing, but deterministic, divergence between the two rates is governed by the regularity of the cyclical movement in the rate of profits, as presented in chapter 25 of volume I. It is at this point that Engels, in a long footnote, took issue with Marx's conception of a regular cycle:

> As I have already noted elsewhere, the last general crisis represented a turning-point. The acute form of the periodic process with its former ten-year cycle seems to have given way to a more chronic and drawn-out alternation, affecting the various industrial countries at different times, between a relatively short and weak improvement in trade and a relatively long and indecisive depression (Engels, in Marx, 1981, vol. Ill, p. 620).

Engels then cited the creation of a world market, the rise of new industrial powers behind tariff walls and, finally, the retreat of domestic competition in the face of cartellization, as the main factors counteracting the repetition of the old crisis.

In several respects Engels lagged behind the evolution of German Marxism as well as behind the analyses of the incipient Russian wing. For both strands the German experience was the reference point. The role of the metal and machining sectors in providing sustained impetus to accumulation, while no systemic regular cycle was occurring, made German social democratic thinkers lean towards a sectoral mode of thought. Once accumulation was identified as taking place through the growth of the capital goods sector, the question became to determine the point at which the process could no longer be maintained. As a consequence the very notion of crisis was no longer identified with the cyclical movements of production and of the rate of profits. This new attitude is well expressed by Karl Kautsky's position in 1902. According to Kautsky, 'the market for consumption goods, i.e. consumption demand, expands less rapidly than the accumulation of capital and the rise in the productivity of labour' (Kautsky, quoted in Sweezy, 1968, p. 179). This state of affairs is bound to generate a situation of chronic depression that, because of the persistent unemployment it entails, will eventually become intolerable for the mass of the population.

Kautsky does not seem to have discussed the mechanisms that are supposed to give rise to his scenario, yet they can be easily deduced with the help of modern contributions to oligopolistic pricing. Firstly, Kautsky's thesis

implies that real wages will always increase at a pace slower than productivity, something that was denied, albeit confusedly by Eduard Bernstein. For this to occur the price setting process would have to be such that the rise in labour productivity leads to an increase in the mark-up. Secondly, even if real wages expand less than productivity a crisis need not happen as long as the gap is matched by an increase in investment (Sylos-Labini, 1969). This is indeed the macrosectoral solution proposed by Tugan-Baranovski – of the Russian strand – who calculated in terms of labour values the proportional amount by which production will have to be shifted to the capital goods sector in the face of declining consumption demand. Note that the fall in consumption demand is, in this case, attributed to a rapid decline in the number of workers needed to operate the stock of machines. Although analytically incomplete, Kautsky's views, and *a fortiori* those of the Russian strand, constitute a radical departure from the analysis undertaken by Marx in volume I and in the relevant part on money and real capital in volume III.

13.3 Marx and Hicks: from Primitive to Complex Accumulation

At this point two possible routes are open to us. The first would be to accept Engels' view that the change lies in the historical form of accumulation. Yet this would imply the *a priori* acceptance of Marx's cycle for the early stages of industrialisation. Therefore, we have chosen the second route, where the source of the difference lies in the still primitive character of the theoretical formulation put forward in volume I and reproduced in the relevant part of volume III. This approach is justified by the fact that volume II does address, although in a rough manner, the questions that became germane to German and Russian Marxism. Once the general law of capital accumulation in volume I is shown to be based on a primitive model in a Hicksian sense, the appropriate link should run from volume II to volume III of *Capital*. Yet the connection appears to be highly problematical.

To paraphrase Hicks (1965, 1985), a model where capital accumulation proceeds through 'parsimony' is indeed primitive. The relation between 'parsimony' and accumulation is highlighted in the simplest of all constructions: a pure one-sector corn economy with constant coefficients of production. Corn output minus corn wages is accumulated, which means that it is invested. Why should the unconsumed corn be kept aside (in warehouses) except for uncertainty related to weather? Net investment means here that more corn is ploughed back than last year. If the number of people available for exploitation has increased well above the number required to carry out production, the corn wage that will be paid out by the end of the next year will fall. Hence by the next year the amount of corn available for investment will further expand by an amount equivalent to the difference between the old and the new corn wage multiplied by the total number of workers employed

during the year. In this way the share, the rate of profits and the growth rate will have moved in the same upward direction. Exactly the opposite happens when accumulation meets a reduced number of available workers. The logical smoothness of the mechanism of the reserve army of labour works only when output is strictly homogeneous. The introduction of technical change in chapter 25 of volume I does not alter the issue. In fact it appears only as a device to obtain surplus population without having to rely on immigration flows from the non-capitalistic sectors of the economy. Marx's cyclical growth is, in essence, remarkably similar to what Hicks has identified as the original model of Adam Smith. Now, it is true to say that in its intentions Marx's volume I was not meant to be limited to a one-commodity world, but whenever he analyzed the dynamics of accumulation he reverted to the corn model.

As soon as commodities are heterogeneous the logical simplicity of the general law breaks down. If tractors and corn are produced by means of tractors, and if the economy operates at full capacity, a fall in the corn wage will not, *ipso facto*, generate more overall investment. The fall in *real* wages will simply cause a less than full exploitation of capacity in the corn sector through an unwanted accumulation of corn inventories, thereby leaving idle some of the tractors operating in the corn sector. For real investment to rise, these tractors will have to be shifted to the tractor producing sector. Only at this point will it be possible to speak of a process whereby the notional shift in the distribution of income from wages to profits becomes an actual one leading to higher accumulation. But between the notional and the actual increase in the rate of profits there is a wide gap. The significance and importance of this gap can be gauged from the explicitly Marxian reproduction theory developed by Lowe (1987, 1976).

At this stage it is necessary to distinguish between problems associated with structural adjustment, or disproportionalities, and those associated with effective demand (realization problems). Although there are important connections between the issue of disproportionalities and the problem of realization and effective demand (Halevi, 1992), they are analytically distinct. The problem of the structural traverse is really about both the sectoral responses occurring when an economy is moved away from its steady state growth path, and the question of whether such a path, relying on all sectors growing in the same proportion, is a useful abstraction. This means that to analyze such problems properly three important considerations must be brought in: (1) the existence of a multisectoral model, (2) a distinction between at least one consumption sector and a capital goods sector, and (3) capital must be putty/clay. Without the first two we cannot significantly analyze intersectoral relations, while without the assumption of clay capital, problems with intersectoral flows can be ignored as the capital stock can immediately transform itself to the one appropriate to the new equilibrium.

Lowe's model is based on machine tools reproducing themselves as well as producing tractors that are used to plow and harvest corn. Thus a decline in

real wages, as envisaged by Marx in his growth cycle, will, in the first instance, render idle a certain number of tractors in the corn industry. Indeed the reduced demand for tractors turns out to be the structural condition needed to increase the rate of investment in the machine tools sector, thereby pulling up the aggregate rate of investment. However there is no *a priori* mechanism guaranteeing the transition to the new rate. In fact the whole process can be halted in its tracks and the notional (higher) rate of profits may never translate into a real one, even tendentially, unless the process is guided by institutional rather than deterministic forces. In Lowe's theory tractors are not shiftable. Thus the cost of their laying idle can be met by firing workers in the corn sector. The demand for corn will fall, leading to additional idle tractors. Whatever the desired rate of profits capitalists aspire to, their investment decisions will be governed by the state of real effectual demand. Hence corn producers will reduce their demand for tractors, leading to unused capacity in the machine tools sector. These machines are shiftable and can be used to expand their own production. ['Shiftable' is used in the literature on growth models to describe the degree of mobility of machinery (capital goods) between sectors. If machines are totally specific, that is if they are designed to operate only in a given sector, they are said to be non-shiftable]. Yet to obtain a rise in the self-expanding activities of the machine tools sector very stringent assumptions about expectations and about the information content conveyed by a fall in real wages are needed. These are as strong as those made in general equilibrium analysis (Lowe, 1976, chs 1–12).

It follows that, once complexity is introduced into the classical Marxian picture, the logical smoothness of the process described in chapter 25 of volume I must give way to a method that is capable of conceptualizing that complexity. This method is represented by what Hicks called the 'traverse'. The issue, therefore, is not whether Marx's trade cycle was good for a given historical period and inappropriate for the era of trusts and cartels, it is the inability to account for structural complexity, which calls into question the descriptive strength of Marx's general law. This is not the case if we look at Marx's contribution in volume II of *Capital*, which rightly attracted the bulk of the attention of German and Russian Marxists. Volume II does not stand in isolation since the idea of the structural traverse operates as a non-deterministic undercurrent in classical thought. Hence the next section will examine the role of the structural traverse in the work of Ricardo and Marx.

13.4 The Structural Traverse in Classical Economics and Marx

Before the writings of Marx, structural problems associated with economies being out of equilibrium, in particular those associated with the structural traverse, were regarded as significant by Ricardo only in a late addition to his *Principles*, the chapter on machinery. Ricardo avoided most of the problems

by effectively developing a one-commodity model with circulating capital. Although he allowed for manufacturing as well as the agricultural sector, his focus on the latter was due to his belief that all major economic relations were determined within the agricultural sector, so that problems of sectoral disproportionalities were not relevant. It has also been established that, despite his attempts to generalize, his analysis of value never left that of a one-commodity world. Nevertheless the analysis of value does allow for the economy not to be at its equilibrium level, as market prices can deviate from natural prices. However the forces of competition will tend to restore the latter. Importantly, because the forces that determine the equilibrium value (natural value) differ from those that push the economy back to that equilibrium, there is no question of path determinacy. To reiterate, natural prices are determined by the cost of production and are proportional to embodied labour. There is no role for demand. However it is the forces of competition through the workings of supply and demand that push the economy back to those natural levels in the event of deviation. The natural prices are unaffected by the adjustment path. The same is true for the natural subsistence wage.

An exception to the above discussion is Ricardo's analysis of the impact of machinery, which he introduced into the third edition of *Principles*. The anomaly *vis-à-vis* the general trend of thought adopted in *Principles* is that the introduction of fixed capital is incompatible with the labour theory of value and it represents the only part of the book where the economy is seen to generate unemployment. Although the analysis is still of a one-commodity type, the introduction of fixed capital may disturb the full employment equilibrium and cause structural unemployment. According to Ricardo, the creation of fixed capital will divert resources away from the production of wage goods (corn). This means that, although the economy is at full employment during the initial period of the construction of the machine, in the next period the reduced resources in the wage goods sector will cause a lower output, thereby shrinking the wages fund. This will in turn reduce employment. The new machine will eventually enable a higher level of accumulation within the wage goods sector, which will lead to the creation of sufficient wage goods to absorb the unemployment. In other words, Ricardo modelled a structural traverse in which the creation of machines enables the economy to switch to a higher growth rate. However during the adjustment period there will be structural unemployment.

Importantly, Ricardo's analysis was more sophisticated than that of Marx in volume I, where the one-commodity assumption denied the possibility of structural problems. Marx did confront the issue of compensation in chapter 15 of volume I, but in a partial disequilibrium way. He observed that when workers are fired they cease to confront capitalists *qua* workers but face them as consumers. This, Marx said, will lead to a fall in the price of wage goods, *voila tout*! The important insight on the role of effective

demand is lost in the partial approach taken by Marx. In contrast structural considerations arise in volume II, particularly in part 3, where the reproduction schemes address precisely this problem, albeit in a different form. The model analyzes intersectoral flows between a capital-goods producing sector and a consumption-goods producing sector, with fixed (clay) capital. Marx then considered the conditions necessary for each sector to absorb its accumulation requirements, both from its own production and from that of the other sector, without any coordination being imposed except that derived from the market.

The basic point of these models is to examine the conditions under which a capitalist economy can grow (expanded reproduction) without being subjected to crises of overproduction in any department, that is, without structural problems (cf. Sardoni, 1982). In fact Marx showed that the conditions necessary for such unproblematic growth are extremely unlikely, and that, as a result, over-production within departments is likely to generate structural problems. The problem stems from the dual role of workers – as consumers of the output of the wage goods sector and as a cost of production – so that wages and profits are inversely related (Sardoni, 1987). This antagonism at the heart of capitalism provides an important obstacle to balanced growth, as it necessitates growth in workers' powers of consumption, which is antagonistic to capitalist class interests. As a result the problem with intersectoral flows will spread to the whole economy, resulting, according to Marx, in a fall in investment, which causes an increase in unemployment:

> But as things actually are, the replacement of capitals invested in production depends to a large extent on the consumption capacity of the non-productive classes; while the consumption capacity of the workers is restricted partly by the laws governing wages and partly by the fact that they are employed only as long as they can be employed at a profit for the capitalist class. The ultimate reason for all real crises always remains the poverty and the restricted consumption of the masses, in the face of the drive of capitalist production to develop the productive forces as if only the absolute consumption capacity of society set a limit to them (Marx, 1981, vol. III, p. 615).

It is here, when the initial crisis caused by structural disproportionality spreads to become a general underconsumption problem, that the link between disproportionalities and effective demand comes into its own (Halevi, 1992).

In other words, the reproduction schemes do not show the actual conditions of capitalist economies, rather they are used to investigate the conditions under which such economies could grow without crises, as in the Harrod–Domar model. Having shown this, the next stage should be to analyze what happens outside the steady state. In a sense, Marx stopped his

analysis exactly where Hicks and Lowe started theirs. Given the difficulty of growth without structural problems, the next step would be to analyze the structural traverse to see how the capitalist economy will respond to crises. Instead volume III abandons the sectoral approach of the reproduction schemes, and therefore does not put the structural problems raised by them into the centre of the analysis of crises. Indeed in chapter 30, where Marx discussed the relation between financial and productive capital, he relied on an analysis of the falling uniform rate of profits (taken from volume I) in a one-sector framework.

In fact, in a multisectoral framework the imposition of a uniform rate of profits has profound implications. As we have shown elsewhere (Halevi and Kriesler, 1991) a uniform rate of profit within a multisectoral framework is only consistent with balanced growth. However this imposes stringent restrictions on the model, as it implies, for example, conditions of uniform technological change and growth in productivity. In addition it ignores the possibility of changes in the composition of output, or in the mix of consumption and capital goods. Furthermore if, following Engels' suggestion in a footnote to that chapter (p. 620), we abandon the assumption of competition and full capacity utilization, then there is no longer a necessary trade-off between profits and wages, as an increase in wages (for example) may lead to an increase in capacity utilisation due to the extra effective demand it has generated.

The abandonment of the assumption of competition also leads to a reconsideration of the tendency towards a uniform rate of profits. Once we allow for imperfect competition, then sectoral profit differences may remain due, *inter alia*, to barriers to entry. This means that, as a result, we are no longer limited to considerations of balanced growth. In fact imperfect competition, coupled with technological changes and uneven growth in productivity and per capita demand (Pasinetti, 1981), means that sectors are extremely unlikely to grow in the same proportions.

13.5 Conclusions

This chapter has examined a problem that was raised in volume II of *Capital* but neglected in volumes I and III, namely the role of the structural traverse in the process of capitalist growth. It was argued that the work of Lowe and Hicks in this area was a necessary supplement to Marx's insights, and allowed focus to be placed on the fundamental problem of capitalist dynamics. It should be noted that there is some further recognition of structural factors in volume III in the discussion of the transformation problem. However this discussion is fundamentally flawed for the reasons outlined above. Reliance on the tendency towards uniform rates of profits means that the essence of monopoly capitalism as well as intersectoral differences are ignored. This in turn means that the real significance of the sectoral dynamics of volume II are replaced by a model in which sectoral factors enter only in a static way.

Note

1. A referee has asked us to look at the recent literature on the subject. However we have worked with the best modern anthology of the *original papers* of the debate, published in Italy by Lucio Colletti and Claudio Napoleoni (1970). No original collection exists in English. Unwittingly, the referee's comments highlight the perverse tendency in the Anglo-American world to bypass the original texts and rely on second-hand commentary.

References

Colletti, L. and C. Napoleoni (eds) (1970) *Il futuro del capitalismo. Crollo o sviluppo?* (Bari: Laterza).
Halevi, J. (1992) 'Marxism and Post-Keynesian Economies', *History of Economics Review,* no. 18.
Halevi, J. and P. Kriesler (1991) 'Kalecki, Classical Economics and the Surplus Approach', *Review of Political Economy,* vol. III.
Hicks, J. R. (1965) *Capital and Growth* (Oxford: Clarendon Press).
Hicks, J. R. (1985) *Methods of Dynamic Economics* (Oxford: Clarendon Press).
Lowe, A. (1976) *The Path of Economic Growth* (Cambridge: Cambridge University Press).
Lowe, A. (1987) 'Structural Analysis of Real Capital Formation', in A. Oakley (ed.), *Essays in Political Economics: Public Control in A Capitalist Economy: Adolph Lowe* (Sussex: Wheatsheaf Books).
Marx, K. (1981) *Capital: A Critique of Political Economy,* vols I–III (Harmondsworth: Penguin).
Pasinetti, L. (1981) *Structural Change and Economic Growth* (Cambridge: Cambridge University Press).
Ricardo, D. (1951) *On the Principles of Political Economy and Taxation* (Cambridge: Cambridge University Press).
Sardoni, C. (1982) 'Multi-sectoral Models of Balanced Growth and the Marxian Schemes of Expanded Reproduction', *Australian Economic Papers,* vol. xx.
Sardoni, C. (1987) *Marx and Keynes on Economic Recessions* (Sussex: Wheatsheaf).
Sweezy, P. (1968) *The Theory of Capitalist Development* (New York: Monthly Review Press).
Sylos-Labini, P. (1969) *Oligopoly and Technical Progress* (Cambridge, MA: Harvard University Press).

14
Employment and Planning

Joseph Halevi

The work of Adolph Lowe can be considered as a milestone in the construction of a theoretical framework in which the stability of full employment as well as its attainment become inseparable from the ex-ante planning of sectoral proportions. At the same time, the ex-post planning of the adjustment path is required whenever the initial quantitative assumptions turn out to be incorrect.[1] The remarkable characteristic of Lowe's approach consists in the fact that it permits formulating an argument for planning under conditions of economic maturity. This point is rather important because most works on planning have, so to speak, subsumed the historical fact that socialist planned economies grew out of a social transformation of hitherto "backward" societies. As a result, the emphasis was mainly laid on questions of capital formation in the sense of the mobilization of the existing economic structure in order to produce an altogether different one in a relatively short span of time. The dynamics of sectoral proportions has been analyzed mostly in terms of the speed in which the new structure can be built in a context where the "backward" sector is identified with an unlimited supply of labor.[2] Hence, because of the historical link between planned economies and the emancipation from backwardness, intersectoral (Marxian) type models have been produced with the aim of studying issues concerning the possibilities of, and the obstacles to, accelerated accumulation. As to mature capitalist economies, the aggregative approach prevailed so that even discontinuous phenomena, like the *accelerator*, which profoundly affect the intersectoral relations of the economy, have been discussed in terms of a method which does not allow any light to be shed on those relations.

Lowe's contribution has the invaluable merit of raising the issue of sectoral proportions for an economy which does not have to face the task of

Reprinted from *Social Research*, 50(2): 345–358, 'Employment and Planning,' by Halevi, J. With kind permission from John Hopkins University Press. First published in Copyright © 1983 New School for Social Research. All rights reserved.

embarking on a process of growth and development in which initially the subsistence component of economic life dominates over the rest.

In this paper, after an illustration of the basic traits of Lowe's system, I will discuss that part of Keynes's *General Theory* in which the production and allocation of capital goods emerges as a major determinant of the stability of full employment over time.

14.1 Economic Maturity and the Structure of Production

The model economy depicted by Lowe possesses an amount of capital equipment which, with normal capacity utilization, can employ the whole of the existing labor force.[3] Total employment is therefore determined by the crew needed to operate each unit of equipment—that is, by the degree of complementarity between workers and machines. Technical progress continuously changes the degree of complementarity, but since a different crew requires a different machine, technical change is the source of nonreversable changes in the physical proportions between labor and machinery. Real capital accumulation is, in this context, no longer an instrument for the absorption of the labor force employed and underemployed in the nonmodern branches of the economy. Instead, the formation of real capital finds its objective role exclusively in the fact that it must provide an amount of equipment roughly in line with the natural increase in the population of working age plus the number of people displaced by technical progress.

An economy of this kind can be considered mature because it is the degree of capacity utilization which determines the level of employment. In other words, unemployment is not due to the lack of capital equipment, but it is tied to the degree of unused capacity and therefore to the difference between potential and actual output. Reference to the difference between potential and actual output in aggregate terms can be useful to identify the degree of unused capacity. However, it becomes worthless for the purpose of discussing the condition of accumulation sketched out above once the system has been brought to operate at full capacity by means of short-run "Keynesian" policies.

Machinery is nowadays produced by means of machines; consumption goods are also produced by machines. Thus, whether or not a mature system is capable of satisfying the condition of accumulation mentioned before depends on the proportion between the machines installed in the capital-goods industries and those installed in the consumption-goods industries. At this point, the aggregative approach vanishes. The dynamics of the economy must be expressed in terms of the interrelation between two different sectors: capital goods and consumption goods. But the proportion between capital and consumption goods is itself the outcome of the way in which capital goods have been distributed between different sectors. Hence, it is the structural composition of equipment which governs the relation

between items for consumption and items for accumulation; the latter were correctly described by Marx as being totally unfitted for consumption. This means that the basic interconnections which at any one time give rise to a definite interindustrial configuration of the economy are to be found within the capital-goods sector. Therefore, this sector can no longer be treated as a single homogeneous compartment producing an equally homogeneous equipment item which can be installed anywhere in the economy.

The novelty of Lowe's approach consists precisely in having split the capital-goods sector into two branches. One called sector 1A produces equipment which can reproduce itself or can generate a capital good designed exclusively to produce consumption goods. When part of the output of sector 1A is installed for the production of the equipment generating consumption goods, another branch emerges called sector IB. The consumption-goods sector, whose capital input is the output of sector IB, is called by the traditional notation sector 2. The subdivision of the equipment-goods sector into two branches should yield different results from the usual two-sector model; otherwise the exercise would become a purely taxonomical experiment without any analytical value. For this purpose, I will now present a numerical example comparing the transition to a lower growth rate of a two-sector model and of a Lowe-type model.

At the beginning of this section I stated that a mature economy, where no labor reserves exist, should produce an amount of capital goods capable of employing the natural increment in the labor force plus the workers displaced by technical progress. To simplify the numerical example, only the natural increment will be taken into account. Moreover, I will assume that one machine is produced by one machine and that the period of construction is one time unit (year). Hence a given stock of machines in the capital-goods sector at the beginning of the year produces by the end of the year an equal number of new machines, which can be distributed between capital- and consumption-goods sectors in a proportion not necessarily equal to the initial stock. Since in a two-sector model there is only one type of machine, which can be used either for the production of equipment or of consumption goods, I assume that the same machine is manned by the same number of workers irrespective of its sectoral allocation. Finally, the percentage of machines going out of use because of wear and tear at the end of each period is 10 percent.

Consider now the case in which at the beginning of a given period the total stock of machines has to be distributed between the two sectors in accordance with two estimates of the growth of the labor force which will come into effect at the beginning of the subsequent period. In the first variant, it is assumed that the work force will grow at a rate of 10 percent; in the second variant, the growth rate is zero, hence the output of capital goods must be equal to the wear and tear. Each machine employs two workers and each machine geared to the production of consumption goods produces an annual output of 10 units.

From Table 14.1 we can see that full-employment equilibrium is achieved in both cases. This is so because in a two-sector model capital goods are not specific: they can produce any of the two commodities which form the model and they therefore can be shuffled around. The main difference between variant 1 and variant 2 lies in the real-wage rate. In variant 1, 2,000 workers buy a flow of consumption goods equal to 8,000 units so that the real wage rate is 4 units. In variant 2, the same workers buy 9,000 units, giving rise to a real-wage rate of 4.5 units. No difficulties, however, arise in relation to the attainment of a permanent state of full-capacity output and full employment.

This situation does not obtain in a Lowe-type model where a specific capital good producing only consumption goods is introduced. In a Lowe model, the transition to a lower growth rate must lead to unused capacity. Table 14.2 is based on the same assumptions: each machine produces one machine and employs two workers, etc. The difference lies in the fact that the capital-goods sector is formed by the branches 1A and IB. The capital goods

Table 14.1 Two-sector model

Total stock of machines at the beginning of the period: 1000			
Total employment at the beginning of the period: 2000			
Variant 1: Workforce grows at 10% per annum			
Stock of machines in the capital-goods sector*	200	}	1000
Stock of machines in the consumption-goods sector	800		
Depreciation of total stock of machines end of period	100		
Output of machines by the end of the period	200		
Net increment of machines by the end of the period	100		
Increment of the labor force at the beginning of new period	200		
Total stock of machines at the beginning of new period	1100		
Total employment provided by the stock of machines	2200	=	Total work force
Variant 2: Zero growth rate of the workforce			
Stock of machines in the capital-goods sector*	100	}	1000
Stock of machines in the consumption-goods sector	900		
Depreciation of total stock of machines end of period	100		
Output of machines by the end of the period	100		
Net increment of machines	0		
Increment in the labor force at the beginning of new period	0		
Total stock of machines at the beginning of new period	1000		
Total employment provided by the stock of machines	2000	=	Total work force

* Each machine installed in the capital-goods sector produces, at the end of the period, one machine. This assumption is retained in Table 14.2, where the exercise is applied to a Lowe-type model. In a Lowe-type model the 200 units forming the single capital-goods sector will be divided between sector 1A arid sector 1B. One machine in each of the two capital-good sectors is therefore assumed to produce one machine.

Table 14.2 Lowe-type model

Total stock of machines at the beginning of the period: 1000		
Total employment at the beginning of the period: 2000		
Variant 1: Workforce grows at 10% per annum		
Stock of machines in the capital-goods sectors	200 =	1A + 1B
[of which: sector 1A	40]	
[sector 1B	160]	
Stock of machines in the consumption-goods sector	800	
Depreciation of total stock of machines end of period	100	
[of which: in the capital-goods sectors	20]	
[in the consumption-goods sector	80]	
Output of sector 1A = depreciation + growth of sectors 1A+1B	40	
Output of sector 1B = depreciation + growth of the stock of machines in the consumption-goods sector	160	
Increment in the stock of machines in the capital-goods sectors	20 }	100
Increment in the stock of machines in the consumption-goods sector	80 }	
Increment in the labor force		200
Total stock of machines at the beginning of the new period	1100	
Total employment provided by the stock of machines	2200 =	Total work force
Variant 2: Zero growth rate of the work force		
Stock of machines in the capital-goods sectors	200 =	1A + 1B
Stock of machines in the consumption-goods sector	800	
Depreciation of total stock of machines end of period	100	
[of which: in the capital goods sectors	20]	
[in the consumption goods sector	80]	
Output of machinery by the two capital-good sectors	200	
Net increment in the total stock of machines	100	
Increment in the labor force	0	
Total stock of machines at the beginning of new period	1100	
Total employment provided by the stock of machines	2200	greater than 2000 = total work force

produced by 1B cannot be installed anywhere except in the consumption-goods sector.

In Table 14.2, the transition from variant 1 to variant 2 in a Lowe-type model leads to unused capacity, that is, to a situation where total employment which could be provided by total capital stock at the beginning of the new period exceeds the available work force. As a consequence, some of the machines must remain unused. The source of this nonsmooth adjustment is the nonshiftability of the machines installed in the consumption-goods sectors. More specifically, the stock of equipment in sectors 1A and 1B can

be shifted only between these two sectors but cannot be moved to the consumption-goods sector. As a result, the stock of machines in the capital-goods sector (1A and 1B) cannot be changed at the beginning of the period in order to meet the expected growth rate of the labor force in the next period. In the case of variant 2, Table 2, this means that the 200 units of equipment in sectors 1A and 1B will produce 200 units of equipment by the end of the period, irrespective of how they are distributed between 1A and 1B at the beginning of the period. Yet only 100 units of total capital stock will go out of use because of wear and tear, so that total stock will increase by 100 units while there is no increase in the supply of labor. Unused capacity is inevitable.

In a two-sector model, by contrast, the proportion between the stock of machines in the single capital-goods sector and the stock of machines in the consumption-goods sector can be modified at the beginning of the period as shown in variant 2 of Table 14.1. This is possible because machines are homogeneous, and their function varies only in relation to their sectoral allocation. From an equilibrium point of view, the final result in Lowe must be, under conditions of variant 2, the same as the final result in variant 2 of a traditional two-sector scheme. That is, if population ceases to grow, output of machines must equal depreciation. Yet in a Lowe-type model this cannot be achieved without going through a phase of unused capacity. The effects of unused capacity on the economy may, however, be of a multiplicative type with further cuts on investment and further increases in unused capacity. These effects can therefore be considered as market responses to a structural condition. From a normative perspective, the central question is how to steer the structural proportions in such a way that the economy settles at the new equilibrium level. The existence of unused capacity in the case considered here is structural, that is, inevitable. It cannot therefore be eliminated by means of demand management. It can be dealt with only in terms of a *planned* distribution of idle machinery, with the specific objective of not allowing sector 1A (which represents the reproductive component of the economy) to fall below the productive capacity needed to keep the system at its new terminal equilibrium (as in variant 2 of Table 14.1).

The type of investment and mothballing decisions required by the process outlined above have got little to do with market responses. These are nothing, in a decentralized capitalist economy, but the expression of the asymmetrical movements of the different sectors when changes are not uniform. Investment and disinvestment decisions have to be based on the planning of sectoral proportions in order to bring the economy to a successful completion of the transitional phase.

From Lowe's approach two types of overproduction are possible. The first type occurs when the initial proportions in the distribution of capital goods could allow for a balanced expansion of the system but consumption demand falls short of the supply of consumption goods. The buildup

in inventories in the consumption-goods sector will reduce the demand for capital goods, thereby generating unused capacity in the equipment-producing industries. Consequently, the economy finds itself unable to grow at the equilibrium rate, although its structural composition of investment goods could have allowed a normal expansion. This kind of overproduction can be remedied simply by changing the distribution of income in favor of wage earners, that is, by raising the real wage so as to avoid the accumulation of inventories in the consumption-goods sector. No major changes in the proportions between sectors are required here.

The second kind of overproduction occurs when the output of capital goods is in excess of the increment in the labor force necessary to operate the additional machines. An overproduction of machines in relation to the available labor force cannot be corrected only by an increase in the real-wage rate within the period considered. In the longer run, that is, in the new equilibrium, the real wage will have to be higher. This, however, is the outcome of a complex process of guided sectoral adjustments during which unused capacity cannot be eliminated but only intelligently distributed between the sectors of the economy. It is the "management" of the allocation of investment goods that matters in the second case, not just an aggregate policy of demand management.

The approach followed so far brings into sharp relief the difference between inventory accumulation in the consumption-goods sector and inventory accumulation in the capital-goods sectors. In Marxian terms, the former corresponds to a case of underconsumption and can be corrected by short-run measures affecting the distribution of income. The latter represents the case in which the expansion of capital becomes a barrier to capital itself.

In the next section it will be argued that it is precisely the second kind of overproduction, that is, excess supply of machines in relation to the work force, which was regarded by Keynes as the most serious threat to full employment in a capitalist economy.

14.2 Production of Machines and Employment in Keynes

In chapter 16 of the *General Theory*,[4] Keynes put forward the view that the abundance of capital goods becomes a prerequisite for the maintenance of full employment. At the same time, the abundance of capital equipment causes a negative effect on investment decisions, thereby endangering the stability of a fully employed economy. In his view, it is the institutionally given level of the rate of interest which prevents capitalists from undertaking investment projects yielding an almost zero rate of profit. This qualification is important because Keynes thought that the natural position toward which a mature economy *ought* to tend should be approximately that of the terminal position of variant 2 in Tables 14.1 and 14.2. Let me remind the

reader that the terminal position of variant 2 implies a zero net rate of profit: investment must be equal to replacement since population no longer grows.

Keynes's argument is based on two considerations, one theoretical and one of a factual and normative nature.

The theoretical consideration consists in the assumption that capital goods command a yield over their cost not because they are productive but because they are scarce. Hence, "if capital becomes less scarce the excess yield will diminish, without its having become less productive—at least in the physical sense."[5] The second consideration is related to Keynes's definition of a rational macroeconomic goal of a mature economy, on the assumption that measures are taken to ensure a rate of interest consistent with a full-employment rate of investment and that the state will make sure that the growth of equipment will approach a saturation point without an excessive burden on the rate of consumption of the present generation. Then,

> On such assumptions I should guess that a properly run community equipped with modern technical resources, of which the population is not increasing rapidly, ought to be able to bring down the marginal efficiency of capital in equilibrium approximately to zero within a single generation; so that we should attain the conditions of a quasi stationary community where change and progress would result only from changes in technique, taste and institutions. . . .[6]

The above two considerations constitute the frame of reference within which the problem is discussed on grounds similar to those on which I formulated the hypothesis of variant 2. Capital has to be kept scarce in order to yield a profit. But what does this mean for a society "so well equipped with capital that its marginal efficiency is zero and would be negative with any additional investment"? Keynes's answer is the following:

> If, in such circumstances, we start from a position of full employment, entrepreneurs will necessarily make losses if they continue to offer employment on a scale which will utilize the whole of the existing stock of capital.[7]

It is extremely important to see that Keynes starts from a position of full employment under economic maturity. But capital equipment cannot continue to be fully utilized, otherwise capitalists will suffer losses. What is, therefore, the meaning of the proposition according to which in an economy well equipped with capital any additional investment will yield a negative marginal efficiency? The discussion of Lowe's model developed in the previous section can provide us with an unambiguous answer. In such an economy the *composition* of capital stock corresponds to a situation whereby the full capacity output of the capital-goods sectors will generate

an overproduction of machinery in relation to the employable population. Capitalists will then be unable to sell their machines. Investment and employment will be cut.

Keynes's argument runs in terms of an unspecified notion of capital equipment. In this context he believed that if it were possible to reduce the rate of interest up to the point where income out of capital disappeared, it would become relatively easy to make capital goods so abundant as to bring their profitability to near zero. Private entrepreneurs would still remain the agents making the decisions about the production and allocation of investment goods. Now, we have seen that in a two-sector model with one homogeneous capital good, the transition from a higher to a lower growth rate can be more or less smoothly achieved. It seems, therefore, that Keynes's condition can be satisfied. If, however, the economy has a significant degree of specificity in the production of capital goods, as is the case in Lowe's model, the transition will involve unused capacity. The reduction of the interest rate or, as Keynes thought, even negative interest rates would not eliminate capitalists' decisions to cut investment in the wake of excess capacity. A downward multiplier will ensue, stopping the transition in its tracks. Hence, in a Lowe-type model Keynes's reliance on a central control over the rate of interest appears of secondary importance. Instead, it is the central control over the bulk of investment, either by licensing private investment or directly by the state, which acquires significance.

So far, my discussion of Keynes's position has been based on his own grounds. It seems to me that, when Lowe's schemes are brought in, the planning dimension of investment is strengthened without detracting anything from the depth of Keynes's views about the necessity of eliminating capital income if full employment is to be maintained. Yet the question of central control over intersectoral proportions becomes particularly important as soon as we abandon Keynes's world of the individual entrepreneur and enter the world of the large corporation, or what Baran and Sweezy aptly called the system of monopolistic capitalism. Large-scale economies involving production indivisibilities along with a technical structure based on the *longue durée* of capital formation are all phenomena which grew hand in hand with the emergence of what Schumpeter called Trustified Capitalism. The very formation of a separate and specific capital-goods sector appears to have gathered momentum during the last two decades of the nineteenth century, which are also remembered as the period of the rise of trusts and cartels.

The formation and consolidation of monopolistic capitalism radically changes the process of capital accumulation and leads to a situation where the stock of capital and its degree of utilization become an element of control by the large corporation. Perhaps the best way of grasping the differences involved is to refer to Marx's view of competition and to Baran's explanation of the difference between competition and monopolistic conditions. Marx wrote that competition "compels him [the capitalist] to

keep constantly extending his capital in order to preserve it, but preserve it he cannot, except by means of progressive accumulation."[8] For Baran, a dichotomous situation arises in mature capitalist societies:

> In terms of a rational husbandry of society's resources, the capital preservation policy of the monopolistic firm may be frequently preferable to the excess investment and the destruction of capital that take place under competitive conditions. Yet, as is often the case under capitalism, such advance in rationality as is achieved is perverted into its opposite if the monopolistic-preservation policy contributes to a shrinkage of investment opportunities and leads to a reduction of output, income, and employment.[9]

In Baran's analysis it is the monopolistic preservation policy that ensures the nonattainment of Keynes's condition for employment stability, that is, abundance of capital goods and no income out of capital and wealth. Yet the general development of productive capacity and the very fact that corporations are in a position to control their capital stock creates the objective conditions for the "collectivization" of this control in order to steer the mature economy in the direction postulated by Keynes.

Under monopolistic conditions where specificities and discontinuities prevail, the progressive social implications of Keynes's analysis can be understood only in a framework which explicitly takes into account the structural aspects of capital accumulation.

In my view, the structural analysis of capital formation and liquidation as conducted by Lowe is necessary for the identification of the specific conditions which characterize present-day capitalism. "The basic disease of monopoly capitalism is an increasingly powerful tendency to overaccumulate. At anything approaching full employment the surplus accruing to the propertied classes is far more than they can profitably invest."[10]

In a Lowe-type model, the planned modification of the composition of capital stock, and not Keynesian policies, emerges as the necessary response.

Notes

I should thank Adolph Lowe and Edward Nell for many discussions on the points discussed in this paper. I am also grateful to Riccardo Fiorito of the University of Teramo, Italy, for clarifying comments during a presentation of an earlier draft of this paper.

1. Adolph Lowe, "A Structural Model of Production," *Social Research* 19 (1952); Adolph Lowe, *The Path of Economic Growth* (Cambridge: Cambridge University Press, 1976).
2. Maurice H. Dobb, *An Essay on Economic Growth and Planning* (London: Routledge & Paul, 1960); Amartya K. Sen, *Choice of Techniques* (Oxford: Blackwell, 1960); K. N. Raj and A. K. Sen, "Alternative Patterns of Growth under Conditions of Stagnant Export Earnings," *Oxford Economic Papers* 13 (February 1961): 43–52;

Lionel G. Stoleru, "An Optimal Policy for Economic Growth," *Econometrica* 33 (April 1965): 321–348.

3. Lowe, *Path of Economic Growth.*
4. John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936).
5. *Ibid.,* p. 213.
6. *Ibid.,* pp. 220–221.
7. *Ibid.,* p. 217.
8. Karl Marx, *Capital,* vol. 1 (Moscow: Progress Publishers, 1974), p. 555.
9. Paul A. Baran, *The Political Economy of Growth* (Harmondsworth: Penguin, 1970), p. 200, n. 67.
10. Harry Magdoff and Paul M. Sweezy, *The Deepening Crisis of U.S. Capitalism* (New York: Monthly Review Press, 1981), p. 148.

15

The Composition of Investment under Conditions of Non Uniform Changes

Joseph Halevi

15.1 Introduction

15.1.1 This paper will discuss Professor Adolph Lowe's analysis of an economy subject to discontinuous changes, in relation to some aspects of the works by Maurice Dobb and Michał Kalecki on socialist planning.

The main thrust of the argument will be directed towards the implications of looking at production as a process involving specificity of equipment and complementarity between the latter and the labour force actually employed. Both phenomena arise whenever output is governed by what Marx called an organised system of machinery. The production of machines by means of machines tends to establish a definite technical relation between them; their non-malleable physical character is the source of non-smooth changes which reflect themselves also in the composition of the work force.

Central planning appears in Dobb's studies on developing economies as the main instrument to overcome the stifling effect on investment caused by indivisibilities in capital equipment, without at the same time losing control on sectoral proportions. His observations will be integrated with Meir Merhav's concept of technological dependence, which explicitly takes into account the functional role of imports. The discussion, to be carried out in the next section, will also point at the different, but not less important impact of factors complementary and specificity in a mature economy. Use will be made of a pioneering paper by Nicholas Kaldor in which he argues that instability stems from maladjustments between machinery and labour, thus creating the conditions for state intervention.

Revised from *Banca Nazionale del Lavoro Quarterly Review*, No. 137, 213–232, 1983, 'The Composition of Investment under Conditions of Non Uniform Changes,' by Halevi, J. With kind permission from *Banca Nazionale del Lavoro Quarterly Review*. All rights reserved.

15.1.2 In many respects Lowe's model encompasses and supersedes those of Dobb and Kalecki because it provides an unambiguous definition of the structural composition of investment. The capital goods sector is divided into two branches: one, called machine tools sector, generates equipment for its own expansion as well as for the second branch which produces machinery to be allocated only in the consumption goods sector. No homogeneity between the outputs of the two equipment sectors exists; whereas in conventional two-sector models heterogeneity is confined to the difference between capital and consumption goods.

The third section will discuss Dobb's and Kalecki's contributions in the light of Lowe's. Dobb did in fact use an earlier version of Lowe's scheme without, however, following its dynamic implications. Finally, the last section will analyse, on the basis of the model suggested in the third one, the possibility of excess capacity and deficiency of capital which can arise also in a planned economy when the system moves from a higher to a lower growth rate.[1]

15.2 Observations on the Specificity of Equipment in Developing and Mature Economies

15.2.1 At any one time, the technical basis of the economy conditions the forms in which the economic surplus can be utilised. But a developing economy faces the task and the problem of investing in a manner largely independent of the pre-existing material structure. To the extent to which such an operation is possible, indivisibilities in equipment, which "are likely to be significantly large (relatively to the scale of the economy) at early stages of development",[2] may make the expansion of a certain branch unprofitable although its growth can be of crucial importance for the formation of other industries. Planning performs the role of removing the obstacles imposed by the rigidity of fixed capital and of securing, overtime, the construction of complementary industries.[3] The concrete mechanism which initiates the "take off" has been called by Dobb the *Accelerator in Reverse*, because it presupposes the production of capital goods well in advance of any market demand for them.

Since the emphasis is here on the *longue durée* of capital formation, a necessary aspect of industrialization, the rationale is the same as that given by Schumpeter in *Capitalism, Socialism and Democracy*, who maintained that a system which does not use its resources optimally at a given point in time may display a long-run performance superior to a system obeying the optimality criteria.[4]

Dobb's main frame of reference was the USSR. This country inherited from the Tsarist regime a deficient but not altogether negligible industrial sector including machine tools factories, which are of primary importance to the activation of the *Accelerator in Reverse*. Many poor countries do not have, however, the possibility of transforming their savings into a type of investment capable of triggering a process of sustained growth.[5] This structural

inability to supply capital goods, which must then be imported, is what Merhav termed technological dependence. In Merhav's analysis development in an open economy strengthens the role of the capital goods sector, because trade takes place between two fundamentally different entities. On one hand, we have the advanced economy which, through its machine tools industry, can generate technical progress, change the type of machinery and thus choose, to a large extent, its degree and field of specialisation in a dynamic sense. On the other hand, we have the backward economy for which no such spectrum of endogenous choices is available.[6]

The exports going to finance imports of capital goods must be such as to expand the import capacity of the country.[7] The adaptation of investment to the changing export requirements can lead, in the absence of long-term agreements, to a composition of equipment divorced from the needs and goals of national socioeconomic development. It should be noticed that, when equipment is specific, any significant modification in its distribution involves a process of formation and liquidation of capital, which is all the more painful and wasteful in a developing country. Under conditions of technological dependence Dobb's *Accelerator* appears to be much more unstable due to the enormous difficulties of planning the proportionality between one (poor) country's output and that of the rest of the world.

The undiminished role of the capital goods industry is emphasised also in those writings where machinery is imported as a gift. If the purpose is to achieve full employment and balanced growth, the allocation decisions follow very closely Dobb's mechanism for a closed economy. The difference consists in the fact that the acquisition of gifts reduces the pressure on consumption and actually creates the technical basis for the conversion of savings into productive capacity.[8]

15.2.2 Dobb's analysis of the indivisibilities in capital accumulation and their necessary connection with planning has become a milestone for the theory of economic development.

A totally different picture emerges when we come to the interpretation of adjustment processes in mature capitalist societies. It is generally assumed, as in ISLM macroeconomic models, that with perfect market flexibility the economic system would quickly find its full employment level of output.

Now it is true that developed countries do not face the structural limits in the production of equipment goods mentioned before. Yet, as Paul Baran pointed out, the problem facing the policy makers and managers "would be not slow adjustments to small changes—the main pre-requisite for the applicability of the rules derived from static analysis—but choice among few technological alternatives involving large indivisibilities and 'fixed coefficients'."[9] Also the advanced economy is subject to the discontinuities which occur whenever growth factors change.

The implications, for state intervention, of the structural characteristics of economic activity, were lucidly grasped by Kaldor in the essay published in

1938. Although his propositions were not intended to elucidate the rationale of a socialist system, they can be of use in placing Kalecki's views on central planning in the context of a mature economy.

Kaldor's argument is based on a sharp distinction between disequilibrium in saving and investment in the short run, and maladjustment between equipment and labour which may arise in the longer run. For the purposes of this paper the problem will be presented in the following way.

Let us assume an economy with two vertically integrated sectors, capital and consumption goods, operating below full capacity, it is also assumed that wage-earners do not save. At any one time the value of output of each sector is equal to the respective wage bills multiplied by the markups. The difference between the value of output and the wage bill gives the level of profits in each sector. The sum of profits multiplied by the propensity to save out of profits determines the level of saving, which in turn is equal to investment and therefore to the value of capital goods.

An excess of saving over investment arises when full employment in the investment sector has a multiplier effect which, given the money wage, the markups and the propensity to save, leaves the consumption sector below its full capacity-full employment level. The reverse takes place when investment exceeds saving: to full employment in the consumption industries there corresponds unused capacity in the equipment producing industries. Both situations can be remedied in the short run by measures affecting the distribution of income: in favour of wages in the first case and in favour of profits in the second.

An advanced economy can be characterised as one in which, even in the short run, the employment capacity of existing capital stock can absorb the existing labour force under conditions of full capacity. It therefore follows that, for a given distribution of equipment between various sectors, a real possibility exists for the employment capacity of newly produced machines to exceed the increment in labour supply. Technical progress will not necessarily induce entrepreneurs to scrap old equipment in favour of the new. Old equipment will remain in use as long as the direct cost per unit of output is less than the total cost per unit of output produced by the new.

To avoid the persistence over time of the disequilibrium between capital and labour, a significant shift would be required in favour of investment goods allocated in the consumption goods sector. In a situation where equipment is specific, the adjustment process cannot be secured exclusively by the fall in prices of capital goods. As Lowe pointed out, such a price fall would create a deflationary spiral within the equipment industries which would perpetuate the excess supply conditions.[10] From the viewpoint of entrepreneurs operating in these industries the problem becomes how to stop a continuing deflation in capital values and prices. The logical step is to cut investment giving rise to a downward multiplier effect. Thus, as Kaldor put it: "Once redundant capacity appears it will be almost impossible to

maintain activity undiminished, unless state investment activity is extended so wide as to replace private investment."[11]

According to Kalecki the mechanism of the multiplier, both upward and downward, is a central macro-economic aspect of an oligopolistic mature capitalist economy. A completely different mechanism is at work in a socialist economy. "In order to bring into focus the nature of this process [i.e. of the multiplier] in the capitalist economy it is useful to consider what the effect of a reduction in investment in a socialist economy would be. The workers released from the production of investment goods would be employed in the consumption goods industries. The increased supply of these goods would be absorbed by means of a reduction in their prices. Since profits of the socialist industries would be equal to investment, prices would have to be reduced to the point where the decline in profits would be equal to the fall in the value of investment. In other words, full employment would be maintained through the reduction of prices in relation to costs."[12]

The level of activity is in this case tied to the amount of available productive capacity; and the change in prices relatively to wages corresponds to planned changes in the allocation of capital goods. Indeed for Kalecki the *differentia specifica* of a centrally planned economy lies in the fact that the price/wage relation can be fixed and modified by the planning authorities in accordance with the rate of accumulation. This immediately raises the question about the possible obstacles to a successful transition from one growth rate to another.

15.3 A Comparison Between Lowe's Model and Those of Dobb and Kalecki

15.3.1 A close look at the above quotation reveals that Kalecki based his preference for central planning not on the assumption of a permanent priority in the capital goods sector, but on the consideration that a socialist economy can adjust to a lower rate of accumulation and growth without being entangled in a downward multiplier process. Priority in the investment sector is not denied. It is seen rather as a temporary measure to raise the growth rate and to absorb labour reserves. Shifts from investment to consumption or vice versa are themselves the outcome of movements within the capital goods sector. Structural transformations in the latter provide the key to whether or not an 'efficient' adjustment is possible. It is at this point that Lowe's model can be inserted.

Consider an economic system whose productive activities are split into three sectors: consumption goods C, investments goods I, which are produced only for replacement and expansion of capital stock in the C sector, machine tools X, which are allocated in the X sector as well as in the intermediate sector I. The machine tools department performs, therefore, a genuine role of reproduction and self-reproduction, displaying a dynamics

of its own. In this way we have two sectors X and I, whose capital inputs are homogeneous, so that shiftability in capital stock between them can be assumed. The I sector, produces equipment which is an input only for the consumption sector, which means that capital stock in the latter is non-transferable. It is easy to see that this scheme combines transferability with specificity. In two sector models, by contrast, only two extremes are possible, either complete flexibility or complete rigidity, both at the expense of the internal dynamics of the equipment industries.

Using the traditional notation of K for capital stock, the subscripts x, i, c for the respective sectors and calling u the proportional depreciation coefficient, n the uniform share of consumption in each of the three sectors, we have in constant prices:

(1) $X = u\,(K_x + K_i) + \Delta K_x + \Delta K_i$

(2) $I = u\,K_c + \Delta K_c$

(3) $C = n\,(X + I + C)$

The first two equations simply state what has just been said in words. Eq. (3), which will no longer appear in our discussion, helps us understand the exchange conditions between capital and consumption goods. Writing S_c and S_i for saving (= investment) in the respective sectors, and remembering that the whole output I becomes investment in the C sector, we get from (3):

(4) $S_c = I = (1 - n)\,C = nX + nI$
thus: recalling that gross investment in I is the value of machinery received from X:

(5) $I\,(1 - n) = nX = S_i = I_i$ where I_i = investment in the I sector.

On the assumption that all profits are saved and all wages consumed, eq. (4) asserts that the amount of capital goods sold from the I to the C sector, must be exchanged with an amount of consumption goods equal to the value of the wage bills of the two equipment industries. Equation (5) reveals that the amount of capital goods received by the I sector from the machine tools industry X must be exchanged with an amount of consumption goods equal to workers' consumption in the X sector. The affinity of equations (1) to (5) with Marx's schemes of reproduction is very clear, although there is an important modification: in Marx's two-sector model each department gets a certain amount of goods from the other, while in Lowe's construction no part of the I sector output goes to X. Profits in the former have to be entirely realised in selling to C then spent to purchase goods from X, as shown in the equilibrium relation (5).

When the system grows at a uniform rate g the proportion between I and X will correspond, *ceteris paribus*, to $\frac{K_i}{K_x} = q$ multiplied by the ratio of the respective output-capital coefficients, which, for simplicity, we assume to coincide. Expressing K_x in terms of X multiplied by its capital output ratio, substituting qK_x for K_i, solving for g and differentiating with respect to q we get:

(6) $\frac{d_g}{d_q} < 0$; i.e. changes in the growth rate are negatively related to changes in K_i/K_x and therefore to the proportion of X output going to the I sector.[13]

The ratio between consumption and aggregate gross investment is in turn positively related to q and indeed in the simple case of uniform capital coefficients C/(X + I) is identical to q. Since I is gross investment in the consumption sector, an increase in q will raise the ratio between capital stock in the consumption sector and the sum of the capital stocks in the two equipment sectors. It follows that the contradiction between consumption and accumulation manifests and exhausts itself in the proportion between the two departments producing means of production.

It appears from the above model that there is a qualitative priority of the machine tools sector but not necessarily a quantitative one. The need to assign such a quantitative supremacy will depend on the phase in which the economy finds itself, a question to which we shall return in the next section.

To grasp the relevance of the tripartite scheme let us briefly discuss a special but not unrealistic case of accelerated accumulation involving induced starvation of a part of capital stock.

'Induced starvation' occurs when the maximum investment effort is put into the machine tool sector at the expense of total investment in the rest of the economy. On the assumption that K_x and K_i are homogeneous, so that K_i can be shifted to produce X, this would mean that capital stock in the consumption sector, which is not transferable, ceases altogether to receive replacement equipment. Disregarding the drastic effects on consumption caused by the depletion of K_c under conditions of an increase in employment and investment—an increase due to the self-reproduction of the X sector—this policy is feasible only in so far as the size of capital stock is non-negligible. An economy with a very limited machine tools industry falls within the boundaries of Merhav's notion of technological dependence. The structural incapacity to supply machine tools prevents a rise in the saving ratio from being fully transformed into an increase in the investment ratio.[14]

15.3.2 Michał Kalecki came very close to a similar formulation of the dynamics of investment. Chapter 11 of his *Essays on the Economic Growth of*

the Socialist and the Mixed Economy is titled "The Structure of Investment." It is a model where investment in the capital goods industries is singled out from aggregate investment. It centres on the following two equations

(a) $g = \alpha\, i - u$; (b) $g_k = \beta \cdot k - u$

where g and g_k are the growth rates in the whole economy and in the capital goods sector.

i = I/Y = share of gross investment in national income.

$k = I_k/I$ = share of investment allocated in the capital goods sector.

α and β the aggregate output-capital ratio and output-capital ratio in the capital goods sector.

u is the uniform depreciation rate.

When k increases α tends to β.

Subtracting (a) from (b) and solving for k we get:

(c) $$k = \frac{\alpha}{\beta} i + \frac{1}{\beta} (g_k - g)$$

When the economy expands at a uniform rate, $g^k - g = 0$ and $k = \frac{\alpha}{\beta}\, i$.

If a decision is taken to raise the growth rate, the share of investment must be increased as well, which means that the new equilibrium value of k will also be higher. Yet to raise g it is necessary, all things being equal, to increase g_k first, since accumulation in capital goods industries pulls up the capital stock of the whole economy. Thus, there will be a transitional period where $g_k > g$, entailing an intermediate value of k greater than the terminal one when the economy will be growing at a new higher uniform rate. As a consequence, while approaching the new equilibrium growth rate, the pressure on capital goods industries must be reduced.

In the context of the actual experience of the Eastern European socialist countries Kalecki's exercise serves as an important warning against the bias towards rising accumulation rates. From a theoretical point of view, however, Kalecki's approach is subject to the same criticism levied against the inability of two-sector models to take into proper account the structural transformations operating within the investment sector itself.

To be sure Kalecki was aware of such a limitation and reformulated the expression for k, eq. (c), to account for either a certain degree of shiftability (transfer of machinery from consumption to investment good industries) and/or a favourable change in the structure of foreign trade (increase in imports of machinery at the expense of consumption goods).

(d) $$k^* = \frac{\alpha}{\beta} i + \frac{1}{\beta}(1 - T)(g_k - g);\ \text{thus } k^* < k$$

where T = coefficient of shiftability of machines.

Eq. (d) says that the share of aggregate investment can be now increased by utilising, for the purpose of producing capital goods, machinery installed in the consumption sector. This means that the share of investment going to the capital goods sector is, for a given $(g_k - g)$, smaller than that required if T were zero.

In a simple two-sector model the meaningfulness of the coefficient of transferability T depends very much on the implicit assumptions about the different lengths in the construction period of capital equipment. No hidden assumptions are needed in a Lowe type model in which the period of construction is uniform and it is equal to one year. In equations (1) and (2) the coefficient T applies only to the capital stock operating in the I and X sectors. The value of the coefficient can be fixed at such a level that the reduced K_i generates an output still in excess of replacement requirements in the consumption goods sector, whose output therefore will not fall in absolute terms.

If we now apply the same reasoning and the same assumptions to a two-sector model, transferability acquires an unambiguous meaning when it coincides with 'induced starvation.' When reinvestment in the capital goods sector of its own total output does not suffice to meet the planned difference $(g_k - g)$ part of consumption goods equipment will have to be shifted. Consumption goods output will fall as a result of the combined effect of non-replacement and of the transfer of machinery.

It is easy to see therefore that, in order to take into minimal account such complex, and by no means smooth effects of investment activity, it is necessary to introduce at least one diversification in the capital goods sector.

15.3.3 Throughout his book *An Essay on Economic Growth and Planning*, Maurice Dobb made an explicit and extensive use of Lowe's 1955 version of the three department scheme, thus recognising its importance for the theory of socialist planning.

Several questions can be raised, however, as to whether Dobb's use of the structural approach was appropriate relatively to its explanatory power vis à vis the problem of specificity in capital goods production.

Dobb's reasoning contains two lines of thought. One is concerned with how to expand investment when the supply of wage goods is limited on the assumption that the surplus of labour cannot lower the industrial wage below a certain socially given level. The second deals with the connection between the rate of investment and the productive capacity of the stock of capital in the equipment sector.

It is clear that the latter case can be most suitably analysed in terms of our three-sector model, whereas Dobb carries out the discussion on the basis of the simple two-sector scheme. Observations about the impediments that could arise during the process of accumulation are confined to general remarks on the ceiling of the share of investment in capital goods industries over total investment as well as on the negative impact on consumption resulting from a continuous increase in that share.

By contrast, and rather surprisingly, Dobb uses Lowe's work, with an important change, to discuss the first case which is a problem of choice of techniques. Dobb modifies the model by expressing the three sectors in terms of the distribution of the labour force, rather than that of the respective capital stocks which are assumed to last forever. If the supply of wage goods (and the number of workers producing them) is given, the expansion of investment, with the aim of increasing wage goods output in the immediate future, cannot be implemented by shifting workers from consumption to investment activities. Instead it would be necessary to move workers from the I to the X sector along with the choice of a technique of production whose capital intensity maximises the growth rate. The model works on the assumption that production lags are negligible and that capital goods produced in the past are malleable.[15] This approach tends to obfuscate the real significance of the structural interdependencies under conditions of input specificity.

The shortcomings of Dobb's approach become evident when the objective is no longer to increase wage goods supply in the short run but, rather, to put all the investment effort into the expansion of the X sector. He writes: "In this way all the labour available to the investment sector will be progressively drawn into [the X sector] and concentrated there in using machine-tools of a cheaper type but inferior productivity to produce more expensive types of much higher productivity."[16] The main issue here is not the choice of techniques, rather it is one of structural proportions. More specifically the central question is what happens to replacement requirements in the consumption sector when the workforce in the I sector (which produces equipment for C) moves to the production of machine tools. The answer is 'induced starvation' of capital equipment in the consumption industries. The analysis must therefore focus on the limits to 'induced starvation' because, as equipment in the C sector shrinks, so will its labour force, violating Dobb's assumption that it should not change. Such an assumption is possible only if capital goods last for ever. But this hypothesis *de facto* reduces the role of structural constraints and runs against Dobb's correct observation that intersectoral relationships should be of primary preoccupation of any planned economy. This dichotomy arises from the use of a model centred on bottlenecks and discontinuities for a purpose, (choice of techniques) where the analytical apparatus plays down the existence of rigidities.

15.4 The Transition to a Lower Growth Rate

15.4.1 In this section we shall analyse the shifts that must occur in the composition of capital equipment when growth rates fall, which amounts to discussing in greater detail the effects of a fall in investment (or in its share) pointed out by Kalecki in the passage quoted at the end of the second section. It is also hoped that the discussion of the structural discontinuities that accompany the downward adjustment process will contribute in the direction suggested by Dobb in 1967, partly as a result of a critical evaluation

of the investment policies followed by most socialist countries.[17] The view advanced by Dobb consists of a multi-stage theory of growth for a socialist economy: after having experienced a phase characterised by investment priority in heavy industry, the economy should enter a phase where either the share of accumulation is stabilised, or it is reduced in favour of consumption only to be stabilised later to prevent a continuous decline in the growth rate.

The perspective rate of change in the supply of labour will determine, in the main, which of the two variants is chosen. Let us therefore proceed on the same simple assumption made by Lowe: a given equilibrium growth rate can no longer be maintained because of a fall in the rate at which the workforce expands.

15.4.2 Other things being equal, this will generate a glut in capital equipment similar to the case of maladjustment referred to by Kaldor. Such a glut will appear in the equipment for the production of consumption goods if the structural shifts take place in anticipation of a lower growth rate; whereas it will appear in the machine tools sector if the shifts occur ex post factum. The second possibility has been extensively discussed by the author in chapter 18 of the *Path of Economic Growth*; here we shall analyse the first form of over-production of machinery.

In order to steer the economy towards the expected lower growth rate it is necessary to reshuffle the stock of capital sometime in advance. But this is possible only between K_x and K_i, the stocks in the two equipment sectors, since K_c is heterogeneous vis à vis the rest. The percentage change of q which will bring the K_i/K_x ratio to the level corresponding to the new growth rate, is for non-infinitesimal discrete variations:

$$(7)\quad \frac{\Delta q}{q} = \frac{1}{H}\left[\frac{-(\pm\Delta g)}{1-m(g+u)}\right];$$

$$\text{from } q = \frac{1-m(g+u)}{m(g+u)}$$

$$\text{where } H = (g + u \pm \Delta g)$$

In Lowe's scheme the change in q is possible in advance of the actual decline in g without disequilibrating the economy relatively to the current g. Suppose that the reduction in the growth rate of the labour force is expected to manifest itself at the beginning of (t + 1). The adjustment in K_i/K_x can take place already at the beginning of (t – 1) without any prejudice to the equilibrium between capital and labour when this is still growing at the old rate. In fact, on Lowe's assumption of uniform capital-output ratios, the percentage increment in total capital from (t – 1) to (t) remains unaltered. It is the capital stock in the consumption sector which will

increase above average. The ratio between output I and its recipient K_c is, from equation (2): $\frac{I}{K_c} = (u + g)$, so that if g falls $\frac{I}{K_c}$ must also fall. But, in raising the value of q, as shown in equation (7) with a (positive product of the signs, sector I has received, at the beginning of (t – 1), more equipment from the machine tools industry than would have been the case if the system expanded at the previous value of q. As a consequence $\frac{I}{K_c}$ will be greater than the old (u + g) and *a fortiori* greater than the new one. Thus given the actual values of the coefficients and of q the I/K_c ratio moves in a direction opposite to the one required for terminal balanced proportions. The glut in machinery for consumption goods originates from this situation.

As noted above from (t – 1) to (t) capital will have expanded in line with the increase in the labour force, only its internal composition will have changed. Total equipment secures full employment with a higher proportion of machines and labour employed in the consumption sector. Consumers' goods prices will be reduced relatively to wages as envisaged by Kalecki. Over production of equipment is bound, however, to appear at the end of period (t). This is because the $\frac{I}{K_c}$ ratio will still be above the new equilibrium value. Capital stock in the two equipment sectors expands according to the new growth rate, but equipment made available to the consumption sector exceeds that rate.

At this point the authorities may give priority to the full utilisation of capital stock in the consumption sector, by hiring workers from the two departments producing means of production with the consequent formation of unused capacity there. Such kind of options, and possibly further shifts from K_x to K_i, are open as long as the bulge in the $\frac{I}{K_c}$ ratio causes total capital to increase more than labour. The limit to these options is given by the danger of what Lowe called capital dearth. The formation of unused capacity in the machine tools sector may reach a point where the latter is no longer capable of sustaining the expansion of capital stock in accordance with the new equilibrium growth rate. In this way despite the fact that transition to a lower growth rate implies abundance of capital, the structural outcome can be a deficit of equipment in the machine tools sector, which to be corrected requires a "backward switch" in the utilisation of labour and machinery. In the above context the role of the planning system is not to secure full capacity output at all costs but to regulate the distribution of unused capacities with the aim of maintaining full employment and preventing the possibility of capital dearth.

It should be noted that a two-sector model, is in no position to depict the processes outlined hitherto. Any modification in the ratio between the stock of the single capital goods sector and the stock of the consumption goods

sector affects immediately the expansion of total capital stock. In our case this would have led to a below equilibrium growth from (t – 1) to (t) with the formation of unemployed labour. The restructuring of the proportions between the two sectors could have begun only in period (t). If equipment is freely mobile the equilibrium ratio is *ipso facto* attained without over production of capital goods in the subsequent period. If only the gross output of capital goods is subject to allocation decisions a glut of machinery can emerge also in the two-sector case. The model fails, however, to shed any light on the internal dynamics of investment.

15.4.3 The foregoing discussion suggests that also a planned economy will be subject to unused capacities when it moves to a lower growth rate. Its main problem is to avoid sliding into a situation of capital deficit without reacting by over-investing, which means sucking resources away from the consumption goods sector, with no future benefits because over-investment will lead to further maladjustments.

Professor Lowe's construction, in placing the long-run implications of the formation and liquidation of real fixed capital at the centre of economic analysis, has also highlighted the objective limits in the reliance on market signals as a guide for future action. In simpler words: if the information conveyed by the market can tell what is going wrong, it does not necessarily mean that it can tell what has to be done. The complex phases of structural modifications necessitate elements of control over the broad composition of investment and over the price-wage relation.

In the context of a mature socialist economy the main issue is, we believe, not so much the dichotomy between the plan and the market, as the formation of an institutional set up flexible enough to allow for a decision-making process registering as much and as quickly as possible the changing objective conditions.[18] Kalecki reflected such an institutional framework in what he called the government's decision function which expresses the positive and negative evaluations leading to a decision about the planned growth rate. Clearly if the function is to be interpreted in a non-technocratic way (which inter alia is the only correct manner of interpretation), it presupposes the existence of bodies at different levels of the society where discussions about the overall and specific patterns of socio-economic development are an ongoing process.

As to the capitalist economy we have already seen in the second section how a disequilibrium between capital and labour may entail a deflationary spiral and a downward multiplier effect. A prolonged state of depression can in turn lead to a deficiency in capital equipment relatively to the long-term requirements of the economy. But if the government intervenes just to keep up capital expenditure without bothering about its sectoral distribution it will create additional rigidities because capacity utilisation will be increased in a manner unrelated to the necessary shifts in the composition of capital.

15.4.4 By making the adjustment process a function of the supply of labour we have kept technical progress in the background. To introduce it explicitly would require an analysis of structural changes under different types of innovations and of their combined effects. Technical change reinforces the importance of the approach followed in this paper: an economy with zero innovations and zero population growth has no problems of structural shifts. But an economy with technical progress and zero population growth is permanently subject to modifications in the composition of capital equipment. The complexity of dealing with innovations stems from the fact that in a Lowe type model there is a structural lag between the appearance of an innovation and its absorption by the system as a whole. The process of absorption makes the analysis of the formation and liquidation of real capital even more relevant and emphasises its discontinuous character.

Notes

I am grateful to Professor Paolo Sylos-Labini, University of Rome, for many useful comments. I should also thank the Department of Economics of the University of Nairobi (Kenya) for assistance in the preparation of an early draft of this paper.

1. The main references for the analysis of the structure of investment will be: LOWE (1976) especially chs. 13, 18, 22; DOBB (1960), MERHAV (1969) and KALECKI (1972) ch. 11. Dobb and Merhav used an early version of Lowe's model, LOWE (1955). Models similar to Lowe's were also developed by RAJ and SEN (1961) and by NAQVI (1963). They did not, however, explicity deal with changes in intersectoral proportions. Starting from a situation of scarcity of equipment they deal rather with where to allocate a given amount of imported capital goods. Kaldor's paper referred to above appeared in 1938 and was reprinted in KALDOR (1960).
2. DOBB (1960), pp. 11–12.
3. Oscar Lange gave a very clear definition of the scope of planning: "For planning economic development long term investments have to be taken out of the market mechanism and based on judgement of developmental economic policy. This is because present prices reflect present data whereas investment changes data by creating new incomes ..." and: "In other words, investment changes the conditions of supply and demand which determine equilibrium prices." LANGE (1969) p. 160.

   It is therefore possible to say that market signals represent responses to past decisions about investment, which in the meantime materialised in a given quantity of non-malleable capital goods.
4. In the presence of exhaustible resources technical progress should lead, in the course of time, to a more economical use of them. If this does not take place, the amount of capital equipment, which in the future will be allocated to discover and exploit new deposits, will have to be larger than expected. Technical progress is necessary even to maintain the stationary state. To extract from year to year a given quantity of minerals rising quantities of equipment will have to be enlisted if technical change is zero. See on this point LOWE (1976), chs. 19, 20, 26.
5. As it appears from the ILO study on rural poverty. ILO (1977).
6. According to Professor K.N. Raj the development of a machine tools sector in China, made possible also by the type of her trade with the USSR, was an

important factor in the repayment of her debts with the Soviet Union and in overcoming shortages of foreign currency. RAJ (1969).

7. In Merhav's study the import dependence of investment is at the roots of lopsided development. The demand for capital equipment stemming from the domestic sector is constrained by export earnings. At the same time the level of investment in the export sector is largely independent of the level of demand in the domestic sector. In a situation where the two sectors are not complementary to each other the link between them can be that of competition for factors in the home market. See MERHAV (1969) chs. 1 and 5.
8. Lionel Stoleru produced a two-sector fixed coefficients optimal control model which incorporates Dobb's *Accelerator in Reverse*. He applied it to Algeria with two objectives: full employment balanced growth and production of consumer goods. It came out that with a 3 to 4 ratio of foreign aid to the initial domestic output of capital goods, to achieve full employment per capita consumption would have had to fall initially by 28 per cent, without foreign aid by 65 per cent. The introduction of foreign aid did not affect the pattern of allocation of equipment; the authorities remained in full control of the distribution of capital goods. The merit of the exercise lies in showing, by implication, the degree of leeway that must be given to many ex-colonial countries to develop. See STOLERU (1965).
9. BARAN (1969), p. 147.
10. This is also the view of trade cycle theorists who explained crises in terms of overcapitalization. BOUNIATAN (1928).
11. KALDOR (1960), p. 115.
12. KALECKI (1971), p. 97.
13. Relation (6) is derived from: $X = m(1 + q)(u+g) X$, which is then solved for g and differentiated with respect to q. m is the capital-output ratio. It is assumed, as Lowe does, that the capital-output ratio is uniform. The capital-labour ratio is also treated by Lowe as uniform and non-malleable. This assumption is retained in our paper. In Chapter 13 of Lowe (1976) variability in capital-labour ratios is introduced in order to show that it does not eliminate structural discontinuities.
14. Studies on the industrialization of the USSR seem to support the hypothesis that 'induced starvation' did to some extent take place. See ERLICH (1960, 1978), VYAS (1979). Vyas's work relies on recent analyses by Soviet scholars.
15. See SEN (1960), Appendix to ch. 3.
16. DOBB (1960), p. 61.
17. DOBB (1967).
18. Wrong reaction to objective conditions was the principal cause of a recession induced by over-investment in Czechoslovakia in the early 60s. See GOLDMANN (1965).

Bibliography

BARAN, P.A. (1969), "National Economic Planning," in *The Longer View,* Monthly Review Press, New York.

BOUNIATAN, M. (1928), "The Theory of Economic Cycles Based on the Tendency Towards Excessive Capitalization," in *Review of Economics and Statistics,* February.

DOBB, M.H. (1960), *An Essay on Economic Growth and Planning,* Routledge and Kegan Paul, London.

DOBB, M.H. (1967), "The question of 'Investment-priority for Heavy, Industry'," in *Papers on Capitalism, Development and Planning,* International Publishers, New York.

ERLICH, A. (1960), *The Soviet Industrialization Debate,* Harvard University Press, Cambridge, Mass.

ERLICH, A. (1978), "Dobb and Marx-Fel'dman model: A Problem in Soviet Economic Strategy," in *Cambridge Journal of Economics,* vol. 2, no. 2, June.

GOLDMANN, J. (1965), "Short and Long Term Variations in the Growth Rate and the Model of Functioning of a Socialist Economy," in *Czechoslovak Economic Papers,* no. 5.

ILO (1977), *Poverty and Landlessness in Rural Asia.*

KALDOR, N. (1960), "Stability and Full Employment" in *Essays on Economic Stability and Growth,* Duckworth, London, (originally published in *The Economic Journal,* December 1938).

KALECKI, M. (1971), *Selected Essays on the Dynamics of the Capitalist Economy, 1933–1970,* Cambridge University Press, Cambridge, (U.K.).

KALECKI, M. (1972), *Selected Essays on the Economic-Growth of the Socialist and the Mixed Economy,* Cambridge University Press, Cambridge (U.K.).

LANGE, O. (1969), "The Computer and the Market, in *Socialism, Capitalism and Economic Growth, Essays presented to Maurice Dobb*, ed. by C.H. Feinstein, Cambridge University Press, Cambridge, (U.K.).

LOWE, A. (1955), "Structural Analysis of Real Capital Formation," in *Capital Formation and Economic Growth* (a Conference of the Universities – National Bureau Committee for Economic Research), Princeton.

LOWE, A. (1976), *The Path of Economic Growth*. Cambridge University Press, Cambridge (U.K.).

MERHAV, M. (1969), *Technological Dependence, Monopoly and Growth.* Pergamon Press, New York.

NAQVI, K.A. (1963), "Machine-Tools and Machines: A Physical Interpretation of the Marginal Rate of Saving," in *The Indian Economic Review,* vol. VI, no. 3, February.

RAJ, K.N. (1969), "Role of the 'Machine-Tools Sector,' in Economic Growth. A Comment on Indian and Chinese Experience," in *Socialism. Capitalism and Economic Growth,* cit.

RAJ, K.N. and SEN, A.K. (1961), ''Alternative Patterns of Growth under Conditions of Stagnant Export Earnings," in *Oxford Economic Papers,* vol. XIII, no. 1, February.

SEN, A.K. (1960), *Choice of Techniques,* Basil Blackwell, Oxford.

STOLERU, L. (1965), "An Optimal Policy for Economic Growth," in *Econometrica,* vol. XXXIII, no. 2, April.

VYAS, A. (1979), "Primary Accumulation in the USSR Revisited," in *Cambridge Journal of Economics,* vol. 3, no. 3, September.

16
Structural Analysis of Development and Underdevelopment

Joseph Halevi

16.1 Introduction

This chapter will discuss Adolph Lowe's (1955, 1976) contributions by positioning them in relation to the accumulation and crisis debate developed by Russian and German Marxism at the turn of the century (Section 2), to the question of the traverse in a mature economy (Section 3), and to the quasi-structural theories of development of Maurice Dobb and of the Indian school of planning (Section 4).

The reference to the well-known Marxist debate seems to be a useful vehicle to single out the essential differences between a developed and an underdeveloped economy. Indeed, in the next section it will be shown that the tendency towards an unlimited, crisis-free, expansion idealized by Tugan-Baranovsky either will break down because of an excessive accumulation of machines relative to the available workforce, or will require a substantial surplus of labour *vis-à-vis* the production of equipment. The formation of a stock of capital large enough to employ the whole of the working population is then taken to be the factor which differentiates developed from developing economies.

The third section constitutes the centrepiece of the chapter. The conditions for the fulfilment of a mature traverse will be described by means of a model incorporating the essential features of Lowe's framework. Methodologically, the traverse process shows the stringency which the problem of capital formation and liquidation imposes upon sectoral relations. Thus, in the fourth section, after a detailed presentation of Dobb's and the Indian contributions, Lowe's stringency will be applied to a critical examination of those models. Finally, in the conclusions, we shall address

Revised from *Political Economics in Retrospect. Essays in the Memory of Adolph Lowe*, 164–194, 1998, 'Structural Analysis of Development and Underdevelopment,' by Halevi, J. With kind permission from Edward Elgar Publishing. All rights reserved.

the question of the cultural framework in which the structural approach to both growth and development was devised and we shall point out the limitations, also cultural, inherent in their treatment of the links between technical and social relations.

16.2 From Tugan-Baranovsky to Lowe

Lowe's notion of structure is explicitly linked to Marx's schemes of reproduction whereby the economy is divided into two separate sectors, one producing capital goods and one producing consumption goods. This analytical construction has led Marx to raise, in the second volume of *Capital*, the issue of the relation between accumulation and sectoral proportions. After Marx, most Russian and German Marxian thought was influenced by the sectoral approach to accumulation and crisis, rather than by the one-sector cyclical analysis propounded in Chapter 25 of the first volume of *Capital* (Colletti and Napoleoni, 1975). The shift in emphasis was largely due to the impression made on the leaders of the Social Democratic movement in Germany by the nature of Bismarckian growth based on the rapid expansion of the capital-goods sector. German Social Democracy then became concerned, except for the evolutionist wing represented by Bernstein, with whether or not the expansion of the capital-goods sector could continue regardless of consumption demand. Within this framework Marx's two-sector schemes of reproduction formed the analytical foundations of the debate and determined the bifurcation between those stressing the role of consumption demand and those stressing the causal relation between sectoral disproportions and economic crises. The latter strand focused on the way in which, with falling consumption demand, the surplus could be distributed between the two sectors without engendering any slowdown in accumulation. The specification of sectoral flows becomes paramount to the analysis of accumulation. In so doing, the disproportionality school correctly understood the fact that in a two-sector framework the expansion of profits can come only from the expansion of the capital-goods sector.

The significance of structural analysis in Lowe, however, goes farther than the disproportionality approach adopted by Central European and Russian Marxism, which we will henceforth call the *Russian current*.[1] In the latter strand, sectoral analysis matters only in so far as it highlights the separability of the elements serving as means of consumption from those serving as means for capital accumulation. Sectoral analysis does not matter, however, in relation to the specific character of capital goods, since machines can always be freely allocated between the two sectors.

Such is not the case with Lowe, where a specific machine is produced for the consumption-goods sector. The economy is, therefore, formed by a capital-goods sector producing machines for the consumption-goods sector and by a capital-goods sector producing machine tools for itself as well as for

the production of the consumption-goods sector's machine.[2] Furthermore, in the system of reproduction used by the Russian current there is no complementarity between machinery and labour, not even for a limited sequence of periods. It is precisely the lack of any form of complementarity which allowed Tugan-Baranovsky to argue for a smooth increase in the number of machines operated by each worker.

The objective of the Russian current was to demonstrate that investment can be realized independently of the dynamics of consumption. In a nutshell, the reasoning put forward by the Russian current consists in assuming that whenever technical progress reduces the quantity of labour necessary to produce one unit of output, the composition of the latter will shift to the capital-goods sector exactly by the amount of productive capacity released from the consumption-goods sector.

The gist of Tugan-Baranovsky's thought can be formulated in terms of physical quantities instead of labour values. Consider a two-sector Marxian model of the following kind:

$$K_{(0)} = K_{i(0)} + K_{c(0)} \tag{16.1}$$

$$E_{(0)} = n_{i(0)}K_{i(0)} + n_{c(0)}K_{c(0)} \tag{16.2}$$

$$\lambda_{(0)} = K_{i(0)}/K_{(0)} \tag{16.3}$$

$$\alpha\lambda_{(0)} = 1 + G_{(0)} \tag{16.4}$$

$$zE_{(0)} = \gamma K_{c(0).} \tag{16.5}$$

In the above model, equation (16.1) describes the total capital stock K at time $t_{(0)}$ as being equal to the sum of the capital stock installed in the investment- or capital-goods sector K_i and the stock installed in the consumption-goods sector K_c. Likewise, following equation (16.2), employment E is distributed between the two sectors according to the employment capacity of each machine installed in the capital-goods sector – n_i – and the corresponding employment capacity in the consumption-goods sector – n_c. Equation (16.3) defines the share λ of the stock of capital installed in the capital-goods sector over the total stock at time $t_{(0)}$. Equation (16.4) states that the growth rate of total capital G plus replacement, is equal to the output coefficient of the capital-goods sector α multiplied by the sector's share of total capital. The model assumes that capital is of a fully circulating nature. Finally, equation (16.5) describes the Marx–Robinson–Lowe condition whereby the real wage z multiplied by the level of employment E must be equal to the amount of consumption goods produced by the stock of capital installed in the consumption-goods sector. The parameter γ is, therefore, the output coefficent per machine in the consumption-goods sector.

If we assume a given real wage z, the value of λ is determined by substituting equations (16.2) and (16.3) into (16.5) and then solving for λ:

$$z(h\lambda + n_c) = \gamma(1 - \lambda), \tag{16.6}$$

where $h = (n_i - n_c)$ and

$$\lambda = (\gamma - zn_c)/(zh + \gamma). \tag{16.7}$$

Tugan-Baranovsky worked out his mechanism of boundless accumulation in terms of labour values, which imply, just like in Lowe's model, a uniform labour–machine ratio for both sectors. Hence, in our model, $h = 0$ and equation (16.7) reduces to:

$$\lambda = (\gamma - zn)/\gamma,\ n = n_c = n_i \tag{16.8}$$

Tugan-Baranovsky's story can be now conceptualized as follows. At time $t_{(0)}$, the economy is characterized by a distribution $\lambda_{(0)}$ of the share of the capital stock installed in the capital-goods sector. This value of λ will carry a growth rate determined by equation (16.4). With fully circulating capital, we can assume that the new machines coming into being at time t + 1, will have a new uniform employment coefficient of:

$$n_{(t+1)} = n_{(0)}(1 - \varepsilon), \tag{16.9}$$

where ε is the discrete rate of automation from time (0) to time $t + 1$. From equation (16.8) we know that λ is inversely related to n, so that a fall in n will increase the new value of λ and, with it, the growth rate of capital stock. As long as labour is available there is no problem in obtaining the new value of λ. Whether or not the negative employment effect of the decline in n is offset by the positive effect caused by the growth rate of the stock of capital depends upon the value of the ratio $E_{(t+1)}/E_{(0)}$. Translated in terms of the coefficients pertaining to the stock of capital we have:

$$E_{(t+1)} = \alpha\lambda_{(0)}K_{(0)}n_{(0)}(1 - \varepsilon).$$

Thus:

$$E_{(t+1)}/E_{(0)} = \alpha\lambda_{(0)}(1 - \varepsilon). \tag{16.10}$$

If the value of (16.10) is unity, the decline in n will not bring about industrial unemployment because enough machines have been produced to keep everyone employed. By virtue of equation (16.8) the new value of λ will be greater than $\lambda_{(0)}$, but proportions will be maintained in such a way that

no equipment remains unused. By substituting $G + 1$ into $\alpha\lambda_{(0)}$ and setting (16.10) equal to, or less than, unity, we obtain the relationship between Tugan-Baranovsky's *feasible* rate of automation and the rate of growth *G:*

$$\varepsilon \geq G/(1 + G). \tag{16.11}$$

In Tugan-Baranovsky's analysis, there is no reference to surplus labour originating from the hitherto non-capitalistic segments of the economy, since he considered a fully industrialized system which is encompassed by the two-sector reproduction schemata. Thus, abstracting from demographic growth, the value of ε cannot be smaller than $G/(1 + G)$. If it were so, an overproduction of machines would take place. In this context, excluding the blissful case in which the two sides of *k* are equal, Tugan-Baranovsky's mechanism can occur only if $\varepsilon > G/(1 + G)$. In other words, the creation of industrial unemployment allows for a reallocation of equipment towards the capital-goods sector without idling any machine. This result confirms Tugan-Baranovsky's theory, according to which the decline in consumption demand due to the fall in the level of employment is not, *per se*, a cause of economic crisis.

Yet, within the Marxian approach adopted by Tugan-Baranovsky, the creation of a reserve army of labour will have an additional effect upon the upward shift of λ because of the negative impact of unemployment on the real wage rate. Equation (16.8) shows that the rise of λ will now be determined by the fall in *n* and by the fall in the real wage rate z. As a consequence, the growth rate *G* will rise, lifting the $G/(1 + G)$ ratio relatively to ε. Unless ε increases further, and in such a way as to guarantee a persistent gap *vis-à-vis* the ratio $G/(1 + G)$, the geometric expansion of the output of machines generated by Tugan-Baranovsky's mechanism tends to bring the economy closer and closer to a crisis caused by an excessive production of machines relative to available labour, well before full automation is completed.[3] Obviously, this danger can be postponed as long as the society contains a natural economy generating an almost unlimited supply of labour.

In bringing about the possibility of a crisis generated by an overproduction of machinery relative to the employable labour force, we have moved from a Tugan-Baranovsky world, where proportionality is determined by the *value* of the flows between the capital and the consumption-goods sector, to a Lowe world, where proportionality is contingent upon the relationship between the sectoral *physical* composition of the stock of capital and the available labour force.

The only context in which the Tugan-Baranovsky process can be maintained over time is that of an economy having a virtually unlimited supply of labour so that it can move smoothly towards full automation without its hyperaccumulation being blocked by a bottleneck in the supply of workers. This is indeed quite a paradoxical outcome of Tugan-Baranovsky's theory, once looked at through Lowe's structural prism.

16.3 Economic Maturity and the Traverse

The likely outcome of the Tugan-Baranovsky process, confirms the perception about the historical evolution of capital accumulation developed by economists such as Kalecki (1976) and Kaldor (1956). For these authors, the productive capacity installed in advanced capitalist countries is such that the possibility of an overproduction of machinery dominates over the euthanasia of wage labour resulting from automation. A similar position is also to be found in Lowe's (1955, 1976) work but not as a result of a superimposed stylized fact. Lowe's model does not describe the evolution through time of economic life, say from primitive to industrial accumulation. It is, instead, concerned with the study of the process of building up and of wearing down equipment in a morphologically self-contained system. Once this system is defined as an industrial one, then the labour force cannot but work with produced capital goods. There are no other forms of material sustenance in a system so defined. Hence, if there are too many people of working age relative to the employment capacity of installed equipment, the explanation must be sought either in an exogenous exit of labour, or in a prior change in the rate of accumulation which might have led to a dearth in capital formation.

16.3.1 From Kalecki to Lowe

During the discussion of the Dobb–India models, to be conducted in Section 4, it will be shown how important is the maintenance of a coherent morphological structure for the study of development paths. In this section, I shall take Kalecki's approach as the starting-point of the study of the traverse. We might begin with Kalecki's definition of the *differentia specifica* between the advanced and the underdeveloped capitalist economies:

> The main problem of a developed capitalist economy is the adequacy of effective demand. Such an economy possesses a capital equipment which more or less matches the existing labour force, and therefore it could generate a rather high income per capita provided that its resources are fully utilised. (Kalecki, 1976, p. 20)

In this context, Kalecki believed that advanced capitalist economies tend to a situation of underinvestment since if 'investment falls short of savings of capitalists then a part of the product will remain unsold, and thus goods will accumulate in stock' (ibid., p. 21). Kalecki took the full-employment traverse of a socialist planned economy as an instrument with which to highlight the reasons why such a traverse would not occur in a capitalist society. In the latter, employment is seen as determined by the relationship between investment and national income. He wrote:

> During a slump the fall in investment also causes a reduction in consumption so that the fall in employment is larger than that arising

> directly from the curtailment of investment activity. In order to bring into focus the nature of this process in the capitalist economy it is useful to consider what the effect of a reduction in investment in a socialist economy would be. The workers released from the production of investment goods would be employed in consumption goods industries. The increased supply of these goods would be absorbed by means of a reduction in their prices. Since profits of the socialist industries would be equal to investment, prices would have to be reduced to the point where the decline in profits would be equal to the fall in the value of investment. In other words, full employment would be maintained through the reduction of prices in relations to costs. In the capitalist system, however, the price–cost relationship ... is maintained and profits fall by the same amount as investment plus capitalists' consumption through the reduction in output and employment. (Kalecki, 1971, pp. 96–7)

Kalecki did not specify, however, why investment ought to be reduced. The only rational motivation for a curtailment in investment can come from structural analysis. More specifically, the objective (that is, social) justification of such a measure must be seen in a decline in the supply of labour relative to available equipment. This hypothesis is consistent with the Kaleckian view that an advanced capitalist economy possesses a level of capital equipment which, at full capacity, can employ the whole of the working population. Under these circumstances, it is equally reasonable to assume that the productive capacity of the capital-goods sector is such that it can easily generate an amount of machines whose aggregate employment capacity exceeds the level of full employment. If those two assumptions are accepted, the socially meaningful traverse is, for an advanced industrialized economy, that of a structural adjustment following a decline in the supply of labour (Lowe, 1976, Ch. 18).

The formal structure of Lowe's theoretical apparatus enables us to say that Kalecki's full employment–full capacity 'socialist' traverse cannot, by and large, be generalized quite independently of whether or not prices are flexible in relation to costs. In particular, the economy can hardly escape the formation of unused capacity during the downward adjustment.

16.3.2 Lowe's Downward Traverse

Consider a simple Lowe-type model based on two capital-goods sectors and on a sector producing a single homogeneous consumption-good's sector. We then have:

$$K_{k(0)} = K_{m(0)} + K_{i(0)} \tag{16.12}$$

$$\lambda_{(0)} = K_{m(0)}/K_{k(0)} \tag{16.13}$$

$$\alpha\lambda_{(0)}K_{k(0)} = K_{k(0)}(G_{k(0)} + d) \tag{16.14}$$

$$\beta(1 - \lambda_{(0)})K_{k(0)} = K_{c(0)}(G_{c(0)} + d), \tag{16.15}$$

where K_m is the stock of capital in the machine-tool sector. This machine can either reproduce itself, or be installed in the intermediate investment sector made up by the stock K_i which, in turn, produces the specific machine for the production of consumption goods. K_c is, therefore, the stock of capital in the consumption-goods sector; α and β are the coefficients giving the output for each machine installed in the K_m and K_i sectors, respectively, and d is the given uniform rate of depreciation. The λ coefficient is the two-sector Fel'dman coefficient of industrialization applied to Lowe's tripartite scheme.

In contrasting Kalecki's hypothetical traverse with Lowe's actual traverse, the difference between the two approaches will hinge on the different sequential mechanisms set in motion by changing λ in equation (16.15), compared to a change in λ. in equation (16.3) of the previous section where λ, applies to a two-sector model.

Following Lowe's assumption that each sector has a uniform machine to labour ratio, total employment E is given by:

$$E_{(0)} = n(K_{k(0)} + K_{c(0)}) \tag{16.16}$$

where n is the labour to machine ratio.

At full-capacity employment levels, the unit money wage multiplied by the level of employment must be equal to the value of consumption goods. Hence:

$$wE_{(0)} = p_c\gamma K_{c(0)}, \tag{16.17}$$

where γ is the output coefficent in the consumption-goods sector, w is the money wage and p_c is the unit price of consumption goods. Setting $K_{c(0)}/K_{k(0)} = q_{(0)}$, substituting (16.16) into (16.17) we have:[4]

$$z = \gamma q_{(0)}/(1 + q_{(0)}). \tag{16.18}$$

where $z = w/p_c$.

With the economy ready at time $t_{(0)}$ to grow at a uniform rate, the growth of the two stocks of capital is: $G_{k(0)} = G_{c(0)} = G_{(0)}$.

At this point we can address Kalecki's description of the adjustment mechanism. He maintains that in a socialist economy the adjustment to a fall in investment would not be through the reduction of employment and output via unused capacity. Instead, workers would be moved to the consumption-goods sector and the increase output of consumption goods would be met

by reducing prices relative to wages. This is, however, only a virtual not an actual traverse. Both would indeed coincide in a two-sector model. A reduction of investment would mean a fall in the λ coefficient and a rise in the proportion of investment goods allocated to the consumption-goods sector. The fall in investment will cause unused capacity in the investment-goods industries. The unused equipment, and the workers associated with it, would be transferred to the production of consumption goods since, in a two-sector model, capital goods are homogeneous. The increased output of consumption goods would then be purchased by the same number of workers earning the same money wage as before. Now, if the new value of the two-sector λ coefficient is such that the growth rate of the stock of capital is equal to that of population (and of productivity), the system would have adjusted to the new full-employment growth rate.[5]

In a Lowe context the adjustment mechanism is far more complex. To begin with, a cut in investment decisions allows a transfer of machinery only from the sector producing machine tools (primary equipment) to the secondary equipment sector producing machines for the consumption-goods industry (see equation (16.13)). This means that labour is mobile only between the two equipment sectors and not throughout the whole spectrum of the economy. As a consequence, the ratio between the stock of capital in the consumption-goods sector and the combined stock of the two equipment-producing sectors will not change simultaneously with a change in λ. In fact, at any point of time, the ratio K_c/K_k is determined by the value of λ, prevailing in the previous period. From equations (16.14) and (16.15) we have:

$$q_t = [K_{c\tau}(1 - d) + \beta(1 - \lambda_\tau)K_{k\tau}]/[K_{k\tau}(\alpha\lambda_\tau - d + 1)], \qquad (16.19)$$

where $\tau = t - 1$. It follows that $q_{(0)}$ is invariant to any change in λ effectuated at time $t_{(0)}$.

A fall in the value of λ at time $t_{(0)}$ would only modify the composition of the labour force within the two equipment sectors, leaving unaltered the ratio between the labour force employed in the two capital-goods sectors and that employed in the consumption-goods sector. Thus equation (16.18) will not change in the wake of a change in λ, which means that, contrary to Kalecki's conclusion, consumption-goods prices will not change either.[6] Kalecki's reliance on the price mechanism to achieve balanced proportions under modified investment conditions does not, therefore, appear to be warranted. According to Kalecki, price flexibility ought to be a constituent element of an advanced socialist economy. He concluded his example of a reduction in investment in a socialist economy by stating that:

> It is indeed paradoxical that, while the apologists of capitalism usually consider the 'price mechanism' to be the great advantage of the capitalist

> system, price flexibility proves to be a characteristic feature of the socialist economy. (Kalecki, 1971, p. 97)

It is true also that in Lowe's case prices of consumption goods will have to fall in a subsequent phase, but this, too, is secondary to the structural changes which would have to be considered following a decline in the λ coefficient, which, in the three-sector model, applies only to the distribution of equipment between the two capital-goods sectors. Let us develop the argument step by step.

Assume that at time $t_{(0)}$, λ is reduced relative to the value it had at time τ. Let us call this new value λ^*. Between period $t_{(0)}$ and $t+1$, the growth rate of the stock K_k will now be equal to $(\alpha\lambda^* - d)$ which is less than the growth rate existing between period τ and $t_{(0)}$. The growth rate of the stock of capital in the consumption-goods sector will, however, be higher than that prevailing in the previous period. The new intraperiod growth rate of K_c is given by:

$$(\beta\sigma^*/q_{(0)}) - d, \tag{16.20}$$

where $\sigma^* = (1 - \lambda^*) > \sigma_\tau$.

Equation (16.20) is derived from equations (16.15) and (16.19), the latter showing that $q_{(0)}$ is invariant to a change in λ. Hence, the growth rate of K_c will be higher relative to the period τ, the lower the value of λ^* relative to λ. Obviously, this higher growth is not permanent since the lower the value of λ, the smaller will be the difference between the output of machine tools, forming the K_k stock, and the wear and tear of K_k machines. Consequently, the sector producing secondary equipment will not be able to feed the higher growth rate of K_c in the long run. This is, however, a long-term result; in between there will be structural changes which may well alter the course of the traverse, unless they are strictly controlled by means of non-market institutional measures.

To elucidate this point, consider the case in which the fall in λ, from λ_τ to λ^* has been brought about by a decision to reduce investment as a result of an estimated decline in the supply of labour. Clearly, if the new value of λ, is such that the growth rate of K_k exceeds the new growth rate of the labour force, overall excess capacity will ensue. However, if the new value of λ^* is brought to the level equal to the new growth rate of labour supply, K_k will expand in line with it but, by virtue of equation (16.20), K_c would still expand at a higher rate than the supply of labour. Unused capacity becomes inevitable at this point.

What kind of unused capacity? At first glance, unused capacity would have to be wholly concentrated in the consumption-goods sector because the new value of λ, has put the capital-goods sectors in a position to grow just in line with the new rate of labour supply. It follows that the capital-goods sectors will have to hire the number of workers needed to operate

their machinery at full capacity, while the consumption-goods sector will have to absorb the rest. This means that the operational capital stock in the consumption-goods sector would *ipso facto* expand at the same rate as the K_k stock, which is tantamount to saying that the q ratio must become a parameter. If this rule is accepted, the economy will never be able to attain the new normal value of q which is given by equations (16.13) and (16.15):

$$q^* = \beta\sigma^*/\alpha\lambda^*. \tag{16.21}$$

The crucial problem here lies in the fact that the consumption-goods industries have to disregard all the equipment which, if fully operated, will bring the value of q to rise towards q^*. The practical, iterative, working of Lowe's model implies that a reduction in the value of λ will swell the intermediate capital-goods sector K_i by an amount of machinery which will be able to produce equipment for K_c in excess of the level consistent with full employment.

In this context, the hypothesis of turning the initial value of q into a parameter is not acceptable. This is so because only at the new value q^* will the stock of capital K_i be able to supply all the replacement requirements for K_c and a net amount of machinery consistent with the new growth rate of the economy. By contrast, if, after a reduction in λ, q remains below q^*, the K_i sector will persistently produce excess capacity for the consumption-goods sector. To avoid such an outcome it is necessary to reverse the logic followed so far and consider the possibility of putting on the capital-goods sectors the whole burden of unused capacity. In this case, the main problem consists in how to distribute unused capacity between the two sectors during the traverse. Since no general rule exists *a priori*, we will present only the main outlines of two possible trajectories based on the condition that the consumption-goods sector must always be kept at full capacity. This will suffice to show how crucial is the decision concerning the sectoral distribution of unused capacity during the planned traverse. A numerical example of both trajectories is provided in the appendix to this chapter.

The first and very simple trajectory stems from fixing the value of λ at the new lower equilibrium level λ^*. The consumption-goods sector's growth rate swells, while the machine-tools sector K_m produces exactly the right amount of equipment to keep the expansion of the K_k stock in line with the new equilibrium growth rate. In this context, if the consumption-goods sector is kept at full capacity, workers will have to be withdrawn from the capital-goods sectors. The ensuing unused capacity in the capital-goods sectors will reduce the ability of the intermediate investment-goods sector to sustain the overexpansion of the stock of capital in the consumption-goods sector. In particular, if the proportion of the operational K_k stock devoted to the production of machine tools is kept at the value λ^*, the excess capacity accumulated in the capital-goods sectors is unlikely to be reabsorbed.

The institutions guiding the process of adjustment will have to keep allocating the influx of machine tools coming into the K_k sector according to λ^*, regardless of the existence of unused equipment. This result is shown in Model A of the appendix. It is shown there that holding on to λ^* and keeping the consumption-goods sector at full capacity will lead, unlike the case in which unused capacity falls entirely on the consumption-goods sector, to a once-and-for-all accumulation of unwanted equipment.

The second possible trajectory is illustrated in Model B of the appendix. This assumes that, in the wake of an expected reduction in the supply of labour, the shift in the initial distribution of the K_k stock is so drastically in favour of the K_i stock that K_m is reduced to zero for a time span of two periods. This means that the wear and tear of the K_k stock at time $t_{(0)}$ cannot be replaced, while the K_c stock expands by:

$$\beta K_{k(0)}(1 - dq_{(0)}) = K_{c(t+1)} - q_{(0)}K_{k(0)} \tag{16.22}$$

Equation (16.22) gives the maximum expansion feasible for K_c in one period. Meanwhile, the stock of capital K_k will have lost, by time $t + 1$, d per cent (10 per cent in Model B) of its effectiveness because of a zero replacement investment. Yet, the maximum expansion of the K_c stock still creates a situation in which the combined employment capacity of the economy exceeds the number of available workers. As a consequence, the consumption-goods sector can function at full capacity by drawing workers from the capital-goods sectors, thereby concentrating in the latter all the unused capacity. Since the dearth of capital in the K_k sector is allowed to continue for one more period, the further depletion of the K_k stock will require to bring back into commission part of the accumulated unused capacity. In Model B, this happens in the second period, at which point it is assumed that the operational part of the K_k stock is distributed between K_m and K_i according to the value λ^*, $1 - \lambda^*$. The example then shows that full capacity and balanced proportions are restored at the beginning of the fourth period. The difference between the first and the second trajectory lies in the fact that in the second all the intraperiod adjustments are sustained by the capital-goods sectors, which undergo, initially, a phase of depletion followed by a gradual reabsorption of unused equipment.

16.3.3 Lowe and Uzawa

The traverse exercise was conducted in terms of Lowe's assumption of uniform machine–labour ratios in each sector, which is also consistent with Kalecki's description of the adjustment mechanism. On this basis, the formation of unused capacity appears as an inherent characteristic of the structural traverse in a developed economy, where 'developed' means the ability of the capital-goods sectors to produce an amount of equipment in excess of full-employment requirements. Consequently, the planned distribution

of unused capacity becomes inseparable from the planning of sectoral proportions. Now, from the standpoint of attaining a balanced growth path while minimizing the amount of unused capacity, the second trajectory is preferable to the first, at least if the comparison is made between Model B and Model A. The first trajectory is better than the second if consideration is taken of the necessity to store up capacity in the light of unexpected events. Finally, the imposition of the burden of unused capacity on the consumption-goods sector, which means accumulating undesired K_c equipment at a steady rate, is meaningful only if the fall in the growth rate of labour is deemed to be temporary. In this way, the accumulation of unused consumption-goods equipment will prove beneficial for absorbing workers when the supply of labour begins to rise again, Yet the crucial adjustment will depend, even in this case, on the system's capacity to liberate capital in the K_m sector.

Lowe's theory of structural changes highlights the qualitative, not quantitative, supremacy of the capital-goods sectors. The total stock of capital constitutes the engine of the system, the proportions between K_m and K_i give the direction at which the system can and should travel. The degree of unused capacity in the K_k sectors gives the degree of freedom avaible in mapping out the adjustment path (Model B) or the degree of flexibility relatively to an unforeseeable expansion in the supply of labour (Model A).

Adolph Lowe's formulations are based on the explicit assumption that the economy possesses the sectors needed to undertake a process of structural change. Thus, his approach is more oriented towards the problem of capital liberation and capital liquidation of an advanced economy. When Lowe first presented his hypotheses in the mid-1950s, there existed a number of publications which tended to emphasize some of the crucial elements of his analysis. Interestingly enough, these contributions came from different intellectual roots. Masao Fukuoka (1955), by using a Leontief model of fixed production coefficients, showed that full employment attained by means of Keynesian policies may not necessarily bring about full capacity. During the same period, an Austrian-inspired book (Lachmann, 1956), devoted entirely to the structure of capital, stressed the specificity of capital goods.

Yet, none of these works addressed the twin issues of specificity and complementarity in relation to growth conditions. The uniqueness of Lowe's approach resides in having combined the heterogeneity of the composition of capital, with complementarity and flexibility in a macroeconomic framework which, *inter alia*, is the only framework in which accumulation and growth can be analysed. During the 1960s, a number of growth models – such as Uzawa's – were developed, incorporating, implicitly, traverse-type aspects (Gandolfo, 1970; Foley and Sidrauski, 1970); but their neoclassical orientation did not allow questions to be raised which Lowe considered to be of crucial importance for the study of capital formation in advanced economies.

Model C of the appendix shows a Lowe version of the Uzawa model. It assumes the same convergence conditions of the neoclassical two-sector

fixed coefficient growth model, with the difference that in Lowe they apply to the two capital-goods sectors K_m and K_i only. The absence of structural analysis surfaces, in the neoclassical case, from the fact that sectoral relations are the passive outcome of inertia: in the Lowe version of Uzawa's model, the value of λ, is, period by period, determined as the solution to the allocation problem. Indeed, given the labour–machine ratios in the three sectors and given the initial stocks of K_k and K_c and their respective output coefficients, the appropriate momentary equilibrium value of λ can be found for a particular growth rate of labour. Such a result requires a ranking of labour–machine ratios of the two capital-goods sectors, K_i ought to be the least labour-intensive. Model C, then, shows that, within feasible values, such a ranking in intensities does lead to a steady reabsorption of the unemployment stemming from structural changes. Just the same, in our Lowe version of Uzawa's model, the value of λ, has to fluctuate significantly in order for stability to be kept through time. By contrast, in the two-sector Uzawa model, once stability is attained, the value of λ stabilizes as well. But the highly cyclical nature of the behaviour of λ from period to period, just to keep the system at full employment, empties Uzawa's conditions of any substantive content, even if they can be applied in a Lowe framework.

As a consequence, Lowe's procedure of treating λ, as a policy, or instrumental variable, seems to determine the difference between the purely passive sectoral adjustments of an Uzawa model, where only the relative values of the coefficents matter, and the traverse conditions outlined by Lowe where the planned, thus active, determination of the value of λ defines the phases of the transitional path. The proof that, in Lowe, λ is not determined endogenously is given by the fact that uniform labour–machine ratios within the K_k sector imply a vanishing determinant of the capital-goods sector's matrix. It therefore makes perfect sense to tackle directly the issue of sectoral relations without being absorbed by the question of relative factor intensities. Furthermore, in Lowe, labour–machine ratios can be uniform within the K_k sector, but they can still differ between K_k and K_c. This means that the economy is not characterized by uniform labour–machine ratios. When labour–machine ratios differ between K_k and K_c, but not within K_k, Lowe's traverse does not change analytically but only quantitatively.[7]

The emphasis put by neoclassical theorists on factor intensities, as a way to smooth out any form of Harrodian instability, explains why from the mass of the growth-theoretic literature of the postwar period, Lowe's contribution intersects directly only with Hicks's celebrated chapter on the traverse in *Capital and Growth* (Halevi, 1992b).

16.4 Structure and Underdevelopment

A radically different situation prevailed as far as the development literature was concerned. An objective convergence towards a Lowe-type *Fragestellung*

emerged from different areas of the world as shown, for instance, in Merhav's book where the theses of the Latin American School of dependency are tied to Lowe's sectoral analysis (Merhav, 1969).

It is, however, from a particular and composite developmentalist orientation that a direct analytical connection with Lowe's approach is most evident. This composite school originated largely in Great Britain and India. In Great Britain, Maurice Dobb's (1960) *Essay on Economic Growth and Planning* explicitly used Lowe's 1955 version of the three-sector model in order to discuss the problem of the choice of techniques for a development strategy constrained by a limited surplus of wage goods, as well as by an initial lack of machine tools. In India, a number of scholars (Raj and Sen, 1961; Naqvi, 1963) produced a set of models which are identical to that expressed by equations (16.12) to (16.15). Here the main difference *vis-à-vis* Lowe's approach lies in that raw materials requirements are taken into account and that machines have an infinite life.

Neither Dobb's nor the Indian models consider the question of the traverse because the economy is supposed to be dominated for a very long time by a large reservoir of labour. The sectoral allocation of machines and of labour is not, therefore, gauged on the basis of the terminal traverse, but on the basis of the growth patterns which can be obtained by allocating labour and machines to the machine-tools, intermediate investment-goods and consumption-goods sectors.

The Dobb–India models are based on the view that the growth-cum-modernization mechanism must take place according to the principle of the *accelerator in reverse*. That is, by the need to expand the production of capital goods well in advance of any market demand for them. This approach was justified by reference to a basic stylized fact, which, at that time, seemed self-evident. The structure of exports inherited from the colonial period was dominated by products having a low demand elasticity relative to income. As in the case of the Latin American school, accumulation and growth were thought to be constrained by limited foreign exchange earnings. In this way, the structural weakness of domestic capital stock was a mirror image of the qualitative inconsistency between the type of global effective demand and the need for domestic development. If these stylized facts are accepted, developing economies would face the task of giving priority to the investment sector precisely when they do not have the necessary machine tools to build it up.

Later it will be pointed out that of the two approaches to development mentioned above, the Indian one is, by far, the closest to Lowe's method of analysis. In fact Dobb's model is akin to Lowe's only in the very general description of the sectors but not in their structural specifications, or in the way the system functions.

16.4.1 Dobb and Lowe

Dobb's purpose was to show that a choice of technique involving a higher capital-intensity in the capital-goods sectors is compatible with the

maximization of the growth rate under conditions of abundant labour supply. He then proceeded to construct a model where, for a given real wage, the number of workers employable by the investment sectors is constrained by the limited surplus of wage goods. It follows that the total surplus of wage goods divided by the real wage rate determines the level of employment in the two equipment sectors.

Making the further assumption that machines do not depreciate, he then discussed the possibility that all the investment effort is put into the sector producing machines for the consumption-goods sector. Since equipment has an infinite lifetime, the growth rate of the economy is determined by pouring all the output of capital goods into the consumption-goods sector. Hence, the increments in the stock of capital for the economy as a whole take place in the consumption-goods sector. This is possible only because no machines are used to produce machines and those produced have an infinite lifetime.

From the above illustration it is evident that, conceptually, Dobb's model is only marginally related to Lowe's. For Adolph Lowe, the description of the economy in terms of equations (16.12) to (16.15) is a prerequiste for the analysis of modern production processes even when applied to development conditions. First, in Lowe, no commodity, let alone a machine, can be produced without the utilization of a stock of capital equipment. Second, production is characterized by structural lags which are also connected to the replacement requirements of the capital stock. Thus, in Lowe's approach the mechanism of productivity gains outlined by Dobb cannot take place instantaneously, nor can it be separated from the technological traverses generated by changes in production coefficients (Hagemann, 1992).

From a Lowe perspective, there is in Dobb's analysis an idealistic–romantic element expressed by the drastic hypothesis that a strategy for planned development can be conceptualized in terms of modern industrialization starting from scratch without any prior machine requirement.

16.4.2 Lowe and Fel'dman

Paradoxically, Dobb's analysis does not set a structural constraint to the production of capital goods. A completely different typology of development can be deduced from Lowe's approach. To begin with, if development means modern industrialization, then the basic structural interconnections which dominate in an advanced economy must characterize especially the capital-goods sectors of the industrializing economy. Lowe's structural approach allows for the identification of a crucial limiting condition for development called 'cannibalization' (Lowe, 1976, Ch. 16). This is nothing but the decision to forgo replacement investment, so that machine tools can be put to the exclusive function of reproducing themselves. The significance of cannibalization does not lie in its actual feasibility, but in that it sheds light on constraints arising from the capital goods themselves. It is safe to say that, had Dobb fully grasped Lowe's 1956 paper, the exceptionally

fluid and unstructural choice of technique story contained in the *Essay on Economic Growth and Planning* would not have been produced. Furthermore, the cannibalization case, or maximum expansion from within, highlights an important morphological difference between Lowe's concept of structure and that of Fel'dman.

A central feature of Lowe's process of structural change in an upward direction is given by the conditions governing the maximum expansion from within the K_m sector.

The condition for maximum expansion from within is given by setting the value of λ, in equation (16.13) equal to unity. In equation (16.22) the process of maximum expansion of the K_c stock during the downward traverse is immediately slowed down if the maximum expansion of K_c is kept for more than one period. In fact, once the K_m stock is shifted entirely towards the K_i sector, the K_i stock ceases altogether to receive replacement equipment. K_i will thus shrink in absolute terms, thereby reducing the absolute supply of machinery to the consumption-goods sector (Model B in the appendix). The limits to maximum feasible expansion of the K_c stock are, therefore, structurally determined by the lack of replacement equipment flowing to the K_i sector.

In the case of maximum expansion from within, the technical limits are not so sharply defined. The limits are first and foremost social in character. With λ set equal to unity, the K_i stock is shifted entirely to the K_m sector. K_c will no longer receive replacement equipment and it will shrink absolutely. This process is called by Lowe cannibalization of equipment. It is clear that the process can continue as long as enough force is brought to bear upon the population to make it accept a sharp reduction in real consumption. In economic terms, this also means that the state must confiscate all the (declining) surplus produced by the consumption-goods sector. That surplus is, indeed, transferred to the workers operating the K_m stock, but no goods are obtained in return. Thus, no price equation can be written for the unidirectional flow of consumption goods to the machine-tools sector, so that the transfer can be enforced only through confiscation.

Now, leaving aside the social aspect of the process, an economy which can undertake a process of cannibalization is by no means an underdeveloped one (Lowe, 1976, Ch. 16; Erlich, 1960). In other words, such an economy does possess a self-expanding core, although it may not yet be large enough to affect the whole economic stratification of the society. The 'cannibalization' perspective on industrialization brings out simultaneously the difference between Dobb and Lowe as well as that between Fel'dman and Lowe.

In Fel'dman, the degree of industrialization is defined as the ratio between the share of investment going back to the investment sector and the share going to the consumption-goods sector. Thus, an underdeveloped economy ought to be marked by a low percentage of capital goods' output reinvested into the capital-goods sector itself. Notice that this percentage is nothing

but the ratio $\lambda/(1 - \lambda)$ applied in a two-sector context (see equation (16.3) in Section 2). In Lowe's approach, the crucial ratio is $\lambda = K_m/K_k$, namely the proportion of machine tools which is reallocated to the production of machine tools.

The Lowe ratio is more relevant than Fel'dman's for reasons related to the social description of the economy. Indeed, if the rate of industrialization is conceived only in terms of the ratio between investment in the capital-goods sector and investment in the consumption-goods sector, the latter, when referred to a predominantly agrarian society, must include all types of consumption items. In a socially underdeveloped economy the consumption-goods sector may include a great number of commodities which are not produced by modern industrial means. Thus, Fel'dman's definition of investment in the consumption-goods sector, especially when applied to Soviet Russia of the late 1920s, *de facto* encompasses investments which do not stem from the modern industrial sectors. It is obvious, then, that in such a society the share of investment going to the consumption-goods sector would appear to be disproportionately large. The Lowe model, by contrast, establishes a strict homogeneity within the industrial sector itself. The homogeneity is given by the existence of two capital-goods sectors operated by a homogeneous capital good called machine tool. The *modern* consumption-goods sector is spawned by the chosen value of the λ coefficient applied to the K_k stock, where $K_k = K_m + K_i$. It follows that the Lowe ratio, and not the Fel'dman ratio, is the appropriate variable for the planning of industrialization paths. An economy which cannot operate on the Lowe-based λ coefficent will not be in a position to determine any meaningful growth strategy.

16.4.3 Lowe and the Indian School

The Indian models of structural development due to Raj and Sen (1961) and elaborated upon by Naqvi (1963), addressed precisely this kind of question. As already noted, the models are formally close to Lowe's except for the fact that the Indian contributions contain a coefficient specifying the use of raw materials, while keeping the assumption of machines with an infinite lifetime.

As shown in Section 3 during the discussion of the downward traverse, the behaviour of the system is always determined by the particular value of λ. This is so because the economy is supposed to be sustained by its own machine-tools sector. As in Dobb's case, the Indian approach assumes the K_m sector to be initially non-existent or negligible. Machine tools come into being through the expenditure of a given amount of foreign exchange earnings, and/or a given amount of foreign grants. In the case of the Raj and Sen contribution, the structural vacuum manifests itself through the inability to operate upon λ, so that the planning authorities can only fix the share of consumption over national income.

With a negligible K_m sector, the grant – or given amount of foreign exchange – can be used to import either I or M machines. The possibility of importing the machines constitutes the condition for an undeveloped economy to become a Lowe-type structurally advanced system. Raj and Sen did not discuss the case in which the imported M machines are used for their own reproduction. Consequently, their model does not describe a full transition to a Lowe economy.

The need to adopt a conceptually homogeneous approach to the study of industrial production and of structural transformation emerges quite vividly from Naqvi's (1963) modification of the original Raj and Sen model. Naqvi analysed the case in which the given amount of foreign exchange is allocated to the importation of M machines which can then be allocated either to produce additional M machines and/or to produce I machines, thereby leading to a gradual development of the K_m and K_i sectors. In so doing, Naqvi discovered the Lowe coefficent λ (equal to K_m/K_k) and used it as a closure of his system. As in Lowe, the higher the value of λ, the higher the long-run growth rate. Unlike Lowe, however, he stuck to the assumption of machines with an infinite lifetime, which is an absurdity especially in a developing context, where no functioning modern resources are readily available.

The Indian models assumed, quite correctly, that the economy is so poorly endowed with industrial capital stock that cannibalization of equipment is unfeasible. The maximum expansion from within can come only from using the imported M machines to produce additional M machines. In this vein, Naqvi advocated quite a high value for λ obtained by curtailing the demand for modern, non-essential, consumption goods arising from the wealthy classes. It might seem reasonable, at this point, to neglect replacement requirements, since the imported M machines are new and are used to produce additional new M machines.

Common sense, not formal modelling, suggests the opposite. A developing economy has a higher rate of replacement requirements in its nascent modern sector than a mature industrial one. For one thing, such an economy has a poor receiving infrastructure for attending to the imported machines and an equally poor transportation system. The value of λ will be constrained by the need to use part of the imported machines for the construction equipment with which to build the required infrastructure. Meanwhile, because of the underdeveloped conditions of the society, the imported machines will suffer from a rate of wear and tear much higher than that prevailing in the countiy which has produced them. As a consequence, the actual value of λ will in great part be tied to produce the machines necessary to replace those being scrapped.

Within the structural approach adopted here, the only way in which an economy with little modern capital equipment can sustain a process of K_m expansion is by a constant stream of imports of M machines and of the

equipment needed to build the receiving infrastructure. To achieve this, either a very large amount of international public expenditure is needed and/or export markets have to be guaranteed.[8] The inability to utilize modern equipment because of structural bottlenecks in obtaining imported inputs and because of lack of proper maintenance was, indeed, a characteristic of the developing countries choosing inward-oriented industrialization. The situation has changed in the case of South-East and North-East Asian growth because the capacity to import capital goods (from Japan) has been tied to institutionally-arranged agreements concerning the capacity to export to the richer markets, especially to the United States (Lim, 1985; Woo, 1991; O'Brian, 1990; Halevi, 1993).

In conclusion, comparing the Dobb–India models to that of Adolph Lowe we can see that they are structural in form but not so much in content. In the case of Dobb (1960) the choice of technique result is obtained through the formidable assumption that machines are produced only by labour and by omiting structural discontinuities altogether (Halevi, 1987). After specifying structural relations in a consistent manner, the Raj–Sen–Naqvi models whittle them away by neglecting the socio-morphological constraints which in developing countries may lead to the simultaneous formation of a high rate of unused capacity and a high rate of decay through poor maintenance. Instead, these contributions take a romantic flight into the future by assuming that a given, once-and-for-all amount of grants, spent on the purchase of machine-tools M, can trigger the mechanism of endogenous industrialization. As will be pointed out in the concluding section, the Dobb–India approach is an expression of a specific developmentalist culture of the 1950s.

In the approach followed by Lowe, the morphological structure is homogeneous. The whole economy, and the societal relations sustaining it, is contained within the framework of the three-sector system of production. Once this framework is defined, structural relations govern each movement of the system through time. Thus, a developing economy is also subject, in its industrial component, to exactly the same structural processes as a mature one. Indeed, it is by sticking to Lowe's tight and coherent definition of structure that we were able to point out the limitations inherent in the models developed both by Dobb and by the Indian school.

16.5 Conclusions

In this chapter Lowe's approach has been put at the centre of the analysis of structural processes in both advanced and developing economies. As far as the former are concerned, the importance of Lowe's notion of complementarity and flexible specificity has been singled out by pointing to the limitation of Tugan-Baranovsky's theory of unlimited accumulation. Once Tugan-Baranovsky's reasoning is cast in terms of the physical conditions linking the two sectors of production, it is quite likely that his idealization

of boundless growth will, sooner or later, meet the barrier represented by the degree of complementarity between workers and machines, thereby leading to an overproduction of equipment *vis-à-vis* the existing labour force. This situation has, then, been taken to represent an inherent characteristic of a developed economy.

The third section, therefore, analysed the downward traverse by using Lowe's tripartite scheme. The main lesson is that even in a planned system, it is virtually impossible to secure full capacity during the transitional phase. In this context, the need for planning emerges from the necessity to stipulate a macro-objective constituted by the idea of full employment. Planning has also been associated with the price flexibility that would be missing in a mature capitalist economy (Kalecki). The traverse section argues, however, that price flexibility is not the central factor in the adjustment process, thereby confirming Hicks's view that prices cannot give much guidance about the planning of production and about the path to equilibrium (Hicks, 1985, p. 142).

At this point we may ask why full employment should be taken as a postulated macroeconomic goal if it does not constitute a natural objective of the system. The answer to this query must be found in the specific cultural framework in which growth theories were constructed in the first two decades of the postwar period. As Pasinetti observed long ago, the analysis based on a constant reference to full employment is justified 'because full employment is the situation that matters, and that, indeed, now-a-days forms one of the agreed goals of any economic system' (Pasinetti, 1974, pp. 119–20). In the same vein, Lowe stated that 'full employment has become the universally adopted aim of public policy in mature countries' (Lowe, 1976, p. 9). Twenty years later, there is enough political evidence for doubting the contemporary validity of those statements.

Just the same, within a cultural context which assumed full employment to be the real purpose of policy-makers, Lowe has succeeded in showing that in a system deemed to be dominated by the large size and the technical specificity of inputs, problems of capital formation and of capital liquidation (the downward traverse to full employment) govern the stages of the actual adjustment path. At this point the structural characterization of the economic system raises another question related to the separation of the technical relations from the social relations of the system.

The strict distinction of the material basis from the social framework has been a main feature of Marxian-inspired structuralist approaches. From Tugan-Baranovsky, to Lenin, to Fel'dman and to Preobrazhenski, intersectoral quantitative relations completely dominated over the social framework. In Lowe, instead of having the former guiding the latter, the study of structural movements is accompanied by the analysis of the motorial (behavioural) factors which are bound to prevail in any particular institutional setup. This is certainly an advancement over the material

determinism which has permeated Marxian economic thought. Moreover, Lowe has shown that the objective of full employment cannot be pursued in terms of aggregate demand policies but only through a structural approach. However, if full employment has ceased to be the 'agreed goal of any economic system' (Pasinetti), this was certainly due to factors connected to the social framework itself and the way in which structural transformations and social contexts mutually influenced each other. As a consequence, it seems to us impossible, today, to keep the institutional–behavioural study of the capitalist system on a separate, albeit parallel, plane from the quantitative-structural one. The need to rescue the great methodological teachings of Max Weber and of Werner Sombart – in which social stratification, political and institutional forms strictly interact with the phases of economic evolution – appears in all its importance precisely with the fading away of full employment as a guiding principle of public policy.

If in the mature economy full employment was seen to be firmly embedded in the objectives of policy-makers, in the formerly colonial areas *endogenous* developmentalism appeared to be the agreed goal of any country which achieved independence. The common element of this culture, which embraced nations comprising the vast majority of the planet's population, was the Soviet experience of industrialization. Regimes as different as those prevailing in China, India and Indonesia thought in terms of an economic takeoff based upon the severance of the colonial pattern of trade and on the priority which had to be assigned to domestic-oriented growth. The high point of this pathos was reached in 1955 at the first non-aligned nations' conference in the Indonesian city of Bandung, marked by the presence of Nehru, Chou En Lai, Sukhamo, Nasser and Tito, which advocated a form of development oriented towards the expansion of the internal market.

The models produced by Dobb and the Indian school can be said to represent the political economy of the Bandung conference. They are not a replica of the Soviet model, since, unlike Fel'dman's, they do not posit the prior existence of a capital-goods sector. Instead, they focus on how to start a process of growth without a sizeable machine sector and without a substantial flow of foreign exchange earnings. Heavily influenced by the type of structural approach developed by Lowe, these models fail twice. On the one hand they were not capable of taking full account of the structural relations which a Lowe-type method demanded, and on the other hand they did not offer any analysis of how those societies can traverse from the previous mode of production to the new desired one.

The importance of the study of the social framework is once more highlighted by the fading of that kind of economic culture. The developmentalism of the Bandung conference certainly did not fail because this or that model was not implemented correctly. Its demise was rather due to a much more complex array of social factors pertaining to the nature of intermediate regimes in developing countries (Kalecki, 1976; Halevi, 1992b).

In the light of the foregoing observations, Adolph Lowe's coherent morphological system, although suffering from a too strict separation between the technical–structural and the socio-motorial features of modern societies, has a significant cognitive dimension in relation to those processes which ushered in the demise of the Dobb–India perception of development. The cases of Japan and of East and South-East Asia, can be taken as examples of where Lowe's methodology has cognitive validity. These, however, are not examples of endogenous developmentalism in the sense of Bandung and of the Dobb–India models, but of the formation, through capital accumulation, of structural hierarchies at the international level.

A major feature of Japan's economic expansion during the era of high-speed growth was the allocation of industrial inputs on the basic of structural priorities. Steel output, for instance, was first planned in order to provide inputs to the metal and mechanical industries; later a new plan was devised aiming at producing steel suitable to the consumption-goods industries (Kosai, 1986). Protected by a set of international institutional arrangements guaranteed by the United States (Nester, 1990), Japan developed its industrial apparatus with a relatively low share of exports over national income, hovering around 10 per cent in 1956 and 11.3 per cent in 1970. This allowed Tokyo's authorities to focus on internal accumulation, thereby developing a vast array of machine-tools industries.

In the early 1970s, with the end of accelerated domestic growth, such a situation enabled Japan to become the dominant supplier of capital goods to the rest of Asia, a phenomenon aided also by Japanese direct investment abroad. The possession by Japan of a much wider core machine-tools industry is the single most important factor in generating a persistent balance-of-payment deficit towards Tokyo by high-export performers such as South Korea, Taiwan, Thailand and Singapore, and, more recently, China. The particular role acquired by Japan through its machine-tools sector in providing basic commodities to the region's industries is demonstrated also by the fact that Asia has become the largest source of Tokyo's balance-of-payment surpluses.

The analytical understanding of this historical development, truly the most significant in the evolution of capitalist formations during the present century, does demand a conceptualization of production *à la* Lowe where a strategic sector, the machine-tool one, determines the transition between different growth paths. In this sense, Lowe's traverse analysis represents the didactical exercise which enables the reader to grasp the structural roots of hierarchical relations.

Notes

1. The analysis of accumulation and consumption in terms of Marx's two-sector scheme influenced first Germany's and then Austria's Social Democrats, beginning with Karl Kautsky and ending (tragically) with Rudolf Hilferding. Yet, in Tsarist

Russia and in its empire, it gave rise to a veritable school of thought represented by Bulgakov, Tugan-Baranowsky and Lenin. The last of the disproportionality crisis theorists was Preobrazhenski, who published a formidable piece in Moscow by the end of the 1920s (Preobrazhenski, 1985).

2. This tripartite characterization of production is not alien to the *Russian current*, either. Lenin used it for descriptive purposes to argue against the *Narodniki*, that the impoverishment of the proletariat was not a symptom of crisis but an integral part of the capitalistic transformation occurring in Tsarist Russia (Lenin, 1893; Halevi, 1992a).
3. The above is nothing but a formalization and an adaptation to Tugan-Baranovsky's case of a verbal argument developed by Kaldor in 1938 on the basis of a two-sector model. Kaldor argued that even with technical progress, an economy producing at full capacity can hardly escape the possibility of investment crisis due to an overproduction of equipment (Kaldor, 1938).
4. The value of q represents the ratio between two heterogeneous stocks: the number of machines K_c already installed in the consumption-goods sector and the number of machines installed in the two capital-goods sectors. This is a perfectly meaningful ratio. If the number of machines in the consumption-goods sector is known and if β, α and d are also known we can determine the size of K_i and K_m necessary to keep the system in a stationary state.
5. A numerical example will help clarify Kalecki's reasoning. Assume a two-sector model where 80 machines are installed in the consumption-goods sector and 20 in the capital-goods one. Each machine employs one worker and the rate of depreciation is 10 per cent. Each machine in the capital-goods sector produces one machine. Thus, with $\lambda = 0.2$, the growth rate of capital stock is 10 per cent. Assume now that investment decisions in the capital-goods sector are such that only 15 machines are used. According to Kalecki's argument, the remaining five machines, and their related workers, ought to be transferred to the consumption-goods sector. It follows that the new value of λ will be 0.15. The growth rate of capital will then be 5 per cent. At the beginning of the new period, the total stock of machines will be made up of 105 units. If, meanwhile, the labour force has also grown by 5 per cent, and this rate is expected to continue for some time, the economy will be on a new full-employment growth path, provided λ remains at 0.15. This outcome is possible only because, as in Lowe's approach, each machine employs the same number of workers irrespective of its sectoral allocation. Assume now that a unit of equipment in the capital-goods sector employs one worker, but that two workers are employed by the machine installed in the consumption-goods industry (this is just a paradox, since if machines are homogeneous, it stands to reason to assume that they have the same degree of complementarity regardless of the sector where they are installed). In this case, the transfer of five machines to the consumption-goods sector would lead to a shortage of labour, engendering unused capacity there. By contrast, if the machine in the capital-goods sector were to employ two workers and that of the consumption-goods sector only one worker, the transfer would involve full capacity and unemployment because of insufficient equipment in the consumption-goods sector.
6. Kalecki's argument applies only to a two-sector model with uniform machine to labour ratios.
7. We will use Model (16.12) to (16.16), but with different labour-machine ratios, to prove our point. In this case equation (16.16) becomes:

$$E_{(0)} = [(n_m - n_i)\lambda_{(0)} + n_i]K_{k(0)} + n_c q_{(0)} K_{k(0)}, \text{ call: } n_m - n_i = h. \qquad (16.A)$$

Assume that from $t_{(0)}$ to $t + 1$ the labour force has grown by a rate g, less than the previous own growth rate and less than the growth rate of capital $\alpha\lambda_{(0)} - d = G$. For full employment to be maintained we have from (16.A):

$$E_{(t+1)} = E_{(0)}(1 + g) = (1 + g)[(h\lambda_{(0)} + n_i) + q_{(0)}n_c]K_{k(0)}. \tag{16.B}$$

This equation expresses the available supply of labour at time $t + 1$ in terms of the stock of capital at $t_{(0)}$ multiplied by the rate of growth g of labour. Now, by time $t + 1$ total equipment would have grown by $G > g$. Hence:

$$K_{k(t+1)} = K_{k(0)}(1 + G),\ K_{c(t+1)} = K_{k(0)}q_{(0)}(1 + G), \tag{16.C}$$

adding up gives:

$$K_{k(t+1)} = K_{k(0)}(1 + G)\ (1 + q_{(0)}) \tag{16.D}$$

The expression in bold in (16.D), must fetch the quantity of workers resulting from the expression in bold in equation (16.B). Thus, writing Φ for the bold part of (16.B), we have:

$$\Phi = K_{k(0)}(h\lambda_{(t+1)} + n_i + q_{(0)}n_c)(1 + G), \text{ call the right-hand side of (10.E), } \Omega. \tag{16.E}$$

In Lowe, as shown in Model (16.12) to (16.16) in the text, the possibility for changing q when the growth rate of labour changes depends on the ability to change λ. Thus $\lambda_{(t+1)}$ is the unknown to be found. Endogenously this can happen only if h is positive or negative. An Uzawa result requires a positive h. If h is zero, the value of $\lambda_{(t+1)}$ cannot be found by equating Φ with Ω. In fact, with $h = 0$, λ vanishes in both Φ and Ω, yet the coefficient n_c is still different from the uniform labour–machine coefficient of the K_k sector.

8. Little attention has been paid to the fact that the industrialization of South Korea in the 1960s was indeed based on the priority given to heavy industry sustained by very particular conditions heavily determined by American international public expenditure. On the financial plane, its external debt was absorbed by the United States; US expenditure during the Vietnam War generated military procurements directly and exports indirectly, through US aid to South Vietnam. Throughout the 1960s more than 90 per cent of the steel and more than 50 per cent of the transportation equipment exported by South Korea was shipped to South Vietnam (Halevi, 1993; Woo, 1991).

References

Bhaduri, A. (1973), 'A Study of agricultural backwardness under semi-feudalism', *Economic Journal*, **83**, March, pp. 120–37.

Colletti, L. and C. Napoleoni (1975), *Il marxismo e il crollo del capitalismo*, Rome: Laterza.

Dobb, M. (1960), *An Essay on Economic Growth and Planning*, London: Routledge and Kegan Paul.

Erlich, A. (1960), *The Soviet Industrialization Debate*, Cambridge, Mass.: Harvard University Press.

Foley, D. and M. Sidrauski (1970), *Monetary and Fiscal Policy in a Growing Economy*, London: Macmillan.
Fukuoka, M. (1955), 'Full employment and constant coefficients of production', *Quarterly Journal of Economics*, **69**, pp. 23–44.
Gandolfo, G. (1970), *Mathematical Methods and Models in Economic Dynamics*, Amsterdam: North-Holland.
Hagemann, H. (1992), 'Traverse analysis in a post-classical model' in J. Halevi, D. Laibman and E. J. Nell (eds), *Beyond the Steady State. A Revival of Growth Theory*, London: Macmillan, pp. 235–63.
Halevi, J. (1987), 'Investment planning', in J. Eatwell, M. Milgate and P. Newman (eds.), *The New Palgrave. A Dictionary of Economics*, London: Macmillan, Vol. 2, pp. 994–7.
Halevi, J. (1992a), 'Accumulation and structural disequilibrium', in J. Halevi, D. Laibman and E. J. Nell (eds), *Beyond the Steady State. A Revival of Growth Theory*, London: Macmillan, pp. 264–88.
Halevi, J. (1992b), 'Asian capitalist accumulation: from sectoral to vertical integration', *Journal of Contemporary Asia*, **22** (4), pp. 444–70.
Halevi, J. (1993), 'Croissance Asiatique et demande effective' (Asian growth and effective demand), *Revue Tiers Monde*, **34** (135), pp. 531–43.
Hicks, J. (1985), *Methods of Dynamic Economics*, Oxford: Clarendon Press.
Kaldor, N. (1938), 'Stability and full employment', in N. Kaldor (ed.), *Essays on Economic Stability and Growth*, London: Duckworth, 1960, pp. 103–19.
Kaldor, N. (1956), 'Alternative theories of distribution', *Review of Economic Studies*, **23**, pp. 83–100.
Kalecki, M. (1971), *Selected Essays on the Dynamics of the Capitalist Economy, 1933–1970*, Cambridge: Cambridge University Press.
Kalecki, M. (1976), *Essays on Developing Economies*, Hassocks: Harvester Press.
Kosai, Y. (1986), *The Era of High Speed Growth*, Tokyo: Tokyo University Press.
Lachmann, L. (1956), *Capital and its Structure*, London: London School of Economics and Political Science.
Lenin, V. (1893), 'On the so-called market question', in *Collected Works*, Vol. 1, Moscow: Progress Publishers, 1968.
Lim, H. (1985), *Dependent Development in Korea*, Seoul: Seoul National University Press.
Lowe, A. (1955), 'Structural analysis of real capital formation', in M. Abramovitz (ed.), *Capital Formation and Economic Growth*, Princeton: Princeton University Press, pp. 60–106.
Lowe, A. (1976), *The Path of Economic Growth*, Cambridge: Cambridge University Press.
Merhav, M. (1969), *Technological Dependence, Monopoly and Growth*, New York: Pergamon.
Naqvi, K.A. (1963), 'Machine tools and machines. A physical interpretation of the marginal rate of saving', *Indian Economic Review*, **6**, February, pp. 19–28.
Nester, W. (1990), *Japan's Growing Power over East Asia. Ends and Means*, London: Macmillan.
O'Brian, L. (1990), 'Indices of industrialization: capital goods production in Malaysia', *Journal of Contemporary Asia*, **20** (4), pp. 509–21.
Pasinetti, L. (1974), *Essays on Growth and Income Distribution*, Cambridge: Cambridge University Press.
Patnaik, P. (1972), 'Disproportionality crisis and cyclical growth – a theoretical note', *Economic and Political Weekly*, **7**, Annual Number, February, pp. 329–36.
Preobrazhenski, E. (1985), *The Crisis of Capitalism*, Armonk, NY: Sharpe.
Raj, K.N. and Sen, A.K. (1961), 'Alternative patterns of growth under conditions of stagnant exports earnings', *Oxford Economic Papers*, **13**, February, pp. 43–52.
Woo, J. (1991), *Race to the Swift. State and Finance in Korean Industrialization*, New York: Columbia University Press.

Appendix

Models A and B

Assume a Lowe system which at time $t_{(0)}$ is characterized by 400 machines in the consumption-goods sector and by 100 machines in the K_k sectors capable of reproducing one machine each. Assume also a rate of depreciation of 10 per cent and a uniform machine to labour ratio of one. Total employment will be 500 persons. Consider now the case that from any period leading up to $t_{(0)}$ the system was growing at a rate of 10 per cent annually. If this rate were to last, the stock of 100 machines in the K_k sector would have to be distributed in a proportion of 0.2 to the K_m sector and of 0.8 to the K_i sector. But, assume that at time $t_{(0)}$ information is obtained that the growth rate of labour declines from $t_{(0)}$ onwards from 10 per cent to 5 per cent per annum. We then have from equation (16.21) the new value of $q = q^* = \beta\sigma^*/\alpha\lambda^* = (1 - 0.15)/0.15$. The economy will now traverse towards this ratio on the basis of the following strategy: all the capital goods in the consumption-goods sector are kept fully utilized, at $t_{(0)}$, the K_m machines are shifted towards the K_i sector so as to raise the latter to 0.85 of the total K_k stock. This case corresponds to Model A; whereas if it is assumed that all the K_m stock is shifted for two periods to the K_i sector, we obtain Model B. In both instances, the output–capital ratio in the K_m and the K_i sectors is one and the rate of depreciation d is equal to 10 per cent. E is employment and n is the uniform labour–machine ratio.

The numerical example in Model A shows that by distributing at time $t_{(0)}$ the K_m and K_i components of the K_k stock according to the new estimated growth rate of employable population E, the system will pile up a given quantity of K_k equipment without being capable of reabsorbing it. In Model B, after withdrawing the stock of machines from K_m altogether for two periods, the system is capable of reabsorbing virtually all the unused equipment within three periods.

Model C

A third model, Model C, can be labelled neoclassical because it is based on the same assumption as Uzawa's famous two-sector model. In order to obtain convergence in the neoclassical two-sector model it is necessary that the capital-goods sector be more labour-intensive than the consumption-goods sector. In a Lowe context, this assumption requires that the intermediate investment sector K_i be more capital-intensive. Furthermore, the higher the degree of automation in the consumption-goods sector the better, precisely because the capital goods installed in it are heterogeneous. Thus,

Table 16A.1 The traverse in the Lowe model

	Model A periods			**Model B periods**			
	$t_{(0)}$	t + 1	t + 2	$t_{(0)}$	t + 1	t + 2	t + 3
E	500	525	551	500	525	551	579
K_m	15	λ*80	λ*83	0	0	11	13
K_i	85	σ*80	σ*83	100	65	61	74
K_c	400	445	468	400	460	479	492
Unused equipment	0	25	26	0	25	11	5

Notes: λ* = 0.15; σ* = 0.85; n = 1; (α, β) = 1; d = 10 per cent; growth of E is 5 per cent from $t_{(0)}$.

we built a Lowe–Uzawa model in which, as in A and B, there are 500 machines of which: 400 are in the consumption-goods sector each employing one worker, 80 are in the K_i sector employing two workers each, and 20 are in the K_m sector employing three workers each. All the other parameters, α, β, d and the new growth rate of E are the same as in Models A and B. However, the neoclassical modification of Lowe's model does not yield the same results as Uzawa's. In the Uzawa model, whenever there is a disequilibrium between equipment and labour, the homogeneity of capital allows for a reshuffling of the stock according to relative factor intensities. This is not possible in a Lowe model, where the capital goods produced by the intermediate sector K_i cannot be shuffled around. Thus, even the neoclassical Lowe economy has to anticipate in advance the fall in the supply of labour. Model C assumes that the economy begins its adjustment at $t_{(0)}$, that is, one period before the fall in the growth rate of E shows up. We start with the assumption that all the K_m stock is shifted to the K_i sector, which will initially create unemployment because of the lower labour-machine ratio in the K_i sector. This unemployment is of no consequence for the structural evolution of the model. Call n_m, n_i, n_c the employment capacity of one machine installed in the K_m, K_i and consumption-goods, K_c, sectors, respectively. We then have: $n_m = 3$, $n_i = 2$, $n_c = 1$; furthermore the economy arrives at $t_{(0)}$ with 620 workers, the latter being the expression of a previous growth rate of 10 per cent. The adjustment to 5 per cent is as follows.

In this model, unlike Models A and B, the value of λ emerges, from period to period, as the solution to the allocation of capital goods and it is determined in each period as follows. For full employment to be attained, it is necessary that once workers have been allocated to operate the specific machine of the consumption-goods sector, the rest will find jobs in the two capital-goods sectors:

$$L - E_c = E_m + E_i = E_k \tag{16A.1a}$$

$$E_k \leq (L - E_c), \tag{16A.1b}$$

where L is total labour force.

$$E_k = [(n_m - n_i)\lambda + n_i]K_k \tag{16.A.2}$$

$$h = n_m - n_i. \tag{16.A.3}$$

Table 16A.2 The traverse in the Uzawa–Lowe model

Model C Uzawa + Lowe		**periods**			
		$t_{(0)}$	$t+1$	$t+2$	$t+3$
L = labour force	L	620	651	683	718
$E_m = n_m K_m$	K_m	0	11	6	10
$E_i = n_i K_i$	K_i	100	79	86	79
$E_c = n_c K_c$	K_c	400	460	493	530
$L - \Sigma E$ = unemployment	U	20	0	0	0

Substituting (16A.2) and (16A.3) into (16A.1) and solving for λ, we obtain:

$$\lambda = (L - E_c - n_i K_k)/hK_k. \tag{16.A.4}$$

In (16.A.4), L is known as well as E_c and K_k. In a Lowe framework, E_c and K_k are determined by the stocks existing in the previous period. Thus, given n_c employment in the consumption-goods sector, E_c, is determined by the total amount of K_c in the previous period less its own wear and tear plus the amount of equipment produced by the K_i sector of the previous period. Likewise, today's K_k is equal to the previous period's K_k plus the output of the previous period's K_m less the wear and tear of the previous period's K_k.

If in the Uzawa version of Lowe's model λ comes out as the solution to the allocation problem, its value is likely to fluctuate heavily. This can be checked by extending the above numerical example over many periods, while keeping the growth rate of labour at 5 per cent. To attain an Uzawa solution such an economy will have to be hyper-planned, since it will not be able to sustain a high rate of fluctuation in the value of λ and yet remain stable. In this context it seems better to stick to Lowe's assumption of uniform labour–machine ratios which implies that λ is a strategic variable. In fact, in Models A and B, λ does not emerge as the solution, the new growth rate and the coefficients of production give us the new terminal value of λ. Its attainment is determined simply by weighing different possible adjustment paths, as shown in Model A and Model B.

17
Lowe, Dobb and Hicks

Joseph Halevi

17.1 Introduction

John Hicks coined the term "traverse" in his book *Capital and Growth* to describe the process of transition from one equilibrium growth path to another. A structural approch to this transition raises the question of whether the several sectors of the whole economy behave in a synchronic or a-synchronic manner.

This question was raised and discussed more than a decade before the publication of Hicks' work in two remarkable articles written by Adolph Lowe. These articles were themselves the continuation of theoretical and empirical research conducted by the author at the University of Kiel in Germany in the 1920s. More recently, the ideas contained in those writings were brought together in a fully fledged theory of discontinuous growth in a book which Lowe titled "*The Path of Economic Growth*."

The basic structure of Lowe's approach is to represent the economy in terms of reproduction conditions, which is a marked departure from the theory of factor proportions. In his early writings and in the first part of the book, Lowe sets out a stationary model and asks what must happen for such an economy to absorb a sudden increase in the labour force. This question represents the simplest formulation of the traverse problem, which will be discussed in the next section.

Lowe's 1955 monograph was of crucial importance for Dobb's theory of planned growth for underdeveloped countries, today known as the Dobb-Sen model. (Dobb 1960, Sen, 1960). Yet, the way in which Dobb used Lowe's model raises the issue of the links between choice of techniques and structural proportions. This matter is discussed in the third section of this chapter where it will be argued that intersectoral relations condition the very choice of techniques.

Revised from *Eastern Economic Journal*, 10(2): 157–167, 1984, 'Lowe, Dobb and Hicks' by Halevi, J. With kind permission from Palgrave Macmillan. All rights reserved.

Because of the similarities between the Dobb and Hicks models with respect to reproduction conditions, the latter will also be analysed in that section.

17.2 Change of Coefficients and Structural Proportions

Lowe's 1955 paper presented a model based on strict circularity and flexible specificity of production. The strict circularity condition is necessary in order to account for the intersectoral input output relations of the system, which determine the way in which the economy reproduces itself. In this context Lowe identifies the machine tool sector as that branch of the economy which can reproduce itself as well as produce machines for different uses. Hence in addition to themselves machine tools produce capital goods which can only be installed in the consumption goods sector. Flexible specificity arises from the dual utilisation of machine tools and from the single use of the machine designed for the consumption sector. To anticipate a point which will be made in the next section, the above mentioned type of specificity is required in order to keep the picture of economic activity as a circular process; ie. if every capital good were specific the only sequence possible would be linear, with no structural feedback.

The basic model starts from the assumption that the system is in a stationary state and it can be formalized as follows. Let K_m, K_I, K_z be the capital equipment in the machine tool, investment and consumption good sectors, respectively. The stocks K_m and K_I are physically homogenous and K_z, which is the result of the output generated by K_I, is heterogenous vis a vis the rest of the capital stock since it can produce only items of consumption. Each sector is vertically integrated, i.e., it produces its own raw materials. Moreover, the output of each sector consists of only one type of commodity, so that, for instance, the consumption good can be represented as corn, and the investment good as tractors, while machine tools constitute the equipment necessary to produce tractors as well as the means of production which are needed to reproduce those machine tools themselves.

Let $\alpha\ \beta\ \gamma$ be the output coefficients of the capital stock in each sector, u the uniform rate of depreciation, M, I, Z the respective outputs and a, b, c the labour coefficients for each unit of output in the respective sectors. Under stationary conditions we have:

$$M = \alpha K_m = u(K_m + K_I) \tag{17.1}$$

$$I = \beta K_T = uK_Z \tag{17.2}$$

$$Z = \gamma K_Z = z(aM + bI + cZ) = (\gamma/u)\ I \tag{17.3}$$

The per capita rate of consumption is z defined in Sraffian terms, i.e. as being above subsistence.

The same structural relations would hold in the case of a uniformly growing economy, provided we add the increments in K_m, K_I and K_z to eqs. (1) and (2). Given the coefficients of production, if the economy experiences growth the rate of per capita consumption z will be lower than in eq. (3). Hence the state of the economy described by eqs (1), (2) and (3) corresponds exactly to what the late Joan Robinson termed a state of bliss; in this situation there is no longer any objective need for capital accumulation. (A similar line of thought is inherent in Keynes' recommendation that capital goods be made so abundant that the marginal efficiency of capital is reduced to zero, which leads to the disappearance of a rate of return on accumulated wealth.)

From eqs. (1) and (2) it is inferred that:

$$\frac{M}{I} = q = \frac{u\alpha}{\beta(d-u)} \text{ implying: } \quad \frac{dq}{d\alpha} < 0; \quad \frac{dq}{d\beta} < 0 \tag{17.4}$$

$$Z\frac{(1-cz)}{(z)} = aM + bI \tag{17.5}$$

Equation (17.5) formed the basis for Dobb's analysis of the choice of techniques in a planned developing economy. It states that employment in the investment industries is determined by the surplus in the consumption sector, divided by the per capita rate of consumption z. A lower z, however, does not increase aM + bI *ipso facto*, but rather creates the conditions for such an expansion because a smaller proportion of machine tools has to be allocated for the production of equipment-producing means of consumption.

The expression for the rate of per capita consumption now taken as the dependent variable, reads:

$$z = \frac{x}{aq + b + cx}; \quad \text{where: } \quad \gamma/u = x \tag{17.6}$$

In Lowe's tightly integrated structural framework z is always a dependent variable, whereas it is a parameter for Dobb. Hence, while Dobb used Lowe's model as the starting point of his analysis, the change in the assumption about z led Dobb to modify implicitly Lowe's basic approach.

From equation (17.6) it follows that z is positively related to changes in the production coefficients and negatively related to changes in labour coefficients. Yet if, for instance, there is a fall in labour coefficients, only the increase in z will prevent the problem of effective demand for consumption and then capital goods from making its appearance, but it will not prevent the emergence of unemployment. Equipment is fully utilised in a technical sense and the increase in the rate of per capita consumption assures that no shortage of demand for consumers' goods exists, which in turn guarantees

no deficit in the demand for capital goods. Nevertheless, there is unemployment. The problem of the traverse begins here with the question of how to absorb the unemployed.

Clearly, the preceeding question is of a social rather than strictly economic nature. The system, as such, is in equilibrium in the goods market and therefore there are no economic forces at work to alter the investment process. It should be stressed that an economy of this kind is not capitalistic since all the productivity increment (fall in labour coefficients) goes into higher wages. The model of the economy is closer to that of a cooperative-Kibbutz in which collective labour works side by side with hired wage labour, but it is the former that enjoys most of the fruits of technological advances.

The assumption of a Kibbutz type of cooperative economy provides a useful basis for the study of the traverse under stationary conditions. It is possible to postulate that, as equipment wears out, its replacement will display lower labour coefficients but unchanged output coefficients. The process is carried out until all equipment is recast, after which every unit of replacement equipment has the same labour coefficient as the corresponding machinery going out of use. If, for the simplicity, we assume labour coefficients to change only in the two investment goods sectors, the size of the labour force in the consumption goods industry is unaffected. From equation (17.3) we see that the amount of labour discharged when recasting ends is:

$$U = I\,[b - b^* + q\,(a - a^*)]; \text{ where U is unemployment, where } a^* \text{ and } b^* \text{ are the new coefficients} \tag{17.7}$$

Once recasting is completed and the system settles at the new coefficients a^* and b^*, unemployment is equivalent to an exogeneous one-time increase in the supply of labour to an otherwise fully employed system.

The main obstacle to the absorption of unemployment lies in the division of the labour force between cooperative members and hired workers since it is from within the latter group that unemployment arises. From a structural point of view the terminal equilibrium conditions for the traverse process are, however, already known. The proportions between the sectors, after absorption is completed, remain exactly the same in all the three equilibrium positions. This is not difficult to verify; given the output coefficients, the ratios M/I and I/Z must be the same in all three cases (see equations (17.1) and (17.2)). The traverse process consists therefore in raising the capital stock K_m producing machine tools to the new equilibrium determined by the percentage increase in the employable labour force; i.e. by U/E. Having reached its new required level K^*_m, the machine tool sector will devote all its net output to building up the capital stock in the intermediate sector. As the latter sector's equipment attains K^*_I, it will set in motion the process by which machinery in the consumption goods sector will be lifted to K^*_z. Once all the three sectors have come to the terminal position of full employment

and zero rate of accumulation, the rate of per capita consumption z will equal the rate prevailing when recasting was completed. (See equations (17.6) and (17.7).)

The obstacles arise from the fact that, in so far as the community is divided into cooperative members, who therefore own the means of production and make decisions about them, and wage labour, it may not be convenient for owners to undergo the hardship of expanding the stock of capital in order to absorb redundant workers. To raise K_m to K^*_m it is necessary to withhold a part or all of replacement equipment going to K_I. The new level of the capital stock in the machine tool sector will be:

$$K^*_m = M\left\{1+\frac{1}{\alpha}[1-u+\delta(a-u)]\right\};$$ where δ is the coefficient of nonreplaceament of capital stock K_I. (17.8)

As a consequence, the stock of equipment K_I shrinks by δu, causing a transfer of labour from the intermediate to the machine tool sector.[3] Likewise, the stock of capital installed in the consumption goods sector will decline in the wake of the shrinkage of its source of equipment. It follows that the supply of consumption goods will also decline while the economy is set on a path of expansion for both capital and employment.

If we assume that the construction period of every unit of equipment is one time unit, then the increase in employment will take place ahead of the recovery in the output of consumption goods, which causes a fall in z relative to its level at the end of the recasting phase. Indeed, during the whole transition period z will remain below that level. Moreover, any significant fall over time of the labour coefficients increases the pressure on the machine tool sector if surplus labour is to be remployed.

Two cases can be identified out. The first relates to the possibility of raising K_m to K^*_m in just one period by withholding replacement of K_I altogether. This means that the coefficient in equation (17.8) is equal to one. The second case arises when K^*_m cannot be attained in the single period even when $\delta = 1$. Strictly speaking, the possibility remains of mobilizing part of the equipment which comprises the stock K_I (which is homogenous with K_m), to bring K_m to its new required level. Yet this option implies a decline in replacement equipment flowing to the consumption sector, which will cause a drastic and sudden contraction of consumption goods output.

In all the cases considered above those who control the means of production face the option of either going through a period of reduced consumption in order to expand the stock of machinery necessary to absorb the unemployed, or foregoing a part of their current consumption by diverting it in exchange for "unskilled" services to the unemployed.[1]

In the above framework redundant labour cannot be reabsorbed via a fall in wages. Equipment and labour remain in a strict relation of

complementarity even when labour coefficients change. This change is brought about by the installation of new machinery as the old is worn out, so that the economy gradually moves from one degree of complementarity to another but cannot move back and forth without continually restructuring its equipment. If wages were to remain unchanged by the end of the recasting period, the unemployment caused by the fall in labour coefficients would become worsened as a result of the lack of effective demand for consumption goods. This proposition would be true *a fortiori* if unemployment had led to a fall in wages.

17.3 Dobb and Hicks

Maurice Dobb made use of Lowe's stationary model not to analyse the process of traverse but to discuss the question of the choice of techniques under planned development. His main objective was to argue against the theory of factor proportions. This was done by simply postulating that the wage rate will not fall to zero even with an unlimited supply of labour; more specifically, the minimum subsistence wage in industry cannot be the same as in the agricultural sector.[2] Moreover, if the supply of consumption goods is inelastic because of the limited production capacity of the industrial sector, the rate of per capita consumption of the industrial workers, (i.e. what we called z) will in fact become a parameter. From equation (17.5) we see that if Z and z are given the only way to expand M and I is to chose a technique of production which lowers the labour coefficients a and b.

The three sector division is used by Dobb to discuss the case in which all investment effort is put into the self expansion of the machine tools sector, which is a process that implies a gradual absorption of K_I by K_m (they are homogeneous so that K_I can be shifted to the machine tool sector). Given the limited supply of consumption goods the expansion of investment cannot take place except in the above mentioned way. For z to remain constant under conditions of a given flow of consumption goods Z, the shift in employment must occur only within the investment sector; that is, it would occur through absorption of workers and equipment in the I sector by the M sector, since any withdrawal of labour from the consumption goods sector will reduce the flow of output. The subdivision of the investment sector into two branches therefore becomes necessary in order to account for the distribution of the labour force changes.

Dobb's analysis rests on the assumption that capital goods last forever; the circularity of production is thus broken since the relation between the output of capital goods and replacement requirements disappears. If circularity is maintained, the rate of per capita consumption z again becomes a dependent variable. Any shift in the composition of capital stock away from K_I and toward K_m will reduce the rate at which I flows into Z, negatively affecting the rate of per capita consumption. If Dobb's hypothesis about K_I being

progressively drawn into K_m were to be applied under conditions of circularity, the outcome would be to halt replacement investment in the consumption sector, with a consequent shrinkage in K_z and an inevitable fall in Z.

We have thus arrived at exactly the same conclusion as the previous section, in which a change in the labour coefficients generated surplus labour, requiring intersectoral shifts with temporarily lower real wages in order to reabsorb redundant labour. The difference consists in the degree of development of the economy under consideration. In the previous case the starting point was already "a state of bliss," whereas now the constraint on productive capacity is a major obstacle to the attainment. Within a framework of circular production, the problem which predominates is the maximum length of time during which a fall in the supply of consumption goods is compatible with the diversion of investment toward the machine tool sector. It follows that the dynamics of structural proportions determines the type of technique in use since these occur only through changes in the composition of investment.

We have seen that Dobb used the basic elements of Lowe's scheme to build a model in which accumulation is based on a technique of production which does not increase employment to a degree which affects the rate of per capita consumption of the employed population. This treatment of capital goods as having an infinite lifetime and flexible form limits the structural analysis to considering only the composition of the labour force, which greatly reduces the importance of intersectoral proportions with respect to the choice of techniques. However, Dobb's effort does correspond to an objective economic problem, that of guiding accumulation in countries which cannot "afford" it because of their limited productive capacity.[3]

In chapter 16 of *Capital and Growth*, John Hicks presents a model which, like Dobb's, assumes equipment of infinite life but, unlike Dobb's, makes the growth rate depend exclusively on the growth rate of population. The economy achieves a quasi state of bliss. Accumulation has to provide the whole labour force with the means of production necessary to maintain full employment. The problem of the traverse thus arises whenever there is a change in the growth rate of the labour force, since the output of machinery must be just enough to absorb the additional workers.

If, to use an expression employed by Hicks, the "Principle of Variation" is assumed to be the central tenet in economics, the question of the traverse would not even arise, nor would the problem of intersectoral proportions. As Hicks wrote in 1932: "The marginal productivity theory assumes that a change in the relative prices of the factors will always be followed by some change in the quantities of the factors employed, that is to say, it assumes that technical methods are freely variable. For if that is not the case, it will be impossible to reorganise a business effectively with one unit less of one factor but with the same quantity of the others." (Hicks, 1932, p. 80). Fixed coefficients of production highlight the fact that the economy is stuck with

a given set of equipment geared to definite uses, so that changes can take place only through gross investment. Thus, when Hicks cast his argument in terms of a two sector fixed coefficients model, (explicitly acknowledging that when it comes to the utilization of equipment fixity prevails over flexibility) it marks an important change in assumptions used to analyze the economic activity.

In relation to Lowe's system, Hicks's procedure can be assessed, as far as reproduction is concerned, on lines similar to those followed in the discussion of Dobb's approach. The assumption that equipment is of infinite durability is even less legitimate than in Dobb's case. In the latter there is a specifically defined historical circumstance in countries in which growth cannot be facilitated by lowering the already meager consumption standards. This explains Dobb's penchant for a model in which higher accumulation is compatible with a technique of production which is not based on still lower rates of consumption. In contrast, Hicks excludes any historical specificity from his model. The mission of reproduction is therefore particularly serious.

Marx defined reproduction in the following terms:

> "The conditions of production are also those of reproduction. No society can go on producing, in other words, no society can reproduce, unless it constantly reconverts a part of its products into means of production, or elements of fresh products. (...) Hence a definite portion of each year's product belongs to the domain of production. Destined for productive consumption from the very first, this portion exists, for the most part, in the shape of articles totally unfitted for individual consumption." (Marx, 1977, V. 1, p. 531).

The implications of the absence of circular reproduction emerge in a strikingly clear manner when Hicks's assumption of equipment of infinite durability is applied to Lowe's model under conditions of zero growth. The capital stock in the two investment sectors would be zero in this case, the only equipment in operation being that installed in the consumption goods sector. Such equipment is absolutely specific in the model, which means that the system is totally incapable of responding to an exogeneous increase in the supply of labour. No machinery could be used for the expansion of capital stock, since there would not be any equipment technically fitted to perform a process of reproduction. By the same token the economy would not possess any means to account for technical change (in the previous section technical change was caused by replacement equipment embodying lower labour coefficients).

Strictly speaking this problem does not arise in Hicks's framework because his model is based on one homogenous capital good which can be allocated to either the capital or the consumption goods sector. Hence with infinite durability of equipment it is always possible to switch part of the latter

back to the production of capital goods. However, in this way structural constraints are virtually eliminated. The only serious obstacle to an adjustment process comes from so large an increase in the influx of labour that a backward switch to the production of capital goods would require a fall in the rate of per capita consumption below subsistence.

The above considerations help put Hicks's model and the shortcomings of his treatment of the traverse into perspective. For Hicks, transition to a higher or lower rate of growth and equilibrium is dependent on the workforce machine ratios of the two sectors. Given a change in the rate of population increase, full utilization and full employment are maintained and the growth rate of capital stock converges towards the new growth rate (determined by the increase or decrease in the rate of growth of population). Hence, at the beginning of each period the proportion of total equipment allocated to each sector must be such that the total capital stock employs the total labour force, even if the latter has increased, more slowly or more quickly than capital equipment relative to the previous period. We can, therefore, write:

$$[N_{kvt} + N_z\,(1 - v_t)]\,(1 + r) = [N_k v_{t-1} + N_z\,(1 - v_{t-1})]\,(1 + g);\ r \neq g \qquad (17.9)$$

Where N_k and N_z are the number of workers per machine in the capital and consumption goods sectors respectively; v is the share of capital stock in the capital goods sector over total capital stock; r and g are the growth rate of capital equipment and of population.

Equation (17.9) states the condition necessary to maintain full employment where the unknown is v_t, i.e. the new distribution of equipment between the two sectors. It is clear that a solution for (9) requires that $N_k \neq N_z$ since:

$$v_t = v_{t-1} + \frac{N_z(1+q)}{N_k - N_z(1+r)} - \frac{N_z}{N_k - N_z} \qquad (17.10)$$

From equation (17.10) it follows that successive changes in r will cause it to converge to g as long as $N_k - N_z > 0$, i.e. as long as the machinery in the capital goods sector employs more workers than that of the consumption goods sector. This result is known as the "capital intensity theorem" on which the smoothness of Hicks's adjustment mechanism depends.

This result is essentially non-economic because it makes the entire investment process a passive by-product of the technological specifications of the model. Moreover, the most plausible case, specifically, that an already fully employed economy with no spare capacity cannot absorb an increment to the labour force in excess of that compatible with the growth rate of equipment, can only be dealt with within the very special case of uniform worker machine ratios. In fact, from equation (17.9) it follows that if $N_k = N_z$, the equation can be satisfied only for r = g, which means that the model economy cannot cope smoothly with a divergence between the rate of growth of capital stock and labour. This situation should be considered as an important,

if not general case, though, it is paradoxically brought to light only when the labour-machine ratios are uniform in Hicks's framework.

The following observations can therefore be made: By eliminating reproduction (a) Hicks' model obliterates the constraints arising from the technical composition of capital, (b) At the same time it gets bogged down in a series of special cases arising from the relative labour machine ratios in the two sectors. The latter is the most interesting case because it implies that the economy cannot adjust immediately although it does not preclude adjustment in the future.

The formidable assumption of one physically homogenous machine able to produce everything, with different labour coefficients according to the sector in which it is put to work, lies at the heart of the ambiguities of Hicks's construction. Is it possible to build a model in which the mechanism of adjustment does not depend on whether the worker machine ratio is greater, smaller or equal to that of the other sector? If the answer is affirmative, then the dynamics of investment is free from technological determinism, while the amount of investment is conditioned by the structural composition of equipment prevailing at any one time. Lowe's model supplies the answer to this problem although he did not specifically tackle the Hicksian formulation of the traverse.

In Lowe's model it is absolutely legitimate to assume that M, the output of machine tools, has only one type of labour-machine coefficient. In point of fact, M is physically homogenous and is either used to reproduce itself and/or produce I, the equipment going to form the capital stock in the consumption goods sector. Hence it is legitimate to conclude that each of the identical machines will employ a given crew; likewise each unit of I, physically different from M, will employ a given crew, numerically different from the crew operating M. Since the integral of past M, net of wear and tear, represents the stocks ($K_m + K_I$) and since the integral of past net I is the stock K_z, it follows that the argument holds true also for ($K_m + K_I = K_k$) and for K_z.

This means that in Lowe's framework an equation like (17.9) in the Hicksian case, is necessarily an inequality (except when r=g) independently of whether the crew operating K_k is equal or unequal to the crew operating K_z.[4] A difference in the labour-machine ratios is not relevant to the system's structural response to an exogenous variation in the growth rate of the labour force in a two sector model. As a consequence, if growth of the labour force declines, unused capacity is bound to appear; in this case the employment capacity of equipment is greater than the total available labour force. Conversely, an increase in the growth rate will make unemployment unavoidable since the employment capacity of machines falls short of the available workforce. The same argument can be applied to technical progress because, as we have seen in the section discussing the basic stationary model, technical progress of a labour saving type can be reduced to an exogenous increase in the labour force.

The transition to a new equilibrium depends exclusively on the institutional characteristics of the system. In the case of a fall in the growth rate of the labour force, excess capacity can lead to a further fall in investment and employment if the economy is a capitalist demand determined economy. In a socialist system, by contrast, the central policy issue would be how to distribute the amount of unused capacity with the objective of avoiding a situation of capital dealth in subsequent period, a situation which can arise from the concentration of unused capacity exclusively in the machine tools sector. (Halevi, 1981)

17.4 Concluding Remarks

The strong point of Professor Lowe's model lies in the elimination of technological determinism in the process of transition from one phase to the next. This is achieved with remarkable simplicity by assuming two capital goods sectors with a homogenous stock and a consumption goods sector with a totally specific stock of machines. The specificity of capital in the latter sector gives rise to a structural lag which can be extended to take into account different production periods between that required for machine tools and that required for building the machine going to the consumption goods sector. Clearly such a distinction is impossible in a two sector model in which equipment flows from a single department of production.

A legitimate question can now be raised as to whether the model presented in Hicks's "Capital and Time", in which each process has an absolutely specific capital good, supersedes Adolph Lowe's work. In "Capital and Growth", successful completion of the traverse process depends on the very special case of the worker machine ratio in the capital goods sector being greater than that prevailing in the consumption goods sector, i.e. it rests on fulfillment of the so-called capital intensity theorem. In "Capital and Time", the traverse problem is analyzed on the basis of the special case of the "simple profile". The simple profile consists of splitting up the process of production into two periods: one in which labour is used to build up equipment and one in which labour is used with that equipment to produce a finished good. Economic activity is therefore seen as a one way avenue moving from inputs (labour) to final demand. Capital equipment becomes associated with working capital; it is, so to speak, a stage in the production of the finished consumption good.

Hicks's elimination of circularity overlooks the need for a special machine producing sector. An implicit critique of this omission is provided by Lowe. "One need only to consider an increase in the aggregate demand for coal, that is growth, in a system in which all real capital is fully utilized. Then we see at once that the critical bottleneck 'in the hierarchy of production' arises in the machine tool stage and that only after capacity has been increased there, can the output of ore-steel-extractive machinery and finally coal be increased". (Lowe (1976, p. 34n)

Notes

1. The ample documentation about this fact ranges from Myrdal's famous *Asian Drama* to the ILO report on poverty and landlesness (Myrdal 1968 and ILO 1977). A cogent critique of the factors proportions approach was developed by Kaldor. (1975).
2. Michał Kalecki argued against Dobb on the grounds that the model becomes irrelevant if labour productivity rises at a given rate as a result of technical progress. But the Dobb-Sen model is aimed precisely at those cases where the limited productive capacity also limits the rate of technical progress. Another criticism by Kalecki is however closer to the type of argument we developed along Lowe's lines. Kalecki points out that to raise the growth rate through an increase in the capital output ratio the share of accumulation over total output must rise more than the capital output ratio. From the angle of Lowe's model this raises the question of whether the composition of investment can be changed to meet the above condition. See Kalecki (1972, ch 10).
3. If $(a\alpha)^* < (b\beta)^*$ then the shrinkage in K_l will lead partly to a transfer of labour to operate K_m and partly to an additional increase in unemployment. Since however K_m and K_l are formed by the same type of machines it is necessary to assume that $a\alpha = b\beta$, $(a\alpha)^* = (b\beta)^*$.
4. Equation (17.9) in the Hicksian case can be rewritten for Lowe's model in the following way: Since $K_k = K_m + K_l$ we write $K_m/K_k = v^*$ and $N_m = N_l = N_k$ (workers per unit of capital stock in the two investment sectors and N_z, workers per unit of capital equipment K_z in the consumption goods sector) Hence:

   (a) $\{K_k[N_k v_t + N_k (1 - v_t)] + N_z K_z\}(1 + r) = (1 + g)\{K_k[N_k v_{t-1} + N_k(1 - v_{t-1})] + N_z K_z\}$

   The left hand side of equ (a) represents the way in which the labour force has to be distributed after capital stock has grown by r. The coefficient v_t is the unknown and it is entirely a matter within the capital good sectors. The right hand side of equ (a) represents the growth of the labour measured in terms of employment capacity of capital stock reckoned at the beginning of the period. Full employment equilibrium means that the equality between the two sides is maintained. In both sides K_m and K_z in the quantities at the beginning of the period at the end of which capital would have grown by r and labour by g. Now it is easy to see that it is not possible to satisfy eq. (a) except when r = g. Equation (a) reduces to:

   (b) $(N_k K_k + N_z K_z)(1 + r) = (1 + g)(N_k K_k + N_z K_z)$

   Which is satisfied only when r = g independently of whether $N_k \gtrless N_z$.
5. Elsewhere I tried to argue that in a socialist setting central planning is a necessary but not sufficient condition for adjustment (Halevi 1981).

References

Dobb M. (1960); *An Essay on Economic Growth and Planning* Routledge and Kegan, London.

Halevi, J. (1981); "The Composition of Investment under conditions of Non Uniform Changes", in *Banca Nazionale del Lavoro Quarterly Review*, June.

Hicks J.R. (1932) "Marginal Productivity and the Principle of Variation" in *Economica*, February.
Hicks J.R. (1975) *Capital and Growth* Oxford University Press, Oxford.
Hicks J.R. (1972) *Capital and Time*, Clarendon, Oxford.
ILO (1977) *Poverty and Landlessness in Rural Asia*, Geneva.
Kaldor N. (1975) "What is Wrong with Economic Theory?" in *Quarterly Journal of Economics*, August.
Kalecki M. (1972) *Selected Essays on the Economic Growth of the Socialist and the Mixed Economy* Cambridge, U.P. Cambridge U.K.
Lowe A. (1952) "A structural Model of Production" in *Social Research,* Vol. 19 Lowe A. (1955) "Structural Analysis of Real Capital Formation" in *Capital Formation and Economic Growth* ed by M. Abramovitz, Princeton University Press, Princeton.
Lowe A. (1976) *The Path of Economic Growth* Cambridge U.P. Cambridge U.K.
Marx K. (1974) *Capital* Vol. I. Progress Publishers Moscow.
Myrdal G. (1968) *Asian Drama*, Pantheou New York.
Sen A.K. (1960) *Choice of Techniques* Basil Blackwell, Oxford.

18

Harcourt, Hicks and Lowe: Incompatible Bedfellows?

Peter Kriesler

> 'Well, in *our* country,' said Alice, still panting a little, 'you'd generally get to somewhere else—if you ran very fast for a long time, as we've been doing.'
>
> 'A slow sort of country!' said the Queen. 'Now, *here*, you see, it takes all the running *you* can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that.'
>
> 'I'd rather not try, please!' said Alice. 'I'm quite content to stay here.'
>
> (The Red Queen's explanation to Alice of the principles of the traverse, in Lewis Carroll, *Through the Looking Glass* [1872])

18.1 Introduction

In a very interesting and important paper titled 'Marshall, Sraffa and Keynes; incompatible bedfellows?' Harcourt explores the nature of centres of gravitation as explanations of long-period equilibrium. In that paper, he provides an excellent taxonomy for the possible meaning of these positions, as well as outlining some of the problems associated with them.

The paper examined the nature and taxonomy of long-period positions, before providing, by building on the foundations laid by Joan Robinson, the

Revised from *Keynes, Post-Keynesianism and Political Economy: Essays in Honour of Geoff Harcourt*, 3: 400–417, 1999, 'Harcourt, Hicks and Lowe: Incompatible Bedfellows?,' by Kriesler, P. With kind permission from Taylor and Francis LLC. All rights reserved.

basis of an important critique of both the static method and of equilibrium analysis:

> We then are required to scrap the short cut of using the statical method and tell a much more sophisticated story of the initial failure to reach an implied rest state changing the rest state itself.
>
> (Harcourt 1981:216)

> Exactly the same puzzles hound the concept of prices of production, especially when we try to incorporate them as operational concepts in an analysis of modern oligopolistic economies. It is not, as orthodox economists would argue, that the existence of a tendency to equality of rates of profit in all activities may be questioned because of oligopolistic structures, barriers to entry and all the other paraphernalia of modern I.O. It is, rather, that the dynamic nature of capitalist development with the embodiment of technical advances through investment expenditures is so rapid in most periods as not to allow sufficient historical time for centres of gravit[ation] of a lasting nature to be formed. There is not the time, as Joan Robinson puts it, for the traders to become familiar, through actual experience, with what is the norm, so that when their bearings are cut loose, they—and the economists, too—literally are all at sea, rudderless, not knowing where they are heading, either back or to. The factors that we need theoretically to take as constant in order to allow the centres of gravit [ation] which they imply to be struck (for example, by the forces making for the formation of normal prices) are changing as fast as, or even faster than, the outcomes that the relationships between them are intended to determine.
>
> (Harcourt 1981:218)

We have here the basis of a fundamental critique not only of the viability of long-period positions, but also of the nature of equilibrium analysis. Harcourt's critique points to the argument that the forces which push the economy to its long-period equilibrium will also change that equilibrium. In other words, the adjustment path will change the structure of the economy, thus influencing the final equilibrium position. This suggests either that the concept of equilibrium has no operational meaning, or that equilibria, when analysed properly, must be path-dependent.

This paper continues the investigation into the nature of equilibrium analysis developed in Harcourt's paper, by exploring the concept of the traverse,[1] which relates to the question of adjustment of the economy to equilibrium, that is, to 'disequilibrium' adjustment.[2]

The traverse is at the same time one of the most important concepts in economic theory, and also one of the most neglected.[3] Modern economic theory is normally concerned with some concept of equilibrium, and with

properties of equilibrium systems. Other than lip service in the form of stability analysis, very little is said about the path an economy may take to reach an equilibrium, if it is not already there. In this paper we are concerned with this question in the form of the relation between disequilibrium analysis and the concept of the traverse. According to Hicks, who first coined the term,[4] the 'traverse' traces out 'the path which will be followed-when the steady state is subjected to some kind of disturbance.' (Hicks 1973: 81). In other words, the traverse describes the dynamic (out of equilibrium) adjustment path in historical time.[5] Some economists have been very vocal about the fruitlessness of studying the equilibrium properties of an economic system without considering the question of whether the economy will actually get there. In other words, they have voiced their doubts about the comparative static method which dominates modern economics.[6] More pointedly. Joan Robinson (as well, of course, as Harcourt) has often criticised the separation of equilibrium analysis from the analysis of the traverse, as she believed that the actual equilibrium which an economy achieves (if it is capable of achieving one)[7] will be vitally dependent on the path it takes.[8]

18.2 A Taxonomy

It is important to distinguish between the concept of equilibrium and the use of equilibrium analysis. Equilibrium, as an organising concept, plays an important role in most economic theory, with no implications about an economy's ability to achieve that position.[9] This differs from 'equilibrium theory', which utilises the comparative static method to compare equilibrium positions. Basically, we can distinguish three views as to the role of the traverse and of disequilibrium analysis in economic analysis. The most widely held view is that which analyses the economy in terms of static equilibrium positions utilising the comparative static method, but accepts that the economy may not always be in equilibrium. Within this view, we can distinguish three substreams. In the first of these, the analysis of out-of-equilibrium positions is relegated to minor importance, if discussed at all. By assuming that the equilibrium is stable, the issue of the actual path the economy may take is ignored. The second view, which is by no means incompatible, is that shared by the Classical economists, in their value theory, as well as by some neoclassical economists.[10] According to this view, if an economy is out of equilibrium then it will be attracted to a given equilibrium position, which remains constant, regardless of the path it takes to approach it. Many neoclassical economists who simply consider the sufficiency conditions for the stability of a general equilibrium can be seen to be within this stream. Finally, there are those economists who, while they accept that an economy will tend towards equilibrium, argue that the final equilibrium position is path-determined. There are two interpretations of 'path determinacy'. The first occurs where there are multiple equilibria,

so that the one which the system actually achieves is dependent on the path it takes when not in equilibrium. This is contrasted with the path dependency associated with hysteresis which:

> is due to the fact that the movement of the system when it is out of equilibrium may change the data on which the static equations which define the equilibrium are based, so that these equations will change and determine a *different* equilibrium and so on and so forth. In other words, the (set of) equilibrium point(s) is *not* independent of the dynamic movement of the system, that is, this set is path-dependent.
>
> (Gandolfo 1987:461)

It is this latter interpretation of path determinacy which is the main concern here, with the later works of John Hicks and the works of Adolph Lowe being of particular relevance. Some neoclassical economists also implicitly share this view by showing that there may not be a unique equilibrium, in which case the actual equilibrium achieved will be path-determined. In addition, recent work on hysteresis,[11] particularly in the labour market[12] can be considered within this view as the 'equilibrium' rate is seen to be dependent on the length and severity of any deviation from it, i.e. it is path-determined.

The second view of the role of the traverse is peculiar to the new Classical macroeconomists. According to this view, there is no role for the traverse as all we need to know is subsumed in the equilibrium state.

The final view is that an economy is never in static equilibrium, nor does it tend towards it. In this case, dynamic analysis without reference to static equilibrium would be of utmost analytical value. This is the view of those economists who eschew the use of *conventional* equilibrium analysis. The best known of these is Kalecki,

It is important to note that some economists hold one of these views with respect to certain variables, but another with respect to others. For example, it may be felt that there is some equilibrium level of prices, but no corresponding equilibrium with respect to output. Some would put Adam Smith in this category, since his analysis of price is usually in terms of long-period centres of gravitation, but his analysis of growth in output is in terms of dynamic increasing returns to scale.[13] In addition, there are many who belong in more than one stream. In particular, many neoclassical as well as Sraffian economists doubt that the necessary stability conditions are fulfilled,[14] Moreover, the work of Lowe can also be considered within this hybrid group, as he considers the likelihood of the traverse converging to a new equilibrium.

This paper looks at these three views and considers the manner in which they treat the question of the traverse. The first group by far dominates the discipline, for epistemic rather than scientific reasons. The second view emerged as a historical reaction to the advances of Keynesianism. Finally,

the third view, namely that the economy is always on a traverse, can be associated with the works of Kalecki and Joan Robinson; the contributions of Hicks and Lowe to the analysis of the traverse will be considered in the same section.

18.3 Equilibrium and the Traverse

The Classical economists analysed the forces which would bring the economy back to what they referred to as natural positions. Rather than using the concept of equilibrium, they analysed the economy in terms of 'centres of gravitation' (à la Smith). In their analysis, the traverse describes the adjustment process of the economy towards these centres. The forces which brought prices back to their natural positions were normally conceived in terms of a tendency towards a uniform rate of profits. This tendency, coupled with the free mobility of capital, meant that mobile capital responded to any differential from the uniform rate of profits.[15] That is, if, for example, a particular sector of the economy was earning larger rates of profit than the average, then capital would move into that sector, increasing supply, and reducing both price and profit rates. This adjustment would continue until the profit rate in that sector was brought into line with the average rate of profits. So, for the Classical economists, the traverse was propelled by the tendency towards uniform rates of profits which ensured that market prices would gravitate towards natural prices. In their vision of the determinants of the centres of gravitation of prices (that is, natural prices), demand played no direct role. For this reason, the analysis of what happened when there was a divergence between natural and market prices concentrated on 'actual' values rather than, as with most stability analysis, 'conjectural' values. In other words, because demand does not play an important role in the determination of natural prices, trading outside natural (equilibrium) prices is allowed within the stability analysis. This means that the Classical economists were analysing a dynamic system with moving centres of gravitation in their determination of value, with the analysis occurring in historical time. The forces which produced the convergence to natural positions were different to the forces which determined those positions, so that they were not path-determined.[16]

The modern version of the Classical theory, labelled alternatively Sraffian or neo-Ricardian economics, attempts to resurrect this method. However, there are underlying problems which have arisen since the time of the Classical economists related to the changing nature of capitalism, which are not addressed. In particular, the adjustment to the long-period position is either simply subsumed under the term 'tendency towards a uniform rate of profits', or else the adjustment path is shown to converge under some conditions. This last approach involves a fundamental fallacy. It is not enough to show that convergence to long-period positions can occur under some

specific conditions. For the long-period approach to be methodically valid as an analytical framework for the analysis of capitalist economies, it must be shown that such convergence will occur under *all* reasonable conditions. In any case, it is difficult to maintain the validity of the analytical separation of the forces determining equilibrium from those pushing the economy to that equilibrium (as the discussion of Harcourt noted above indicates) for modern capitalist economies. This is due to the fact that the investment process, which is supposed to equalise profit rates between sectors, does not merely change the quantities of commodities produced, as it did for the Classical economists. Rather, since in modern capitalist economies investment is embodied in machines, investment is associated with technical progress and increasing returns in a cumulative manner. This, of course, as Young, Kaldor and Myrdal have shown, is extremely destructive of any concept of equilibrium. In any case, it is difficult to argue that forces pushing equalisation of profit rates are the dominant forces in modern monopolistic economies.[17]

The analysis of the early neoclassical economists was comparative static, although there was some lip service paid to disequilibrium-type problems in the form of stability analysis. For Walras, stability was brought about by the relationship between price movements and excess demand. Walras postulated that if any market was not in equilibrium at the current price, then price would move in the same direction as excess demand. Unlike the Classical economists, whose analysis allowed economic activity to continue even when market prices deviated from their natural values, in Walras' analytical framework transactions are ruled out by axiom until equilibrium prices have been determined, due to the role of demand in the determination of those equilibrium prices. No trading was allowed out of equilibrium, since if there were trading, then it is analytically unfeasible to obtain an equilibrium solution. This was due to the change in the value of agents' initial endowment if trading at non-equilibrium prices occurred. If trading outside equilibrium is allowed to occur then the system will exhibit hysteresis. To overcome this problem Walras introduced the infamous 'tâtonnement' process,[18] while Edgeworth utilised the notion of 'recontracting'. Their equivalent of a traverse was, in effect, conjectural analysis in the sense that no actual exchanges were transacted until an equilibrium position was established. These models could not trace out the actual adjustment path of the economy, but rather described sufficient conditions for an equilibrium to be stable, but only in the 'conjectural' sense described above. This approach corresponds to Joan Robinson's notion of 'logical time'.[19]

Modern neoclassical economists have studied the stability requirements of a general equilibrium system at great length. The first point to note is that the analysis usually suggests the possibility of multiple equilibria. If this is the case, then the actual equilibrium reached will be dependent on the path the economy takes when it is out of equilibrium, as well as its initial position. However, this should not be confused with the hysteresis discussed earlier, as

the actual data of the system, in this case, *are not changed* by the movement outside equilibrium. In the case of multiple equilibria, the position of the equilibrium is determined independently of the adjustment path. The path will only determine which equilibrium the economy tends towards. Otherwise, modern stability analysis is usually conducted using the same methodological approach as that of its predecessors. The analysis is about the sufficient conditions for stability, given that no trading occurs until an equilibrium position is reached. Where trading outside equilibrium is permitted, very stringent postulates are required to show that an exchange economy converges to an equilibrium, and the system will exhibit hysteresis.[20] Difficulties of showing convergence within production economies may be highlighted by the work of Hahn, who, after considering many dynamic production models, appears highly sceptical about the possibility of economies, as described by modern general equilibrium theory, being able to reach, much less maintain, a steady state (equilibrium) growth path (see Hahn 1985: Parts III and IV).[21]

It should be noted that there are aspects of modern neoclassical analysis in which the path-determined nature of the equilibrium is explicitly analysed. One such area is that of chaotic dynamics, which has only recently been incorporated into economic theory,[22] There is also the work explicitly associated with the concept of hysteresis, especially in the labour market. The basic idea behind such models is that the 'equilibrium' level of unemployment, as well as the trajectory of employment, will be determined by the path which the economy takes when it is out of equilibrium.[23] In particular, a level of unemployment greater than the equilibrium level will tend to raise the 'natural' rate, while a level of unemployment lower than the equilibrium level will tend to lower it. Various explanations have been proposed to explain this phenomenon, with most focusing on the process of wage determination within the labour market.

Before continuing, it is important to consider the limitations of the comparative static method which underlies much of the analysis discussed so far. The validity of this method rests on a number of assumptions about the underlying dynamics which the economy must exhibit outside equilibrium. First, it must be shown that the economy is stable; that is, if it is displaced from equilibrium then there are forces which ensure that it converges to an equilibrium position. Second, equilibrium can not be path-determined in the sense of hysteresis, for if it is, then in order to determine the new equilibrium, the dynamic adjustment path must be traced out. The result of not accepting at least one of these properties must be a rejection of the comparative static method.

In addition, for that method to generate useful insights, the convergence to equilibrium must be relatively 'rapid':

> If the predictions of comparative statics are to be interesting in a world in which conditions change, convergence to equilibrium must be

> sufficiently rapid that the system, reacting to a given parameter shift, gets close to the predicted new equilibrium before parameters shift once more. If this is not the case, and, a fortiori, if the system is unstable so that convergence *never* takes place, then what will matter will be the 'transient' behaviour of the system, as it reacts to disequilibrium. Of course, it will be a misnomer to call such behaviour 'transient', for it will never disappear.
>
> (Fisher 1983:3, original emphasis)

Of course, modern neoclassical economists have attempted to grapple with these issues, and Hahn, Negishi and Fisher processes are some of the fruits of these works. However, these all involve an abandonment of the comparative static method.

18.4 The Irrelevance of the Traverse

A group of economists sometimes called the 'New Classical Macroeconomists' have popularised a radical new method for analysing economic behaviour which effectively rules out disequilibrium and therefore the traverse. Essentially, the 'New Classical Macroeconomics' (NCM) arose as an answer to the sterile debates of the 1960s between neoclassical Keynesians and monetarists as to the efficacy of monetary policy. Basically, both groups agreed that the economy tended towards a long-run full employment equilibrium, but the 'Keynesians' argued that there were short-run impediments which may mean that in the short term unemployment may persist for some time. The main culprit in the story was expectations. The NCM reply to this was to assume that expectations were determined in the same way as other economic variables, that is, by rational economic agents making optimal use of the resources and information available to them. In effect, what they assume is that economic agents 'are aware of the values of the variables affecting the market where they currently are...and of the true probability distributions governing the future state of this market and the present and future states of all others' (Lucas 1983:158). The result of this assumption, coupled with the postulate of continual market clearing, is in effect to abolish the distinction between the short run and the long run, in that, if agents are aware of the equilibrium values of all variables, then they will always act on that information, and so will act to ensure that 'prices and quantities are taken to always be in equilibrium'. (Lucas 1983; 287, also 179), So, 'New classical economists defy the convention and interpret the equilibrium price as the actual price' (Klamer 1984:15). Even the business cycle is regarded as an equilibrium phenomenon.[24] These are defined as equilibrium models because, 'in these models, the concepts of excess supply and demand play no observational role and are identified with no observational magnitudes' (Lucas 1983:287).[25]

Clearly, since the analysis assumes that agents are always and everywhere in equilibrium there is, by definition, no possible role for the traverse.

18.5 Life is a Traverse

This section will consider the work of Hicks and Lowe on the economic analysis of the traverse, as well as discussing the contributions of Kalecki to dynamic analysis. All these writers, in the works under consideration, eschew comparative static analysis in favour of a dynamic analysis in historical time. In all the models, the sequence in which events occur is important and irreversible. Furthermore, they shun the method of analysing individual agents, which is manifest in the neoclassical models discussed. In their place, they focus either on the structure of production, or in the case of Kalecki, on the class analysis of effective demand.

As was noted above, Hicks was the first economist to use the term 'traverse' in his *Capital and Growth* (1965), Here Hicks studies the various methods economists have utilised for analysing economic dynamics. After considering the concept of 'growth equilibrium', Hicks turns to the question of the traverse:

> Suppose we have an economy which has in the past been in equilibrium in one set of conditions; is it possible (or how is it possible) for the economy to get into a new equilibrium, which is appropriate to the new conditions? We do not greatly diminish the generality of our study of disequilibrium if we regard it in this way, as a Traverse from one path to another.
>
> (Hicks 1965:184)

Hicks' analysis of the traverse is in terms of a two-sector, fixed coefficients model. The model represents his attempt to utilise the methods of the Classical economists, and is very similar to Sraffa's model,[26] with two important differences. First, because Hicks assumes that capital is immortal, there is no depreciation and therefore he can avoid joint production. Second, Sraffa's model is a static model whereas Hicks' is a steady-state growth model. In part, the return to the method of the Classical economists, whose analysis of growth are reviewed by Hicks in the earlier parts of that book, represented attempts to look at the questions of growth in terms of dynamic equilibria. Hicks explicitly acknowledges that he is attempting to follow the path derived from Harrod and Domar and developed by Joan Robinson, Kaldor, Samuelson and Solow,[27] The model differs from that of Lowe and Kalecki in that it considers a two-sector model with one capital good which can freely be moved between capital and consumption goods sectors. Without the complications implied by structural disproportionalities, Hicks concludes that a full-employment path to equilibrium is only possible if the consumption goods sector is more mechanised than the capital goods

sector. Even if this condition is fulfilled, a full employment traverse is not guaranteed, but must satisfy a series of technologically determined conditions with respect to the man/machine ratios in the two sectors (Hicks 1965: 187–90). Hicks reaches the important conclusion that 'smooth adjustment may not be possible' (*ibid.:* 190).[28] In *Capital and Time* (1973), Hicks moves away from the 'Classical' traverse, and attempts to analyse the traverse within an Austrian framework. In order to get a unique and unambiguous period of production, Hicks has to resort to the uninteresting case of the 'simple profile', for reasons related to the capital controversies (as he makes clear at 41–4). Unfortunately, this becomes essentially a one-product world, and is not, therefore, particularly enlightening. This latter attempt of Hicks to analyse the traverse within a neoclassical framework may be contrasted with the efforts of Kalecki and Lowe, and illustrates the difficulty of using the neoclassical approach to meaningfully discuss disequilibrium phenomena.

Lowe,[29] in a return to the concerns of the Classical economics, sees the main problem of economics as the description of the 'path of economic growth'. He believes that growth is not normally of the steady-state equilibrium type, so he specifically analyses the traverse, and concentrates on the implications of structural change. For this reason, he focuses on the nature of changes in the structure of production and on intersectoral relations, again reminiscent of the Classical economists. To examine this problem, Lowe developed a three-sector model which incorporated not only the concept of historical time but also two important aspects of production rarely dealt with by modern economists. These were the specificity of capital goods,[30] and the importance of reproduction, which is necessary for the incorporation of intersectoral relations. Specificity is dealt with by differentiating two subsectors of the capital goods sector (sector 1). In the first subsector (1a) capital goods are produced which can either reproduce themselves or produce capital goods for the consumption goods sector (sector 2). Although, at this stage, there is no distinction between the capital goods, specificity becomes important when the capital goods produced in this sector are installed so as to produce capital goods for the consumption goods sector. On installation these capital goods lose their generality and, in an irreversible process, become specific to the production of capital goods for the consumption goods sector. These capital goods may be considered a separate branch of production (1b). The capital good output of this sector is installed in the consumption goods sector to produce consumption goods.

Lowe uses this model to examine the nature of the traverse. He begins by assuming that the economy is initially in a stationary state, and considers the implications for the traverse of changes and restrictions on variables. The model is used to consider the structural changes within the capital goods sector which are necessary to facilitate, for example, changes in technology and changes in the rate of growth of the labour force. In this way the analysis is able to consider changes in the structure of production and their

implications for intersectoral relations during the traverse, and so consider the likelihood of a new-steady state emerging.

Without going into the detailed mechanics of the model, an important conclusion to emerge is Lowe's demonstration that, although there may very well be a traverse which leads to a new full employment steady state, it is unlikely to be achieved within a decentralised market system. This, in part, results from the market transmitting the 'wrong' signals in terms of the optimal structure of production and intersectoral flows.

For Kalecki, like Lowe, the object of analysis of modern capitalist economies is the dynamic growth path of the economy. However, in contrast to Lowe's work, Kalecki does not use static equilibrium or the steady state, even as reference points. Rather, he explicitly eschews equilibrium analysis, casting doubt on its validity as a method appropriate for analysing growth in modern capitalist economies.[31]

Kalecki's central concern was with understanding the movements of actual economies, in particular, with the analysis of business cycles and growth. Most of his other economic analysis can be interpreted as steps toward this final goal.[32]

Although Kalecki, like Lowe, disaggregated the economy into three sectors, or departments, the disaggregation served different purposes. Kalecki divided the economy into one capital goods sector and two consumption goods sectors, differentiating workers consumption from that of capitalists. The distinction from Lowe's model reflects Kalecki's different emphasis; rather than being concerned with the structure of production, Kalecki was concerned with problems associated with realisation in the form of effective demand, as he believed that 'the main problem of a developed capitalist economy is the adequacy of effective demand' (Kalecki 1976: 20).[33]

He did, however, share Lowe's concern with reproduction and with intersectoral relations, but concentrated on flows of commodities and of incomes between sectors. As a result of Kalecki seeing the main determinant of income and growth in mature capitalist economies as being the level of effective demand, he made it one of the central elements of his analysis. Related to this was the role of investment, which he perceived as having a dual aspect. On the one hand investment was part of effective demand so that the higher the level of investment in any period, the greater the level of employment in that period. On the other hand, because investment contributed to the creation of extra capacity, the higher was the level of investment in this period, the larger would be the problem with achievingfull employment in the next. This 'paradox', according to Kalecki, struck at the heart of the capitalist system:

> 'The tragedy of investment is that it causes crisis because it is useful. Doubtless many people will consider this theory paradoxical. But it is not the theory which is paradoxical, but its subject—the capitalist economy' (Kalecki 1939:148–9).

Although Kalecki concentrated on the role of effective demand in his analysis of capitalist economies, in his work on socialist economies the structure of production, rather than effective demand, was seen as an important constraint on economic activity. Here he came much closer to the traverse analysis of Hicks and Lowe, and in many ways their efforts are complementary to Kalecki's. In the analysis of the multiplier and the effect of a reduction in investment on the level of economic activity, Kalecki differentiated between the implications for capitalist economies and for socialist economies. In a capitalist economy, a reduction in investment causes a reduction in profits which feeds through to a multiplied reduction in income, due to the resultant reduction in consumption. Kalecki contrasts this to the effects of a reduction in investment in a socialist economy, where he argues there is no problem with effective demand:

> The workers released from the production of investment goods would be employed in the consumption goods industries. The increased supply of these goods would be absorbed by means of a reduction in their prices. Since profits of the socialist industries would be equal to investment, prices would have to be reduced to the point where the decline in profits would be equal to the value of the fall in investment.
>
> (Kalecki 1954:62–3)

Notwithstanding his contention that a change in investment in socialist economies would lead in the long period to shifts in the structure of production without implications of the multiplier on the level of economic activity, and hence without the problems with effective demand that occurred in capitalist economies, Kalecki accepted that the short-run adjustment process could be problematic. In his analysis of 'the structure of investment in socialist economies' (Kalecki 1963), he acknowledges the possibility of short-run problems in adjustment caused by capacity bottlenecks, in the sense of too much (or too little) capacity in the capital goods sector. It is here that his work touches on issues raised by Hicks and Lowe. Using a two-sector model, and differentiating investment in the capital goods sector from aggregate investment, he shows that changes in the growth rate of the economy will necessitate deviations between the growth rate of investment and that of the economy, during the transition period. However, 'there exists a ceiling to the deviation of the rate of growth of investment from that of national income which is determined by the production capacity of the investment sector' (Kalecki 1963: 107).[34]

Kalecki's two-sector model suffers from its inability to sufficiently disaggregate the structure of the investment goods sector. This is of particular importance when the problem is that of differential growth rates between the consumption and investment goods sectors, with investment goods being provided to both sectors, Kalecki acknowledged the problem by

allowing for changes in the way equipment is used, especially 'the possibility of turning plant used in the manufacture of consumer durables to production of machinery' (Kalecki 1963: 109); and through favourable changes in the composition of foreign trade. The analysis is reformulated, introducing a coefficient to account for these effects, and this causes the capacity constraint to be relaxed. Halevi (1981) shows that the meaningfulness of this coefficient depends on implicit assumptions about the nature of the capital equipment in the two sectors, and that such implicit assumptions are not necessary in a Lowe three-department model. It is here that Lowe's model can be seen as supplementing Kalecki's discussion of structural problems in the investment goods sector, as well as showing the difficulty of getting rid of excess capacity.

Finally, as well as a sceptical attitude towards the relevance of equilibrium method to the study of modern capitalist economies, Kalecki was also dubious about the validity of the "long-period' method. In particular, he argued: '*In fact, the long-run trend is but a slowly changing component of a chain of short-period situations; it has no independent identity*' (Kalecki 1971: 165, emphasis added).

This would appear to contradict the Classical notion of 'long-run' centres of gravitation, from which market price may deviate in the short period, but will gravitate towards. In other words, it is a clear denial of the validity of long-run method, *a fortiori* long-run equilibrium.

This provided a particularly important influence on the works of Joan Robinson. From her earliest criticisms of neoclassical capital theory (Robinson 1953–4) she has been very critical of analysis which uses an equilibrium methodology, stressing that such a methodology must, by its very nature, ignore both history and uncertainty about the future. In particular, Robinson has always stressed the inability of comparative static analysis to handle the essence of modern capitalist economies, historical time. In doing so, she has denied the possibility of economies actually getting into equilibrium if they are not already there:

> The neo-classical economist thinks of a position of equilibrium as a position towards which an economy is tending to move as time goes by. But it is impossible for a system to *get into* a position of equilibrium, for the very nature of equilibrium is that the system is already in it, and has been in it for a certain length of past time.
>
> (Robinson 1953–4:120, original emphasis)[35]

18.6 Conclusion

This brief survey of the role of the traverse in economic theory has indicated its importance for almost all economic theory, as signalled by Harcourt's comments noted above. At the same time it has pointed to the sad state

of neglect of the traverse in modern theory, especially neoclassical theory. Notwithstanding this, it clearly has an important role, even in equilibrium theory. Unless it can be shown that any disturbance from an equilibrium will lead to an actual (rather than 'conceptual') traverse which converges to a new equilibrium relatively quickly and without hysteresis, the whole edifice of comparative static methodology is fundamentally flawed. There has been much analysis which shows that any deviation from an equilibrium position will lead to cumulative movements away from that equilibrium. Important examples are the concept of cumulative causation made popular by Wicksell and Myrdal, and revived by Young in his work on increasing returns (Young 1928), which in turn inspired Kaldor's work on Verdoorn's Law (Kaldor 1966), Furthermore, many other writers have considered dynamic non-equilibrium models. Goodwin, for example, has made important contributions in this field. In particular, his predator/prey model of a growth cycle and his dynamic non-linear analysis (reprinted in Goodwin 1982) are important contributions to the field. However, the work of these economists remains very much outside the mainstream, and has had little impact.[36]

There is still much to do.

Acknowledgements

I would like to thank, but in no way implicate, Neil Hart of the University of Western Sydney, Bill Junor of Macquarie University, Joseph Halevi of the University of Sydney, Geoff Harcourt of the University of Cambridge, Victoria Chick of University College London, Peter Reynolds of Staffordshire University, Greg Mahony of the University of the West of England, and Bruce McFarlane for their helpful comments.

Notes

1. An example of Harcourt's discussion of the role of the traverse in non-neoclassical theory is in Harcourt 1979:171–4.
2. 'It is only by a study of "disequilibrium" adjustment that we will get adequate answers to the [fundamental questions of economics]' (Harcourt 1976:136).
3. For example, in the *New Palgrave* dictionary (Eatwell *et al.* 1987), there is no entry on Traverse.
4. As far as this author is aware; see also Lowe (1976: 10n).
5. For the distinction between 'historical' and 'logical' time see Robinson (1953, 1974). The importance of historical time is taken to be its unidirection, so that time can only move forward. This implies that the link between time periods is given by the stock of capital inherited from the past, and the expectations determined by it.
6. This is also true of some neoclassical economists. See, for example, Fisher (1983).
7. She was always dubious of the possibility of an economy *ever* achieving equilibrium. See below, final section.
8. See, for example, Robinson (1953, 1974).
9. For an excellent discussion of the way in which the concept of 'equilibrium' is dependent on the theoretical approach being used, see Dow (1985: ch. 5).

10. It should be noted that we do not consider all neoclassical theory, as such a task is beyond the scope of this paper. Rather the focus is on the underlying 'core' of neoclassical theory, the comparative static models of intertemporal general equilibrium.
11. The term 'hysteresis' is defined as 'referring to situations where equilibrium is path-dependent' (Blanchard and Summers 1987:289).
12. There has also been some work which extends the analysis of hysteresis to the study of international trade and to the study of firms' fixed costs. See Baldwin (1988, 1989).
13. Lowe (1975) describes Smith's analysis as a dynamic growth process with 'dynamic feedbacks' and a 'spiralling path of growth'.
14. A good example of this within neoclassical theory is the textbook analysis of 'cobweb' cycles in agriculture, where the adjustment process may either converge to equilibrium or explode.
15. It should be noted that, despite superficial similarities, this process is quite different from the neoclassical concept of adjustment in a perfectly competitive market. See Eatwell (1982) and Harris (1988).
16. Cf. Harcourt (1981).
17. These arguments are spelled out in greater detail in Halevi and Kriesler (1991).
18. For a detailed explanation of two different interpretations of the tâtonnement process, see Hahn (1985:192).
19. See Robinson (1974).
20. See, for example, Arrow and Hahn (1971; ch, 13) and Fisher (1983).
21. In addition we can mention modern monetary analysis of the exchange rate, where the analysis is an outgrowth of control theory, which considers the adjustment of the exchange rate and prices to monetary disturbances. The analysis allows for initial overshooting, due to the role of expectations, before eventual adjustment to the new equilibrium, which is independent of the adjustment path (see Dornbusch 1976).
22. For a survey of recent economic developments of chaotic theory see Frank and Stengos(1988).
23. The notion of the trajectory and path being dependent on the direction of movement is a result in catastrophe theory known in economics (at least) since Zeeman's 1977 presentation (Zeeman 1977).
24. See Lucas (1983:179–240, 271–97): and Lucas in Klamer (1984:40–2).
25. See also Lucas in Klamer (1984:38). For the definition of equilibrium in NCM see Sargent in Klamer (1984:68–9).
26. See Hicks (1985:132n).
27. Hicks (1965: vi). The importance of Robinson (1965) is explicitly noted.
28. For the inappropriateness of prices as a guide to decision-makers on the traverse, see *ibid.:* 196–7.
29. Our discussion of Lowe's model is relatively brief, not because of its lack of importance but rather due to the fact that most of the relevant issues have been discussed in a series of papers by Halevi, who has considered the relation between Lowe's traverse and the works of Dobb, Hicks, Kalecki and Marx. See Halevi (1983, 1984, 1992) and Halevi and Kriesler (1992). See also Harcourt (1979).
30. Kaldor, in a much neglected article (Kaldor 1938), explicitly addresses the problems caused by the specificity of factors of production.
31. See, for example, Kalecki (1971:165).
32. See Kriesler (1987:84: 1996).

33. See also Kalecki (1976:17, 20–2, 66).
34. See Kriesler (1994).
35. Robinson's *Collected Papers* abound with such condemnation of equilibrium method. As a good example, see 'History versus equilibrium', reprinted in Robinson (1979). See also Harcourt (1981).
36. Much of this literature is discussed in Harcourt (1979).

References

Arrow, K. and Hahn, F. (1971) *General Competitive Analysis*, Edinburgh: Oliver and Boyd.
Baldwin, R. (1988) 'Hysteresis in import prices: the beachhead effect' *American Economic Review*, 78, 773–85.
____(1989) 'Sunk-cost hysteresis', *NBER Working Paper* no. 2911.
Blanchard, O.J. and Summers, L.H. (1987) 'Hysteresis in unemployment', *European Economic Review*, 31, 288–95.
Dornbusch, R. (1976) 'Expectations and exchange rate dynamics', *Journal of Political Economy*, 84, 1161–74.
Dow, S. (1985) *Macroeconomic Thought*, Oxford: Blackwell.
Eatwell, J, (1982) 'Competition', in I. Bradley and M. Howard (eds) *Classical and Marxian Political Economy*, London: Macmillan, 203–28.
Fisher, F.M. (1983) *Disequilibrium Foundations of Equilibrium Economics*, Cambridge: Cambridge University Press.
Frank, M, and Stengos, T. (1988) 'Chaotic dynamics in economic time-series', *Journal of Economic Surveys*. 2, 103–33.
Gandolfo, G. (1987) 'Stability', in J. Eatwell, M. Milgate and P. Newman (eds) (1987) *The New Palgrave*, vol. 4, London: Macmillan, 460–4.
Goodwin, R.M. (1982) *Essays in Economic Dynamics*. London: Macmillan.
Hahn, F. (1985) *Money, Growth and Stability*, Cambridge MA: MIT Press.
Halevi, J. (1981) 'The composition of investment under conditions of non uniform changes', *Banca Nazionale del Lavoro Quarterly Review*, 213–32.
____(1983) 'Employment and Planning', *Social Research*, 50, 345–58.
____(1984) 'Lowe, Dobb and Hicks', *Eastern Economic Journal*, 10, 157–67.
____(1992) 'Accumulation and structural equilibrium', in D. Laibman, E. Nell and J. Halevi (eds) *Beyond the Steady State: Essays on the Revival of Growth Theory*, London: Macmillan, 264–88.
Halevi, J. and Kriesler, P, (1991) 'Keynes, classical economics and the surplus approach', *Review of Political Economy*, 79–92.
Halevi, J. and Kriesler, P. (1992) 'Introduction to the traverse', in D. Laibman, E. Nell and J. Halevi (eds) *Beyond the Steady State: Essays on the Revival of Growth Theory*, London: Macmillan, 225–34.
Harcourt, G.C. (1976) 'The Cambridge controversies: old ways and new horizons or dead-end?', reprinted in C. Sardoni (ed.) (1992) *On Political Economists and Modern Political Economy: Selected Essays of G.C. Harcourt*, London and New York: Routledge, 130–65.
____(1979) 'Non-neoclassical capital theory', reprinted in C. Sardoni (ed.) (1992) *On Political Economists and Modern Political Economy: Selected Essays of G.C. Harcourt*, London and New York: Routledge, 166–79.
____(1981) 'Marshall, Sraffa and Keynes: incompatible bedfellows?', reprinted in P. Kerr (ed.) (1982) *The Social Science Imperialists: Selected Essays, G.C. Harcourt*, London: Routledge and Kegan Paul, 205–21.

Harris, D.J. (1988) 'On the classical theory of competition', *Cambridge Journal of Economics*, 12, 139–67.
Hicks, J.R. (1965) *Capital and Growth.* Oxford: Oxford University Press.
____(1973) *Capital and Time*, Oxford: Clarendon Press.
____(1985) *Methods of Dynamic Economics*, Oxford: Clarendon Press.
Kaldor, N. (1934) 'The determinateness of static equilibrium', *Review of Economic Studies*, reprinted in N. Kaldor (1960) *Essays on Value and Distribution*, London: Duckworth, 13–33.
____(1938) 'Stability and full employment', *Economic Journal*, reprinted in N. Kaldor (1960) *Essays on Economic Stability and Growth*, London: Duckworth, 103–19.
____(1966) 'Causes of the slow rate of economic growth in the United Kingdom', reprinted in N. Kaldor (1978) *Further Essays on Economic Theory*, London: Duckworth, 100–38.
Kalecki, M. (1939) *Essays in the Theory of Economic Fluctuations*, London: Allen & Unwin.
——(1954) *Theory of Economic Dynamics*, London: Allen & Unwin.
——(1963) 'The structure of investment', reprinted in M. Kalecki (1972) *Selected Essays on the Economic Growth of the Socialist and the Mixed Economy*, Cambridge: Cambridge University Press, 102–11.
——(1971) *Selected Essays on the Dynamics of the Capitalist Economy, 1933–1970*, Cambridge: Cambridge University Press.
——(1972) *Selected Essays on the Economic Growth of the Socialist and the Mixed Economy*, Cambridge: Cambridge University Press.
——(1976) *Essays on Developing Economies*, Cambridge: Cambridge University Press.
Klamer, A. (1984) *The New Classical Macroeconomics*, Kent: Wheatsheaf.
Kriesler, P. (1987) *Kalecki's Microanalysis*, Cambridge: Cambridge University Press.
——(1994) 'On Fel'dman's model of economic growth', in Bruce McFarlane and Peter Groenewegen (eds) *Socialist Thought in The Post Cold War Era*, Journal of Contemporary Asia Press, 27–38.
——(1996) 'Microfoundations: a Kaleckian perspective', in J. King (ed.) *An Alternative Macroeconomic Theory: The Kaleckian Model and Post-Keynesian Economics*, Boston: Kluwer, 55–72.
Lowe, A. (1975) 'Adam Smith's system of equilibrium growth', in A.S. Skinner and T. Wilson (eds) *Essays on Adam Smith*, Oxford: Clarendon Press, 415–25.
——(1976) *The Path of Economic Growth*, Cambridge: Cambridge University Press.
Lucas, R.E. Jr (1983) *Studies in Business-Cycle Theory*, Cambridge MA: MIT Press.
Robinson, J. (1953) 'A lecture delivered at Oxford by a Cambridge economist', reprinted in J. Robinson (1973) *Collected Economic Papers, IV*, Oxford: Blackwell, 254–64.
——(1953–4) 'The production function and the theory of capital', *Review of Economic Studies*, XXI, reprinted in J. Robinson (1975) *Collected Economic Papers, II*, 2nd edn, Oxford: Blackwell, 114–31.
——(1964) *The Accumulation of Capital*, 2nd edn, London: Macmillan.
——(1974) 'History versus equilibrium', reprinted in J. Robinson (1979) *Collected Economic Papers, V*, Oxford: Blackwell.
Young, A.A. (1928) 'Increasing returns and economic progress', *Economic Journal*, 38, 527–42.
Zeeman, E.C. (1977) *Catastrophe Theory*, Reading MA: Addison-Wesley.

19

The Traverse, Equilibrium Analysis, and Post-Keynesian Economics

Joseph Halevi, Neil Hart and Peter Kriesler

The traverse refers to the movement of the economy outside equilibrium. It requires a consideration of how an economy may achieve equilibrium and how it may navigate toward a new one if conditions change. Analysis of these themes, from the classical economists onward, leads to the conclusion that it is difficult to envisage any useful role for equilibrium theory in the absence of some evidence that there are forces in the economy that propel it to equilibrium, without influencing the position to which the economy is gravitating toward. Complicating factors, emphasized in the post-Keynesian literature, include the existence of path dependency, hysteresis, cumulative causation, and the evolutionary nature of economic change.

19.1 Introduction

The traverse defines the movement of the economy outside equilibrium. It plays a particularly important role in post-Keynesian economic analysis, as most post-Keynesian economists deny the relevance and usefulness of equilibrium analysis for understanding actual economies[1] and stress the importance of adjustment paths.

The concept of equilibrium has played a central organizing role in much of political economy and economics. The way equilibrium is treated has been a major point of methodological differentiation between different groups of economists. The importance of equilibrium in traditional theory has ranged from it being seen as the central organizing concept for economic thought, to it being upheld as a description of actual economies, which are seen to exhibit strong tendencies toward equilibrium. Despite this central role, the analysis of how the economy achieves equilibrium has often been a secondary consideration.

Revised from *The Oxford Handbook of Post-Keynesian Economics Volume 2: Critiques and Methodology*, 175–197, 2013, 'The Traverse, Equilibrium Analysis, and Post-Keynesian Economics,' by Halevi, J., Hart, N. and Kriesler, P. With kind permission from Oxford University Press. All rights reserved.

For equilibrium analysis to serve the central purpose that economists have ascribed to it, there must be forces that push the economy to that equilibrium or to the equilibrium path without affecting the equilibrium itself. In other words, for equilibrium to be a useful concept in the way it is traditionally described, the adjustment path that the economy takes to achieve that equilibrium must not influence the equilibrium to which it is pushing the economy. The need for a theory of the traverse arises *unless* it can be established that the forces (if present) pushing an economy toward equilibrium (i.e., the adjustment path) have no influence on the equilibrium position to which the economy is said to be tending. The necessity for such a theory is perhaps best illustrated by considering the implications arising from its absence within mainstream equilibrium analysis. The difficulties of developing a meaningful treatment of the traverse within this setting in turn highlights fundamental shortcomings inherent in the application of static equilibrium techniques to the analysis of economic issues.

These themes can be illustrated with brief reference to a number of different contexts in which the equilibrium approach has been popularly applied. The next section examines the differing views as to the role of equilibrium and the traverse in economic analysis. We then consider the role of the traverse for the classical political economists and Marx, before turning to its use by Alfred Marshall in his partial equilibrium method. This is contrasted with the notion of equilibrium in general equilibrium theory in the Arrow-Debreu tradition. From here, we present modern traverse theory beginning with the context in which originated it, in other words, as developed first by John Hicks (1965) and set out in a more comprehensive form by Adolph Lowe (1976). Finally, the chapter considers its role in Kaleckian-Keynesian-Goodwin approaches.

19.2 The Traverse versus Equilibrium

The role that the traverse plays in economic analysis is closely linked to the view of equilibrium. Although most economic theory has traditionally relied on some concept of equilibrium as a central organizing concept, there is an important distinction between equilibrium and equilibrium analysis. Equilibrium can be used as a reference point for the analysis, without any requirement that the economy tend toward it. However, in equilibrium analysis, by contrast, there is a presumption of a tendency for the economy to be pushed toward the equilibrium position.

We can distinguish a number of views about the appropriate role of equilibrium analysis in economics:

1. Equilibrium is a useful concept, and the economy will tend toward an equilibrium.
2. The economy is always in equilibrium.

3. Equilibrium is not a useful concept, as the economy is always on a dynamic path that does not tend toward any equilibrium.

The first of these views dominates the discipline as, traditionally, most economists have relied on a comparative static method to compare equilibrium positions, drawing inferences from the comparison. These economists accept that the economy may not always be in equilibrium but nevertheless argue there is a tendency toward it that makes it a useful concept for analysis. Within this group of economists, we can distinguish two further views. By far the dominant view is that there are strong forces that push the economy to its equilibrium position, without actually influencing that position. In other words, although the economy may experience disequilibrium, this will be temporary, as equilibria are stable and independent of the adjustment path. The equilibrium is an attractor, a center of gravitation, that remains unaffected by the path the economy takes to reach it. Classical economists and most neoclassical economists, as well as some post-Keynesians (including most Sraffians), ascribe to this view. A variant associated with general equilibrium analysis allows for the fact that there may be multiple equilibria so that the path the economy takes will determine which of these equilibria it will achieve, though the existence of these will not be influenced by the disequilibria path. In this case we have some path determinacy, in the sense that the final position of the economy will depend on its adjustment path and its starting point; however, this position, and that of the other equilibria, are determined independently of that path, whose only impact is on which equilibrium is actually achieved. In other words, all the potential equilibria outcomes are independent of the adjustment path.

In contrast to the view just described is the belief that, although the economy may tend toward an equilibrium position, that equilibrium will itself be path determined, in the sense that the path that the economy takes outside equilibrium will influence its final values. The adjustment path influences the equilibrium position by changing the fundamentals of the economy. So the potential equilibrium outcome cannot be known independent of the adjustment path. Another version of this position is known as hysteresis, according to which "the variable values created by the system depend, in addition to its relations and parameters, on the history of the shocks" (Katzner 1993, 324).[2]

The second view, that the economy is always in equilibrium (even during cycles), is associated with the New Classical macroeconomics. The addition of the assumption of rational expectations to that of continuing market clearing means that all economic outcomes are, by definition, equilibrium ones.

> In recent years, a number of economists have worked to develop what I prefer to call *equilibrium* models of business cycles. These are models that utilize the contingent claim point of view…in which prices and

> quantities are taken to be always in equilibrium. In these models, the concepts of excess demands and supplies play no observational role and are identified with no observational magnitudes.
>
> (Lucas 1980, 709; see also Lucas 1983)

The final view is that equilibrium is not a useful method of analysis, as it plays no operational role in actual economies. Equilibrium is not an attractor and plays no role in the path of the economy, which is a dynamic growth path, subject to cyclical influences. Under this head we would include post-Keynesian economists like Kalecki and Goodwin, and also many evolutionary economists. Although this position is extremely important in understanding the traverse, as it is dealt with by a number of other chapters in the *Handbook*, we will not explicitly consider it in the rest of this chapter.[3]

Within these positions, the "traverse" is explicitly analyzed by economists who use it to consider the movement of economies outside equilibrium. In particular, the adjustment path is analyzed to consider the conditions under which it will converge to a new equilibrium.

19.3 Historical Antecedents

The traverse played an important role in the works of the classical political economists, particularly when they analyzed the forces that pushed the economy to its "natural values." These forces are mainly determined by supply, demand, and the workings of competition and are, therefore, of a different nature and are therefore determined very differently from natural values, which are mainly determined by cost of production and labor values. As a result, the forces that lead market prices to gravitate to (or around) their natural values did not affect those values. In other words, because they are determined fundamentally differently, the forces pushing the economy to its natural values did not influence those natural values, so there was no path determinacy.

However, problems did arise in the consideration of whether there is an endogenous natural adjustment path driven entirely by microeconomic decisions related to changes determined by technical progress or population. These questions arose from the early discussions within political economy. An important case is Ricardo's and Barton's discussion of whether or not the economy can reabsorb the workers made redundant by new technologies. Initially Ricardo believed in a positive outcome, but subsequently he, judiciously, changed his mind (Samuelson 1988). Until the third edition of his *Principles*, Ricardo had, in a number of places, supported the view that the introduction of machinery would not have any long-run impact on the level of unemployment. However, in the third edition, Ricardo introduced a new chapter, "On Machinery," in which he changed his mind and now

accepted that the introduction of machinery, while it would be advantageous to the interest of capitalists and landlords, would be "very injurious to the interests of the class of labourers" (Ricardo [1817] 1951, 388). He argued that his original mistake was due to his "supposition that whenever the net income of society increased, its gross income would also increase" (388). However, he realized that while machinery could increase profits and rents (net income), they may be associated with a lower total output, and therefore lower employment. Ricardo considers a number of other influences of the new machinery on employment, including its impact on reducing the price of necessities. However, he does not fully trace out the traverse implied by its consequences.[4]

Within Marxian economics there are at least two major instances involving transitional states that are subject to path determinacy. The first appears in Marx's notes on the schemes of reproduction. He observes that setting the schemes in a context where the two sectors move apace is dictated by the necessity to derive the essential relations of the system positing a balanced equilibrium state. Yet he pointed out that sectors would not move apace; the conditions for equilibrium growth are unlikely to be fulfilled, thus generating a cycle in replacement capital and in the proportions between the different branches of the economy. There is no automatic mechanism ensuring the rebalancing process (Sardoni 1981). The second instance relates to the last issue, and it occupied a great deal of the thinking of early twentieth-century Marxists when they started to grapple with the question of effective demand, which they called the realization problem. Some, such as Tugan Baranovsky, argued that underconsumption would not be a factor of crisis, nor would be technological unemployment, provided the economy attained the right proportions between the sectors of production. Thus crises would arise from the fact that in a decentralized private economic system it would be difficult to achieve the right balance between the different branches of production (Sweezy 1942).

From the above examples we can see that the traverse addresses the question raised by Joan Robinson already in the 1950s, namely, how to get into equilibrium. If, for whatever reason, the economy happens to be already in equilibrium, can it traverse to a new one if initial conditions change? The main economic theories developed after the classics essentially refrained from studying out-of-equilibrium situations seriously, the exception being perhaps Marx and the Marxian debate about crises of disproportionalities (Sweezy 1942).[5]

19.4 Marshall, Neoclassical Economics, and the Traverse

In the preface to his *Principles*, Marshall had proclaimed that the Mecca of the economist lies in economic biology, and that "while frequent use is made of the term 'equilibrium' which suggests something of statical analogy," the subject matter is in fact "concerned throughout with the forces

that cause movement: and its key-note is that of dynamics, rather than statics" (Marshall [1890] 1920, xiv). The challenge Marshall had set himself was to construct a theory of value within an equilibrium framework that was at the same[6] time in harmony with the "organic" forces that determine economic change through time. The difficulties Marshall encountered in realizing this objective was most apparent in his demand-and-supply-based partial equilibrium analysis of the effects of a change in demand on prices in an industry in the long period, a time period in which plant itself could be remuneratively produced and applied. In this context, Marshall was forced to concede serious limitations to the applicability of the comparative static method:

> It must however be admitted that this theory is out of touch with real conditions of life, in so far as it assumes that, if the normal production of a commodity increases and afterwards again diminishes to its old amount, the demand price and the supply price will return to their old positions for that amount….For, when any casual disturbance has caused a great increase in the production of any commodity, and thereby has led to the introduction of extensive economies, these economies are not readily lost. Developments of mechanical appliances, of division of labour and of the means of transport, and improved organisation of all kinds, when they have been once obtained are not readily abandoned.
>
> (Marshall [1890] 1920, 807–8)

Therefore, the operational meaning that can be attributed to the "true" long-period supply schedule within an equilibrium framework becomes more than problematic. Shifts in demand schedules cannot be coupled with movements along this supply schedule, as it would infer that economies (or diseconomies for that matter) once introduced can be reversed or reconstructed. The "true" long-period supply schedule in effect shows combinations of price-quantity values that *were* on a succession of shifting demand curves. In this sense, as Schumpeter (1954, 995) concluded, the "true" long-period supply curve in Marshall's system has to be interpreted as an historical phenomenon, not an analytical one. Therefore, while its construction may conceivably be combined with demand schedules to indicate equilibrium positions *ex post*, it could not describe the process by which the equilibrium positions may be attained or maintained. In particular, there is an absence of any consideration of the process by which an economy may move between hypothetical equilibrium positions. The nature of the journey the economy may be embarking on as it seeks a new equilibrium position is obscured within the comparative statics that characterized Marshall's, and later conceptualizations, of long-period analysis.

As Marshall acknowledged, the element of time is a chief cause of the difficulties in economic investigations. The significance of this theme was

restated in Joan Robinson's critical reconsideration of her theory of imperfect competition:

> In my opinion, the greatest weakness of the *Economics of Imperfect Competition* is one which it shares with the class of economic theory to which it belongs—the failure to deal with time. It is only in a metaphorical sense that price, rate of output, wage rate or what not can move in the plane depicted in a price-quantity diagram. Any movement must take place through time, and the position at any moment of time depends upon what it has been in the past. The point is not merely that any adjustment takes a certain time to complete and that (as has always been admitted) events may occur meanwhile which alter the position, so that the equilibrium towards which the system is said to be *tending* itself moves before it can be reached. The point is that the very process of moving has an effect upon the destination of the movement, so that there is no such thing as a position of long-run equilibrium which exists independently of the course which the economy is following at a particular date.
>
> (Robinson [1953] 1975, 234; see also Robinson [1974] 1979)

19.5 The Traverse, Equilibrium Analysis, and Post-Keynesian Economics

The implications for the analysis of economic change were further explained as follows by Nicholas Kaldor:

> There can be no such thing as an equilibrium state with optimum resource allocation, where no further advantageous reorganization is possible, since every such reorganization may create a fresh opportunity for a further reorganization.
>
> (Kaldor 1975b, 355)

Building on the ideas of Adam Smith, Veblen (1898), and Allyn Young (1928), Kaldor went on to develop *the* notion of circular and cumulative causation, where a nonequilibrium process is explicitly involved and in which history is instead intended to take on a pivotal role.[7] Within this approach, circular causation emphasizes the multicausal nature of the complex linkages between core variables, while cumulative causation occurs as positive feedback processes magnify and multiply the impact of these interactions through time. As Kaldor also realized, this approach to economic reasoning has links to themes pursued within evolutionary economics, and to Marshall's dictum that the Mecca of the economist lies in economic biology:

> Yet Marshall's *Principles* seem to me an infinitely more valuable work than Walras's *Elements* or Pareto's *Manual*, even though it may not be equal

> to these two as a source of inspiration to later generations. Marshall realized that human societies are subject to continuous evolution, the precise direction of which can never be predicted; and he frequently emphasized that economics has far more in common with biology than with mechanics.
>
> (Kaldor 1985, 59)

These connections were recognized in Nelson and Winter's seminal contribution to modern evolutionary economics:

> Contemporary commentary on this [Marshall's treatment of increasing returns] tends to rebuke Marshall for his affront to the logic of purely static analysis; the fact that he quite correctly emphasized the role of (informational) increasing returns as an economic mechanism of irreversible change received less attention. On this question and many others, our evolutionary theory is closer to the original Marshallian doctrine than is contemporary orthodoxy.
>
> (Nelson and Winter 1982, 45)[8]

We can contrast these attempts to explicitly incorporate time and path determinacy into post-Keynesian economic analysis with their treatment in mainstream theory. The relevance of these issues to mainstream general equilibrium analysis, in particular, can be highlighted with reference to the damaging implications arising from the Sonnenschein-Mantel-Debreu (SMD) theorem. The general equilibrium theories provided an analytical framework in which the fundamental axioms and intuitions of "neoclassical economics" could be expressed and confirmed in a rigorous mathematical form, characteristically combining the principles of optimization by economic agents and the coordination of their activities through perfectly competitive markets where relative prices reflected all relevant data about the economy. The SMD theorem demonstrated that, with respect to the more sophisticated Arrow-Debreu models, the aggregate excess demand function that characterized competitive equilibria inherited only limited properties from individual's demand functions; continuity, homogeneity of degree zero, and the validity of Walras's law (together with boundary conditions as prices approach zero). These properties are not sufficient to restrict the admissible aggregate excess demand function in a way that would ensure uniqueness or stability of equilibrium.[9]

General equilibrium theory has been predominately preoccupied with the question of the existence of equilibrium prices, corresponding to a configuration in which the excess demand is zero for every commodity. Within the assumed perfectly competitive market conditions, it was supposed that prices convey all relevant information about the economy. Clearly, to investigate satisfactorily stability issues, the theorist has to have

something substantial to say about the way an economy functions out of equilibrium, which requires an examination of the nature of price adjustments. However, while the general equilibrium models were founded on a system of market prices, there was no meaningful analysis of the processes by which prices may be established beyond vague and erroneous references to the "Walrasian auctioneer." What is required is a meaningful analysis of the *changing* institutional environment in which markets operate; the manner in which information is attained and disseminated; and the way in which individuals, groups, and economic entities interact with each other. In the absence of a consideration of these themes, the operations of a price system cannot be explained, and a meaningful discussion of the stability issues outlined above is not possible. Without uniqueness and stability guarantees, the idea that policy inferences can be derived from comparative static analysis within the general equilibrium framework is decidedly problematic. Once again, the inability to explain how an economy is said to move between hypothesized equilibrium positions, that is, the traverse, has led to conceptual difficulties that frustrate attempts at addressing the SMD implications in an economically meaningful way.

Neoclassical economics until relatively recently, and with the occasional relevant exception (see, for example, Hahn 1966 and Fisher 1983), eschewed nonequilibrium situations altogether, and it never deals with transitional processes. Robert Solow hit the right note when he observed that the traverse is one of the most difficult topics in economics (Solow 1984). Indeed the traverse lies at the very heart of economic theory, and it encapsulates the main epistemological questions besetting the discipline.

19.6 Origins of the Modern Traverse: The Context

The term "traverse" was coined by John Hicks in *Capital and Growth*, published in 1965. It is important that we set the treatment of the traverse within the context of the book as well as within the theoretical debates of the period. The context of the former was Hicks's abandonment of his own earlier general equilibrium approach, known as the Temporary Equilibrium Method (Hicks 1939). The context of the latter was defined by the Joan Robinson question and by the debates over capital theory as well as over growth theory, to which we must add the development of markup fixed price theorizing.

Hicks's 1939 *Value and Capital* may well be considered as the book that started the march to dominance of general equilibrium theory in the English-speaking world. After 1945 with American political and cultural hegemony in the capitalist world, the establishment of the theory of perfectly, always clearing, competitive markets as the idealized, hence ideological, representation of the actual capitalist system came from Paul Samuelson (1947). However, the ground for his *Foundations of Economic Analysis* was

prepared by Hicks's work. In *Value and Capital* Hicks determined the conditions for obtaining a temporary equilibrium, that is, an equilibrium that does not imply the attainment of a full competitive outcome in the long period. The result is important only in a negative sense, although at the time it was taken to be the usual "first step" toward something more substantial in a longer run that never came. The method is quite simple. Time is divided into weeks; prices are fixed within each week and fully flexible at the beginning of the next. Each week is treated as self-contained. Thus there is no presupposition that the outputs at the end of one week will be those required to get the system going onto the next period. There is therefore no need to specify production or reproduction conditions. On the basis of the principle of gross substitutability, entailing a price substitution effect always greater than the income effect, Hicks arrived at a weekly equilibrium where all the desired demands are equal to all the desired supplies achieved by means of price flexibility. The temporary equilibrium method is free from inquiring into paths pertaining to capital accumulation and to its rate of return (profit). The importance of Hicks's method lies in his separation of the conditions of equilibrium in pure exchange from those of production and accumulation. Equilibrium theory has not moved forward from Hicks's work in 1939. In many respects it went backward, as it became temporal (Samuelson 1947) or intertemporal, as in the Arrow-Debreu constructions. In the latter case we face the absurd assumption that decisions are taken once and for all at the beginning of an agent's life span.[10]

John Hicks was therefore fully aware that in his weekly equilibrium, prices had to adjust almost instantaneously when the outputs at the end of one week would become the new endowments for the next. Hence twenty-six years later in *Capital and Growth* he would write:

> The fundamental weakness of Temporary Equilibrium is the assumption, which it is obliged to make, that the market is in equilibrium—actual demand equals desired demand, actual supply equals desired supply—even in the very short period, which is what its single period must be taken to be. This assumption comes down from Marshall, but even in a very competitive economy, such very short-run equilibration is very hard to swallow; in modern manufacturing industry it is hard to swallow indeed. It was inevitable that the time should come when it had to be dropped.
>
> (Hicks 1965, 76)

We may ask why it took Hicks a quarter of a century to come up with the view that industrial prices do not move according to supply-and-demand relations: a legitimate question since in 1939 the US Congress published the study headed by Gardiner Means where it emerged that at the onset of the Depression the fall of industrial prices following the fall in demand was rather limited, especially in the highly concentrated sectors (Means 1939).

A few years later the famous Oxford Hall and Hitch inquiry argued that for companies, marginal cost pricing was a figment of the imagination (Hall and Hitch 1939). Yet by the 1960s the view that markup pricing dominated in industry was being corroborated in a stronger manner both in theory and in practice, through the evidence that prices were cost, not demand, determined (Kalecki [1954] 1991; Bain 1956; Sylos Labini 1962; Modigliani 1959). Furthermore, Piero Sraffa (1960) published the most difficult simple-looking book ever written, where competition entailed a price system in which demand played no role at all.[11] The above is in our view the context within which Hicks matured his approach toward the traverse. The first step required abandoning the constraint imposed by the instantaneous adjustment of supply and demand prices, to be replaced by what?

All that is said about prices is that they must cover costs; more strictly that a thing will not be produced unless it is profitable to produce it. Subject to this condition, prices can be whatever sellers like. It is not a very stringent condition, if it is unaccompanied by any rule about profits being normal; and the normalization of profits (equalization between different sectors) is a complication for which it is difficult to give sufficient time during the lapse of the single period (Hicks 1965, 78).

Hicks's new price system is exactly Sraffa's: a two-sector economy is built and given the capital and labor coefficients, then prices are determined by a uniform rate of profits that multiplies the price per capital coefficient, which is then added to the wage rate per labor coefficient. Although there is a uniform rate of profits, there is no presupposition that it will converge to a new uniform rate should conditions change. The price system is located in a series of successive periods that define Harrodian dynamics. The latter is nothing but a situation where the economy's composition of output is given, and so is its saving rate as it grows along the warranted path. In this way the single period is extrapolated into the Harrodian longer period that, we know, is unstable and uncertain. Remarkably, Sraffa's prices, where proportions do not change, constitute the microfoundations of Hicks's version of Harrod's dynamics. Indeed, precisely because prices are fixed by the given coefficients of production and the uniformity in wage and rate of profits, they can be used as real output indexes. But Harrodian dynamics is unlikely to continue unless the warranted path coincides with the natural full employment path. Thus the second step requires quitting Harrodian dynamics when growth reaches the ceiling of full employment. It also entails exit from the Sraffa price system because both sectoral proportions and distribution will have to change. We are now entering the realm of the traverse.

19.7 The Hicksian Classical Traverse

Back in those days the memories of the Great Depression were still alive among economists. The intellectual endeavor was to make the new

Keynesian-based theories work at the policy level as well. Neoclassical economists themselves did not hail the unregulated free market system; rather they extolled the virtues of the mixed economy, as Paul Samuelson did in the various editions of his textbook. However, despite the concern about the calamity of mass unemployment, a somewhat simplistic attitude prevailed. It was, as Hicks put it, "the fanfare of the Keynesian orchestra" (Hicks 1985, 131). It boiled down to viewing the boosting of public expenditure and the budget deficit as a miraculous cure-all, without any thoughts being given to whether the structure of production could actually undertake the transition to the new levels of activity.

In 1939, and in 1948 after the end of World War II, Roy Harrod pointed out that while the economy can be brought to full employment, remaining at that level could be quite problematical. As long as there is an ample supply of labor, the actual growth path can be higher than the full employment one. Yet when the ceiling is reached, the previous path ceases to be sustainable due to the instability of the warranted growth path: any attempt to stay on it will lead to excessive saving—because of the higher-than-equilibrium investment—and to a Keynesian recession. Harrod intentionally did not offer any solution to the dilemma in order to underscore the instability of the full employment path. The answers to the Harrod problem came simultaneously in both a neoclassical-Keynesian and classical-Keynesian version. The Solow-Swan growth model is the neoclassical response to Harrod. Even by keeping the Keynesian assumption of a given propensity to save, the economy will adjust to long-period growth equilibrium provided the capital-output ratio varies according to the relative abundance of capital and labor.[12] Thus Harrod's too-high saving ratio is transformed into an increase in the supply of capital relative to labor. Under diminishing marginal productivities, the increased supply of capital will entail a lower growth rate and a higher capital intensity of production. There is no intrinsic reason for a Keynesian recession to occur since the economy can smoothly move to a lower full employment path.[13] The issue of the traverse begins with Hicks's critique of Solow's model in chapter 12 of *Capital and Growth* (Hicks 1965), although the traverse chapter proper is delayed until chapter 16.

In Solow if the growth rate rises, so should the rate of profits; this is true also for classical economics. But Solow also keeps the saving ratio unchanged. By using Sraffa's price system, which requires, at least, a two-sector model, Hicks shows that in a two-sector model with a given propensity to save, a positive relation between the rate of growth and the rate of profits is possible if and only if in the consumption goods sector the capital-to-labor ratio is higher than in the capital goods one. This is nothing but the well-behaved neoclassical production function in a two-sector framework. Hence it yields an absurd result in the opposite case where the capital goods sector is more capital intensive. Here the rate of growth and the rate of profits are inversely related: the rate of profits falls when the growth rate rises!

19.8 The Lowe Traverse and Economic Growth

John Hicks developed the concept of the traverse essentially for critical purposes, that is, in order to show that prices are not much guidance for dynamic non-steady-state processes. Importantly, Hicks's conclusion is not conditional upon any kind of rigidity. It suffices that the production coefficients of the two-sector model do not fit the special neoclassical requirements outlined in the early 1960s by three Japanese mathematical economists, Shinkai, Inada, and Uzawa (Gandolfo 1971). These are known in the literature as the Inada-Uzawa conditions, which postulate that the capital goods sector has to be more labor-intensive than the consumption goods sector for smooth neoclassical adjustment to occur.[14] However, Hicks did not integrate into his analysis the principle of effective demand. Also, in his most problematical neo-Austrian version of the traverse put forward in *Capital and Time* (Hicks 1973), the issue of effective demand never appears, and yet one would have thought that, given Harrod's difficulty regarding the stability of the full employment path, the question would feature prominently in analysis of the traverse. Indeed, the issue has been taken up essentially by a number of scholars writing in the classical and post-Keynesian tradition (Halevi 1992, Halevi and Kriesler 1991, Henry and Lavoie 1997, Lavoie and Ramirez-Gaston 1997, Nell 1998). Contrary to Hicks's critical use of the concept of the traverse, Adolph Lowe (1893–1995) developed a form of traverse analysis oriented to identify the structural phases required for undertaking a process of transition (Lowe 1976). Although in his 1976 book Lowe borrows the term "traverse" from Hicks, greatly acknowledging the latter's contribution, the first Lowe traverse was set out in 1952, a revised version of which had most notably been reproduced in a pioneering volume on capital formation edited by Moses Abramovitz (Lowe 1952, 1955).

Lowe further developed the concept of the traverse in an explicit return to the concerns of classical political economics, when analyzing the "path of economic growth." Rejecting the idea that growth typically occurs with steady-state equilibrium, he made the traverse and consequent structural change the focus of his analysis. As a result, changes in the structure of production become the focus of attention, with the resultant intersectoral relations having an important impact on the growth path.

Lowe's model stressed the importance of historical time and the nonreversibility of economic decisions, particularly investment decisions. Of particular importance in his analysis was the role of the specificity of capital goods,[15] with capital goods being seen as being essentially heterogeneous. In order to capture this concept, Lowe developed a three-sector model, with a consumption goods sector supplemented with two distinct capital-goods-producing sectors. One capital goods sector produced the capital goods for the consumption goods sector, while the other produced the capital goods for both capital goods sectors. The capital goods in this latter sector "are

for the industrial sector what seed wheat and the reproductive system in animals are for agricultural production" (Lowe 1976, 30).

In a modern industrial economy structure is defined in terms of the composition of the capital goods sector. The fixed capital stock is characterized by the durability of equipment, by its internal heterogeneity, and by the gestation period needed to produce it. Furthermore, machinery must itself be reproduced, and a theory of structural change should account for this fact. Thus the minimal requirement for a proper treatment of dynamic transformations is the existence of a self-reproducing branch within the capital goods sector. Obviously this is a set of subsectors that in Lowe are collapsed into a branch called the machine tools industry or primary equipment. Given that in Lowe's model, as much as in Hicks's, consumption goods are aggregated into one single sector, the machine tools industry ends up producing its own capital goods as well as the capital goods needed to produce the machines making the consumption good. This means that the output of the machine tools sector can be allocated in both capital goods sectors, while the output of the capital goods sector producing equipment for the consumption goods sector is nonshiftable. Having presented his stylized facts regarding fixity, specificity, and reproducibility of capital, Adolph Lowe does not have to preoccupy himself with the degree of substitutability between machinery and labor. Thus his assumption is that capital-to-labor ratios and the capital-to-output ratio are given and uniform in all sectors. The attentive reader will recognize here the strong similarity with Marx's schemes of reproduction, acknowledged by Lowe and, indeed, even in value terms Lowe's system corresponds to pure labor values, but only when it works at capacity.

The question that prompted Hicks to formulate the theory of the traverse was whether a smooth endogenous transition from one steady-state growth path to another was at all possible. The answer has been in the negative. For Lowe, the traverse, as outlined as early as 1952, was formulated to consider the question of what should happen to ensure that the transition is successful. This way of formulating the problem establishes the connection between the traverse and the problems of realization and effective demand in a manner closer to Kalecki's approach than to Keynes's.

As an example, consider a simple case of a fully stationary economy at simple reproduction, that is, at a zero growth rate. We make the classical assumptions of fixed production coefficients and that workers consume all their income, while capitalists save all of theirs. Assume that for whatever reason the economy experiences a once and for all increase in the supply of labor. For such an increase to be absorbed by the system, it is necessary that new productive capacity be created. Where will the new capacity come from? Assume that initially we have 1,000 employed workers operating 1,000 machines, 10 in the machine tools sector producing 10 machines per year, 90 people operating 90 machines in the machine sector producing

90 capital goods for the consumption goods industry, while 900 workers operate 900 machines in the consumption goods sector. With depreciation at 10 percent per year the production of machines is exactly equal to the numbers that must be replaced year in year out: the machine tools sector produces 10 machines; one goes back to it as replacement and nine replace the equipment worn out in the intermediate investment goods sector. Likewise the intermediate investment sector produces the 90 machines that will replace the 10 percent worn out of the 900 machines in the consumption goods sector.

Assume now that the labor supply experiences a once-over rise of 10 percent, just to keep the calculations simple. Given the data at our disposal, we know that to absorb the 100 additional people it is necessary to provide 10 percent more jobs, which, in the above model, amounts to producing 100 more machines. Furthermore, the additional machines should be distributed among the three sectors in such a way as to guarantee the stability of the new, final, stationary state. The initial data coupled with the known increase in the supply of labor give us the new final position: every sector should be expanded by 10 percent.

Let us now consider a market route for the absorption of the extra supply of labor. We assume wage flexibility to perfectly reflect the increase in labor supply: (again for simplicity) we assume that a 10 percent increase in labor supply will lead to a 10 percent fall in money wages. The extra labor acts, therefore, as a Marxian reserve army of unemployed workers. In a perfectly competitive market, prices should decline exactly in the same proportion as the fall in money wages, so nothing will change: capacity will not be liberated, and the system will be stuck with 10 percent unemployment due to the fact that there are too few machines relatively to labor. We hit here upon the issue of "capacity liberation," which is at the core of any growth process. Thus for capacity to be liberated in order to create additional capacity, prices of consumption goods should not fall at all, thereby transforming the decline of money wage into one of real wages. Such a situation corresponds to an oligopolistic market form. Individual firms do not operate in relation to an agreed-upon macroeconomic goal. Their business is to respond to demand and to defend their profit margins. The latter are strengthened by the fixity of prices, while consumption demand shrinks by exactly 10 percent due to the fall in real wages. This means that 90 machines in the consumption goods sector will no longer be utilized. Three sequential events may happen now. First, the consumption goods sector will reduce the replacement demand for capital goods from the intermediate investment goods sector, which was supposed to deliver 90 units of replacement equipment. The new investment demand from the consumption goods sector can be anywhere between less than 90 units and zero. The second event is the repercussion on the intermediate investment goods sector of the reduced replacement demand by the consumption goods sector: also, the output of

the intermediate goods investment sector can fall anywhere between less than 90 and zero. The third event is the further decline in consumption demand due to the lower real wages and lower employment levels, which sets in motion another Keynesian round of investment and employment cuts. Although the decline in real wages is exactly what is needed to liberate capacity, increased production is unlikely to be achieved by uncoordinated and structurally constrained firms and sectors. The solution can arise only if there is in the economy a sector that can go against the market trend by generating independent demand based on a macroeconomic dynamic reading of the situation. Such a sector will take goal-oriented decisions.

In the Lowe model outlined above two sectors are passive; they can only react to current demand. They are bounded by the short period and cannot by themselves break out of it. The passive sectors are the consumption goods and the intermediate goods investment sectors since neither has any internal reproduction capacity. The sector that can go beyond the short period is the machine tools sector. It can read the macroeconomic situation correctly and act accordingly. In essence it becomes the planning lever of the economy. As Oscar Lange once pointed out: supply and demand express static situations; developmental processes must be taken out of the static supply-and-demand context (Lange 1967).

To see how the asymmetric process unfolds, assume that in the wake of a 10 percent fall in real wages 90 units of equipment in the consumption goods sector are made idle. The sector will immediately adjust capacity to demand and will reduce its replacement requirements to zero. Hence the output of the intermediate sector falls to zero. It follows that as the consumption goods sector goes into a depression, the intermediate sector hits ground zero right away. Yet it does not have to go into a depression provided it is led by the machine tools sector, which, we assume, has read the situation correctly and gears up to expand the whole economy by 10 percent. The capital stock of the intermediate sector is made of the same equipment as that of the machine tools sector. Since the intermediate sector no longer has to supply machinery to the depressed consumption goods sector, it can allocate part of its own machinery to produce additional machine tools. We know that the new final position is 11 machine tools in the machine tools sector, 99 in the intermediate sector, and 990 units of specific equipment in the consumption goods sector. Employment in the two investment sectors will not fall, therefore, and, soon afterward, will start rising as the two capital goods sectors begin to increase their own stock of capital toward the new terminal level. The expansion in the capital goods sectors will increase the demand for consumption goods, thereby enabling the consumption goods sector to recover in terms of output and employment. From this point onward the consumption goods sector expands toward the new stationary state, pulled up by the two capital goods sectors. When the final stage is reached, money wages will have to have increased at given prices so as to

recover the lost ground. Indeed, in the absence of technical progress real wages will have to be equal to those ruling before the increase in the supply of labor.

So the structural model is used to analyze the impact of economic growth on an economy from an initial stationary state, as well as to examine the effect of changes in important parameters such as changes in the growth rate of the labor force or changes as a result of changes in technology. The implications of these factors for structural change and for intersectoral relations are considered, in order to see whether a new full employment steady state will emerge. As our example has demonstrated,

> an important conclusion to emerge is Lowe's demonstration that, although there may very well be a traverse which leads to a new full employment steady state, it is unlikely to be achieved within a decentralised market system. This, in part, results from the market transmitting the "wrong" signals in terms of the optimal structure of production and intersectoral flows.
>
> (Kriesler 1999, 410)

The foregoing example is the simplest case of a traverse in a Lowe framework, and yet it highlights the crucial connections between the changes in the composition of output and effective demand within each transitional phase. However, there are several types of traverses in Lowe since his book also deals with technological change seen as nonuniformly spread processes. In these cases, issues emerge of capacity liberation and liquidation within the transitional phases taking different forms as to where technical change occurs first. The focus on what happens within the transitional phases is the main difference between Lowe's and Hicks's traverses. In the latter attention is centered solely on whether an automatic convergence to equilibrium exists or not. Furthermore, the method of the Lowe traverse raises once again a point made by Piero Sraffa (1960) regarding how to look at economic processes: either in terms of linear processes going from given resources to final demand, or in terms of circular production flows. A modern economy is a surplus-producing one; hence circular flows are more relevant than the one-way avenue from resources to final demand. In this context any analysis of a modern economy must contain a set of sectors performing like corn seeds in the classical corn model, without, however, obscuring the overall specificity of production (Gehrke and Hagemann 1996). Traverse analysis is also useful in understanding problems associated with developing economies. Lowe-type models with a self-reproducing primary equipment sector and with a secondary equipment sector producing machines only for consumption goods were used by Raj and Sen (1961) and Naqvi (1963) to map out development patterns for the Indian economy under conditions of stagnant export earnings.

19.9 The Traverse and Macroeconomics

The origin of contemporary macroeconomics is usually associated with the publication of Keynes's *General Theory* (1936), with the subsequent development of macroeconomic theory largely reflecting diverging interpretations of, and reactions toward, the approach formulated by Keynes and his close colleagues at Cambridge. While Keynes's *General Theory* has been routinely represented within a Walrasian-style equilibrium framework, Keynes emphasized that his analysis was not founded on the notion of a stationary equilibrium:

> Or, perhaps, we make our line of division between the theory of stationary equilibrium and the theory of shifting equilibrium—meaning by the latter the theory of a system in which changing views about the future are capable of influencing the present situation….We can consider what distribution of resources between different uses will be consistent with equilibrium under the influence of normal economic motives in a world in which our views concerning the future are fixed and reliable in all respects;—with a further division, perhaps, between an economy which is unchanging and one subject to change. Or we can pass from this simplified propaedeutic to the problem of the real world in which our expectations are liable to disappointment and expectations concerning the future affect what we do today.
>
> (Keynes 1936, 292–93)

Keynes argued that the state of expectations is liable to constant change, a new expectation being superimposed long before the previous change has fully worked itself out; so that the economic machine is occupied at any given time with a number of overlapping activities, the existence of which is due to various states of expectation (1936, 50). As John Hicks (1979, 80) observed, equilibrium under the circumstances being described by Keynes could only be perceived narrowly in terms of states in which there were no surprises, such that what happens during the period falls sufficiently within the range of what is expected for no revision of expectations to be necessary. However, while this strict interpretation of equilibrium may leave some room for the theorist to maneuver, Hicks in his reconsideration of the IS/LM issued the following caution regarding the use of this apparatus in formulating policy implications:

> When one turns to questions of policy, looking toward the future instead of the past, the use of equilibrium methods is still more suspect. For one cannot prescribe policy without considering at least the possibility that policy may be changed. There can be no change of policy if everything is to go on as expected—if the economy is to remain in what (however

> approximately) may be regarded as its *existing* equilibrium. It may be hoped that, after the change in policy, the economy will somehow, at some time in the future, settle into what may be regarded, in the same sense, as a new equilibrium; but there must necessarily be a stage before that equilibrium is reached. There must also be a problem of traverse. For the study of a traverse, one has to have recourse to sequential methods of one kind or another.[16]
>
> (Hicks 1980–81, 153, emphasis in original)

However, the task allocated to the "sequential method" in explaining the movements of an economy through time within the setting of equilibrium reference points is rather daunting. As Allyn Young (1928) emphasized in his contribution to the Marshallian cost controversies of the 1920s, economic change becomes progressive and propagates itself in a cumulative way, echoing the perspective found in Veblen's writings:

> The economic life history of the individual is a cumulative process of adaptation of means to ends that cumulatively change as the process goes on, both the agent and his environment being at any point the outcome of the last process.
>
> (Veblen 1898, 391)

This view of the cumulative nature of the traverse is the essence of Kalecki's later analysis. "In fact, the long-run trend is but a slowly changing component of a chain of short run situations; it has no independent entity and the [analysis] should be formulated in such a way as to yield the trend-cum business cycle phenomenon" (Kalecki [1968] 1991, 435). Kalecki had always rejected the notion of equilibrium and was not concerned with analyzing equilibrium positions. For Kalecki, like Keynes, the main determinant of the level of economic activity and of employment was the level of aggregate of demand. As a result, his analysis concentrated on the structure of demand. For him, the essence of the problem of adjustment of economies was what happened to the composition of demand, particularly as a result of the changes in the distribution of income that occurred during the cycle. As he was concerned with problems associated with realization in the form of effective demand, Kalecki, like Lowe, disaggregated the economy into three sectors, or departments, though his disaggregation served different purposes. Kalecki divided the economy into a capital goods sector and two consumption goods sectors, differentiating worker's consumption from that of capitalists.

Of particular importance was the role of investment, due to its dual impact on effective demand. In the short period, investment contributed directly to effective demand so that increased investment in any period directly increased employment and output in that period. However, because

investment led to the production of new capital and, therefore, to extra capacity, the higher was the investment in any period, the harder would it be to achieve full employment in the next period. This "paradox," according to Kalecki, struck at the heart of the capitalist system: "The tragedy of investment is that it causes crisis because it is useful. Doubtless many people will consider this theory paradoxical. But it is not the theory which is paradoxical, but its subject—the capitalist economy" (Kalecki 1939, 148–49). The attempt to reconcile these two aspects of investment was important for Harrod's dynamic model, but also for Kalecki's analysis of economic growth and cycles (Kriesler and Nevile 2012), and helps explain his emphasis on path determinacy: "the rate of growth at a given time is a phenomenon rooted in past economic, social, and technological developments rather than determined fully by the coefficients of our equations as is the case with the business cycle" (Kalecki [1968] 1991, 450).[17]

19.10 Further Developments

This survey of the role of the traverse in political economy has focused on the explicit modeling of the traverse by Hicks and Lowe and has only briefly mentioned subsequent developments. Following the influence of the pioneers of post-Keynesian analysis, many post-Keynesians have worked on dynamic growth analysis, where path determinacy is a key feature. Many of the contributions to this *Handbook* provide excellent examples of this. In addition, the emphasis on path determinacy is also an important theme of the work of evolutionary economists, who see the economy and its components as evolving in response to changes in the economic environment, while itself causing changes in that environment. Not surprisingly, there are major overlaps between the work of evolutionary economists and many post-Keynesians, with evolutionary processes and complex dynamics playing key roles in the works of both; see, for example, Velupillai 2013, Rosser 2002, 2013, and Hart 2013.

Lavoie, in a number of papers (Lavoie 1996, Lavoie and Ramirez-Gaston 1997), has considered the problem of the traverse in Kaleckian models. Lavoie (1996) models an adjustment process of the economy to bring the rate of capacity utilization in the long period into equality with its "normal rate." Such an adjustment process is plausible within the model, but both the resultant "fully adjusted position" and the "normal rate of capacity utilization" "can be shown to depend on the path taken during the traverse, i.e. on the adjustment process during the transition" (Lavoie 1996, 144).

In addition, there are many aspects of post-Keynesian analysis that utilize path determinacy and traverse methodology that we have not been able to cover adequately and have been discussed elsewhere in the *Handbook*, including the structural economic dynamics associated with

Goodwin (Goodwin 1982) and Pasinetti (Pasinetti 1981, 1993) and Kerr and Scazzieri 2013; and, as was discussed above, cumulative causation and path dependence—discussed in Blecker 2013 and Setterfield 2002, 2013.

Clearly, the traverse is intimately linked to concepts such as path dependency, hysteresis, and cumulative causation, all of which highlight the importance of time for economic analysis, as recognized by Marshall, Keynes, Hicks, and Joan Robinson, albeit from different theoretical perspectives. Importantly, traverse analysis demonstrates the significance of one of the fundamental principles of post-Keynesian analysis, the importance of analyzing processes in historical time: "Once we admit that an economy exists in time, that history goes one way, from irrevocable past into the unknown future, the conception of equilibrium…becomes untenable" (Robinson [1973] 1979, 172), and the traverse becomes the key object of economic analysis.

Notes

We would like to thank Geoff Harcourt, Raja Junankar and John Nevile for their helpful comments.

1. Though it may play a role in doctrinal debates (Harcourt 2001, 326–27).
2. For a history of hysteresis in economics see Cross (1993b). The Spring *1993 Journal of Post Keynesian Economics* has an interesting symposium on hysteresis, where its relevance to post-Keynesian economics is discussed—see, in particular, Cross (1993a), Davidson (1993), and Katzner (1993).
3. See also the discussion in Kriesler (1999).
4. Eltis has argued that Ricardo's analysis of the impact of increased mechanization foreshadows Hicks's traverse in *Capital and Time* (Eltis 1985, 266–67).
5. Also, Keynes in the preface to *A Treatise on Money* argued that his "object has been to find a method which is useful in describing not merely the characteristics of static equilibrium, but also those of disequilibrium, and to discover the dynamical laws governing the passage of the monetary system from one position of equilibrium to another" (Keynes [1930] 1971, xvii).
6. For a comprehensive discussion of Marshall's dilemma, see Hart 2012.
7. The contributions of Myrdal (1965, 1968) must also be recognized. Kaldor's major contributions include Kaldor (1966, 1970, 1972, 1985, 1996). Surveys of this literature can be found in Thirlwall (1983) and O'Hara (2009), while Toner (1999) discusses the evolution of the CC approach more generally, and Forstater and Murray (2009) trace the antecedents in the work of the classical economists and Marx before considering their influence on post-Keynesian economists. Significant extensions to Kaldor's largely descriptive analysis can be found in Setterfield's (1997) formal modeling, as well as in his chapter for this *Handbook*, and, in an open economy context, in Blecker's chapter. Harcourt (1995) explains this in terms of a wolf pack analogy.
8. The linkages between Marshall's proposed scheme of economic biology and modern evolutionary theory are explored most directly in Metcalfe (2007).
9. For further discussion of the Sonnenschein-Mantel-Debreu results see Kirman (2006), Rizvi (2006), and Rizvi's chapter in this *Handbook*.

10. As Kaldor notes, "From period 2 on, life must become very boring!" (1996, 7).
11. See also Sraffa's letter to Asimakopulos quoted in Harcourt (2008, 75).
12. Solow-Swan assumed that the government kept the economy at full employment in the short run (Harcourt 2006, 109–10).
13. Sen ([1962] 1970) argues that if an independent investment function is introduced, Harrod's instability problem quickly reappears in the Solow-Swan model, because stability depends upon reactions to unrealized expectations.
14. Interestingly, the Inada-Uzawa conditions and the outcome of Hicks's classical traverse show that the accusation made against Sraffa—that the absence of demand function in the determination of prices is a consequence of fixed production coefficients—is plainly wrong. It is equally interesting to observe that the most faithful Sraffians did not notice the help that, only five years after the publication of Sraffa's book, they were receiving from the inventor of temporary general equilibrium theory.
15. Kaldor, in a much-neglected article ([1938] 1960), explicitly addresses the problems caused by the specificity of factors of production.
16. However, note Shackle's reservations: "In his 'explanation' Sir John still does not seem to me to acknowledge the essential point: the elemental core of Keynes' conception of economic society is uncertain expectation, and uncertain expectation is wholly incompatible with the notion of equilibrium" (Shackle 1982, 437–38).
17. Fuller discussions of Kalecki and the traverse can be found in Halevi and Kriesler (1992) and Kriesler (1999).

References

Bain, J. 1956. *Barriers to New Competition.* Cambridge: Harvard University Press.

Blecker, R. A. 2013 "Long-Run Growth in Open Economies: Export-led Cumulative Causation or a Balance-of-payments Constraint?" In *The Oxford Handbook of Post-Keynesian Economics, Volume 1: Theory and Origins*, eds. G. C. Harcourt and Peter Kriesler, 390–414. Oxford: Oxford University Press.

Cross, R. 1993a. "Hysteresis and Post Keynesian Economics." *Journal of Post Keynesian Economics* 15: 305–8.

Cross, R. 1993b. "On the Foundations of Hysteresis in Economic Systems." *Economics and Philosophy* 9: 53–74.

Davidson, P. 1993. "The Elephant and the Butterfly: or Hysteresis and Post Keynesian Economics." *Journal of Post Keynesian Economics* 15: 309–22.

Eltis, W. 1985. "Ricardo on Machinery and Technological Unemployment." In *The Legacy of Ricardo*, ed. G. Caravale, 257–84. Oxford: Basil Blackwell.

Fisher, F. M. 1983. *Disequilibrium Foundations of Equilibrium Economics*, Cambridge: Cambridge University Press.

Forstater, M., and M. Murray. 2009. "Circular and Cumulative Causation in the Classics: Anticipations, Family Resemblances, and the Influence on Post Keynesian Economics." In *The Foundations of Non-equilibrium Economics: The Principle of Circular and Cumulative Causation*, ed. S. Berger, 154–71. London: Routledge.

Gandolfo, G. 1971. *Mathematical Methods and Models in Economic Dynamics*. Amsterdam: North Holland.

Gehrke, C., and H. Hagemann. 1996. "Efficient Traverses and Bottlenecks: A Structural Approach." In *Production and Economic Dynamics*, ed. M. Landesmann and R. Scazzieri, 140–66. Cambridge: Cambridge University Press.

Goodwin, R. M. 1982. *Essays in Economic Dynamics*. London: Macmillan.
Hahn, F. 1966. "Equilibrium Dynamics with Heterogeneous Capital Goods." *Quarterly Journal of Economics* 80: 633–46.
Halevi, J. 1992. "Accumulation and Structural Disequilibrium." In *Beyond the Steady State: A Revival of Growth Theory*, ed. J. Halevi, D. Laibman, and E. Nell, 264–88. Houndmills: Macmillan Academic and Professional.
Halevi, J., and P. Kriesler. 1991. "Kalecki, Classical Economics and the Surplus Approach." *Review of Political Economy* 3: 79–92.
Halevi, J., and P. Kriesler. 1992. "An Introduction to the Traverse in Economic Theory." In *Beyond the Steady State: A Revival of Growth Theory*, ed. J. Halevi, D. Laibman, and E. Nell, 225–34. Houndmills: Macmillan Academic and Professional.
Hall, R. L., and C. J. Hitch. 1939. "Price Theory and Business Behaviour." Oxford Economic Papers 2: 12–45.
Harcourt, G. C. 1995. "Markets, Madness and a Middle Way." In *Harcourt, Capitalism, Socialism and Post-Keynesianism*, 9–24. Aldershot: Edward Elgar.
Harcourt, G. C. 2001. *50 Years a Keynesian and Other Essays*. London: Macmillan.
Harcourt, G. C. 2006. The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers. Cambridge: Cambridge University Press.
Harcourt, G. C. 2008. "The Contributions of Tom Asimakopulos to Post Keynesian Economics." In *Keynes and Macroeconomics after 70 Years*, ed. L. W. Wray and M. Forstater, 64–79. Aldershot: Edward Elgar.
Hart, N. 2012. Equilibrium and Evolution: Alfred Marshall and the Marshallians. Houndsmills: Palgrave Macmillan.
Hart, N. 2013. Alfred Marshall and Modern Economics: Equilibrium Theory and Evolutionary Economics. Houndsmills: Palgrave Macmillan.
Henry, J., and M. Lavoie. 1997. "The Hicksian Traverse as a Process of Reproportioning: Some Structural Dynamics." *Structural Change and Economic Dynamics* 8: 157–75.
Hicks, J. R. 1939. *Value and Capital*. Oxford: Clarendon Press.
Hicks, John 1965. *Capital and Growth*. Oxford: Oxford University Press.
Hicks, John 1973. Capital and Time. Oxford: Clarendon Press.
Hicks, John 1979. *Causality in Economics*. New York: Basic Books.
Hicks, John 1980–81. "IS-LM: An Explanation." *Journal of Post Keynesian Economics* 3: 19–54.
Hicks, John 1985. *Methods of Dynamic Economics*. Oxford: Oxford University Press.
Kaldor, N. (1938) 1960. "Stability and Full Employment." In Kaldor, *Essays on Economic Stability and Growth*, 103–19. London: Duckworth.
Kaldor, N. 1966. *Causes of the Slow Rate of Economic Growth of the United Kingdom*. Cambridge: Cambridge University Press.
Kaldor, N. 1970. "The Case for Regional Policies." *Scottish Journal of Political Economy* 18: 337–48.
Kaldor, N. 1972. "The Irrelevance of Equilibrium Economics." *Economic Journal* 82: 1237–55.
Kaldor, N. 1975. "What Is Wrong with Economic Theory?" *Quarterly Journal of Economics* 89 (3): 347–57.
Kaldor, N. 1985. *Economics without Equilibrium*. New York: M.E. Sharpe.
Kaldor, N. 1996. *Causes of Growth and Stagnation in the World Economy*. Cambridge: Cambridge University Press.
Kalecki, M. 1939. *Essays in the Theory of Economic Fluctuations*. New York: Farrar & Rinehart.
Kalecki, M. (1954) 1991. *The Theory of Economic Dynamic*. London: Allen and Unwin. Reprinted in Collected Works of Michał Kalecki, ed. J. Osiatyński, vol. 2, Capitalism: Economic Dynamics, 207–338. Oxford: Clarendon Press.

Kalecki, M. (1968) 1991. "Trend and the Business Cycle." In *Collected Works of Michał Kalecki*, ed. J. Osiatyński, vol. 2, Capitalism: Economic Dynamics, 435–50. Oxford: Clarendon Press.

Katzner, D. W. 1993. "Some Notes on the Role of History and the Definition of Hysteresis and Related Concepts in Economic Analysis." *Journal of Post Keynesian Economics* 15: 323–45.

Kerr, P., and R. Scazzieri. 2013 "Structural Economic Dynamics and the Cambridge Tradition". In *The Oxford Handbook of Post-Keynesian Economics, Volume 1: Theory and Origins*, eds. G. C. Harcourt and Peter Kriesler, 257–87. Oxford: Oxford University Press.

Keynes, J. M. (1930) 1971. A Treatise on Money. Vol. 1: The Pure Theory of Money. Reprinted as vol. 5 of *The Collected Writings of John Maynard Keynes*, ed. D. Moggridge. London: Macmillan for the Royal Economic Society.

Keynes, J. M. 1936. *The General Theory of Employment, Interest and Money.* London: Macmillan.

Kirman, A. 2006. "Demand Theory and General Equilibrium: From Explanation to Introspection, a Journey down the Wrong Road." *History of Political Economy* 38 (supplement): 246–80.

Kriesler, P. 1999. "Harcourt, Hicks and Lowe: Incompatible Bedfellows?" In Keynes, Post-Keynesianism and Political Economy: Essays in Honour of Geoff Harcourt, ed. C. Sardoni and P. Kriesler, 400–417. London: Routledge.

Kriesler, P., and J. Nevile. 2012. "Dynamic Keynesian Economics: Cycling Forward with Harrod and Kalecki." *Cambridge Journal of Economics* 36: 405–17.

Lange, O. 1967. "The Computer and the Market." In Socialism, Capitalism and Economic Growth: Essays Presented to Maurice Dobb, ed. C. H. Feinstein, 158–61. Cambridge: Cambridge University Press.

Lavoie, M. 1996. "Traverse, Hysteresis, and Normal Rates of Capacity Utilization in Kaleckian Models of Growth and Distribution." *Review of Radical Political Economics* 28: 113–47.

Lavoie, M., and P. Ramirez-Gaston. 1997. "Traverse in a Two-Sector Kaleckian Model of Growth with Target-Return Pricing." *Manchester School of Economic and Social Studies* 65 (2): 145–69.

Lowe, A. 1952. "A Structural Model of Production." *Social Research* 19: 135–76.

Lowe, A. 1955. "Structural Analysis of Real Capital Formation." In *Capital Formation and Economic Growth*, ed. A. Moses, 581–634. Princeton, NJ: Princeton University Press.

Lowe, A. 1976. *The Path of Economic Growth*. Cambridge: Cambridge University Press.

Lucas, R. E. 1980. "Methods and Problems in Business Cycle Theory." Journal of Money, Banking and Credit 21: 696–715.

Lucas, R. E. 1983. *Studies in Business-Cycle Theory.* Cambridge: MIT Press.

Marshall, A. [1890] 1920. *Principles of Economics*. 8th edition. London: Macmillan.

Means, G. C. 1939. *The Structure of the American Economy.* Washington, DC: U.S. Government Printing Office.

Metcalfe, J. S. 2007b. "Alfred Marshall's Mecca: Reconciling the Theories of Value and Development." *Economic Record* 83: S1–S22.

Modigliani, F. 1959. "New Developments on the Oligopoly Front." *Journal of Political Economy* 66: 215–32.

Myrdal, G. 1965. *Economic Theory and Underdeveloped Regions*. London: University Paperbacks.

Myrdal, G. 1968. *Asian Drama: An Inquiry into the Poverty of Nations*. New York: Twentieth Century Fund.

Naqvi, K. A. 1963. "Machine-Tools and Machines: A Physical Interpretation of the Marginal Rate of Saving." *Indian Economic Review* 6: 19–28.

Nell, E. J. 1998. *The General Theory of Transformational Growth: Keynes after Sraffa*. Cambridge: Cambridge University Press.

Nelson, R., and S. Winter. 1982. An Evolutionary Theory of Economic Change. Cambridge: Harvard University Press.

O'Hara, P. 2009. "The Principle of Circular and Cumulative Causation: Myrdal, Kaldor and Contemporary Heterodox Political Economy." In *The Foundations of Non-Equilibrium Economics: The Principle of Circular and Cumulative Causation*, ed. S. Berger, 91–105. London: Routledge.

Pasinetti, L. L. 1981. *Structural Change and Economic Growth: A Theoretical Essay on the Dynamics of the Wealth of Nations*. Cambridge: Cambridge University Press.

Pasinetti, L. L. 1993. *Structural Economic Dynamics: A Theory of the Economic Consequences of Human Learning*. Cambridge: Cambridge University Press.

Raj, K. N., and A. K. Sen. 1961. "Alternative Patterns of Growth under Conditions of Stagnant Export Earnings." *Oxford Economic Papers* 13: 43–52.

Ricardo, D. [1817] 1951. *The Works and Correspondence of David Ricardo*. Vol. 1: *Principles of Political Economy and Taxation*. Ed. P. Sraffa with the collaboration of M. H. Dobb. Cambridge: Cambridge University Press.

Rizvi, S. A. T. 2006. "The Sonnenschein-Mantel-Debreu Results after Thirty Years." *History of Political Economy* 38:228–45.

Robinson, J. [1953] 1975. "Imperfect Competition Revisited." *Economic Journal* 63:579–93. Reprinted in *Collected Economic Papers*, 2nd edition, vol. 2: 222–38. Oxford: Basil Blackwell.

Robinson, J. [1974] 1979. "History versus equilibrium." In Robinson, *Collected Economic Papers*, 2nd edition, vol. 5: 48–68. Oxford: Basil Blackwell.

Robinson, J. [1973] 1979. "What Has Become of the Keynesian Revolution?" In Robinson, *Collected Economic Papers*, 2nd edition, vol. 5: 168–77. Oxford: Basil Blackwell.

Rosser, J. B., Jr. 2002. "Complex Dynamics and Post Keynesian Economics." In *The Economics of Demand-Led Growth*, ed. M. Setterfield, 74–98. Cheltanham: Edward Elgar.

Rosser, J. Barkley, Jr. 2013. "A Personal View of Post-Keynesian Elements in the Development of Economic Complexity Theory and Its Application to Policy" In *The Oxford Handbook of Post-Keynesian Economics, Volume 2: Critiques and Methodology*, eds. G. C. Harcourt and Peter Kriesler, 198–201. Oxford: Oxford University Press.

Samuelson, P. A. 1947. *Foundations of Economic Analysis*. Cambridge: Harvard University Press.

Samuelson, P. A. 1988. "Mathematical Vindication of Ricardo on Machinery." *Journal of Political Economy* 96(2): 274–82.

Sardoni, C. 1981. "Multi-sectoral Models of Balanced Growth and the Marxian Schemes of Expanded Reproduction." *Australian Economic Papers* 20:383–97.

Schumpeter, J. A. 1954. *History of Economic Analysis*. New York: Oxford University Press.

Shackle, G. L. S. 1982. "Sir John Hicks' 'IS-LM an Explanation': A Comment." *Journal of Post Keynesian Economics* 4(3): 435–38.

Sen, A. K. (1962) 1970. "Interest, Investment and Growth." Rewritten in *Growth Economics*, ed. A. K. Sen, 219–32. Harmondsworth: Penguin.

Setterfield, M. 1997. "History versus Equilibrium and the Theory of Economic Growth." *Cambridge Journal of Economics* 21:365–78.

Setterfield, M. 2002. "A Model of Kaldorian Traverse: Cumulative Causation, Structural Change and Evolutionary Hysteresis." In *The Economics of Demand-Led Growth*, ed. M. Setterfield, 215–33. Cheltanham: Edward Elgar.

Setterfield, M. 2013. "Endogenous Growth: A Kaldorian Approach". In *The Oxford Handbook of Post-Keynesian Economics, Volume 1: Theory and Origins*, eds. G. C. Harcourt and Peter Kriesler, 231–56. Oxford: Oxford University Press.

Solow R. M. 1984. "Mr Hicks and the Classics." *Oxford Economic Papers*, n.s, 36 (Supplement: Economic Theory and Hicksian Themes): 13–25.

Sraffa, P. 1960. *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory.* Cambridge: Cambridge University Press.

Sweezy, P. 1942. *The Theory of Capitalist Development: Principles of Marxian Political Economy.* New York: Monthly Review Press.

Sylos Labini, P. 1962. *Oligopoly and Technical Progress.* Cambridge: Harvard University Press.

Thirlwall, A. P. 1983. "A Plain Man's Guide to Kaldor's Growth Laws." *Journal of Post Keynesian Economics* 5(3): 345–58.

Toner, P. 1999. *Main Currents in Cumulative Causation: The Dynamics of Growth and Development*. Basingstoke: Macmillan.

Veblen, T. B. 1898. "Why Is Economics Not an Evolutionary Science?" *Quarterly Journal of Economics* 12:373–97.

Velupillai, K. V. 2013. "Post-Keynesian Precepts for Nonlinear, Endogenous, Nonstochastic, Business Cycle Theories". In *The Oxford Handbook of Post-Keynesian Economics, Volume 1: Theory and Origins*, eds. G. C. Harcourt and Peter Kriesler, 415–442. Oxford: Oxford University Press.

Young, A. A. 1928. "Increasing Returns and Economic Progress." *Economic Journal* 38:527–40.

Part II
Post-Keynesian Economics

20

The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers

G. C. Harcourt

This paper summarises the key elements of G. C. Harcourt's (2006) book of the same title. Special emphasis is given to the contribution of the Cambridge pioneers, such as John Maynard Keynes, Richard Kahn, Joan Robinson, Nicholas Kaldor, Michał Kalecki, Richard Goodwin, Piero Sraffa, Luigi Pasinetti, and Dennis Robertson. The objective of their approaches is to comprehend the dynamics of an advanced capitalist economy, particularly in the context of a monetary system of production. Here, investment leads and saving follows, while the marginal propensity to save of capitalists is greater than that of workers. The economic surplus is produced in the consumption goods sector, and utilised in the capital goods sector. Mark-up pricing is important for the determination of the surplus, as is the trade off between profit-margins and sales. Kalecki's principle of increasing risk plays a role in the cyclical dynamics, as does the two-sided relationship between profitability and accumulation. The prevailing business climate is important in determining future expectations, while endogenous money and credit help to finance investment. Growth is thus endogenous in these models of finance, accumulation and profit, while potential conflict plays a role in the pricing and investment decisions and in the process of inflation. A general policy vision emanates from these foundations.

20.1 Introduction

I start, first, by thanking the original inhabitants of the land on which we are now meeting for their courtesy in having us as their guests. Secondly, I must apologise to Peter Groenewegen and John King as they have already heard me talking on the present topic at the ESHET Conference in Porto in April 2006. Also, following John King's comments as discussant of the paper

Revised from *History of Economics Review*, No. 45, 95–105, Winter 2006, 'The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers,' by Harcourt, G. C. With kind permission from The History of Economic Thought Society of Australia. All rights reserved.

at Porto (I thoughtfully lent him the page proofs of the book on which the paper was based, Harcourt (2006), to read on the day the paper was presented), I feel I should have subtitled the book, *The Core Contributions of the Cambridge Pioneers*. But, as I quote Dennis Robertson in the Preface to the book as saying, 'it can't be helped now' (Robertson 1957, p. 7).

When writing the book, I had in mind two sets of readers: first, undergraduate and graduate students who may be looking for alternative approaches to thinking about theoretical, applied and policy issues in economics. By presenting a structure of the thought (and its origins) that I have found so helpful over my working life I hope at least to interest and possibly even enthuse this first set. Second, I also hope that what I have written may interest teachers and researchers in economics, not so much perhaps for the details of the analysis, with which many would be familiar, but for the way in which one person at least sees the interconnections and interrelationships that have emerged as our discipline has evolved and developed.

The ideas in the book themselves have evolved and developed for me over the past fifty years, in both lectures and research. My model is not exactly Dennis Robertson's three volumes of *Lectures on Economic Principles* in Cambridge (1957, 1958, 1959); but I suppose it has something in common with them, even with his admission that 'if it is all wrong, it can't be helped now' (Robertson 1957, p. 7). I trust, though, that I have not written in quite so querulous a tone as that into which Robertson sometimes lapsed, for I remain, as ever, a happy and enthusiastic, even optimistic, person who nevertheless is willing to admit that he may be wrong.

I wrote the first draft of the Preface in April 2005, in the fiftieth year since I first came to Cambridge in September 1955. Half my working life has been spent here (the other half in Adelaide, most happy years) and I count myself most fortunate to have studied and taught in such a stimulating and satisfying, even if sometimes so cantankerous an environment.

Much more than this, though, in 2005 Joan and I celebrated our Golden Wedding anniversary on 30th July. As ever, her love and support made possible the writing of the book, much of which occurred in the study she imaginatively prepared for me in our New Square home when, having had three years' grace over and above the obligatory seventy years' constraint, I no longer had a room at Jesus. I dedicated the book to her with my love.

20.2 The Cambridge Pioneers

Why post-Keynesian economics and who were its Cambridge pioneers? Maynard Keynes, Richard Kahn, Richard Goodwin, Nicholas Kaldor, Luigi Pasinetti, Joan Robinson and Piero Sraffa all started initially, at least in some degree, within the mainstream of their time. They all moved well and truly outside it, attempting to create either a revolutionary alternative or to

rehabilitate the classical Marxian tradition, in most cases in the light of the Keynesian revolution. The one exception is Michał Kalecki, whose personal history and independent mind combined to place him virtually always outside the mainstream. The book, though, is not principally concerned with why and how the discontents that led them to change their minds arose. Rather, its principal object is to set out the structures of their alternative approaches in order to suggest modes of thinking about theoretical and policy issues in political economy.[1]

The structures presented here are based on over forty years of teaching and researching under the rubric of what is now called post-Keynesian economics. I certainly was not aware that it was so called when I started on this track in the 1950s. In fact, I have much sympathy with the stance of my old friend, the late Athanasios (Tom) Asimakopulos, who declined an invitation to be included in the first edition of Philip Arestis and Malcolm Sawyer's admirable *A Biographical Dictionary of Dissenting Economists* (1992), because he regarded his views and contributions as belonging fully within the mainstream of economics proper, not in a dissenting stream.[2] It was only in order to provide a suitable tribute to his influential contributions and splendid personal example as a teacher and human being that his widow, Marika, allowed the entry on Tom to be included in the second edition of Arestis and Sawyer (see Harcourt 2000). However, it must be admitted that when I first wrote this (August 2004), though something of a backlash/comeback may be discerned (see Harcourt 2001 for reasons why), the views and approaches taken in the book still continue to be regarded by the bulk of the profession as those of dissenters.

The most succinct definition of post-Keynesian economics comes from Joan Robinson (1978; *CEP,* volume V, 1979, p. 210): 'To me, the expression *post-Keynesian* has a definite meaning; it applies to an economic theory or method of analysis which takes account of the difference between the future and the past' (emphasis in the original).

I obviously have no quarrel with this; but, as I try to be ever-mindful of historical developments, I also wish to stress that the approaches to political economy that reflect post-Keynesian thought are there partly for historical reasons and partly because of logical associations. Post-Keynesianism is an extremely broad church. The overlaps at each end of a long spectrum of views are marginal (*sic*), often reflecting little more than a shared hostility towards mainstream neoclassical economics and methodology, *IS/LM* Keynesianism and the 'fix-price' Keynesianism of the 'New Keynesians' and certain French economists. Some post-Keynesians are working actively towards a synthesis of the principal strands.[3] Others regard the search for a synthesis, for a general all-embracing structure, as a profound mistake: to quote Joan Robinson (1974; *CEP*, volume V, 1979, p. 119), a founding mother, a misguided attempt to replace 'one box of tricks' by another. Post-Keynesianism should be a situation-and-issue-specific method of doing

political economy, a 'horses for courses' approach, itself an all-embracing structure at the methodological level (see Harcourt 2001, Essay 19).

The principal object of analysis is the advanced capitalist economies of the twentieth and twenty-first centuries. The central aim is to provide a framework within which to understand and explain their macroeconomic and/or microeconomic processes over time. It must be admitted that the tradition within which they are presented objects vigorously to the microeconomic/macroeconomic dichotomy of mainstream economics (see Joan Robinson 1977b; *CEP*, volume V, 1979, pp. 4–5 for a typically forceful argument why.) Basically, neither individual nor group/class behaviour may be understood without making explicit the economy-wide structures and relationships that provide the backdrop to their behaviour. Similarly, economy-wide structures and relationships not only influence but also are influenced by individual and group/class motivations and behaviour. Thus the microeconomic foundations of macroeconomics must always be complemented with—indeed, it could be argued, dominated by—the macroeconomic foundations of microeconomics, see Crotty (1980).[4]

The particular subsets of the mainstream literature that this happy band became increasingly dissatisfied with were the theory of distribution, especially the marginal productivity theory in its aggregative form (but also the supply and demand approach in general, see Bharadwaj 1978); the theory of pricing at the level of the firm and the industry, principally as it came down from Marshall and Pigou; the theory of investment behaviour and expenditure that is implied in Marshall and Pigou and, more explicitly, in the writings of Irving Fisher; and the theory of growth, to which is allied the theory of the trade cycle (the business cycle to our North American cousins), as it has been developed in the postwar period by leading neoclassical economists (some of whom, for example, James Meade, Robert Solow and Trevor Swan were/are also leading Keynesians). In doing so, they were inspired and stimulated – even irritated – by Roy Harrod's and Evsey Domar's seminal contributions in the late prewar and early postwar years. The final objective of the book was to show how the alternative theories of the post-Keynesians under each of these heads may be combined into an overarching general framework that may then be applied in explanations of postwar happenings in the advanced capitalist world. This same framework, together with its constituent parts, may be used to rationalise various policy proposals that tackled, or should have been used to tackle, some of the major malfunctions of these economies in the same period.

An equally important aim of the volume was to rescue the pioneering contributions of this first generation from the benign neglect and misunderstandings that are starting to occur as the time from their respective deaths lengthens. It is important to have recorded for posterity the background and the nuances to the making of the theories by people who knew these pioneers personally and who were present for at least part of the time when

the ideas were developed, not only to restore them to their correct place in the narrative but also to correct the misconceptions and often neglect they suffer or experience as the third and even fourth generation of post-Keynesians increasingly come to constitute the post-Keynesian literature and canon. I do not mean to denigrate the contributions of the latter groups; but I would like to restore to their rightful place the fundamental pioneering contributions of the first contributors.[5]

20.3 Structure and Main Themes of the Book

The structure of the book is as follows: in chapter 2 I discuss post-Keynesian macroeconomic theories of distribution. I start with Kaldor's 1955–6 paper, as it is the best known. I use it and its characteristics as the backdrop to discussions of Kalecki's earlier contributions, including his review of Keynes's *General Theory*, Joan Robinson's eclectic approach and Frank Hahn's macro theory of employment and distribution, which was initially developed in his PhD dissertation at the LSE in the later 1940s and early 1950s.

I start with Kaldor's paper not only because it is the best known but also because it is the most idiosyncratic. For here was Kaldor, an eminent Keynesian, arguing that a growing capitalist economy, if it is in equilibrium, must be at full employment, and that the theory he developed is a long-period one. The theory is Keynesian because he insists that investment leads and saving responds. But his first two assumptions led Paul Samuelson (1964) to dub him Jean-Baptiste Kaldor. Kaldor used two empirical generalisations to complete his model: first, that prices are more flexible than money wages in the long term, and so change more rapidly than money wages in situations of excess demand or supply; secondly, that the marginal prosperity to save of profit-receivers (profits) is greater than the marginal prosperity to save of wage-earners (wages).[6] This allowed total saving (as a proportion of full employment long-period income) to change as the distribution of income changed in response to discrepancies between planned investment (as a proportion of full employment long-period income) and the initial value of planned saving (also as a proportion of full employment long-period income), until planned saving and planned investment were equal to one another.

In Kalecki's earlier account of a macro theory of distribution, the analysis applied to the short period, in which there is not necessarily full employment, so that both the distribution of income and the levels of activity and employment may be determined simultaneously. An explicit connection is made between the pricing practices of firms and the overall distribution of income. (In Kaldor's early models on these themes price-setting behaviour is not explicitly discussed.)

In my book I use Joan Robinson's well-known exposition of Kalecki's theory (see Joan Robinson 1977a; *CEP*, volume V, 1979). It is presented in

a neat diagram on which several generations of Cambridge undergraduates have been brought up, first by Joan Robinson and then, later, by me in my lectures in the 1980s and 1990s on post-Keynesian economics.

As we have already noted, Joan Robinson's approach over the years to the theory of distribution was eclectic. By the time she published her *magnum opus*. *The Accumulation of Capital*, in 1956, she was working within Kalecki's structure, which had applications not only to an understanding of how capitalism works but also to how a democratic socialist regime could work too. (Alas, the Stalinists in charge of Kalecki's native Poland never gave him a chance to put his suggestions into practice when he returned there in the 1950s.)

I illustrate Joan Robinson's approach in which she used his structure by examining the real aspects of the creation and extraction of a surplus from the consumption goods sector to be used by the workers in the investment goods sector. I show the crucial roles of productivity in the consumption goods sector and the size of the real wage in the determination of the *potential* rate of accumulation—whether it is *realised* or not depends, of course, on the planned investment behaviour of the capitalist class in given situations in capitalism and of planners and managers in socialism. The analysis follows David Worswick's 1959 stockade dictator version of Joan Robinson's model in *The Accumulation of Capital* (a representation with which she was not *that* pleased) and Harry Johnson's 1962 version of her model with one technique of production available and dominant at any moment of time. (She felt that the major propositions of her theory of growth could be established without explicitly incorporating an analysis of the choice of techniques.)

I also exposit Kalecki's extraordinary review article of *The General Theory,* which unfortunately was not published in full in English until December 1982.[7] The review not only shows conclusively that Kalecki independently discovered the principal propositions of *The General Theory* but also that he set the arguments in the most appropriate framework for analysing capitalism—Marx's schemas of production and reproduction. He showed explicitly both the microeconomic foundations of macroeconomics, including a macroeconomic theory of distribution and the reverse flow of macroeconomic foundations of microeconomics. In the process he showed that market structures were qualitatively unimportant in establishing the main systemic results (see also Shapiro 1997 and Marris 1997).

Post-Keynesian theories of the determination of the size of the mark-up were discussed in chapter 3. Adrian Wood's 'Golden Age' model (1975) was taken as the benchmark against which were assessed the 'historical time' model developed by Peter Kenyon and myself (1976) and the choice of technique in the investment decision in both the orthodox and the post-Keynesian approach.[8] Wood's model is explicitly Golden Age or steady state with expectations always realised so that the analysis is set in logical time. Harcourt and Kenyon's model is an attempt to set the same general problem

in historical time, relating pricing and the investment decision to succeeding short-periods' behaviour of the firm. Discussion of the latter model is preceded by an analysis of the choice of technique in both an orthodox and a post-Keynesian setting, partly because Wood claimed that his analysis was unaffected by the choice of technique rule used, and partly in order to illustrate the different results obtained, according to whether the neoclassical axiomatic approach, or the post-Keynesian approach based on real-world decision-making rules, is employed.

Wood developed a relationship between the rate of growth of sales revenue of the firm and the size of the mark-up needed to provide internal finance to match the accumulation needed to sustain this rate of growth, given the supply of external finance in the existing situation. He identified an opportunity frontier and a finance frontier. The former takes in the opportunities for growth of the firm in terms of alternative pricing, investment and sales policies. At some point the firm encounters a trade-off between a higher profit margin on the one hand and a higher rate of sales on the other. Rates of accumulation are the clue to how fast sales may grow because they determine both capacity and costs of production. There is a unique opportunity frontier for the firm, which itself is usually taken to be a price leader in an oligopolistic setting operating in situations of given overall aggregate demand.

The finance frontier relates to the trade-off between mark-up levels, rates of growth of sales revenues and the investment needed to provide the capacity to produce the output associated with the sales. Where the two frontiers intersect determines both the mark-up set and the rate of growth of sales (and of accumulation to back them up).

When choice of techniques is possible the two frontiers become families, each member of which is associated with a given technique of production. Because the opportunity frontiers move out at a decreasing rate (convex to origin isoquants) while the finance frontiers fan out at a proportional rate, their intersections provide a locus that has a maximum rate of growth of sales revenue, size of mark-up combination. The chapter closes with a discussion of why internal finance is usually preferred to other forms of finance of investment expenditure. Kalecki's principle of increasing risk is taken as the most insightful explanation.

Chapter 4 is concerned with macroeconomic theories of accumulation. It starts with a critique of the details of Keynes's theory in *The General Theory* and after. The critique stems from the writings of Abba Lerner, Kalecki, Joan Robinson and Asimakopulos. The critique argues that Keynes had the right ingredients but the wrong recipe in his chapter 11 on the marginal efficiency of capital (*mec*). Lerner (1944) provided an internal critique by pointing out that Keynes failed to distinguish between the *mec* and the marginal efficiency of investment (*mei*), even though it was the latter in which he was principally interested because it related to the short-period equilibrium

flow of aggregate investment. Lerner's conclusions may be stated in two propositions: (1) in full, stock-flow equilibrium, *mec* = *mei* = *i,* where *i* is the exogenously given value of the rate of interest; and (2) in short-period flow equilibrium, *mei* = *i* < *mec*.

Even these refinements would not suffice for Keynes's three other critics. Keynes had given two reasons why there is, in any given situation, a downward sloping relation between desired rates of accumulation and given values of *i*. The first, relating mainly to the short period, is associated with the assumption of rising marginal costs of production in the short period and marginal cost pricing being usually universal in all sectors of the economy. With given expectations about future flows of expected profits associated with possible investment projects, higher supply prices implied lower *mei*'s. But, his critics argued, this may only occur in the economy as a whole *if* individual business people in the calculations of their *mei*'s used, not known current market prices of investment goods, but rather their equilibrium prices which aggregate investment, if implemented, would bring about. That is to say, Keynes had assumed rational expectations for a second time in his life. (The first was when he planned to do just enough preparation to become 12th Wrangler in the finals of the Mathematics Tripos at Cambridge in 1905, a respectable but not brilliant result which satisfied him but not his father.)

The second reason, a more long-period one, rested on the assumption that long-term demand curves for products were givens while short-period supply curves in future periods would be farther and farther out to the right, the greater were the levels of investment in the current short period (because they would supply greater and greater capacities in the future). The intersections of the supply and demand curves thus implied lower and lower expected prices and therefore expected profits and so lower *mei*'s, the larger the investment now.

But here Keynes was being untrue to his own self, as he always argued in other contexts that the present played a large role in determining expectations about the future. As higher levels of accumulation now would imply greater sales, higher prices and profits, these should be expected in the future and so longer-term demand curves could *not* be taken as givens. Therefore it was not inevitable that expected prices and profits would be lower and so *mei*'s less.

The solution of the critics was to take Keynes's ingredients and rewrite the recipe in terms of a two-sided relationship between profitability and accumulation. Thus, higher rates of accumulation now implied higher systemic profitability. Higher profitability now meant higher expected profitability in the future which would induce higher rates of desired accumulation. Where the two relationships intersected gave, in effect, through Joan Robinson's famous banana diagram (Joan Robinson 1962, p. 48), her version of Harrod's warranted rate of growth—for the expectations of business people

in a given situation would be realised and so maintained. At least, this was so provided the relationships themselves remained unaffected over time by what Harold Macmillan once memorably called (in a different context, of course), 'events, dear boy. events'. All the ingredients involved in their criticism therefore come together in Joan Robinson's well-known banana diagram, an exposition of which ended the chapter.

Chapter 5 contains a brief discussion of money and finance—whether they are exogenous or endogenous in theory and real life. The narrative starts with Keynes's 1937 articles on the finance motive, which stress the distinction between finance and saving and the ordering, at individual and systemic level, of finance → investment → saving. On this base I erect the arguments of modern scholars—Kaldor (1983), Basil Moore (1988), Victoria Chick, Sheila Dow, Giuseppe Fontana (2003), for example—as to why finance, especially banking finance, is predominantly endogenous and that Keynes did *not* disagree with this. For his immediate purposes in *The General Theory,* he took the supply of money as a *given* but not as an exogenous variable. His liquidity preference theory may then be restated in an endogenous money framework as Sheila Dow (1997) showed. As I explain at the beginning of the chapter I have always found money and the theory of money something of a mystery but that does not mean that I regard them as unimportant. After all, one of Keynes's greatest innovations and achievements was to analyse a monetary production economy by integrating monetary and financial considerations with real ones right from the start of the analysis.

In chapter 6 all the previous developments are brought together in an explanation of postwar inflationary episodes, drawing on the conflict inflation models of Steve Marglin (1984a, 1984b) and Bob Rowthorn (1977). Although Rowthorn clearly had precedence, I chose Marglin's version as its components fitted so neatly with what had gone before in the earlier chapters. Both authors stressed the crucial insight that lasting but not accelerating inflation serves to bring about an uneasy truce between capital and labour. Neither completely achieved their aspirations (rates of accumulation for capital, real wage levels and rates of increase for labour) but through inflation the non-realisations of aspirations never tended to worsen either.

Theories of growth from Adam Smith to 'modern' endogenous growth theory are discussed in chapter 7. We start with Smith and Ricardo's theories, move on to Marx and then to Harrod's theory. The reaction to Harrod's findings and problems by Solow and Swan, on the one hand, and Kaldor and Joan Robinson, on the other, are then discussed together with Richard Goodwin's eclectic theories and Pasinetti's grand synthesis. The chapter closes with discussions of Kaldor's later views in which he scraps many of his earlier ideas in order to stress the complementarity between the production of primary products and industrial products in the world economy, and of endogenous growth theory, emphasising how it relates to previous discussions from Smith on.

The concluding chapter 8 uses the approaches developed in earlier chapters to examine their application to policy issues. It discusses how 'vision', approach and method interrelate with policy recommendations. It closes with a proposed 'package deal' solution to a crucial dilemma raised by Kalecki in his classic 1943 paper on the political aspects of full employment, especially how it may be permanently sustained as opposed to attained from a deep slump.

The volume ends with two appendixes: biographical sketches of the pioneers—Keynes, Kalecki, Sraffa, Joan Robinson, Kahn and Kaldor—and an account of the conceptual core of the post-Keynesian discontent with the orthodox theories of value, distribution and growth. I not only discuss the theoretical core and results of the Cambridge-Cambridge controversies in capital theory but also the implications of the Cambridge, England, findings for econometric theory and practice. In particular, I stress the dangers for econometric specification of collapsing the long period and short period into one, even within the neoclassical framework. The reason why I confine these criticisms to an appendix is because I want to emphasise in the text the positive aspects of the post-Keynesian approach and structure.

Notes

Jesus College, Cambridge, UK. This paper was a 'Keynote Address' at the July 2006 HETSA Conference at Ballarat. The title is also the title of Harcourt (2006). I am most grateful (with the usual disclaimer) to the Conference participants and two anonymous referees for their comments.

1. Some of the reasons for their discontent are given in the appendixes to the volume: these contain short intellectual biographies of the main contributors (Appendix 1) and a sketch of some of their principal arguments (Appendix 2).
2. As with Brian Reddaway and Austin Robinson, Tom's contributions are erected firmly and securely on the base of a thorough knowledge of the writings of Marshall and Keynes and, in Tom's case, of Kalecki and Joan Robinson, as well as on a deep critical understanding of the content and method of neoclassical economics.
3. The deepest and most profound example of the attempts to provide a coherent synthesis is the splendid monograph by Heinrich Bortis. *Institutions, Behaviour and Economic Theory: A Contribution to Classical-Keynesian Political Economy* (1997). Reading successive drafts of Henry's book taught me so much. If I were ever to be persuaded that a synthesis were possible, it would be because of his arguments. A referee suggested Marc Lavoie's *Foundations of Post-Keynesian Economics* (1992) as the other significant work that should be mentioned.
4. A referee points out that in Kalecki's approach, 'certain key elements are determined at the micro level, while others are determined at the macro level, so that [the determination of] the level of total employment ... requires both micro and macro. [Hence] it does not make sense to talk about either being a "foundation" for the other'. I do not completely agree; see my discussion of Kalecki's model in Harcourt (2006).
5. Paul Davidson (2003–4) has written a most idiosyncratic review article of John King's history of post-Keynesian economics since 1936 (King 2002). It was entitled 'Setting the record straight . . .' I was tempted to write a reply with Luigi Pasinetti

entitled *'Really* setting the record straight' but desisted after I read the courteous but powerful replies to Davidson by Marc Lavoie and King himself.

6. Luigi Pasinetti's famous 1962 paper analyses what happens when wages are not the sole source of income of wage-earners because they have saved in the past and acquired financial and other assets.
7. I asked a former Cambridge graduate student of mine, Ferdinando Targetti, and his Polish wife, Boguslawa Kinder-Hass, to translate the article for publication in *Australian Economic Papers,* with a commentary by them (see Targetti and Kinder-Hass 1982). I regard it as the most important article published during my years as joint editor of *Australian Economic Papers*.
8. A referee has pointed out that in the literature relating to these issues there is a debate concerning the appropriate notion of costs as well as what determines the markup. There are also two broad approaches to the latter: one which follows Kalecki in locating it in the oligopolistic conditions facing the firm, the other, which is exposited in the book, locates it in the investment plans of the firm.

References

Arestis, P. and Sawyer, M. (eds) 1992. *A Biographical Dictionary of Dissenting Economists*. Aldershot: Edward Elgar. Second edition, 2000.

Bharadwaj, K. 1978. *Classical Political Economy and Rise to Dominance of Supply and Demand Theories*. New Delhi: Longman Orient.

Crotty, James R. 1980. 'Post-Keynesian theory: an overview and evaluation', *American Economic Review,* 70, pp. 20–5.

Davidson, P. 2003–4. 'Setting the record straight on *A History of Post Keynesian Economies', Journal of Post Keynesian Economics,* 26, pp. 245–72.

Dow, S. C. 1997. 'Endogenous money', in G. C. Harcourt and P. A. Riach (eds), *A 'Second Edition' of The General Theory*, volume 2, pp. 61–78.

Fontana, G. 2003. 'Post Keynesian approaches to endogenous money: a time framework explanation', *Review of Political Economy,* 15, pp. 291–314.

Harcourt, G. C. 1982. *The Social Science Imperialists: Selected Essays,* edited by Prue Kerr. London: Routledge and Kegan Paul.

Harcourt, G. C. 2000. 'Askimakopulos, Athanasios (Tom) (1930–1990)', in P. Arestis and M. Sawyer (eds). *A Biographical Dictionary of Dissenting Economists,* second edtion, pp. 7–17.

Harcourt, G. C. 2001. *50 Years a Keynesian and Other Essays*. London: Palgrave.

Harcourt, G. C. 2006. *The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers*. Cambridge: Cambridge University Press.

Harcourt, G. C. and Kenyon, P. 1976. 'Pricing and the investment decision', *Kyklos,* 29, pp. 449–77, reprinted in Harcourt, 1982, pp. 104–26.

Harcourt, G. C. and Riach, P. A. (eds) 1997. *A 'Second Edition' of The General Theory,* two volumes. London: Routledge.

Johnson H. G. 1962. 'A simple Joan Robinson model of accumulation with one technique', *Osaka Economic Papers,* 10, pp. 28–33.

Kaldor, N. 1955–6. 'Alternative theories of distribution', *Review of Economic-Studies,* 23, pp. 83–100.

Kaldor, N. 1983. 'Keynesian economics after fifty years', in Worswick and Trevithick (eds), 1983, pp. 1–28.

Kalecki, M. 1936. 'Pare uwag o teorri Keynesa' (Some remarks on Keynes' theory),' *Economista,* 3, reprinted in *CW*, volume 1, 1990, pp. 223–32; see also Targetti and Kinda-Hass, 1982.

Kalecki, M. 1943. 'Political aspects of full employment', *Political Quarterly,* 14, pp. 322–31, reprinted in Kalecki, 1971, pp. 138–45 and *CW,* volume I, 1990, pp. 347–56.
Kalecki, M. 1971. *Selected Essays on the Dynamics of the Capitalist Economy, 1933–1970*. Cambridge: Cambridge University Press.
Keynes, J. M. 1936. *The General Theory of Employment, Interest and Money.* London: Macmillan, *CW,* volume VII, 1973.
Keynes, J. M. 1937a. 'Alternative theories of the rate of interest', *Economic Journal, 47,* pp. 241–52, *CW,* volume XIV, 1973, pp. 201–15.
Keynes, J. M. 1937b. 'The 'ex ante' theory of the rate of interest', *Economic Journal,* 47, pp. 663–9, *CW,* volume XIV, 1973, pp. 215–26.
King, J. E. 2002. *A History of Post Keynesian Economics since 1936*. Cheltenham: Edward Elgar.
Lavoie, M. 1992. *Foundations of Post-Keynesian Economics*. Aldershot, UK and Brookfield, USA: Edward Elgar.
Lekachman, R. (ed.) 1964. *Keynes' General Theory: Reports of Three Decades*. London: Macmillan.
Lerner, A. P. 1944. *The Economics of Control: Principles of Welfare Economics*. London: Macmillan.
Marglin, S. A. 1984a. 'Growth, distribution and inflation: a centennial synthesis', *Cambridge Journal of Economics,* 8, pp. 115–44.
Marglin, S. A. 1984b. *Growth, Distribution and Prices*. Cambridge, MA: Harvard University Press.
Marris, R. L. 1997. 'Yes, Mrs Robinson! *The General Theory* and imperfect competition', in G. C. Harcourt and P. A. Riach (eds), *A 'Second Edition' of The General Theory,* volume 1, pp. 52–82.
Moore, B. J. 1988. *Horizontalists and Verticalists: The Macroeconomics of Credit Money.* Cambridge: Cambridge University Press.
Pasinetti, L. L. 1962. 'Rate of profit and income distribution in relation to the rate of economic growth', *Review of Economic Studies,* 29, pp. 267–79.
Robertson, D. H. (later Sir Dennis). 1957. *Lectures on Economic Principles, Volume I.* London: Staples Press.
Robertson, D. H. (later Sir Dennis). 1958. *Lectures on Economic Principles, Volume II.* London: Staples Press.
Robertson, D. H. (later Sir Dennis). 1959. *Lectures on Economic Principles, Volume III.* London: Staples Press.
Robinson, Joan. 1956. *The Accumulation of Capital*. London: Macmillan.
Robinson, Joan. 1974. 'History versus equilibrium', London: Thames Polytechnic, reprinted in *Collected Economic Papers,* Oxford: Blackwell, volume V, 1979, pp. 45–58.
Robinson, Joan. 1977a. 'Michał Kalecki on the economics of capitalism', *Oxford Bulletin of Economics and Statistics,* 39, pp. 7–17, reprinted as 'Michał Kalecki', in *Collected Economic Papers,* Oxford: Blackwell, volume V, 1979, pp. 184–96.
Robinson, Joan. 1977b. 'What are the questions?', *Journal of Economic Literature,* 15, pp. 1318–39, reprinted in *Collected Economic Papers,* Oxford: Blackwell, volume V, 1979, pp. 1–31.
Robinson, Joan. 1978. 'Keynes and Ricardo', *Journal of Post Keynesian Economics,* 1, pp. 12–18, reprinted in *Collected Economic Papers,* Oxford: Blackwell, volume V, 1979, pp. 210–16.
Rowthom, B. 1977. 'Conflict, inflation and money', *Cambridge Journal of Economics,* 1, pp. 215–39.

Samuelson, P. A. 1964. 'A brief survey of post-Keynesian developments [1963]', in Lekachman (ed.), 1964, pp. 331–7.
Shapiro, N. 1997. 'Imperfect competition and Keynes', in G. C. Harcourt and P. A. Riach (eds), *A 'Second Edition' of The General Theory,* volume 1, pp. 83–92.
Targetti, F. and Kinda-Hass, B. 1982. 'Kalecki's review of Keynes' *General Theory', Australian Economic Papers*, 21, pp. 244–60.
Wood, A. 1975. *A Theory of Profits*. Cambridge: Cambridge University Press.
Worswick, G. D. N. 1959. 'Mrs Robinson on simple accumulation', *Oxford Economic Papers,* 11, pp. 125–41.
Worswick, D. and Trevithick, J. (eds) 1983. *Keynes and the Modem World: Proceedings of the Keynes Centenary Conference, Kings College, Cambridge, Cambridge*. Cambridge: Cambridge University Press.

21

Luigi Pasinetti: The Senior Living Heir of the Cambridge School of Economics and the Last of the Great System-Builders

G. C. Harcourt

21.1 Introduction

Luigi Pasinetti and I were PhD students together in Cambridge in the 1950s. We met informally to discuss Joan Robinson's *magnum opus, The Accumulation of Capital* (1956), which she called 'my big book'. Luigi was way ahead of me in his understanding of the intricacies of her analysis of, for example, Wicksell effects, the Ruth Cohen curiosum, and so on, but we were at one in our admiration of her overall performance in the book. (It was published when she was the same age as Keynes was when he published *The General Theory*.) Subsequently we were colleagues in the Cambridge Faculty in the 1960s. I read some of Luigi's papers then in draft and I have continued to do so in subsequent years when I was in Australia and then back in Cambridge while he returned full time to Italy. He, in turn, was very kind to me, especially with his detailed, useful comments on certain key sections of my 1972 book on capital theory. Mauro Baranzini and I much enjoyed preparing the *Festschrift* volume for Luigi's sixtieth birthday (Baranzini and Harcourt, 1993). (We started five years before his birthday and presented it to him three years after, vaguely right even if precisely wrong.)

Luigi's 1993 guide to his 1981 *magnum opus* contains the brilliant concept of human learning and its consequences set in the context of a 'pure labour' economy and examining theoretically its development through time, 'an abstraction [which is nevertheless] aimed at grasping the basic features of the industrial economies of our time' Pasinetti, (1993, p. xiii). I also read his outstanding plenary lecture, 'The Cambridge School of Keynesian Economics,'

Revised from *Structural Dynamics and Economic Growth*, 37–144, 2012, 'Luigi Pasinetti: The Senior Living Heir of the Cambridge School of Economics and the Last of the Great System-Builders,' by Harcourt, G. C. With kind permission from Cambridge University Press. All rights reserved.

Pasinetti (2005a), to the 2003 'Economics for the Future' conference which was organized by the Cambridge Political Economy Society to celebrate 100 years of the Economics Tripos at Cambridge[1]; the introduction by Mauro and myself to Luigi's *Festschrift* volume; and, of course, others of his books and essays. I have also had the privilege of reading for the Cambridge University Press his book, *Keynes and the Cambridge Keynesians* (2007).

21.2 Pasinetti, Malthus and Historical Induction

All through his career Pasinetti has stressed the natural links of Keynesian developments, on the one hand, to our classical forebears, on the other. He early on realized that the intervening developments of neoclassical economics, a misnomer if ever there was one, could not be ignored because its conceptual foundations had to be criticized, but could be reached over when the positive developments of Keynesian and post-Keynesian theory were being written. Here is a typical statement:

> Keynes' theory of effective demand, which has remained so impervious to reconciliation with marginal economic theory, raises almost no problem when directly inserted into the earlier discussions of the Classical economists. Similarly, ... the post-Keynesian theories of economic growth and income distribution, which have required so many artificial assumptions in the efforts to reconcile them with marginal productivity theory, encounter almost no difficulty when directly grafted on to Classical economic dynamics. (Pasinetti, 1974, p. ix)

In his Cambridge lecture, Pasinetti lists 'eight "constructive" features [of] the Cambridge School of Keynesian economics' Pasinetti, (2005a, p. 841). The third is listed as '*Malthus and the Classical economists (not Walras and the Marginalists) as the inspiring School from the History of Economic Thought*' (p. 842, emphasis in the original). In thinking about Pasinetti's role here I was struck by how close his approach is to that of Malthus, whose own approach was set out superbly by Maynard Keynes in his essays on Malthus, 'the first of the Cambridge economists' (Keynes, 1935). In his 'Centenary Allocution' (originally published in the June 1935 issue of the *Economic Journal*), Keynes wrote:

> Let us . . . think of Malthus today as the first of the Cambridge economists – as . . . a great pioneer of the application of a frame of formal thinking to the complex confusion of the world of daily events. Malthus approached the central problems of economic theory by the best of all routes. He began to be interested as a philosopher and moral scientist . . . applying the *a priori* method of the political philosopher. He then immersed himself . . . in the facts of economic history and of the contemporary

> world, applying the methods of historical induction and filling his mind with a mass of the material of experience. And then finally he returned to *a priori* thought, . . . this time to the pure theory of the economist proper, and sought . . . to impose the methods of formal thought on the material presented by events, so as to penetrate these with understanding by a mixture of intuitive selection and formal principle and thus to interpret the problem and propose the remedy. In short, from being a caterpillar of a moral scientist and a chrysalis of an historian, he could at last spread the wings of his thought and survey the world as an economist! (Keynes, 1935, p. 233)[2]

In several places, Pasinetti describes how his personal experiences as a young person made him aware of the deep problems of the post-war economy in which he grew up: 'The work which is here presented is a theoretical investigation into the long-term evolution of industrial economic systems. A combination of three factors – one factual . . . – originally prompted this investigation. The factual element was provided by the extremely uneven development – from sector to sector, from region to region – of the environment in which I lived (post-war Europe) at the time I began my training in economics' (Pasinetti, 1981, p. xi). So, like Malthus, he built his approach to economic theory on observations and experiences.

21.3 Pasinetti, Classical and Keynesian Pioneers

There are few economists writing today with Pasinetti's clarity of vision and expression. He is able to absorb large literatures and impose on them crystal-clear précis of their essential characteristics. In this way contrasts in approaches and methods, often inevitably obscured in the originals, emerge beautifully and succinctly. A typical example is in the essays Pasinetti has written on the essential difference between neoclassical economics, which concentrates on the nature of exchange, especially in static situations, in order to draw out its theories of value, pricing and distribution, even accumulation and growth, and the classicals, where production is the organizing concept for their parallel developments usually set in dynamic, changing situations. This links well not only with classical writings, especially by Marx where the sphere of production is a dominant entity, but also to Keynes's own revolutionary theory of a monetary production economy. I would add that it is also the principal emphasis in John Kenneth Galbraith's most important book, *The New Industrial State* (1967), where the owners and managers of large companies are concerned with production and related accumulation plans, and with bending consumers' and purchasers' demands to match these former plans, often aided and abetted by government, not least Bush the younger in the US. The Keynesian input is that their efforts

in these dimensions are all directed at attempting to minimize the impact of inescapable uncertainty on decisions and outcomes.

No one has been more aware than Pasinetti of the concern of our classical pioneers with what William Baumol (1951) called their 'magnificent dynamics' – the progress through time of industrialized economies in which changes in methods of production and patterns of spending overall and in composition, all endogenous processes (though their explanations are still rudimentary), interrelate both to raise productivity and potentially to increase standards of living, but also to produce deep malfunctionings on the way. These malfunctionings require, first, understanding and then the formation of sensibly based humane policies to offset their harmful effects.[3]

21.4 Pasinetti's Cambridge Inspirations

As Pasinetti has pointed out in a number of places, he became associated early on with the first generation of Keynes's pupils – Richard Kahn, Joan Robinson, Nicky Kaldor (by osmosis) – those who were principally concerned with 'generalizing *The General Theory* to the long period', as Joan Robinson put it (see, for example, Robinson, 1979). He was also influenced by Richard Goodwin and Piero Sraffa.[4] Goodwin developed two parallel approaches over his working life and achieved a splendid synthesis of them in his later Italian years in Goodwin and Punzo (1987). One came out of the approaches of his 'American' mentors, Wassily Leontief and Joseph Schumpeter; it was concerned with production interdependence in advanced societies. The other was concerned with cycle and growth interrelationships (so Schumpeter played a dual role) and with Keynes's employment theory and Roy Harrod's work on cycles and then on growth dynamics. (Harrod was Goodwin's tutor at Oxford in the 1930s.) To these influences must be added Sraffa's rehabilitation of classical political economy (and his prelude to a critique of economic theory), the nature of production interdependence thrown up by the organizing concept of the surplus, its creation, extraction, distribution and use, in Sraffa's view at an instance in time. Associated with both these strands was the influence of Marx on Sraffa and Goodwin. (Goodwin also regarded Knut Wicksell as his favourite economist). It was not for nothing I once dubbed Dick 'a Twentieth Century eclectic' (Harcourt, 1985; Sardoni, 1992, Chapter 21).

Pasinetti also absorbed, as we all did then (would that I could say 'now' as well), Keynes's theory of the determination of overall employment in the short period. Some of Pasinetti's most profound contributions are concerned with either developing Keynes's theory or defending specific strands of it. I think here especially of Keynes's theory of investment in Chapter 11 of *The General Theory* whereby Keynes and Pasinetti (see, for example, Pasinetti, 1997a), argue for a negative association between the rate of interest and

planned rates of investment in given situations. Pasinetti points out that this does not need an assumption of, or even an argument for, a negative association between the rate of interest and the investment intensity of the techniques chosen. All that is required is that at any moment in time there is a known stock of potential investment projects, more of which will appear to be profitable, the lower is the level of the rate of interest we consider. They cannot, however, be ordered by investment intensities, in the sense that the latter could take on any values *vis à vis* one another. We need to suppose further that it *is* possible to take a given situation and ask what would be different at different values of the rate of interest. Pasinetti considers this to be a legitimate procedure *in the short period*, that the only differences will be different rates of planned investment expenditures, that the feedback through the whole economy on prices etc. of Sraffa's and, for example, Pierangelo Garegnani's analysis, explicitly long period, may be ignored in the short period because it does not occur. Of course, as a consequence of different rates of investment there will be different levels of outputs, employment, prices and so on, but these arise as the consequences of the usual short-period analysis.

21.5 'Natural' and Institutional Economic Mechanisms in Pasinetti's Contribution

Perhaps the most strikingly original aspect of Pasinetti's many contributions, to my mind, is his distinction between institution-free propositions of economic theory, the 'natural' relations of a system, and propositions constrained by time and place because of existing and/or evolving institutions.[5] In Pasinetti (1997b), he argues that the distinction is only cloudily implicit in Keynes's revolutionary contributions, that it needs to be made explicit if we are to produce bodies of theory and approaches to theorizing that can rival, and ultimately dominate and hopefully displace, those of the mainstream. Thus, Pasinetti stresses that Keynes wrote of 'the *principle* of effective demand' (the title of Chapter 3 of *The General Theory*), not the *theory*. Nevertheless, in Pasinetti's view, Keynes never made completely explicit the first, institution-free account of the principle, though he gave many hints and clues and he adapted Marshall's tools to take in the concepts of aggregate demand and supply to explicitly determine the *point* of effective demand.

To get to the most fundamental level of analysis Pasinetti explains how the 45° line (which, he argues, has done so much damage to the development and understanding of Keynes) nevertheless is the appropriate tool for this particular task. Pasinetti banishes the usual interpretation of the aggregate demand function as the level of planned expenditures on consumption and investment goods in a given short period (as seen by the onlooking macroeconomist) plotted against either total income or total employment

levels and makes the causal relationship run from expected levels of aggregate demand (the summation of the individual levels expected by business people) to corresponding levels of production. The 45° line ceases to be a construction line devoid of economic meaning and becomes instead a simple way of expressing the relationship between *expected* sales in the economy at a moment in time (whether they be sales of consumption goods or investment goods *including* own sales to inventory) and the production of commodities generated by and corresponding to them. Provided we assume that business people never produce unless expected sales fit into one of these categories (and we measure in the same units on both the horizontal and vertical axis), we must end up with a 45° line. Pasinetti's construction is the reverse of Say's Law. He extends these ideas to the long-period development of the economy, pointing out that any institutional mechanism that may be invented for the matching of production to demand must have to rely on the same basic principle of effective demand.

Both of Pasinetti's great books are built on the foundations of this distinction, starting with the first which has a dimension of universality necessarily lacking from the second set of developments. This procedure parallels but is not exactly the same as Joan Robinson's and Kahn's concern with Golden Age analysis in logical time as the necessary preliminary to the analysis of processes occurring in historical time. In Harcourt (2007) I argued that neither Joan Robinson nor Kahn was able to get very far with the second task but that Kalecki and Goodwin in their separate, independent but also parallel ways had. To this conclusion I couple the extraordinary, independent contributions of Luigi Pasinetti, the publication of whose *magnum opus* we are celebrating.

Notes

1. It was sad that Luigi could not give the lecture in person, due to illness in his family. I was an inferior substitute, though I hope my presentation of the lecture did justice to its central messages.
2. I rediscovered this wonderful passage when preparing a paper on 'The Cambridge approach to economics' for a conference in Berlin in October 2005 (Harcourt, 2006).
3. In Pasinetti's fine essay (2005b) on Franco Modigliani, he singles out, as do other contributors to the volume, how these twin perspectives always drove Modigliani's life-long endeavours. Pasinetti makes crystal clear as ever, though, that Modigliani's (and Paul Samuelson's and Bob Solow's) version(s) of Keynes, especially the centrality of a rigidly downward money wage, is (are) not either Keynes's or Pasinetti's version, that *The General Theory* can grow out of Marshall but not Walras. See Samuelson (2005) and Solow (2005).
4. In the Preface to Pasinetti (1974, p. x) he wrote: 'I am glad to take this opportunity to express my deep gratitude to that remarkable group of thinkers – Richard Kahn, Nicholas Kaldor, Joan Robinson and Piero Sraffa – whom I had the rare fortune of meeting, discussing with so often and then being associated with, in

Cambridge, . . . the most stimulating place . . . for progressive thought in economic theory. [His] thanks also [went to] Richard Goodwin, James Duesenberry, Franco Modigliani, James Meade and Robin Marris.' Not a bad roll call.

5. Another candidate among several is his solution of Ricardo's search for an invariable standard of value which is independent of different distributions of income, levels and compositions of activity and methods of production with his concept of vertically integrated sectors – 'vertical integration with regard to final goods as soon as our inquiry begins to consider movements through time' (Pasinetti, 1993, p. 13). All of these are specific issues in his overall development of the analysis of structural dynamic systems. I am grateful to Prue Kerr for urging that I stress this.

References

Baranzini, M. and Harcourt, G.C. (eds) (1993), *The Dynamics of the Wealth of the Nations. Growth, Distribution and Structural Change. Essays in Honour of Luigi Pasinetti*, Basingstoke, Hants: Macmillan.

Baumol, W.J. (1951), *Economic Dynamics. An Introduction*, London: Macmillan.

Galbraith, J.K. (1967), *The New Industrial State*, Boston, MA: Houghton Mifflin.

Goodwin, R.M. and Punzo, L.F. (1987), *The Dynamics of a Capitalist Economy*, Oxford: Polity Press.

Harcourt, G.C. (1972), *Some Cambridge Controversies in the Theory of Capital*, Cambridge University Press.

—— (1985), 'A twentieth-century eclectic: Richard Goodwin', *Journal of Post Keynesian economics*, 7, 410–21, reprinted in Sardoni (ed.) (1992), 379–87.

—— (2007), 'What is the Cambridge approach to economics?' in Hein, E. and Truger, A. (eds) *Money, Distribution and Economic Policy. Alternatives to Orthodox Macroeconomics*. Cheltenham, Northampton, MA: Edward Elgar.

Harcourt, G.C. and Riach, P.A. (eds) (1997), *A 'Second Edition' of The General Theory*, 2 vols, London: Routledge.

Keynes, J.M. (1935), 'The Commemoration of Thomas Robert Malthus: Three allocutions: III Mr Keynes,' *Economic Journal*, XLV, 230–4.

—— (1936), *The General Theory of Employment, Interest and Money*, London: Macmillan.

Pasinetti, L.L. (1974), *Growth and Income Distribution. Essays in Economic Theory*, Cambridge University Press.

—— (1981), *Structural Change and Economic Growth. A Theoretical Essay on the Dynamics of the Wealth of the Nations*, Cambridge University Press.

—— (1993), *Structural Economic Dynamics. A Theory of the Economic Consequences of Human Learning*, Cambridge University Press.

—— (1997a), 'The marginal efficiency of investment' in Harcourt and Riach (eds.), vol. 1, 198–218.

—— (1997b), 'The principle of effective demand' in Harcourt and Riach (eds.), vol. 1, 93–104.

—— (2005a), 'The Cambridge School of Keynesian Economics,' *Cambridge Journal of Economics*, 29, 837–48.

—— (2005b), 'How much of John Maynard Keynes do we find in Franco Modigliani?', *Banca Nazionale del Lavoro Quarterly Review*, LVIII, 21–39.

—— (2007), *Keynes and the Cambridge Keynesians. A 'Revolution in Economics' to be Accomplished*, Cambridge University Press.

Robinson, J. (1956), *The Accumulation of Capital, London: Macmillan.*

—— (1979), *The Generalization of the General Theory and Other Essays*, London: Macmillan.
Samuelson, P.A. (2005), 'Franco: a mind never at rest', *Banca Nazionale del Lavoro Quarterly Review*, LVIII, 5–9.
Sardoni, C. (ed.) (1992), *On Political Economists and Modern Political Economy. Selected Essays of G.C. Harcourt*, London: Routledge.
Solow, R.M. (2005), 'Modigliani and Keynes', *Banca Nazionale del Lavoro Quarterly Review*, LVIII, 11–19.

22

Luigi Pasinetti and the Political Economy of Growth and Distribution

Joseph Halevi

This paper, especially written especially for our volumes following a suggestion by G.C. Harcourt, arises from a set of notes I wrote in July 2014 for my long-time friend, Thomas Ferguson, Professor of Political Science at the University of Massachusetts in Boston and a leading member of the Institute of New Economic Thinking, who asked me to prepare a point by point briefing on Pasinetti's work in the light of a meeting with him in Milan. In the present essay the sequence is kept as in the original notes with some important additions while the text has been changed into a more discursive style.

Pasinetti's writings express – in a most consistent way since 1958 to the present – two interrelated features: extreme clarity and the fact that the philosophical, historical, and societal implications of his works emerge rather straightforwardly from the analytical framework contained in them. This aspect will be singled out as I proceed through his contributions. For the purpose of this essay I divide Pasinetti's works into a number of stages. This is done essentially for analytical simplicity since the stages are themselves integrated with each other. For instance, the 1980s and most of the 1990s are dominated by his theory of vertically integrated processes and structural change (Pasinetti 1981, 1993). Instead, the 1960s appear to be characterized more by his publications on Ricardo's theory of capital accumulation (Pasinetti 1960), on the debates on capital theory and on the neoclassical rate of return (Pasinetti 1966, 1969), as well as on his seminal completion of Kaldor's post-Keynesian theory of income distribution and growth culminating in the Cambridge equation (Pasinetti 1962, in Pasinetti 1974, ch. V). However, Pasinetti had already presented the first draft of his novel approach based on vertically integrated sectors in 1965. Furthermore his preoccupation with dynamic processes related to the growth of productivity, since this is the main objective of the vertically integrated approach, dates back to the late 1950s when, in a debate with Robert Solow, he came to the conclusion that the Solow-Swan type production function cannot – in

any theoretically significant way – account for technical progress (Pasinetti 1965, 1959).

I call the first stage the Cambridge-Sraffa phase setting the cut-off point with the publication of the 1981 book *Structural Change and Economic Growth*. This period can be divided in two sub-phases: the Ricardo-Cambridge-Kaldor sub-phase and the Sraffa sub-phase. The last section of this survey will be devoted to Luigi Pasinetti's theoretical treatment of issues related to two ongoing crises: the European one and the global financial one.

22.1 The Cambridge-Sraffa Stage

In the Ricardo-Cambridge-Kaldor sub-phase the essential text is Pasinetti's volume *Essays on Growth and Income Distribution* (1974) which includes, among other chapters especially written for that volume, the 1960 essay on Ricardo, the 1962 essay on Kaldor's theory of income distribution and growth as well as a very relevant critique of trade cycle models grafted onto a growth trend published in 1960. It showed that no trend factor can be consistently obtained from multiplier-accelerator cyclical models (Pasinetti 1974, ch. III). Pasinetti developed this view in a criticism of Duesenberry (1958) who attempted to do just that. The idea that cycles and growth could not be combined has been developed by Kalecki in his writings on the dynamics of the capitalist economy. (Kalecki 1971, ch 15).

The 1960 paper on Ricardo lucidly showed that the latter's theory contains a logically consistent process of accumulation and growth leading eventually to a stationary state. The analytical foundations of such a dynamics lie in the Classical view that saving is made only for investment purposes, that wages are at subsistence so that the rate of profits is thereby determined as a residual, and that the diminishing fertility of each additional plot of land does not impact upon prices but affects, instead, the distribution of income to rents relative to the share and rate of profits. Pasinetti then goes on to show that Keynesian dynamics is distinct from Classical dynamics where wages are fixed at subsistence (Ricardo) or gravitate around subsistence (Marx). In Keynesian dynamics – from Harrod to Domar and, especially, to Kaldor – wages, not being at subsistence, emerge as a residual while the rate of profits is fixed first. In Keynesian dynamics the principle of effective demand, absent in the Classics, requires that wages grow at the same rate as productivity: were they to grow less the system would relapse into a state of Keynesian unemployment (Pasinetti 1974a).

In analyzing Keynesian dynamics Pasinetti established the general validity of the Kaldor-Cambridge equation where what matters is the saving propensity out of profits (sp) even with a positive net saving propensity out of wages (sw), provided the latter is LESS than the net propensity to save

out of profits. One of the main implications of the result is that without the condition $s_p > s_w$, a capitalist economy would not be able to function since the agents of capital accumulation (the capitalists) would eventually disappear. The robustness of the Cambridge equation is confirmed also by considering the case when wage-earners save and receive interest. Yet when this is taken into account it will cancel out, the crucial link being that between the growth rate and the propensity to save out of profits (Pasinetti 1974b). The outcome of the Pasinetti theorem is relevant in relation to the Piketty debate (Piketty 2014). In a capitalist economy the rate of profits will have to be always greater than the growth rate even under a more or less fair or stable distribution of income and wealth. A related implication concerns the importance which is to be assigned to stockholders' financial values. Very little. The crucial factor in ensuring capital accumulation is the reinvestment of profits, not the distribution of dividends to stock owners (Pasinetti 2012).

In Pasinetti's works on growth, distribution and, later, on structural change, Keynes's principle of effective demand plays a crucial role because the evolution of the capitalist system has led to a state where profits no longer have to be residually determined. In building up the importance of Keynes's principle, Pasinetti shows that it stands independently from the theory of liquidity preference, thereby driving a big wedge into the Hicks-Modigliani textbook version of Keynesian economics. It is shown that the Principle is based on the distinction between actual production and productive capacity (Pasinetti 1974c) and this is what differentiates industrial from agrarian societies (notice how the historical divide between the two types of society emerges from the clear analytical approach that Pasinetti develops in order to derive the Principle of effective demand). In an agrarian society unsold fish and vegetables will rot, hence farmers will be tempted to get rid of the unsold produce usually by reducing prices. By contrast in a modern economy if demand for industrial commodities declines there will be a downward adjustment in output and employment leading to unused productive capacity. The concept of productive capacity is central to Pasinetti's theory of growth and structural change published in 1981.

We now come to the Sraffa sub-phase which overlaps with the Cambridge-Kaldor phase. The fundamental text here is Pasinetti's 1977 *Lectures in the Theory of Production*, published two years earlier in Italian (Pasinetti 1975, 1977).

Pasinetti's Lectures spell out fully the significance of Piero Sraffa's construction undertaken in his famous slim book *Production of Commodities by Means of Commodities* published in 1960 simultaneously in Britain and in Italy. In Pasinetti's volume the relevance of the Sraffa system ranges from Leontief's input-output analysis – which in those years, while extensively used by international organizations, was being twisted towards a neoclassical factors' substitution based framework (prompted by the influential neoclassical book by Dorfman-Samuelson-Solow, 1958) – to Marx's Labor

Theory of Value, to Neoclassical Capital Theory. At this point it may be more useful to proceed in a point by point manner.

a. To begin with, Pasinetti shows that Leontief's and Sraffa's matrices are mutually consistent, one being the transpose of the other. This should cast doubts about the legitimacy of using the Leontief input-output system in a neoclassical fashion. In Sraffa's book and in Pasinetti's Lectures the price system emerges from the conditions of production, under the assumption of a uniform rate of profits, without any need to resort to supply and demand relations.
b. Through an original elaboration of the Sraffa system, the Lectures show that the Classics, while grappling with a pure labor theory of value, were in fact gravitating towards a pure capital theory of value which obtains, at the limit, when the wage rate is zero so that the profit rate is at the maximum. It should be remembered that in Sraffa the full validation of the labor theory of value occurs, in a multi commodity framework, when commodities are produced by labor only.
c. The Lectures show the consistency of Sraffa's Standard system where an invariable standard is obtained. This part may appear obscure as it is an issue completely internal to the relationship between Sraffa and the Classics. However, it is an important issue in regard to the Classical quest to separate values from distribution. The Lectures show that it is possible, through the Standard commodity, to treat variations in distribution independently from changes in relative prices – which is what both Ricardo and Marx wanted to achieve via the labor theory of value. In fact, through the Standard system it is possible to abstract from the different capital to labor ratios (in Marxian terms, from the different organic compositions of capital) prevailing in a multi-sector economy.
d. By using a Sraffa-type system the Lectures unlock the transformation problem in Marx. They prove that it is perfectly feasible to move from prices of production to labor values. What cannot be shown is which should come first, i.e. whether values arise from prices of production or vice-versa.
e. The Neoclassical reaction to Sraffa's book was that its price system – free from demand and supply relations – depended on the special case of non-substitution or fixed coefficients of production. Pasinetti shows that there are Neoclassical fixed coefficients models where prices arise from traditional conditions. A most important example comes from the Dorfman-Samuelson–Solow (DOSSO) linear fixed coefficients neoclassical production model yielding radically different outcomes from Sraffa's theory. In the DOSSO case prices always emerge as scarcity indexes even though the DOSSO model is of a fixed coefficients kind. Thus, as Pasinetti points out, in a DOSSO model non-scarce commodities would have a zero price whereas in a Sraffa system non-scarce commodities have a positive

price. It cannot, therefore, be argued that the Sraffa system is a special case of the neoclassical production model.

f. Indeed, on the basis of the points (a) to (e), it is shown in the Lectures that the PAS system is a special case (PAS = Paul Anthony Samuelson). The Neoclassical monotonic inverse relation between capital intensity and the rate of interest applies exclusively when there is only one sector in the economy. In general the principle of substitution is irrelevant.

g. Point (f) is a negative result regarding the neoclassical theory of substitution. It can, however, be already anticipated that in his 1981 *Structural Change and Economic Growth* a positive outcome is obtained in relation to the choice of techniques: variations in the wage rate do not matter in the choice of the methods of production, whereas variations in the rate of profits do but the direction in which they impact upon the choice of the methods of production cannot be uniquely determined. This is a very important theoretical conclusion due to the conceptualization of production in terms of vertically integrated processes.

Pasinetti has provided the best and most lucid analysis of production systems. His treatment of capital in production models is particularly relevant today in the light of the renewed interest in the non-applicability of production functions extensively used to measure growth and factors' shares by organizations like the OECD, IMF, etc (Felipe and McCombie 2013).

22.2 The Vertical Integration Stage: From 1981 Onward

The first version of his approach, which Pasinetti elaborated in his Cambridge Ph.D. Thesis, was published in the Vatican City in 1965. Afterwards the two main texts are *Structural Change and Economic Growth* and *Structural Economic Dynamics* (Pasinetti 1981, 1993).

In both books the economy is described at its basic natural level, an idea also found in the Classics but which the Classics mixed, and confused, with actual states. Vertical integration is defined as a series of processes going back in the production of any given commodity. Hence each commodity has a certain slice of economy. For instance, a mobile phone will absorb a certain slice of the aluminium, plastic, rare earth mining etc. It will also indirectly absorb a certain slice of the machinery used to mine rare earth, produce aluminium etc as well as a slice of the machinery needed to produce machinery. Since labor is assumed to be used in each and every process, each commodity can be expressed as a series of labor inputs (coefficients), while output is expressed in terms of units of productive capacity. The direct labor coefficients represent the labor input used to produce the final products, the indirect ones represent the labor going to produce the machinery (and its replacement) needed to produce the final product, the hyper-indirect labor coefficients represent the labor inputs needed to produce new

machinery net of replacement, that is, capital accumulation. Each of these coefficients move (decline) because of technical progress. Prices are, in turn, determined in two ways. In a static way they are determined by the costs of production, but their changes depend on technical progress, that is, on the decline of labor coefficients. Hence, this is truly brilliant, the dynamics of natural prices are determined by changes in the amount of labor needed to produce commodities. In a paper published a few years after his 1981 book Pasinetti, by using the Sraffian concept of subsystems, proved that growing subsystems in a vertically integrated context allow for a generalization of the labor theory of value. More specifically, he showed that to each quantity of a consumption good there corresponds a definite quantity of labor needed for its production (Pasinetti 1988).

Labor coefficients change at different rates from sector to sector. Hence the dynamic process is not uniform. Alongside labor coefficients there are per capita demand coefficients. They behave according to Engel type curves. Hence there is no symmetry between the dynamics of labor coefficients and those of per capita demand. Example: because of technical change labor coefficients in the bread industry will decline, but if Engel type behavior is assumed on the demand side, it is certain that the demand for bread won't rise enough to prevent a loss of jobs. The opening of new products to absorb the unemployed so generated is a possibility but its occurrence in a dimension that can prevent systemic unemployment is unsure. It will depend on two conditions discussed below.

The first is the effective demand condition: that is, the condition whereby all the per capita demand coefficients together generate a level of effective demand which employs all the labor force for the production of what is being demanded: a condition unlikely to be met by itself. The second condition is the capital accumulation condition. This is the dynamic condition for all the productive capacities to be utilized and capital to be added exactly in the proportions required to keep full employment. However, by itself this condition may also not be satisfied if the effective demand condition is not satisfied as well. The full employment effective demand conditions highlight theoretically that the problem of effective demand arises conceptually prior to the problem of capital accumulation. This line of reasoning is developed further in the 1993 book where all output is produced by labor only, hence no capital accumulation, and yet the problem of effective demand still arises.

In Pasinetti's framework the wage rate represents the connecting element in the system if it grows at the same rate as the average productivity rate. This is because it redistributes purchasing power throughout the economy through the dynamics of the coefficients of per capita demand. The wage rate has therefore an eminently macroeconomic meaning. With static wages evidently per capita demand cannot grow, hence the limited changes in some per capita demand coefficients must be offset by opposite changes in

some other per capita demand coefficients. It must be pointed out though that even if wages were to operate efficiently by growing with average labor productivity, the formation of unemployment could still be possible. There is no guarantee that the rise in per capita demand for expanding products will create enough employment as to absorb the redundancies arising from the declining sectors. Two observations follow. The first is that microeconomic efficiency does not entail macroeconomic efficiency. Pasinetti proves analytically what Keynes had rather casually stated in *The General Theory of Employment Interest and Money:* namely, that while there is no reason to doubt entrepreneurs' ability to select their inputs appropriately the failure to attain a full utilization of resources depends upon the system as a whole. Thus one should aim at a satisfactory, from an employment point of view, rather than at an optimal growth rate (Pasinetti 1987). The second observation is that it would be impossible to keep full employment overtime without entrusting the matter to a Central Agency.

In Pasinetti there is a continuous process of technical change but not a mechanism of factors' substitution based, in the traditional sense, on changes in the relative prices of the services of the"factors" of production. There is no production function starting from initially given endowments. This is not an assumption but an outcome of his vertically integrated approach and it may well be worthwhile spending few lines on the issue. A method of production is defined by the summation of the value of the direct, indirect and hyper-indirect labor coefficients required to produce the final commodity. In this context the prices of capital goods are determined by the wage rate, that multiplies the labor coefficients applied to the production of capital goods both for replacement and expansion, as well by the rate of profits that multiplies the proportion of capital goods that goes into the expansion of capital goods.

There is, however, a difference in the way in which the wage rate and the rate of profits contribute to the final prices of the means of production. As stated above, the wage rate multiplies the labor coefficients of every single method of production and it therefore multiplies both the capital goods that are allocated for replacement and those produced for the net expansion of the stock of capital. The rate of profits by contrast enters into the price of capital goods via the annual amount of the lifetime of a machine produced for the net expansion of the stock of capital. Thus, if the life time of a new net machine is ten years, the rate of profits – measured per annum – will multiply the annual amount of that machine, that is, 1/10, adjusted for the proportion of productive capacity of the machine going to the capital goods sector itself. It follows that while the wage rate can be factored out since it multiplies, through the labor coefficients, all the elements entering into the final price, the rate of profits cannot be taken out as it does not multiply all the said elements. Hence if there are, say, three different methods of production A, B, C, the wage rate will multiply all of them equally. Their relative

position will remain unchanged in the wake of variations of the wage. Changes in the wage rate are therefore immaterial to the choice of techniques. The rate of profits is not so because it does not equally multiply all the elements, so that its changes will impact upon the relative position of each method of production. Yet we cannot say beforehand in which direction will the choice of techniques occur. This is a very important result that builds upon, but goes well beyond, the capital theory debates of the 1960s which culminated in the QJE symposium of 1966 with Pasinetti's crucial participation.

The analysis of the process of technical change and of the choice of techniques in the vertically integrated framework has relevant constructive implications. The capital theory debates of the 1960s reached a negative conclusion: the inverse monotonic relation between capital intensity and the rate of interest is not inevitable. Nothing can be said beyond the observation that in general the relation will not hold. Instead, in the Pasinetti framework the treatment of technical change and of the choice of techniques help us uncover important aspects of the economics of international trade and of development.

Pasinetti's approach has appeared to me to be most fruitful as it undermines completely the traditional views about dualism and comparative advantages. We have seen that changes in the wage rate do not affect the choice of the technique of production. By the same token, the methods of production used in a given country do not depend upon whether or not the wage rate is higher or lower relatively to that of other countries. This means that the Leontief paradox is no longer a paradox since what matters for the definition of capital intensity is not the capital/labor ratio – which defines the degree of mechanization- but the capital/output ratio, which defines the capital intensity of production. In this case an economy with a high level of labor productivity may well have a capital/output ratio lower, much lower, than less developed economies where labor productivity is significantly lower. Thus it is misleading to view trade as governed by relative factors' endowments. It is rather determined by two principles: the principle of comparative productivity change advantage and its industry specific variant.

On the basis of the above considerations, the implications for the economy of export sectors are gauged on whether or not their productivity gains are leaked abroad, through lower prices for the consumers of the importing countries. If in a country the export sectors display a growth of productivity higher than that of the domestic non-tradable compared to the same ratio of the importing country (say China is the exporting country and the USA is the importing one), then it can be said that China is leaking its productivity gains abroad. Thus the concentration of technical progress in the exporting sectors may not bring benefits to the domestic economy although, for the purpose of learning about new technologies, such a concentration may be initially necessary. By contrast, in a developed economy the technological

differences between domestic and exporting sectors are not as big as in the less developed ones. Hence the developed economy's domestic sectors' productivity growth will be roughly the same as that of its own exporting sectors, therefore it is more able to retain productivity gains at home. This conclusion stems from the basic feature of Pasinetti's system where prices are determined by production costs so that their changes are governed by the dynamics of labor productivity throughout the whole chain of the vertically integrated labor coefficients. Pasinetti's point can be understood by looking at the issue from the angle of per capita demand: the dynamics of per capita demand is linked to the dynamics of the wage rate which, in turn, is tied to the average growth rate of labor productivity. The wage rate is the element connecting the whole system, but if the largest part of it, i.e. the domestic sectors, displays a growth of productivity significantly below that of the exporting sectors, there would be little room to expand per capita demand. Hence, in the exporting country, dualism will set in because the importing countries will show a more even relation between productivity growth in the export to the domestic sectors.

When applied to specific industries the principle of comparative productivity change advantage takes up a special dimension of practical relevance. When productivity growth in a particular exporting industry in a particular country, relatively to the productivity growth of the rest of the economy in the same country, is greater than the same ratio in the rest of the world, then the competitive position of the exporting industry of the particular country will improve. In other words, if productivity growth in the Chinese auto industry relative to productivity growth of the Chinese economy, is greater than the productivity growth of the auto industry in the rest of the world relative to productivity growth of the rest of the world economy, the international position of the Chinese auto industry will improve. If the dynamics of that ratio (auto industry productivity growth in China/China's productivity growth compared to auto industry productivity growth in the rest of the world/ rest of the world productivity growth) is markedly favourable to China, the auto industry of the advanced countries (rest of the world) will find itself back in a position previously ascribed to infant industries. It will thus require protection in the same way as it was argued for the infant industries. Pasinetti calls this situation the mature industry case for protection. It should be noticed that Pasinetti wrote his theory – starting with his Cambridge University Thesis – when the phenomenon of massive industrial displacement arising out of industrial exports from much poorer countries was very limited. And yet he got the structural tendencies quite correctly.

Furthermore, it would be mistaken to conclude that when the ratio discussed in the foregoing paragraph is favourable to, say, China, the improvement in the international position of the Chinese auto industry will automatically benefit China. For this to happen it is necessary that, on the Chinese side, the ratio is improved by an expansion of the numerator,

that is, by an increase in the productivity growth of the auto industry relatively to the productivity growth of the Chinese economy. If, instead, the expansion of the Chinese ratio relatively to the same ratio in the rest of the world occurs because of a fall in the Chinese denominator, then the Chinese economy will not benefit, although the international position of its auto industry will. Conversely, if the Chinese ratio falls compared to the rest of the world ratio because of a big rise in the Chinese denominator then too bad for the international status of the Chinese auto industry, but it is good news for China because it means that its overall productivity has expanded.

Luigi Pasinetti's treatment of international economic relations is compelling and it is powerful also at the didactic level due to the pristine clarity of the author's exposition. I have used Pasinetti's theory in my Masters course called China in the World Economy which I founded at the University of Sydney in 2004 in order to look more closely into the striking transformation of the People's Republic. The students found Pasinetti's approach to be an effective conceptual framework to navigate the evolution of the Chinese economy in its international dimensions. We also conducted comparisons with other economies like Mexico, Brazil and India and we asked questions like why hasn't this kind of development happened to the same degree with Mexico or India or Brazil? Here too Pasinetti's approach is most illuminating. If one uses the vertically integrated labor coefficients approach to industrial production, it would not take long to understand what happens if VW managers were to say "in the Congo wages are so low that we are going to move there". Even assuming that local labor is perfectly malleable, for VW the outcome will be a disappointment. All the materials, machinery, transport equipment and related facilities will have to be imported from the EU and calculated according to EU costs of production. The end results will be that EU priced capital charges will figure in a very high proportion in the final production price of the Congo made VW where the only local inputs, the direct labor coefficients, are priced at the very low Congo wages. This means that the Congo made VW would not have a domestic demand basis. Moreover, the importation by VW of the machinery and transport equipment from Europe will show up as foreign capital inflows spent to pay for those imports. This may well make the Congolese financial system to be saddled with an external debt while the economy is subjected to a steady flow of industrial imports. How much labor would Congo have to sacrifice in export activities in order to sustain the process? Given the high price of the imported goods from Europe by VW, it is possible that the amount of labor which will have to be sacrificed will end up being excessive relatively to domestic developmental needs. I return to this issue in the next paragraph. Thus for a China type phenomenon to emerge it is necessary that there exist a domestic industrial structure capable of undertaking the transformation without its production costs being burdened by excessive capital charges

arising from inputs and machinery imported from countries with much higher per capita incomes and, therefore, much higher production costs.

But how can a poor country avoid, or minimize, the risk of being burdened by too high capital charges from the richer countries? Traditional theory would tell us to this very day – although things have been made more complicated with informational asymmetries, rent-seeking activities etc, the basic skeleton has remained the same – that the poor country would have to adopt production techniques based on those domestic factors that are more abundant, therefore cheaper. Capital – real – not being among them, the choice of technique should fall on labor-intensive productions. We have seen, however, that in a proper system of production, of which the vertically integrated process is an expression, the relative wage rate is immaterial to the choice of techniques. Hence if a poor country has access to the most advanced methods of production – available, say, in Sweden – it should adopt them forthwith. For comparable productions, the best method in Sweden is also the best method in Papua New Guinea. Yet the gap in the wage levels between the two countries is such that were Papua New Guinea to import the methods from Sweden it would find itself burdened by the high level of capital charges in its final prices. The answer is that the poor country should weigh against the importation of the most advanced methods of production, the amount of labor it has to surrender abroad in order to pay for the imported technologies relatively to the amount of labor it will have to lock into less efficient home produced methods. The amount of labor surrendered abroad is simply the labor needed to produce the goods which have to be exported. If this amount exceeds the labor required to produce home-made technologies and capital goods then it will pay to refrain from buying the most advanced methods from abroad. The conclusion to which Pasinetti's theory brings us in relation to the selection of technologies in an underdeveloped country converges towards similar considerations raised in the development planning literature of the 1950s and 1960s especially in Cambridge and in India (Dobb 1960; Sen 1960). However a significant difference exists between the aforementioned literature and Pasinetti's theory. In the Dobb-Sen models priority was supposed to be given to the capital goods sector and that was it. Just about nothing could be said about the status of consumptions goods and, more importantly, about the status of those who were supposed to consume the goods.

The vertically integrated theory of Luigi Pasinetti is based on a multiplicity of consumption goods, the demand for which follows an Engel type pattern. To each consumption goods a capital goods sector is attached, producing a machine for itself and for the consumption goods sector. It follows that investment priority in the capital goods industry does not make much sense unless further specified. It is the development priority in a set of consumption goods that will entail an investment priority in the corresponding, indeed attached, set of capital goods. How should the set of

consumption goods be selected? In Pasinetti per capita demand coefficients are not randomly listed. They are arranged according to a hierarchical order not dissimilar to Engel's characterization. Thus priority should be given to those commodities where demand should grow most. If, say, in a country the main issue is to change nutritional patterns, investment should go into those sectors providing the machinery and technologies needed to modify them. This may well mean that if agricultural equipment is lacking, and importing it is subject to the limitations described above, that machinery will have to be produced in the country which may require building the relevant steel plants, mechanical industries, etc. But if the program is to be completed successfully the agricultural sector should, for a while, absorb a large slice of the sectors directly and indirectly contributing to it. The hierarchical order in which consumption should be selected arises in Pasinetti as a theoretical necessity rooted in the social reality of mass poverty to this very day. It also expresses the philosophical humanism of Luigi Pasinetti (based on a deep Catholic faith), centered on the centrality of labor, to which I will now turn.

The superiority of labor over capital is the overarching element in the two Pasinetti books on structural change. The role of labor stems from the fact that humanity's creative and productive activities require labor. Only the latter can make capital goods not the other way around. In a growing economic system the production of additional capital goods requires a rate of profit but this too arises from labor. In Pasinetti's natural economic system the rates of profit are determined by the growth rate of population and the growth of per capita demand for the commodities concerned. Since the growth of demand for each commodity is different, natural profit rates will differ as well. If population growth is zero, profit rates will be determined solely by the growth of demand for each commodity. Clearly this growth of demand is entirely determined by the growth rate of labor productivity. Thus the Pasinetti rate of profits is in fact determined by labor, that is, by its growth and by its productivity. This view was already contained in the Cambridge-Kaldor phase of his writings. The 1974 book of essays on *Growth and Income Distribution* ends with a long chapter, chapter VI, dedicated to closing the debate over Kaldor's theory of growth and over the Pasinetti Theorem – where it is proven that the long-term equilibrium growth depends on the rate of profits multiplied by the saving propensity out of profits independently of everything else – which upon its publication elicited a neoclassical response from Franco Modigliani and Paul Samuelson. At the end of the chapter Pasinetti points out that in long term-growth, with all profits saved, the stock of capital disappears altogether from the fraction (P/K) defining the rate of profits. In other words, the rate of profits turns out to be independent from the stock of capital, being exclusively determined by the growth rates of population and of labor productivity (Pasinetti 1974b). Thus labor is the crucial factor for the formation of a rate of profits.

Labor is also a crucial factor in the formation of the rate of interest in a manner that it is totally independent from the rate of profits.

In his 1993 book Pasinetti showed how from even the simplest form of such a natural system, a situation where there is no accumulation and everything is produced by labor, a positive monetary rate of interest arises even with no rate of profits and hence with no accumulation of capital. The procedure is rather straightforward: it is enough to assume that while all output is consumed, some households will save, consume less than their total income, and some households will borrow to consume what savers have not. Then there will be a financial system with credits and debts and a rate of interest attached to the loans. This rate of interest arises totally independently from profits. The objective justification for charging an interest on loans resides in protecting the value of the loan upon repayment. In Pasinetti's system, labor is the source of all productive activities and, as we have seen, also the natural rate of profits is determined by the growth of labor productivity. Keeping over time the value of loans/debts means therefore maintaining their purchasing power in terms of labor. If a loan is made at time t(o) to be repaid at time t(1), and if from t(0) to t(1) labor productivity increases by z%, the corresponding rate of interest, i.e. the rate of interest which will safeguard the purchasing power in terms of labor of the loans made at t(0), will have to be equal to the growth rate of productivity z. This is what Pasinetti has called the natural rate of interest. That rate of interest happens, as he himself pointed out (Pasinetti 2002), to be consistent with the principle of equal exchange as no advantages are obtained by either borrowers or lenders. It will be noticed that both the (natural) rate of profits and (natural) the rate of interest are determined by labor through its productivity, although they arise for totally different reasons. The rate of profits emerges because of the production and utilization of capital goods, while the rate of interest may exist also in a zero profits economy provided there are individuals who save and individuals who borrow to consume more than their current income.

Chronologically, after Karl Marx, Luigi Pasinetti is the thinker that has most strongly put labor at the very centre of economic activity. He has done it in a different philosophical framework which, in its own right, has vastly enriched our understanding of both theory and society.

22.3 Pasinetti and the Present Crises

The conceptual consistency of Pasinetti's contributions has proven itself also in relation to the economic recession and stagnation which set in since 2008, as well as in relation to the quagmire in which the area of the European Union covered by the European Monetary Union (the Eurozone) finds itself. Let us begin with the European situation.

Shortly after the signature of the Maastricht Treaty, Pasinetti captured the problems arising from the Maastricht criteria of a 3% government budget

deficit, and a 60% ceiling on the national debt. In the 1990s he gave seminars on the topic at the Bank of Italy. He defined the Maastricht criteria as being either a myth or a folly, since there is no reason why a particular set of values should define the limit of the deficit and of the debt. Just the same, he took a proactive position putting forward an argument aimed at reducing the damage as much possible.

In 1998 in a now famous *Cambridge Journal of Economics* paper he showed that the debt stabilization criterion is much preferable to convergence to Maastricht values. For countries with high debt ratios, the stabilisation criterion would imply a much less restrictive budgetary policy (Pasinetti 1998). Therefore, countries would not be compelled to undertake drastic austerity measures which, as now amply proven in practice, fail in their own terms leading to higher debt levels and to economic recessions. Alongside the CJE article, Pasinetti also produced theoretical and empirical papers regarding the sustainability zone, devising a method aimed at measuring the burden of the debt (Pasinetti 1997). The burden is defined by the percentage of national income that has to be given up as a proportion of nominal GDP in order to service the debt. Pasinetti developed two conditions:

1. $t = (i–g)D/Y$, where t is the burden of the Debt D and i and g are the interest and nominal growth rates respectively. Y is nominal GDP.

The second condition is a debt sustainability condition which is expressed as:

2. $S/Y \geq -gD/Y$ Where S is not saving but the government's surplus

On policy makers the impact of those contributions has been negligible because, from the start, in Europe, excluding the U.K., the discussion about the single currency has been taken out of the realm of rational discourse.

We can now move to the present crisis. In the press the crisis has often been linked, with good reasons, to the priority that the institutions of modern capitalist countries, at least those of the United States and of the United Kingdom – yet with the crucial participation of Swiss, French and German banks and of the entire Spanish, Irish and Icelandic economies – have given to the inflation of the value of financial assets and to physical assets containing a dominant component of financial rents, such as real estate. The increasing importance that, over the last two to three decades, has been assigned to stock holders' values is a major factor in the priority given to asset-price inflation. In this context, in a recent issue of the *Cambridge Journal of Economics,* Pasinetti has published an essay which addresses the theoretical roots of the bias towards asset-price inflation (Pasinetti 2012).

The article points out that neoclassical theory, when applied to financial matters such as the value of stocks and dividend policies, obfuscates the positive (Classical) role of capitalists' saving. Its main function is to sustain the

accumulation of capital through investment. By contrast, writes Pasinetti, neoclassical economics has come up with a number of constructions where the focus is not the maximisation of profits through investment, but the maximisation, through the stock exchange, of corporate values. Pasinetti mentions explicitly the Modigliani-Miller theorem of the late 1950s observing that "the theorem has led to the belief that there is no difference between the two traditionally considered alternatives regarding the allocation of each single firm's profits, i.e. (i) that of using them internally by adding them to the existing capital stock, or (ii) that of immediately distributing the dividends to the shareholders" (Pasinetti 2012, p.1442). The belief arises from the, ideological, acceptance of perfect financial markets. The influence of both the Modigliani-Miller theorem and, I should add, of Fama's "efficient market hypothesis", on financial institutions and on policy making bodies, created an atmosphere conducive to economic irresponsibility as regard to corporations' use of their profits. It has also blinded the political institutions' view as to the requirements of real capital accumulation for the economy as a whole.

Pasinetti notes that, in final analysis, the stability or instability of the economy will be determined by whether or not the conditions for real capital accumulation are satisfied in relation to the conditions of full employment growth. This is precisely what is highlighted in the Pasinetti Theorem of 1962 (Pasinetti 1962, 1974 ch V). Without the saving propensity out of profits being greater than the saving propensity out of wages, so that the latter is always smaller than the ratio of aggregate investment over national income ($s_w < I/Y$), the economy would not be in a position to function. The implications arising from the Kaldor-Pasinetti framework, combined with the labor focused approach of the 1981 and 1993 contributions, are then contrasted with the Modigliani-Miller view. Financial securities, instruments and paper assets, can be created ad infinitum without any physical limits. But capital goods cannot be produced beyond what is required for full employment growth. Were this to occur the economy would be quickly struck by the formation of unused capacity thereby leading to unemployment.

The crisis of 2008 and beyond was not caused an over-production of capital goods. Yet the merit of the example lies in showing the boundaries within which the economy can operate. It then becomes possible to gauge whether financial companies' ability to generate unlimited instruments creates the illusion of being in an unbounded system, on the debt-credit side, with negative consequence for employment[1].

Notes

I am most thankful to G.C. Harcourt for valuable comments, suggestions and very thorough editing.

1. One can look at the wave of mergers and acquisitions through short-term debt financing in the years before the 2008 as the main cause of the crisis, as argued

recently by Professor Jan Toporowski of SOAS in a recent paper. This is because, according to Toporowski, corporations were unable to refinance their debts and, therefore, had to cut down drastically on real investment (Toporowski 2014a). He also addressed the issue on how may the crisis be overcome: "The natural capitalist way would be for investments to recover. This could quite easily be done, because there are data that show that large corporation are now, after having experienced this serious crisis from 2008 to 2010, sitting on a very large hoard of liquid assets and if they start spending those liquid assets, that would improve the situation" (Toporowski, 2014b).

Bibliographical References

References to Pasinetti's works

Pasinetti, Luigi L. (1958) "Il recente modello di sviluppo di J. Robinson e la teoria neoclassica del capitale: alcune osservazioni", *Rivista Internazionale di Scienze Sociali*, Vol. 66, pp. 429–444.

Pasinetti, Luigi L. (1959) "On Concepts and Measures of Changes in Productivity", *The Review of Economics and Statistics,* vol. 41, pp. 270–282 [Reprinted in Pasinetti 1974, chapter I].

Pasinetti, Luigi L (1960) "A Mathematical Formulation of the Ricardian System", *The Review of Economic Studies,* vol. 27, pp. 78–98.

Pasinetti, Luigi L. (1960) "Cyclical Fluctuations and Economic Growth", *Oxford Economic Papers*, New Series, Vol. 12, No. 2, pp. 215–241 [Reprinted in Pasinetti 1974, chapter III].

Pasinetti, Luigi L. (1962) "Rate of Profit and Income Distribution in relation to the Rate of Economic Growth", *The Review of Economic Studies*, vol. 29, 267–279 [Reprinted in Pasinetti 1974, chapter V].

Pasinetti, Luigi L. (1965) "A New Theoretical Approach to the Problem of Economic Growth", Vatican City: *Pontificiae Academiae Scientiarum Scripta Varia,* n. 28.

Pasinetti, Luigi L. (1966) "Changes in the Rate of Profit and Switches of Techniques", *The Quarterly Journal of Economics,* vol. 80, pp. 503–517.

Pasinetti, Luigi L. (1969) "Switches of Techniques and 'the Rate of Return' in Capital Theory", *The Economic Journal,* vol. 79, pp. 508–531.

Pasinetti, Luigi L. (1974) *Growth and Income Distribution – Essays in Economic Theory,* Cambridge U.K.: Cambridge University Press.

Pasinetti, Luigi L. (1974a) "From Classical to Keynesian economic dynamics", in Pasinetti 1974, chapter IV, pp. 86–102.

Pasinetti Luigi L. (1974b) "The rate of profit in an expanding economy", in Pasinetti 1974, chapter VI, pp. 121–146.

Pasinetti, Luigi L. (1974c) "The economics of effective demand", in Pasinetti 1974, chapter II, pp. 29–53.

Pasinetti, Luigi L. (1975) *Lezioni di teoria della produzione,* Bologna: Il Mulino.

Pasinetti, Luigi L. (1977) *Lectures on the Theory of Production*, New York N.Y.: Columbia University Press.

Pasinetti, Luigi L. (1981) *Structural Change and Economic Growth*, Cambridge U.K.: Cambridge University Press.

Pasinetti, Luigi L (1987) "'Satisfactory' versus 'Optimal' Economic Growth", *Rivista internazionale di scienze economiche e commerciali,* October, Vol. 34 (10), pp. 989–999.

Pasinetti, Luigi L. (1988) "Growing subsystems, vertically hyper-integrated sectors and the labour theory of value", *Cambridge Journal of Economics*, Vol. 12 (1), pp. 125–134.

Pasinetti, Luigi L. (1993) *Structural Economic Dynamics,* Cambridge U.K.: Cambridge University Press.

Pasinetti, Luigi L (1997) "The Social 'Burden' of High Interest Rates" in: P. Arestis, G. Palma, and M. Sawyer (eds.), *Capital Controversy, Post-Keynesian Economics and the History of Economic Thought, Essays in Honour of Geoff Harcourt*, volume I; London & N.Y: Routledge, pp. 161–168. 1997.

Pasinetti, Luigi L (1998) "The myth (or folly) of the 3% deficit/GDP Maastricht 'parameter'", *Cambridge Journal of Economics,* Vol. 22 (1), pp. 103–116.

Pasinetti, Luigi L (2002) "An «analytical» approach to the «just» rate of interest: the priority of labour over capital", *Rivista Internazionale di Scienze Sociali*, Anno 110, No. 3 (Luglio-Settembre), pp. 323–329.

Pasinetti, Luigi L. (2012) "A few counter-factual hypotheses on the current economic crisis", *Cambridge Journal of Economics,* vol. 36 (6), pp. 1433–1453.

Other references

Baranzini, Mauro and G.C. Harcourt (1993) *The Dynamics of the Wealth of Nations: Growth, Distribution, and Structural change: Essays in Honour of Luigi Pasinetti,* New York: St, Martin's Press.

Dobb, Maurice (1960) *An Essay on Economic Growth and Planning*, London: Routledge & Kegan Paul.

Duesenberry, James (1958) *Business Cycles and Economic Growth,* New York: McGraw Hill.

Dorfman, Robert; Paul Samuelson, and Robert Solow (1958) *Linear Programming and Economic Analysis*, New York N.Y.: McGraw-Hill.

Felipe, Jesus and John S.L. McCombie (2013) *The Aggregate Production Function and the Measurement of Technical Change: 'Not Even Wrong',* Cheltenham: Edward Elgar.

Kalecki, Michał (1971) *Selected Essay of the Dynamics of the Capitalist Economy, 1933–1970,* Cambridge: Cambridge University Press.

Piketty, Thomas (2014) *Capital in the Twenty-First Century,* Cambridge, Massachusetts: The Belknap Press of Harvard University Press [originally published as *Le capital au XXIe siècle,* Paris: Seuil, 2013].

Sen, Amartya (1960) *Choice of Techniques: An Aspect of the Theory of Planned Economic Development,* Oxford: Blackwell.

Sraffa, Piero (1960) *Production of Commodities by Means of Commodities*, Cambridge: Cambridge University Press; and: *Produzione di merci a mezzo di merci*, Torino: Einaudi, 1960.

Toporowski, Jan (2014a) "The crisis of finance and the crisis of accumulation: it was not a 'Lehman Brothers Moment'", unpublished paper, London: SOAS.

Toporowski, Jan (2014b) "The discrete charme of the economic crisis. Interview to Jan Toporowski (part one)", http://noirestiamo.noblogs.org/post/2014/11/06/the-discrete-charme-of-the-economic-crisis-interview-to-jan-toporowski-part-one/

23

The Significance of the Theory of Vertically Integrated Processes for the Problem of Economic Development

Joseph Halevi

This paper argues that Pasinetti's theory of growth provides new insights into the problem of economic development. Firstly, by using Pasinetti's 1981 contribution, it is maintained that the method of vertical integration supersedes the Dobb–Sen critique of the neoclassical investment rule. Secondly, it is pointed out that the effective demand full-employment condition developed in the 1993 book is conceptually valid also for a non-industrialized country. This conclusion is compared with the Kaldor–Kalecki–Robinson view according to which Keynesian considerations apply only when the stock of capital suffices to absorb the whole of the working population. Thirdly, and finally, it is shown that the limitations of the Fel'dman–Mahalanobis model of growth emerge in relation to the passive role of per capita consumption demand. In this context Pasinetti's major achievement is identified in the strict connection established between the growth rate of productivity and the role played by the natural wage in his system.

23.1 Introduction

This paper argues that Luigi Pasinetti's theory of vertically integrated processes (Pasinetti, 1965, 1973), transformed into a fully fledged theory of growth in two main stages (Pasinetti, 1981, 1993), contains all the elements for a renewed understanding of the issues related to the emancipation from subsistence conditions. The discussion will be conducted by referring mainly to the Marxian-based contributions to development which dealt with structural change in terms of the choice of techniques on one hand and, on the other, in terms of investment priority in the capital goods sector (Dobb, 1960; Sen, 1960; Fel'dman, 1928; Mahalanobis, 1953; Naqvi, 1963). It will be pointed out that the theory of growth based on vertical integration

Revised from *Structural Change and Economic Dynamics* 7 (1996): 163–171, 'The Significance of the Theory of Vertically Integrated Processes for the Problem of Economic Development,' by Halevi, J. With kind permission from Elsevier Science B.V. All rights reserved.

revolutionizes the very concept of choice of technique and, by focusing on the composition of per capita demand, it overcomes the limitations of Fel'dman's strategy of growth.

From a philosophical point of view the great achievement of Pasinetti's contribution lies in that an effective demand condition for the system as a whole appears logically prior to any other macroeconomic phenomenon, prior also to the problem of capital accumulation. The primacy of effective demand arises from the impact on the labor force of the combined and non-symmetrical movements of the two sets of coefficients: one expressing technical change, the other expressing the changes occurring in the preferences of consumers. This genuinely new growth-theoretic approach has important implications for development economics. In particular, the condition relating to full-employment effective demand is valid also when comparing countries of vastly different per capita incomes in which the path to development requires a definite hierarchical order in the production of consumption goods.

23.2 The Relevant Conceptual Aspects of the Pasinetti System

Classical inspired models of growth and development have assumed, at best, a given real wage rate. This leaves no significant margins for modifications in the composition of per capita demand, since purchasing power would be mostly directed towards a virtually invariant basket of consumption goods.

The pivotal role played by the wage rate in relation to productivity growth is instead, evidenced in *Structural Economic Dynamics,* where production is carried out only by labor (Pasinetti, 1993, ch. 4). When all wages increase with average productivity, the effects of technical progress are distributed in terms of higher purchasing power to the whole community regardless of the sectors where the individual members work (Pasinetti, 1993, pp. 47–48). Structurally, the uniform increase in the natural wage rate links together all the branches of the economy in terms of their efficiency: prices would fall in the sectors where productivity rises more than the average, while sectors with below-average productivity growth will suffer losses, thereby facing the necessity to improve their technological efficiency.

The efficiency property of the natural wage rate highlights an important egalitarian aspect of the natural system as a whole. If wages were tied to the rate of growth of productivity of each sector—more or less like in contemporary efficiency wage models—real wages inequalities would grow indefinitely. The physiological phenomenon of differential productivity growth would then be transformed, at the social level, into a pathological one. By constrast, linking wages to the average increase in productivity enables every worker to benefit from technical progress through the fall in the prices of the most dynamic sectors. This unique aspect of the natural system stems from the treatment of labor as a homogeneous primary input,[1]

since it expresses the social—rather than the physical—nature of the working population.

It is worth noting that Pasinetti's conceptual approach has rehabilitated the Classical, especially Marxian, quest for a notion of abstract labor. The improvement over the Classical approach lies in that the natural wage is not fixed at subsistence level and it actually helps to identify the efficiency properties of the system. By the same token, the Marxian approach to development planning based on curbing the real wage in order to devote the bulk of the surplus to investment, appears as too simplistic since it involves an invariant composition of per capita consumption. Yet, as shown in Section 5, when the natural wage is inserted into the picture, the unilateral nature of the heavy industry model appears in full and affects also the order of priorities for development strategies.

The main pillar of Pasinetti's theory is the effective demand full-employment condition. In a pure labor economy, where wages are the only source of consumption demand, it is required that the sum of the per capita demand coefficients multiplied by the sum of the direct labor coefficients absorb an amount of labor equal to the available working population (Pasinetti, 1993, pp. 18, 44, 50). In turn, the coefficients of per capita demand will also vary according to an Engel-type law at a rate which, in general, will differ from the rate of change in labor coefficients. Under these circumstances full employment is unlikely to be automatically attained. For this reason the macroeconomic equilibrium condition becomes a crucial criterion that defines the social responsibilities inherent in any given productive system (Pasinetti, 1993, p. 149). The role of demand is not altered in any fundamental way by the inclusion of capital goods, except that another condition, defining the sectoral investment equilibria determined by expansion of demand, is added to the system (Pasinetti, 1981, p. 86). But, once more, differences in the pattern of the sectoral coefficients of production vis-à-vis the pattern of the coefficients of per capita demand, do not make sectoral investment equilibria full employment ones.

23.3 Marginalism, the Dobb–Sen Model and Pasinetti (1981)

Until the publication of *Structural Change and Economic Growth* in 1981, the view that the problem of development had to be addressed in terms of the choice of techniques, without reference to the composition of consumption demand, was a common element of the Marginalist and Marxian schools, the latter centered in Cambridge and India. Both schools took for granted that the selection of the methods of production had to be made in relation to the wage rate.

For traditional theory, if wages are allowed to be determined by market-clearing flexibilities, then a labor surplus economy ought to choose production techniques that favor labor-intensive processes. In the Dobb–Sen and

Pasinetti's perspectives, however, a low-income, mostly agriculturally based economy means that virtually all economic activity is concentrated in a technically primitive consumption goods sector with very little surplus per worker left over and above current requirements (Bagchi, 1962).

To address this issue Dobb (1960) and Sen (1960) built two similar models based on the basis of some minimal assumptions. Infinitely lived machines produced by labor alone could be installed only in the consumption goods sector. The wage rate was taken as *given*, so that all the additional surplus of consumption goods arising from the employment of new, more productive, machines would increase the wage fund of the capital goods sector. Dobb and Sen then showed that the growth rate could be maximized by increasing the overall capital intensity of production (Halevi, 1987). Yet, the entire outcome of the exercise depends on the fixity of the wage rate, since if the latter was flexible the result would have quickly evaporated in favor of traditional theory.

In *Structural Change and Economic Growth* Pasinetti shows, beyond any shadow of doubt, that the criterion for choosing the production technique with reference to the wage rate is misleading, with the consequence that the traditional notion of factor intensity appears as an inappropriate concept. Pasinetti's findings are worth discussing in some detail.

In his earlier contribution production by means of machines is thought of as specific to each consumption goods sector (Pasinetti, 1981, pp. 43–49). The method of vertical integration allows unit output to be represented by the chain of labor coefficients linking each stage of the transformation process. The wage rate and the sum of these coefficients enter fully into the determination of unit prices, but they do so in a very different manner. The coefficients of indirect and hyper-indirect labour multiply the sum of the depreciation rate and the rate of profits, while the other addendum is formed only by the direct labor input. The only way in which the wage cost can enter into the unit price is by multiplying every single labor component of the summation. It follows that, in a vertically integrated framework, the wage rate emerges as the only element of the price equations that can be factored out.

Let us now consider two countries, one with a much lower average rate of productivity and wage rates than the other. We assume also that both have access for a particular vertically integrated process and at the same rate of profits, to identical sets of alternative techniques. At this point, following Pasinetti's procedure, the difference in the wage rate is immaterial to the decision of choosing which technique to install. The wage rate simply multiplies all the alternative methods by the same factor. Consequently, the best technique for the advanced country is also the best technique for the underdeveloped country (Pasinetti, 1981, pp. 194–198). The implications for traditional theory are self-evident, while Dobb's and Sen's constructions, which inter alia were based on the hypothesis of a closed economy, are

superseded by a more general formulation deduced from a complete theory of production.

In Pasinetti's theory, given the irrelevance of wage differentials for the choice of techniques, the central question revolves around the developing economy's capacity to access new methods of production.

When two countries have access to the same set of alternative techniques the best machine for the rich country is also the best one for the poor country because the difference in the wage rate is immaterial. In general, however, this is not the case because the composition of demand of the low-productivity country covers only a limited subset of the products available in the advanced country. Thus, the developing economy will not produce the same array of machines as the industrialized country. However, the domestic production of less advanced machines might actually be more economical than the importation of more advanced equipment, if the low-income economy would have to export an amount of goods whose labor content is higher than the quantity of labor required to produce the less-advanced machines at home (Pasinetti, 1981, pp. 194–197).

The relationships between systems at different stages of industrial development appear to be conditioned by the radical disparities in the composition of per capita demand, while each system is bounded by the full-employment effective demand condition. Pasinetti's *Structural Economic Dynamics*—where output is produced only by labor—presents a powerful case for the comprehensive significance of the latter condition.

23.4 Gains from Trade and the Hierarchy of Production

Earlier (non-traditional) ideas about development and underdevelopment focused on the amount of capital stock required to equip the existing work-force. This is indeed the line taken by Kaldor (1956), Kalecki (1976), Morishima (1968), Robinson (1956) and Sweezy (1953), for whom unemployment in the advanced countries is eminently Keynesian—being determined by the degree of unused capacity in the system. These authors considered the problem of effective demand to be of secondary importance in developing economies. Analytically, it is clear that the above group of economists conflated the capital accumulation condition with the effective demand condition. According to this line of thought, when the modern component stock of capital is so small as to absorb only a limited percentage of the active population, the country's unemployment cannot be seen as being related to unused capacity or to any other Keynesian factor.

From a purely practical point of view these authors are not wrong.[2] The revolutionary perspective introduced by Pasinetti says that the hypothesis of a natural wage is valid and essential also, if not especially, in a developing country. In its dynamic form (Pasinetti, 1993, p. 50), the condition expresses the 'delimitation of the labourers who are entitled to the "natural" wage

rate, and thus to the growing productivity benefits, of the economic system' and 'it makes (full employment) responsibities emerge towards these people, i.e. towards a specific community" (Pasinetti, 1993, p. 149). Analytically, this criterion is equally important for both high- and low-income countries because it defines the (socially) bounded nature of the economic system relative to the international framework. For the underdeveloped areas, the question of how to benefit from growing productivity rates is linked to the opportunities to access new methods of production in a manner consistent with the strict hierarchy in which production ought to proceed during the development phases. Pasinetti's novel formulation of the effective demand full-employment condition gives economic and social consistency to the process of growth.

In each country the rise in per capita incomes is determined by the growth of average labor productivity. Thus, if a poor country does not have the internal means to raise its technical capacities it can, in principle, resort to international learning and also to international trade. In a pure labor economy the structure of internal relative prices is determined by the relative quantity of labor necessary to produce the given commodities. The inducement to engage in international trade arises when, for a given difference in average labor productivity between the advanced and the poor country, their relative price structures differ. This means that in some sectors the productivity differential will be greater, while in others it will be smaller, than the averge. The poor country will, therefore, specialize in exporting those commodities in which the productivity differential is less than the average, the opposite being the case for the advanced country (Pasinetii, 1993, pp. 161–168). Prices of internationally traded commodities will equalize, although the respective absolute quantity of labor embodied will differ. However, the wage rate will not equalize across countries unless complete mobility of labor is allowed. For the advanced country, such a mobility will upset the macroeconomic effective demand condition, especially whenever it is underfulfilled. External mobility of labor will also negatively affect the macroeconomic picture of the low-income country. The people migrating to the advanced country will be those who have a stock of technical knowledge that enables them to work with the more sophisticated methods of production of the developed nations. These are also the individuals most needed to improve productivity in the poor country. Thus, the effective demand condition emerges objectively as a reference point analytically as well as socially.

The structural impossibility of full labor mobility sets a definite limit to the openness of the economic system. Gains from international trade are obtained the moment the productive system is fully adjusted to the required specializations, *provided* the adjustment process is implemented with the least possible disruptions. In the subsequent periods no further gains from trade accrue to either country for a given structure of comparative costs. In this case, the principal source of continuous improvements will be the

existing growth rates of productivity which will entirely remain within each country, thereby generating, through their impact on the natural wage, a systemic rise in per capita incomes.

The acquisition, through learning, of new method of production is, therefore, the main source of productivity gains. At this point Pasinetti's theory introduces a complete new element that stems directly from the role ascribed to demand. A low-income country cannot acquire, from the more advanced regions, just any kind of technical knowledge. With the bulk of its per capita demand directed towards essential consumption goods, the country will have a much smaller range of production than the industrialized areas of the world. For any subsequent growth in productivity and in the natural wage, the overwhelming majority of consumers will expand the range of their choices in a strict order determined by their needs. To quote from Pasinetti (1993, p. 156):

> if any increment of productivity, and thus of per-capita income, [...] translates itself into more demand for food, the learning activity will have to be concentrated on increasing productivity in food production. It would be no use to learn how to make, let us say, refrigerators, because very few people would want them. Demand for refrigerators will come later on, but only at higher levels of income, which will never be reached if productivity is not increased in food production to begin with.

In relation to the acquisition of technical methods from the pool of the world's knowledge, the above considerations impose severe constraints which tend to be 'stricter, in each particular country, the lower its level of per capita income' (Pasinetti, 1993, p. 156). The low-income country can benefit only if it learns in the specific subset of the total field of knowledge in which it can provide demand.

23.5 Marx–Fel'dman–Mahalanobis and Pasinetti

The emphasis on demand brings out in a striking manner the qualitative improvement vis-à-vis the well-known Soviet–Indian growth model, which came to be appreciated also by many non-Marxist economists (Domar, 1957; Frankel, 1961; Wiles, 1962; Stoleru, 1965). The Marx–Fel'dman–Mahalanobis two-sector model cannot possibly take into account the composition of consumption demand because it contains only one consumption good. Any increase in per capita income is transformed into a higher level of consumption of the same commodity.

In the light of Pasinetti's theory, and contrary to widespread perceptions, the two-sector heavy industry model has limited structural content. A change in the distribution of investment between the capital and the consumption goods sectors only modifies once and for all the growth rate.

In Pasinetti's approach, given the hierarchical order in which the production of consumption of goods ought to proceed (as in the case of food before refrigerators), the composition of investment should reflect, on the input side, the very same order of priorities. The rise in the demand for 'food' before that for 'refrigerators' should, indeed, lead to a strictly defined temporary priority in the investment goods for food. In other words, at any stage of development, there is a precise set of priorities within the capital goods sector. Pasinetti's approach, by linking the natural wage to productivity growth, does not permit a persistent sacrifice of the benefits arising from productivity increases. A system which, more or less permanently, withholds the fruits of productivity growth is bound to thwart the dynamic feedbacks between technical change, and the opening up of new productions following the change in the per capita demand coefficients induced by the rise in the natural wage.

In general an industrializing country must, at some stage, import capital goods simply because the composition of per capita demand at low levels of income excludes a large number of sectors from the interindustry matrix. In the Indian model this problem was eliminated by assuming that export earnings were stagnant. The few machines that could be imported had to be installed in the self-reproducing machine tools sector in order to start a process of quasi-autarchic growth (Naqvi, 1963). On the whole, none of the standard Marx–Fel'dman theories can deal with the structural asymmetries between the domestic and the exporting sectors. Instead, the vertical integration approach leads directly to the identification of roots of dualism.

The search for export markets, as distinguished from specialization based on comparative costs, can, for Pasinetti, become a 'solution' to the restricted size of domestic demand (Pasinetti, 1993, ch. 9; Halevi, 1992). Under these circumstances the developing country would tend to concentrate all the productivity gains in the fast growing exporting sectors, entailing, at least initially, a less dynamic, and even stagnant, situation in the sectors producing for the domestic market. Thus, the gap between productivity growth in the export vis-à-vis the domestic oriented sectors will be higher in the developing country compared with the industrialized world. The terms of trade will then move against the developing country causing a productivity leak abroad through lower prices (Pasinetti, 1981, pp. 263–267; 1993, p. 168). It is the dualism in productivity growth that prevents the gains from being retained within the economic system. Although such a situation is a necessary phase in the development process, in the final analysis productivity will have to be expanded in the non-exporting industries. Development must, in the end, be concerned with the home market.

23.6 Concluding Remarks

The idea that overall productivity growth determines the wealth of nations dates back to Adam Smith and has found a large echo among economic

historians. From a theoretical point of view, however, the two dominant schools that emerged from nineteenth-century political and philosophical culture have been unable to link productivity growth with the rise in per capita income. This aspect has been overlooked also by Keynes although, as shown in the main body of the paper, the dynamics of effective demand is intimately connected to variations in the coefficients of per capita demand. Development theories, whether of Marginalist or Marxian orientation, have further neglected the issure precisely where it mattered most: development means first and foremost freedom from subsistence and, often, below subsistence conditions.

Notes

1. I thank Professor Pasinetti for a conversation on this point.
2. The same method would actually turn out to be misleading if the effective demand condition is conflated with that of capital accumulation in an already industrialized system (Halevi, 1994).

References

Bagchi, A.K., 1962, The choice of the optimum technique, *The Economic Journal* 72, 658–676.

Dobb, M., 1960, *An Essay On Economic Growth And Planning* (Routledge and Kegan Paul, London).

Domar, E. 1957, *A Soviet Model Of Growth, in Essays in the Theory Of Economic Growth* (Oxford University Press, New York).

Fel'dman, G., 1928, *K Teorii Tempov Narodnogo Dokhoda, Planovoe Khoziaistvo,* November and December.

Frankel, M., 1961, Producer goods, consumer goods and acceleration of growth, *The Economic Journal* 71, 1–19.

Halevi, J., 1987, Investment planning, in: M. Milgate, J. Eatwell and P. Newman, eds., *The New Palgrave* (Macmillan, London).

Halevi, J., 1992, Asian capitalist accumulation: From sectoral to vertical integration, *Journal of Contemporary Asia* 22, no. 4, 444–470.

Halevi, J., 1994, Structure and growth, *Economic Apliquee* 47, no. 2, 57–80.

Kaldor, N., 1956, Alternative theories of distribution, *Review of Economic Studies* 23, no. 2, 83–100.

Kalecki, M., 1976, *Essays On Developing Economies* (Hassocks, Harvester Press).

Mahalanobis, P.C., 1953, Some observations on the process of growth of national income, *Sankhya* 12, 307–312.

Morishima, M., 1968, *Theory Of Economic Growth* (Oxford University Press, London).

Naqvi, K.A., 1963, Machines tools and machines: A physical interpretation of the marginal rate of saving, *Indian Economic Review* 6, no. 3, 19–28.

Pasinetti, L., 1965, A new theoretical approach to the problem of economic growth, *Pontificiae Scientiarum Scripta Varia*, no. 28, Vatican City.

Pasinetti, L., 1973, The notion of vertical integration in economic analysis, *Metroeconomica* 25, 1–29.

Pasinetti, L., 1981, *Structural Change And Economic Growth* (Cambridge University Press, Cambridge, UK).
Pasinetti, L., 1993, *Structural Economic Dynamics* (Cambridge University Press, Cambridge, UK).
Robinson, J., 1956, *The Accumulation Of Capital* (Macmillan, London).
Sen, A.K., 1960, *Choice Of Techniques* (Basil Blackwell, Oxford).
Stoleru, L., 1965, An optimal policy for economic growth, *Econometrica* 33, 321–348.
Sweezy, P.M., 1953, A crucial difference between socialism and capitalism, in: P.M. Sweezy, ed., *The Present As History* (Monthly Review Press, New York).
Wiles, P., 1962, *The Political Economy Of Communism* (Basil Blackwell, Oxford).

24

Ronald Meek's "Magnificent" Review Article of Piero Sraffa's 1960 Classic: Top Hit in Decade 1954–63

G. C. Harcourt

I am not surprised but I am delighted that Ronald Meek's review article, Meek (1961), of Piero Sraffa's 1960 classic received the greatest number of hits in the decade 1954–63 in the *Scottish Journal of Political Economy*. The reviews of Sraffa's book ranged from the incomprehensible through the banal (one was even vitiated by a misinterpretation of the economic intuition of an arithmetic example), to the insightful and definitive. In the last category are the articles by Krishna Bharadwaj (1963), Maurice Dobb (1970), Ronald Meek and, to a lesser extent, Joan Robinson (1961).[1]

Meek (1961) sets out three possible views of what Sraffa could be taken to be doing:

1. an unorthodox theoretical model of a particular type of economy;
2. an implicit attack on modern marginal analysis;[2]
3. a sort of magnificent rehabilitation of the classical approach to certain crucial problems relating to value and distribution.

In light of the huge volume of Sraffa's scholarship that has occurred since then, including opening to scholars the Archives of the Wren Library of Trinity College, Cambridge, where Sraffa's papers are kept, it is clear that Meek's conjectures have been amply confirmed and the author himself, vindicated.[3] His three views contrast with Mark Blaug's Ricardo "without ifs and buts" interpretation, (Blaug 1968, 143–4) and, later, Frank Hahn's inability to get beyond the formal structure of Sraffa's book so that he interprets Sraffa's system as a very special case of neoclassical general equilibrium analysis (Hahn 1975, 1982).

Revised from *The Scottish Journal of Political Economy*, 60(5): 478–480, 2013, 'Ronald Meek's "Magnificent" Review Article of Piero Sraffa's 1960 Classic: Top Hit in Decade 1954–63,' by Harcourt, G. C. With kind permission from John Wiley and Sons. All rights reserved.

Meek makes very clear that Sraffa's analysis is not a form of out-of-date antiquarian concern. He explains how in classical analysis when capitalists arrived on the scene, it was necessary to show that having profits as part of the surplus only modified the law of value in pre-capitalist society. This was a necessary prerequisite to enable them to tackle their major task, "that of the determination of what Marx (and Mill) called the laws of motion of the capitalist system" (Meek 1961, 121).

Over 50 years on from the publication of Sraffa's book and Meek's argument that Sraffa had set out in a modern form the essence of classical and Marxian structures, it is even more clear that his was an astute assessment, not only for their sake but also to provide a sound approach to the analysis of issues in our time.

Because the surplus, potential and actual, is the central concept, and explaining the movement over time of the economy, the major purpose of their analysis, Ricardo and Marx recognized that measuring the size of the surplus at a moment of time (with different possible distributions of income), and over time with overall activity and technical change occurring, were necessary preliminaries to the full analysis.

Meek's explanation of Sraffa's rigorous solution of Marx's transformation problem, by linking Sraffa's concepts of a Standard system and a Standard commodity to Marx's industry with the average organic composition of capital, which in turn leads to a simple account of the distribution of the surplus between wages and profits, is especially helpful in understanding the true purposes of the rise of Monetarism and the Lucasians, to wit, to use the recreation of the reserve army of labour in order to provide a cowed and quiescent work force worldwide in order, in turn, to increase the potential surplus available for national and international accumulation by large multi-national oligopolistic firms. By making explicit the true nature of the labour theory of value and its implications for distribution and accumulation in capitalism, modern political occurrences become transparent, see Harcourt and Kerr 1996; Harcourt 2001, and for a discussion of these issues in the context of Paul Samuelson's evaluation of Marx, see Harcourt 2006, especially 134–5.[4]

By the time Ronald Meek wrote his review he was, he said, a Meekist not a Marxist; but he continued to be a fine scholar of Marx, the classical political economist and the Physiocrats, as well as an astute observer of happenings in the modern world.

Notes

1. The review article by Vincent Massaro and myself published in the *Economic Record* in 1964 and reprinted and expanded in the Appendix to chapter 4 of *Some Cambridge Controversies in the Theory of Capital* (1972) also has claims to be definitive because Piero approved of every word in it before we submitted it for

publication. Vincent and I were much influenced by Ronald's article, especially by his linking Marx's industry with "the social average organic composition of capital" to Sraffa's Standard system, Meek, 1961, 135–36.

2. "The sub-title … is 'Prelude to a Critique of Economic Theory', and Sraffa in his preface expresses the hope that someone will eventually attempt the job of basing a critique … on his foundations" (119).
3. See, for example, the recent (2012) Special Issue of the *Cambridge Journal of Economics* celebrating 50 years on from the publication of Sraffa's book, especially the article by Pier Luigi Porta (2012) discussing aspects of the development of Sraffa's views.
4. Though Meek never explicitly echoed Joan Robinson in her review article in *Oxford Economic Papers* "that the marginal productivity theory of distribution is all bosh" (C.E.P., Vol Three, 1965, 13), by recognizing the central importance of the creation, extraction, distribution and use of the surplus arising in the sphere of production, Meek like Sraffa directed attention to the social forces at work in the unfolding of these processes.

References

Bharadwaj, K.R. (1963). Value through exogenous distribution. *Economic Weekly (Bombay)*, **24**, pp. 1450–4.

Blaug, M. (1968). *Economic Theory in Retrospect*, 2nd edn. London: Heinemann.

Dobb, M. H. (1970). The Sraffa system and the critique of the neo-classical theory of distribution. *De Economist*, **4**, pp. 347–62.

Hahn, F. H. (1975). The revival of political economy: the wrong issues and the wrong argument. *Economic Record*, **51**, pp. 360–4.

Hahn, F. H. (1982). The neo-Ricardians. *Cambridge Journal of Economics*, **6**, pp. 353–74.

Harcourt, G. C. (1972). *Some Cambridge Controversies in the Theory of Capital*. Cambridge: Cambridge University Press.

Harcourt, G. C. (2001). *50 Years a Keynesian and Other Essays*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan.

Harcourt, G. C. (2006). Paul Samuelson on Karl Marx: were the sacrificed games of tennis worth it? In M. Szenberg, L. Ramratten and A. A. Gottesman (eds), *Samuelsonian Economics and the Twenty-first Century*. New York: Oxford University Press, pp. 127–41.

Harcourt, G. C. and Kerr, P. (1996). Karl Marx, 1818–83. In M. Warner (ed.), *International Encyclopedia of Business and Management*. London: Routledge, reprinted in Harcourt (2001), pp. 157–68.

Harcourt, G. C. and Massaro, V. G. (1964). Mr Sraffa's Production of Commodities. *Economic Record*, **60**, pp. 442–54.

Meek, R. L. (1961). Mr Sraffa's rehabilitation of classical economics. *Scottish Journal of Political Economy*, **8**(2), pp. 119–36.

Porta, P. L. (2012). Piero Sraffa's early views on classical political economy. *Cambridge Journal of Economics*, 36(6), pp. 1357–83.

Robinson, J. (1961). Prelude to a critique of economic theory. *Oxford Economic Papers*, *13*, pp. 53–8, reprinted in *Collected Economic Papers*, **3**, 1965, 7–14.

25

The Importance of HUMBUG in The Cambridge-Cambridge Controversies in Capital Theory

G. C. Harcourt

25.1

I am delighted and honoured to contribute an essay to the Special Issue of the *Global and Local Economic Review* in honour of Anwar Shaikh's contributions, and especially to honour 40 years on, the publication of his wonderful HUMBUG article, "Laws of production and laws of algebra: the Humbug production function" in the February 1974 issue of *The Review of Economics and Statistics*.

Anwar and I have been friends since the publication of my 1969 *Journal of Economic Literature* survey article, "Some Cambridge controversies in the theory of capital". Legend has it that, as a graduate student at Columbia (the 1974 article originated in his Ph.D dissertation, "Theories of value and theories of distribution" (1973)), Anwar had a dog-eared copy of the survey in his back pocket as the repository for an oft-read back up to his remarkable doctoral dissertation on issues in the controversies. We met when I visited the New School. Once he very kindly had me stay in his New York apartment, squeezing me in beside the Pakistani radicals seeking refuge from police persecution back home, who were his long-staying guests. As a fine Marxist scholar *and* activist, *Praxis* was Anwar's middle name.

I have since read with admiration many of his outstanding contributions in which he combines great technical skills with deep understanding of the conceptual bases and history of our subject, presenting his findings with the clarity and passion that only those who are on top of all aspects of their subject are capable of.

Revised from *Global and Local Economic Review*, 17(1): 11–21, 2013, 'The Importance of HUMBUG in The Cambridge-Cambridge Controversies in Capital Theory,' by Harcourt, G. C. With kind permission from *Global and Local Economic Review*. All rights reserved.

25.2

In this note I concentrate on his 1974 *Review of Economics and Statistics* paper, Bob Solow's ill-tempered and mistaken response to it, Solow (1974), and Anwar's development of the original ideas and his response to Solow's criticism in Humbug II, Anwar's chapter in Ed Nell's 1980 volume, *Growth, Profits and Property. Essays in the Revival of Political Economy*[1]. What optimists we all were then!

Let me first note the disparity in the lengths of the gestation periods between the submission and acceptance of Anwar's and Bob's papers:

June 1, 1972 – March 28, 1973 (Anwar); March 23, 1973 – March 28, 1973 (Bob).

Moreover, I understand that Solow insisted that his "comment" be published alongside Anwar's article, in itself a sensible suggestion, but that Anwar not be allowed to respond. I regard this as uncharacteristically poor treatment of a young scholar by a well-established one. Indeed, it is way off the regression line of Solow's well-known and rightly admired encouragement of young scholars.[2]

25.3

Apart from the technical elegance and ingenuity of Anwar's analysis, he was one of the first participants in the controversies to put the technical analysis within their proper conceptual setting. Both Amit Bhaduri (1969) and Anwar made explicit that a fundamental issue at stake was the 'vision' of the processes at work in capitalism, of how accumulation and profits arose and were related. Anwar implied immediately (and explicitly in Humbug II) that scarcity and choice in an exchange system transferred to the sphere of production underlie both the theory and empirics of Solow's response and the practice, then and now, of the mainstream generally. J.B. Clark's theory of distribution and Irving Fisher's consumer queen drive the action through her aim to maximise her lifetime expected utility, with all other actors in the economy being but the agents to allow her to achieve this. Whereas Amit and Anwar (and Maurice Dobb, Michał Kalecki and Joan Robinson) have the alternative vision of the classical political economists and Marx, of ruthless swash-buckling capitalists (all three sub-classes) producing and accumulating, with all the other actors dancing to their tune.[3]

25.4

That increases over time in output per person and per hour at the level of the firm, the industry and the economy are the outcome of both "more" and "better" capital per person are technical facts of life which economists of all persuasion accept. Neoclassical economists further argue that the

effects of "deepening" and "bettering" are separable, at least in principle (this is, after all, the conceptual basis of Solow's 1956 and 1957 articles). In contrast, post-Keynesians, for example, Nicky Kaldor and Joan Robinson, ultimately came to argue that they were not, that the factors associated with accumulation bringing about the rise in output per person through embodiment were indissolubly mixed, see, for example, Kaldor (1957), Joan Robinson (1971). It is how the above underlying technical structure is married to the processes of accumulation and distribution that creates the impassable cleavage between the two sides.[4]

25.5

Solow (1957) set out an ingenious way in which to precipitate out the deepening function from the overall relationship between output per person and capital per person which contained both it and the impact of technical progress in the neoclassical version of Harrod's natural rate of growth, Harrod (1939). Solow covered himself by writing that if it were assumed that the time series data used were viewed *as if* they had come from a production function in which, under competitive conditions, factor prices were equal to their respective marginal products and which was subject to the impact of neutral technical progress which raised the whole function over time, he had devised a simple way to fit statistically a function to the points so precipitated out.[5] As we know it was a Cobb-Douglas.

Anwar's criticism was to show that the function that was fitted was an algebraic identity – a law of algebra – in which regardless of how the values of the various variables were created – what processes were responsible for them – GNI would always be identically equal to the share of wages plus the share of profits. Solow's methods and results could neither refute nor confirm that a Cobb-Douglas production function was the originator of what was observed in the data.

Anwar's procedure was to show how a time series spelling out HUMBUG gave the same result – a very good fit of a Cobb-Douglas – as did Solow's adjusted data. Solow's answer, which preceded his description of his methodology quoted in footnote 5 above, was that "Mr Shaikh's article [so much for a Ph.D from Columbia when viewed from MIT] [was] based on misconception pure and simple." (121).

25.6

Anwar joined and was joined by economists from both camps, as it were. Franklin Fisher (1971), for example, carried out a huge simulation exercise in which he showed that if factor shares in the GNI were constant over 'time', a Cobb-Douglas function fitted well even though the conditions for aggregation from individual firms' Cobb-Douglas functions to the economy

as a whole were ridiculously restrictive and demanding. The fit occurred because the shares were constant, not because a Cobb-Douglas was producing the observed statistics. Henry Phelps Brown (1957) (whom Anwar delightfully refers to as P. Brown) had already discussed the short-comings of the Cobb-Douglas associated with Paul Douglas's seminal work but his setting out of the critique was rather obscure and was neglected in the literature as a result. Herb Simon also made the same critique but again did not have an immediate impact, see Simon and Levy (1963). The person who has stuck most tenaciously to the task of propagating and developing Anwar's insights is John McCombie, more recently in the company of Jesus Felipe, see, for example, Felipe and McCombie (2013). (Felipe has also collaborated with Fisher.)

Despite all this continued and damning criticism, the mainstream goes merrily on its way, using Cobb-Douglas or its sophisticated cousins, for example, CES, in both modern macroeconomic analysis and in endogenous growth theory, a procedure that is as intellectually dishonest as the continuing use of partial equilibrium supply and demand analysis after Sraffa (1926) (we are all guilty here).

Anwar (1980), 93, points out that Solow tries to have his cake and eat it too." Having ... said that his method ... [led] him to conclude that even the Humbug economy is neoclassical, [he] next asserts the very opposite ... he runs a [linear] regression ... on the Humbug data [that] gives a very poor fit [and] a negative coefficient for his *k*. [Anwar argues] that linearity is ... a convenient assumption whose applicability must be ... *justified*, not ... assumed." (emphasis in original).

25.7

I spent a week at the Economics Department of Tufts University in 1975 through Tom Cooley's good graces. I gave a seminar on the capital theory controversies (it was based on a paper which was the sequel to my 1972 book; it was later published in *OEP* (1976)). Paul Samuelson and Bob Solow were in the front row.[6] I had to tone down what I had said in other places where I included some cracks about the two MIT inseparables (the cracks were reinstated in the published version, I am not completely lacking in integrity).

After I had given the paper Bob quizzed me as to why I was so agin marginal productivity approaches. He asked: suppose you were a business person and were thinking of employing an extra person? Would you not do so if you expected the extra revenue so gained to exceed the extra wage paid? I said I supposed I would but, being rather non-plussed,[7] I failed to add that this did not logically imply that similar processes happened systemically so that Cobb-Douglas applied, that a systemic theory of distribution did not have to match or reflect the processes at work at the level of the individual firm.

25.8

The best illustration of my passed-over answer comes from Kalecki's remarkable 1936 review article of *The General Theory*, at that time untranslated from Polish.[8] In it, Kalecki starts with a profit-maximising, cost-minimising firm, the production technique of which could well be Cobb-Douglas, situated in either a purely (freely) competitive or an imperfectly competitive market. He nets out raw material costs and splits the value added implied by the net revenue and net cost curves into wage payments and surplus (=profits); he aggregates the values added of all firms in the economy to the economy as a whole and shows how wage-earners spending what they earn and profit-receivers receiving what they spend, given the level of investment expenditure, results in the overall levels of activity and employment, and the distribution of income between wages and profits, being determined simultaneously.

This two-sided relationship between accumulation and distribution was extended by Joan Robinson to the long period (in a Harrodian sense) in 1962 in her banana diagram Robinson (1962), 48, and even further by Donald Harris (1975, 1978) to take in the sphere of production in which the potential surplus is created as a result of the impact of the current state of the class war and the existing technical conditions of production. The realisation problem is analysed in the accompanying sphere of distribution and exchange in which the Keynesian "animal spirits" function and the Cambridge saving function interact to determine the rate of accumulation and the distribution of income and so how much of the potential surplus is realised.

25.9

An essential part of setting up this alternative approach is Anwar's critique of Solow's methodology, of his theory and its application, and Anwar's recognition of the link between 'vision' and the specifics of theory, analysis and applied work. Mainstream analysis of firm's behaviour by no means implies that the system need mirror it. Anwar's contribution also puts paid to the late Charles Ferguson's, Ferguson (1969), and the late Mark Blaug's claims, Blaug (1974), that econometrics would decide how serious for neoclassical theory would be the results of the Cambridge – Cambridge capital theory controversies.[9] The hegemony and ignorance of the mainstream keep this finding at bay but surely truth will ultimately prevail. If, when, it does Anwar's contributions will be major reasons why.

Notes

1. As well as the Humbug papers, I especially admired his writings on Ricardo justified, the 93 percent labour theory of value vindicated (1998), his paper on

the transformation problem (1997) and his systemic analysis of the motion of capitalism through transforming the Keynesian national accounts into their Marxian counterparts (1994).

2. I know of this from personal experience. When I was preparing my 1969 survey article, Bob sent me copious comments on the working papers I circulated on the way to the final draft.
3. It is a nice irony that in his ninth decade the late Paul Samuelson had come to a similar view point. In an Address to the Bank of Italy on October 2, 1997, in which he compared the different experiences of present-day American and European economies, he said: "I lay stress on two main factors … One. In America we now operate … the Ruthless Economy. Two. In America we now have a Cowed Labor force … two features interrelated … [yet] somewhat distinguishable." Especially is this so as Anwar shows that the neoclassical claims only go through if the pure labour theory of value with regard to values and prices goes through, see Shaikh (1974), 115.
4. Duncan Foley and Tom Michl (1999) have provided an appealing classical model to illuminate the empirical findings on which the mainstream erect their analyses and findings.
5. "The factor-share device of my 1957 article is in no sense a *test* of aggregate production functions or marginal productivity …. It merely shows how one goes about interpreting given time series if one starts by *assuming* that they were generated from a production function and that the competitive marginal – product relations apply" Solow (1974), 121, emphasis in original.
6. They had come to Tufts the week before, having mistaken the date the seminar would be on, appropriately, April 1.
7. It was a toss up whether Bob's question or Paul correcting page proofs while I spoke was the more non-plussing.
8. The first full translation was published in the December 1982 issue of *Australian Economic Papers*, see Targetti and Kinda Hass (1982).
9. Joan Robinson further refuted the claim that econometrics could ride to the rescue by her repeated demonstration that comparisons of equilibrium positions (differences) cannot throw light on processes (changes), see, for example, Shaikh (1974) 115, n2.

References

Bhaduri, A. (1969), "On the significance of recent controversies on capital theory: A Marxian view", *Economic Journal*, 79, 532–9.

Blaug, M. (1974), *The Cambridge Revolution: Success or Failure? A Critical Analysis of Cambridge Theories of Value and Distribution*, London: Institute of Economic Affairs.

Brown, P. [Henry Phelps Brown] (1957), "The meaning of fitted Cobb-Douglas functions", *Quarterly Journal of Economics*, 71, 546–60.

Ferguson, C.E. (1969), *The Neoclassical Theory of Production and Distribution*, Cambridge: Cambridge University Press.

Felipe, J. and J.S.L. McCombie (2013), "How sound are the foundations of the aggregate production function?" in Harcourt and Kriesler (eds) (2013), 202–30.

Fisher, F.M (1971), "Aggregate production functions and the explanation of wages: A simulation experiment", *Review of Economics and Statistics*, 53, 305–25.

Foley, D.K. and T. Michl (1999). *Growth and Distribution*. Cambridge, Mass: Harvard University Press.

Harcourt, G.C. (1969), "Some Cambridge Controversies in the theory of capital", *Journal of Economic Literature*, 7, 369–405.
Harcourt, G.C. (1972), *Some Cambridge Controversies in the Theory of Capital*, Cambridge: Cambridge University Press.
Harcourt, G.C. (1976), "The Cambridge controversies: Old ways and new horizons – or dead end?", *Oxford Economic Papers*, 28, 25–65.
Harcourt, G.C. and Peter Kriesler (eds) (2013), *The Oxford Handbook of Post-Keynesian Economics, Volume 2*. New York: Oxford University Press.
Harris, D.J. (1975), "The theory of economic growth: A critique and reformulation", *American Economic Review. Papers and Proceedings*, 65, 329–37.
Harris, D.J. (1978), *Capital Accumulation and Income Distribution*, Stanford: Stanford University Press.
Harrod, R.F. (1939), "An essay in dynamic theory", *Economic Journal*, 49, 14–33.
Kaldor, N. (1957), "A model of economic growth", *Economic Journal*, 67, 591–624.
Kalecki, M. (1936), "Pare uwag o teorii Keynesa" ("Some remarks on Keynes' theory"), *Ekonomista*, 3, reprinted in *C.W.*, vol I, 223–32.
Nell, Edward J. (ed.) (1980), *Growth, Profits and Property. Essays in the Revival of Political Economy*. Cambridge: Cambridge University Press.
Osiatynski, J. (ed.) (1990), *Collected Works of Michał Kalecki, vol I: Capitalism, Business Cycles and Full Employment*. Oxford: Clarendon Press.
Robinson, Joan (1962), *Essays in the Theory of Economic Growth*. London: Macmillan.
Robinson, Joan (1971), *Economic Heresies: Some Old-fashioned Questions in Economic Theory*. London: Macmillan.
Samuelson, Paul A. (1997), "Wherein Do the European and American Models Differ?", Address delivered at the Bank of Italy, October 2, 1997, Number 30, mimeo.
Shaikh, Anwar (1973), "Theories of Value and Theories of Distribution", Ph.D Dissertation, New York: Columbia University.
Shaikh, Anwar (1974), "Laws of production and laws of algebra: The Humbug production function", *Review of Economics and Statistics*, 54, 115–20.
Shaikh, Anwar (1980), "Laws of production and laws of algebra: Humbug II", in Nell (ed.) (1980), 80–95.
Shaikh, Anwar (1997), "Marx's theory of value and the transformation problem", in Jesse Schwartz (ed.), *The Subtle Anatomy of Capitalism*. Santa Monica: Goodyear Publishing Company, 106–39.
Shaikh, Anwar (1998), "The empirical strength of the labor theory of value", in Riccardo Bellofiore (ed.), *Marxian Economics: A Reappppraisal*. London: Macmillan, Vol. 2, 225–51.
Shaikh, Anwar and E. Ahmet Tonak (1994), *Measuring the Wealth of Nations: The Political Economy of National Accounts*. Cambridge: Cambridge University Press.
Simon, H. and F. Levy (1963), "A note on the Cobb-Douglas function", *Review of Economic Studies*, 30, 93–94.
Solow, R.M. (1956), "A contribution to the theory of economic growth", *Quarterly Journal of Economics*, 70, 65–94.
Solow, R.M. (1957), "Technical change and the aggregate production function", *Review of Economics and Statistics*, 39, 312–20.
Solow, R.M. (1974), "Laws of production and laws of algebra: A comment", *Review of Economics and Statistics*, 56, 121.
Sraffa, Piero (1926), "The laws of returns under competitive conditions", *Economic Journal*, 36, 535–50.
Targetti, F. and B. Kinda-Hass (1982), "Kalecki's review of Keynes' *General Theory*", *Australian Economic Papers*, 21, 244–60.

26
Switching and Employment

Joseph Halevi

26.1 The Context

The debate over the neoclassical theory of capital has provided an extensive array of models where the economy is divided between capital and consumption goods. The analytical framework for the discussion of the static factor-price frontier is therefore the same as that used to identify the dynamic properties of fixed coefficients two-sector growth models. This has been shown clearly in a recent book by Mukherji [7]. In this article I shall discuss the implications of this analytical structure for the employment capacity of such systems. I conclude that Pasinetti's contribution constitutes a way out of the special case character of the results yielded by such models [8]. In a two-sector model, the relation between the wage rate and the rate of profit (w/r) is derived from the following pair of price equations:

$$p = pra_i + wb_i$$

$$1 = pra_c + wb_c \qquad (1)$$

where:

p = unit price of capital goods
1 = unit price of consumption goods taken as *numéraire*
a_i = amount of capital goods per unit of capital goods output
a_c = amount of capital goods per unit of consumption goods output
b_i = amount of labor per unit of capital goods output
b_c = amount of labor per unit of consumption goods output
r = rate of profit
w = wage rate

Revised from *Eastern Economic Journal*, 11(3): 229–234, 1985, 'Switching and Employment,' by Halevi, J. With kind permission from Palgrave Macmillan. All rights reserved.

The shape of the *w*/*r* relation is given by the value of the determinant of the coefficients matrix sustaining the price system (1). That is:

$$(a_i b_c - a_c b_i) \gtrless O \tag{2}$$

If the value of (2) is less than zero, then the *w*/*r* relation will be given by a curve convex toward the origin; a positive determinant will imply a concave curve and a zero determinant will generate a straight line. The three cases are illustrated in Figures 26.1, 26.2, 26.3.

The critics of neoclassical capital theory pointed out that if an economy can choose between different techniques these will in general intersect at more than one point, as can be seen by drawing the three curves on one diagram. Hence it becomes impossible to associate in an unambiguous manner a high (low) rate of profit with a low (high) aggregate capital-labor ratio. As a consequence the explanation of the distribution of income in terms of the demand and supply of capital and labor is based on postulates anchored on a special case [1;2].

For my purposes each of the three techniques will be treated as representing different economies. I therefore agree with a remark made by Joan Robinson according to which the possibility of "switching" arises only as a thought experiment. In a concrete economic system, she argued, there is a definite configuration of capital stock. A change in techniques would require a complete restructuring of the stock of capital and not a smooth transition to the new technique [9].

In the above context the question of employment and accumulation can be dealt with, in the main, in two ways. One would be to follow Robinson's *The Accumulation of Capital* and ask what are the structural conditions for

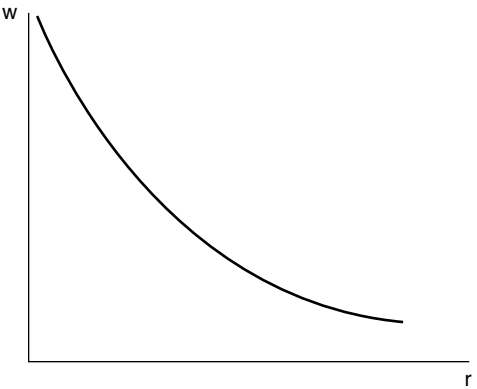

Figure 26.1 Convex wage/profit relation

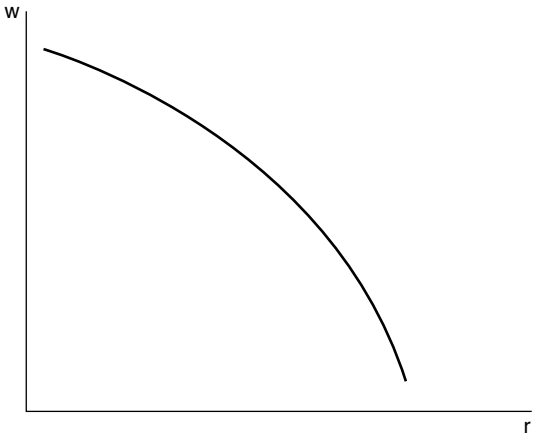

Figure 26.2 Concave wage/profit relation

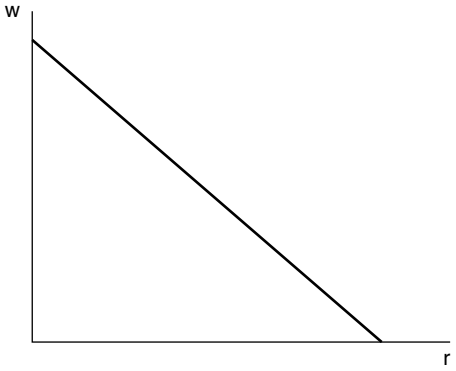

Figure 26.3 Linear wage/profit relation

the economy to converge toward a full-employment steady-state growth path. The initial position of the economy is characterized by a Marx type reserve army of labor. That is a situation where the existing capital stock is far below the level necessary to provide employment to the whole of the labor force [7; 10]. This line of reasoning led Robinson to formulate the well-known hypothesis of a State of Bliss. Capital accumulation can exceed the natural growth rate of population as long as a reserve army of labor exists. Once the latter is exhausted, growth should proceed at the level allowed by natural increments in population. If these are very small there is virtually no objective necessity for accumulation and the profits that go with it. Capital goods should be allocated mostly in the consumption goods sector and the

economy should settle at a quasi-stationary state of full employment and full-capacity output.

It is interesting to see that Robinson's position implies a form of euthanasia of the capitalist. In *The Accumulation of Capital* she succeeds in showing that profit-propelled accumulation becomes an obstacle to full employment in a mature industrial economy. Yet the analysis is not carried much further.

The second approach to the employment-accumulation question is akin to that of Hicks in his contribution to Traverse theory in *Capital and Growth* [3]. Imagine an economy where the existing level of capital stock does provide employment to the whole of the labor force at full-capacity utilization. Let us also assume that the system is in balanced growth and that the labor force—the exogenous factor—suddenly starts expanding at a higher or lower rate than that of capital equipment. Hicks' analysis of the Traverse, based on a two-sector fixed-coefficients model, consists in finding the conditions on the basis of which equipment and labor remain fully employed while the economy "traverses" toward the new growth path.

I shall use Hicks's formulation, which is complementary to that of Joan Robinson, although I do not limit my focus to the conditions required for equilibrium. The main assumptions will be that the multipurpose capital goods do not depreciate—a standard hypothesis that equates the output of machines with net increments of capital stock—and that no wages and all profits are saved.

26.2 Discussion

The analytical basis of the treatment of employment in a two-sector growth model is given by the quantity equations which accompany the price system in (1):

$$K = a_i gK + a_c C$$

$$L = b_i gK + b_c C \tag{3}$$

moreover:

$$gK = (1/a_i)\, kK = I \tag{4}$$

where:

K = total capital stock
L = total labor force employed
C = consumption goods
g = growth rate of capital stock
I = output of machines
k = percent of total capital stock K allocated in the capital goods sector

From equation (4) we learn that the rate of growth of capital stock is equal to the output-capital coefficient of the capital goods sector multiplied by the share of total capital stock installed in the capital goods sector itself. Hence, given the coefficients of production, an increase or decline of the growth rate of the labor force would require a parallel adjustment of the growth rate of capital, which can be brought about via an increase or decrease in the share k of capital goods allocated in the capital goods sector.

The determinant of the pair of equations (3) is the same as that of (1). Thus the properties of the value of the determinant (2) apply also to the relation between the capital labor ratio and the rate of growth. Each of the three possible values of the determinant (negative, positive, zero) implies a specific sectoral employment capacity of a unit of capital goods. In fact from (2) we can obtain $a_i b_c < a_c b_i$, which would hold if the value of (2) were negative. Then:

$$(b_c/a_c < (b_i/a_i) \tag{5}$$

Each of the two ratios in (5) represents the number of workers necessary to operate one unit of equipment in the sector where it is installed, i.e. they are the sectoral labor-capital ratios. In the case of inequality (5) the equipment installed in the consumption sector employs, per unit, fewer persons than the machines operating in the capital goods sector. If the sign of (5) were to be reversed the consumption sector would become the more labor-intensive one. Finally, if (5) were an equality—implying a vanishing determinant—a unit of capital good would have the same number of operators regardless of its sectoral allocation. We shall see that this case has some implications for the emergence of unused capacity.

A discrepancy between the growth rate of capital stock and of the labor force can be reabsorbed, provided the magnitudes are within reasonable values, only if inequality (5) holds. In this way full capacity and full employment can be maintained while the system adjusts to the state of equilibrium. Consider a fully-employed mature economy in which the productive capacity of the machine-producing industry outgrows the supply of labor. This is tantamount to a fall in the growth rate of labor vis-à-vis that of equipment. The relative scarcity of labor would compel producers to invest in the least labor-intensive sector, namely the consumption-goods one. Thus the proportion of machines allocated to the capital goods sector will decline. From equation (4) we know that a fall in the proportion k will lead to a lower rate of accumulation. The behavior of the aggregate K/L ratio would be consistent with the neoclassical growth parable where K/L is inversely related to the rate of accumulation and to the rate of profit. By contrast, if the capital-goods sector were the least labor-intensive, thereby attracting a greater proportion of investment, momentary equilibrium between equipment and the work force can still be found but it will be unstable. With a

higher percentage k of machines operating in the capital-goods sector, the economy will be poised for a faster rate of accumulation precisely when the expansion of the labor force has fallen.

The above presentation allows us to establish a link with general equilibrium theory. Indeed, as shown by Walsh and Gram [13], a two-sector model can also be thought of as a Walrasian model with two factors and two goods. In this context, Walrasian theory is not altogether incompatible with the theories of growth and accumulation developed in the postwar years. The main limitation consists, however, in that accumulation appears in the form of two special cases: the case in which the capital goods sector is more labor-intensive, yielding a stable equilibrium, and the opposite one yielding unstable solutions.

It is now possible to examine the case where the determinant vanishes because the employment capacity of each unit of equipment is the same irrespectively of the sector where it is used.

During the debate over capital theory it has been sometimes argued, as Spaventa did [11], that a situation of uniform capital-labor ratios is as if the economy were producing only one kind of good. While this is correct in a situation of steady state, the statement becomes rather problematical when looked at from the angle of the employment Traverse.

Assume a truly one-commodity system where output can be invested as well as consumed. Then, a fall in the growth rate of labor relative to output can be balanced *ipso facto* by raising consumption; provided, of course, that either entitlements can be swiftly redistributed or, better still, that the underlying social structure is characterized by what Marx called simple commodity production. No surplus capacity would emerge. Yet if the economy produces two distinct kinds of goods—capital goods and consumption goods—with a technique showing uniform labor intensities, the same fall in the growth rate of the work force will lead to an overproduction of machines and therefore to unused capacity.

The problem can be grasped with a simple numerical example. If at the end of a given production period, a year, ten new machines are brought into being, each employing four workers, then forty more people should enter the work force. But if the latter has expanded by only thirty-two people, two machines will end up being redundant. Unlike the cases of non-uniform capital-labor ratios, there is no way to find a new instantaneous equilibrium between equipment and labor since, irrespectively of the sectoral distribution of machines, the amount of labor fetched remains unaltered. Unused capacity is inevitable because the redundant machines cannot be transformed into consumption goods. Paradoxically the structural difference between capital and consumption goods in relation to the employment capacity of the economy is high-lighted in the case of uniform capital-labor ratios.

At this point subsequent developments are rather open-ended. The appearance of excess capacity can lead to a cut in investment causing Keynesian

unused capacity and unemployment. In other words, the effect of a disproportionality between capital and labor—a Marxian phenomenon—may express itself in Keynesian terms as a result of a cut in investment activity.

This mixed Marxian—Keynesian approach is very close to that taken by Kaldor some forty-seven years ago in a very important paper on the stability of full employment [4]. Using, but only verbally, a two-sector model he distinguished between short-period and long-period full employment. In the short period, full employment and full capacity can be brought about by adjusting the distribution of income and the propensity to save. But in the long period, he argued, the central issue becomes the productive capacity of the capital goods sector vis-à-vis the expansion of the labor force. The basic historical hypothesis is that a developed capitalist economy possesses an amount of capital stock which, if fully utilized, could more or less employ the whole of the labor force; this view is shared also by Kalecki and Sweezy [5; 12]. Hence, as indeed Sweezy pointed out, as the economy approaches full-capacity output it can quickly move toward over-accumulation leading to a breakdown in investment. In recent times Morishima [6] has tried to elucidate (with a similar model) the interaction among over-accumulation, Keynesian unemployment and Marx's reserve army of labor. His results, while valuable, depend in a crucial manner on fixed prices and on a Harrodian saving function which is not necessarily the case in Kaldor or in the case discussed above.

26.3 Conclusions

Two-sector models play an important role in clinching the basic aspects of major theoretical constructions. As shown by Walsh and Gram they can express the core of classical as well as neoclassical theories of general equilibrium. Furthermore, they are particularly helpful for the discussion of macroeconomic problems connected with Marx—the founder of the two-sector approach—and with Keynes.

At the same time, whenever one theoretical aspect is elucidated, it is invariably tied to a special case connected with a specific technological configuration of the system. Indeed, the special-case character of the results obtainable with a two-sector model has surfaced particularly during the debate over capital theory. The main reason lies in that the economic structure is locked up in one multipurpose capital good.

The question now is whether a way out exists. For example, is it possible to represent the phenomenon of a breakdown in investment due to excessive accumulation without falling into a special case (such as uniform capital-labor ratios)? The answer is in the affirmative and can be deduced from a recent seminal book by Luigi Pasinetti [8]. The discussion of Pasinetti's work would require a separate and lengthy essay; I will only mention the nature of its significance. Pasinetti constructed a model in which

there are many consumption goods, each produced by means of a vertically integrated sector. Each consumption good is produced by a specific capital good which in turn can reproduce itself. Thus we have a multisector system formed by many pairs of two-sector models. Then, it is possible to obtain simultaneously many different technological configurations, whereas in the "pure" two-sector model only one technological configuration is allowed: the capital-labor ratios can be uniform or different but cannot be both at the same time. By contrast this is precisely what happens in Pasinetti's approach. The implications are straightforward: the special case of convergence toward full-employment equilibrium is ruled out, while that of an inbalance between means of production and labor is not. Hence what in a two-sector model appears as yet another special case, in Pasinetti's it appears embedded in the general features of economic activity. As a consequence, even if we start with full employment of labor and no unused capacity it will be impossible to maintain this state of affairs through time, unless "a central institutional organization [is] entrusted with the specific task of maintaining full employment." [8,91].

References

1. Garegnani, Pierangelo. "Heterogeneous Capital, the Production Function and the Theory of Distribution." *Review of Economic Studies,* July 1970, 407–438.
2. Harcourt, G. C. *Some Cambridge Controversies in the Theory of Capital*. Cambridge, UK.: Cambridge University Press, 1972.
3. Hicks, John R. *Capital and Growth*. Oxford: Oxford University Press, 1965.
4. Kaldor, Nicholas. "Stability and Full Employment," in *Essays on Economic Stability and Growth*. London: Duckworth, 1960, pp. 103–19.
5. Kalecki, Michał. *Essays on Developing Economies*. Hassocks: Harvester Press, 1976.
6. Morishima, Michio. *Theory of Economic Growth*. Oxford: Clarendon Press, 1968.
7. Mukherji, Badal. *Theory of Growth and the Tradition of Ricardian Dynamics*. Delhi: Oxford University Press, 1982.
8. Pasinetti, Luigi L. *Structural Change and Economic Growth*. Cambridge, UK.: Cambridge University Press, 1981.
9. Robinson, Joan V. "The Unimportance of Reswitching." *The Quarterly Journal of Economics,* February 1975, 32–39.
10. _____. *The Accumulation of Capital*. London: MacMillan, 1956.
11. Spaventa, Luigi. "Rate of Profit, Rate of Growth and Capital Intensity in a Simple Production Model." *Oxford Economic Papers,* July 1970, 129–47.
12. Sweezy, Paul M. "A Crucial Difference Between Capitalism and Socialism," in *Marx and Modern Economics,* edited by D. Horowitz. New York: Monthly Review Press, 1968, pp. 315–325.
13. Walsh, Vivian, and Harvey Gram. *Classical and Neoclassical Theories of General Equilibrium*. New York: Oxford University Press, 1980.

27

Multiplier Theory with Tax Rates as Policy Instruments

J. W. Nevile

27.1 More Important Multipliers

Historically, the balanced budget multiplier theorem was important because it corrected the widely held view that the size of the deficit or surplus was the magnitude which indicated the effect of the budget on the economy. The theorem is still emphasised today because this focus of attention on the size of the deficit is not completely dispelled. But in itself the balanced budget multiplier is not particularly important. Budgets rarely are balanced. In any case, the size of the deficit is not something that is normally under the control of the government. It is not an instrument of policy. In most circumstances it is legitimate to regard government expenditures as a policy instrument, but not government receipts, and hence not the deficit. With constant taxation rates, the level of receipts varies with the level of national income. If national income is lower than that expected when the budget was planned, taxation receipts will be lower than expected, and the deficit bigger.[1] It is taxation rates, not taxation receipts, that are under the direct control of the government. Multipliers for government expenditure are relevant to fiscal policy; except in the case of lump sum taxes, those for taxation receipts are not. What are needed are figures giving the ratio between a change in taxation rates and the consequent change in national income.

To examine the effect of government expenditure and taxation rates on the economy, let us return to the simple model consisting of the equations:

$$Y = C + I + \mathrm{G} \tag{1}$$

Revised from *Fiscal Policy in Australia: Theory and Practice*, 52–71, 1970, 'Multiplier Theory with Tax Rates as Policy Instruments,' by Nevile, J. W. With kind permission from Cheshire. All rights reserved.

$$C = a + c(Y - T) \tag{2}$$

$$T = tY \tag{3}$$

G and I are exogenous. Since it is no longer assumed that the budget is balanced, it is no longer valid to put G equal to tY but one can obtain a multiplier for G by substituting equations (2) and (3) into equation (1), obtaining:

$$Y = \frac{a + I + G}{1 - c + ct}$$

The multiplier for G is $\dfrac{1}{1 - c + ct}$

The larger is the term $1 - c + ct$, the smaller is the multiplier; hence, the smaller the marginal propensity to consume, the smaller is the multiplier, and the larger the marginal rate of taxation, the smaller is the multiplier.

It is clear that the level of national income depends, among other things, upon the rate of taxation, and that the larger t the smaller Y. It is possible to obtain a simple formula analogous to a government expenditure multiplier, but which relates changes in Y to changes in t.[2] Let Y and t be the level of national income and the taxation rate before a change is made in t, and $Y + \Delta Y$ and $t + \Delta t$ the level of national income and the taxation rate after a change in t, then:

$$Y + \Delta Y = \frac{a + I + G}{1 - c + c(t + \Delta t)}$$

and

$$\Delta Y = \frac{a + I + G}{1 - c + ct + c\Delta t} - Y$$

dividing through by Y or

$$\frac{a + I + G}{1 - c + ct}$$

$$\frac{\Delta Y}{Y} = \frac{1 - c + ct}{1 - c + ct + c\Delta t} - 1$$

$$\frac{\Delta Y}{Y} = \frac{1 - c + ct - (1 - c + ct + c\Delta t)}{1 - c + ct + c\Delta t}$$

Let k be the multiplier after the change in taxation rates, then:

$$k = \frac{1}{1 - c + ct + c\Delta t}$$

and

$$\frac{\Delta Y}{Y} = - kc\Delta t$$

or

$$\Delta Y = -Ykc\Delta t$$

That is, the change in income caused by a change in the rate of taxation is equal to the product of the original level of income, the multiplier that holds after the change in the taxation rates, the marginal propensity to consume, and the change in the taxation rate; and is in the opposite direction to the change in the taxation rate. For example, in an economy where Y is 4,500 units and c is 0.8, a change in t from 0.19 to 0.20 will decrease Y by the product of 4,500, $\frac{1}{36}$, 0.8 and 0.01, or by 100 units. The formula $\Delta Y = -Ykc\Delta t$ can be understood and justified by considering ΔtY as the amount by which consumers' income is reduced due to the change in t; $c\Delta tY$ is the consequent initial decrease in consumption, and $kc\Delta tY$ is the decrease in income. However, the algebraic derivation is important, as it established that Y is the level of income before the change in t, and k the multiplier that holds after the change in t.

Changes in taxation rates are usually made in percentage terms; for example, a 5 per cent surcharge. It is often more convenient to think in percentage terms and ask by what percentage Y will change when t changes by, say, 1 per cent. The percentage increase in Y, or $100\frac{\Delta Y}{Y}$ is given by $-100kc\Delta t$. Substituting 1 per cent of t, or $\cdot 01t$ for Δt gives $- kct$ as the answer to this question. Similarly, if t is increased by 5 per cent, Y is $5kct$ per cent less than it otherwise would be or, if t is decreased by 10 per cent, Y is $10kct$ per cent greater than it otherwise would be. Thus we can formulate the simple rule that the ratio between a percentage change in t and the consequent percentage change in the opposite direction in Y is equal to the product of the multiplier which holds after the change, the marginal propensity to consume, and the taxation rate. The taxation rate is the rate before the change and is expressed as a fraction between zero and one. To give an example, consider a 5 per cent taxation surcharge imposed in a country where the marginal propensity to consume is 0.8, and one fifth of income is paid in tax. Here k, or the multiplier after the surcharge, is $\frac{1}{1 - .8 + .168}$, and ct is $\cdot 16$. Hence $5kct$ is $\frac{800}{368}$ or approximately 2.2. That is, in this country a 5 per cent tax surcharge will reduce income by approximately 2.2 per cent below the level that it would have had without the surcharge.

The separate effects of a change in government expenditure and a change in the rate of taxation can be added to give the combined effect of both changes. Then:

$$\Delta Y = k\Delta G - kcY\Delta t \text{ or } k(\Delta G - cY\Delta t)$$

Y is the level of income before changes in either G or t, and k is the multiplier after the change in t.[3] It can be seen that increases in both government expenditure and the taxation rate will increase national income if the increase in government expenditure is bigger than the product of the marginal propensity to consume, the initial level of income, and the change in the taxation rates; but will decrease national income if the increase in government expenditure is smaller than this product. The size of this increase or decrease in national income will depend both on the size of the multiplier and on the size of the difference between the increase in government expenditures and the product of the marginal propensity to consume, the initial level of income, and the change in the taxation rates. For example, in an economy where Y is 10,000 units, c is 0.8 and t is 0.2, an increase in t to 0.21, accompanied by an increase of 448 units in G, will increase Y by 1,000 units.

So far we have been manipulating only a very simple model. If expenditures which depend on national income rather than disposable income are introduced, the multiplier is altered, but the rule remains that the change in income due to a change in tax rates is equal to $-Ykc\Delta t$. Consider a model which has all the complications which were introduced when discussing the balanced budget multiplier. This model is given by the following five equations:

$$Y = I^f + I^s + C + G + X - M \tag{1A}$$

$$C = a + c(Y - T) \tag{2}$$

$$T = tY \tag{3}$$

$$I^s = bY - K \tag{4}$$

and

$$M = n + mY \tag{5}$$

I^f, X and G are exogenous. In this model:

$$Y = \frac{I^f + X + a - n - K + G}{1 - c + ct - b + m}$$

so that when taxation rates are constant, the government expenditure multiplier is equal to $\frac{1}{1-c+ct-b+m}$

Following the same algebraic procedures as before will show that if t is changed, $\Delta Y = kcY\Delta t$ where Y is the initial level of income and k is the government expenditure multiplier after the tax change. Thus the formula $\Delta Y = k(\Delta G - cY\Delta t)$ still holds, although the value of k itself is altered.

In this more complex case, as in the simple case, the level of income increases if taxation rates are held constant and government expenditure is increased; or if taxation rates are decreased and government expenditure is held constant; or if government expenditure is increased and taxation rates are decreased; or if both government expenditure and taxation rates are increased, but with the increase in government expenditure being larger than the product of the marginal propensity to consume, the initial level of income, and the change in taxation rates; or if both government expenditure and taxation rates are decreased with the drop in government expenditure being smaller than the product of the marginal propensity to consume, the initial level of income, and the change in taxation rates. The sizes of the propensity to import and of the acceleration coefficient have no effect on whether simultaneous changes in government expenditures and taxation rates increase or decrease the level of income, but they do affect the size of the change in the level of income with any given changes in government expenditures and taxation rates. The formula is symmetrical for increases and decreases in the level of income. All the statements in this paragraph hold for decreases in the level of income, provided that the word 'decrease' is substituted for 'increase' throughout, and vice versa.

It is clear from a perusal of the list in the previous paragraph of the five different ways of increasing the level of income that the size of the deficit may increase, decrease, or stay the same when measures are taken to increase the level of income. This emphasises again the fallacy of using the size of the deficit as a measure of the expansionary power of fiscal policy. It is not even certain that total taxation receipts will rise when the rate of taxation is increased, or fall when it is reduced. Increasing the rate of taxation increases the proportion of income paid in taxes but reduces the level of income, so that taxation receipts may either rise or fall. Taxation receipts will increase with a rise in rates if, and only if, the sum of the marginal propensity to consume and the acceleration coefficient minus the marginal propensity to import is less than one.[4] This can be proved as follows:[5]

$$\begin{aligned} T &= tY \\ &= \frac{t(I^f + X + a - n - K + G)}{1 - c - b + m + ct} \\ &= \frac{I^f + X + a - n - K + G}{\frac{1}{t}(1 - c - b + m) + c} \end{aligned}$$

The assumption that taxation receipts are proportional to income can be relaxed to allow for a constant term in the tax equation. In Australia, and in most other Western countries, the income tax schedule is such that a better linear approximation is given if a negative constant is included in the taxation equation. Consider a model which consists of equations (1A), (2), (4) and (5) plus the equation:

$$T = -U + tY \tag{3A}$$

In this model, income is given by the equation:

$$Y = \frac{I^f + X + a + cU - n - K + G}{1 - c + ct - b + m}$$

It is evident that including a negative constant in the tax equation has not affected the value of the government expenditure multiplier. It will not affect the formula showing the result of a change in tax rates either, as long as the change in rates affects only t and not U. However, in practice, most changes in tax rates are of such a nature that the values of both t and U are changed. Let a change in tax rates be such that:

$$T + \Delta T = -U - \Delta U + (t + \Delta t)Y$$

Then the new level of income is given by:

$$Y + \Delta Y = \frac{I^f + X + a + cU - n - K + G + c\Delta U}{1 - c + ct + c\Delta t - b + m}$$

$$\frac{Y + \Delta Y}{Y} = \frac{I^f + X + a + cU - n - K + G}{Y(1 - c + ct + c\Delta t - b + m)} + \frac{c\Delta U}{Y(1 - c + ct + c\Delta t - b + m)}$$

$$\frac{\Delta Y}{Y} = \frac{1 - c + ct - b + m}{1 - c + ct + c\Delta t - b + m} - 1 + \frac{c\Delta U}{Y(1 - c + ct + c\Delta t - b + m)}$$

$$\frac{\Delta Y}{Y} = -kc\Delta t + \frac{kc\Delta U}{Y}$$

$$\Delta Y = -kcY\Delta t + kc\Delta U$$

$$\Delta Y = -kc(Y\Delta t - \Delta U)$$

If, and only if, the term in brackets in the denominator is positive, T will increase when t increases. That is, total taxation receipts change in the same direction as a change in rates only if (c + b – m) is less than one. This has an interesting consequence. Holding G constant and increasing t will decrease national income, but will increase the deficit if $c + b - m$ is greater than one. It can be proved in a similar fashion that increasing G while holding

t constant will increase national income but will decrease the deficit, if the product of the taxation rate and the multiplier is greater than one. This is the case when $c + b + t - m - ct$ is greater than one.

Thus, if the change in tax rates increases the absolute value of the negative constant at the same time as it increases the marginal rate of tax, as happens for example with a 5 per cent surcharge on income tax, the resulting decline in income is smaller than it would have been if there were no negative constant in the taxation equation, or if the value of this constant were unaffected by the change in rates. If a change in tax rates is such that the absolute value of the negative constant decreases when the marginal rate increases, the change in income is of course bigger than it otherwise would be. Notice, however, that in the equation for the effect of a change in taxation rates, the term Δt is multiplied by Y and the term ΔY is not. Although ΔU is normally much larger than Δt, Y is very large compared with either Δt or ΔU. Hence the term ΔU *is* small compared with $Y\Delta t$, and may be ignored without greatly distorting the results.

So far, investment in fixed capital has been assumed to be exogenous. If this assumption is to be retained, it must be justified. If one is concerned with the current period in a model in which the length of period is fairly short, it is valid to treat private investment in fixed capital as exogenous, or at least as predetermined. That is, one can assume that the level of investment in fixed capital in the current period has already been determined at the beginning of the period, and will not be affected by whatever happens during that period. The time horizon of fiscal policy is usually short. Government budgets usually relate to one year only, with occasional supplementary budgets between the normal annual ones. The major concern is with the year ahead. Models must show the effects of fiscal policy changes on economic variables in the year in which the policy changes are made. The effects in succeeding years are of interest from the point of view of long-range planning, and must be considered when basic trends in the economy are under review. But, from the point of view of maintaining full employment and avoiding inflation, it is the effects of fiscal policy measures in the current year that are the prime consideration. The effects in succeeding years are often completely disregarded since, by the time fiscal policy comes to be formulated for those years, many things will have changed, and fiscal policy will be decided on the basis of the latest information then available.

Fiscal policy normally affects investment in fixed capital in two ways. Through corporate taxation, it may affect the flow of funds available for investment. Through its effects on consumption and national income, it may affect the expected profitability of investment. A year is just short enough for neither of these effects to have much effect in the current period. There are two lags involved, the lag between the experiencing of economic conditions and their effect on decisions to invest, and the lag between decisions to invest and the translation of these decisions into actual expenditures

on real capital equipment. Together these two lags take the best part of a year so that, when determining fiscal policy multipliers, we can treat private fixed investments as predetermined. It must be remembered, however, that the multipliers so obtained are impact multipliers; that is, multipliers which relate only to the effects on income during the current period.

There is one likely set of circumstances in which a fiscal policy change may have a significant effect on private investment in fixed capital in the same year as the change is made. If an investment allowance is introduced, and if businessmen consider that this allowance may be only a temporary feature of taxation laws, they may speed up investment plans in order to make sure of obtaining the allowance.

Up to this point, our analysis has not distinguished the corporate sector from the rest of the economy; but introducing the corporate sector produces little in the way of complications. The simplest case is when funds retained by corporations—in depreciation allowances, in retained earnings, or to pay corporate income tax—are a constant proportion of income. Let this proportion of income be denoted by p. Then equations (2) and (3) are replaced by:

$$C = a + c((1 - p)Y - T) \tag{2A}$$

$$T = t(1 - p)Y \tag{3B}$$

T is now taxes paid by persons only. Combining equations (2A) and (3B) with equations (1A), (4) and (5) gives:

$$Y = \frac{I^f + X + a - n - K + G}{1 - c(1 - p) + c(1 - p)t - b + m}$$

This is the same as the previous formula for Y, except that $c(1 - p)$ appears whenever c appeared before. The results previously obtained still hold once this adjustment is made. The government expenditure multiplier is $\frac{1}{1 - c(1 - p) + c(1 - p)t - b + m}$ and the effect of a change in both government expenditures and the rate of personal taxation is given by:

$$\Delta Y = k(\Delta G - c(1 - p)Y\Delta t)$$

In practice, aggregate dividend payments are not greatly affected by corporate income in the same year. They are largely determined by last year's profits and trends in profits. If this is so, pY is total corporate profits or the gross operating surplus before tax of corporate enterprises. Consumption out of dividends is then included in the constant term a, as dividends are predetermined and not affected by current income. This introduces one additional complication. Since consumption out of dividends is included in

the constant term *a,* changes in the rate of personal taxation may change the size of *a*. However, any such change will be very small and can be safely ignored. In 1967–68, the total amount of dividends received by persons in Australia was $459 million. Personal income tax on these dividends could not have been more than $200 million. A 10 per cent surcharge on taxation rates would only raise, at the most, an extra $20 million in tax on dividends. Allowing, for this tax bracket, a high marginal propensity to consume of 0.75, the change in consumption would be $15 million. Compare this amount with the total gross national product of $24,152 million. Moreover, our estimates of the rate of tax and the marginal propensity to consume have been deliberately made high so that the change in the parameter would be less than $15 million. It is clear that any changes in the constant term can be safely ignored.

In practice, corporate profits are unlikely to be proportional to national income. The average level of profits is lower than the marginal level, so that when income rises during the trade cycle, profits rise more than proportionately. A linear approximation of this relationship can be made by putting a negative constant in the equation for corporate profits so that profits are equal to $-P + pY$. If this is done equation (2A) must be replaced by:

$$C = a + c(P + (1 - p)\ Y - T) \tag{2B}$$

and the equation for national income becomes:

$$Y = \frac{I^f + X + a + cP - n - K + G}{1 - c(1 - p) + c(1 - p)t - b + m}$$

The government expenditure multiplier and the equation showing the effects of a change in taxation rates are unchanged. One interesting implication of this analysis of the corporate sector is that changes in corporate income tax have little effect on national income in the year in which they are made.[6] This is because neither investment expenditures nor dividend payments are affected until the following year. Similarly, to the extent that changes in indirect tax rates are absorbed by corporations and not passed on in higher prices, they result in lower after-tax profits, but have no effect on gross national production in the year in which they are made. In fact, changes in indirect tax rates are passed on more often than not, and it is necessary to examine their effects on national income. This is done in the next section.

To summarise the principal conclusions of this section, the effects on national income of simultaneous changes in government expenditure and taxation rates are given by the formula:

$$\Delta Y = k(\Delta G - c(1 - p)Y\Delta t)$$

k is the government expenditure multiplier after the change in taxation rates and Y the level of income before the change in either expenditure or taxation rates. Various factors which complicated this formula have been considered and their effects shown, but these effects were so small that for most purposes they can be safely ignored. Parameters such as the acceleration coefficient, and the marginal propensity to import, affect the size of the multiplier and hence the size of policy-induced changes in national income; but they play no part in determining whether a given fiscal policy change increases or decreases national income. This is determined by the marginal propensity to consume,[7] the level of income, and the size of the changes in government expenditure and the taxation rate. The formula is of wide applicability, as long as taxes are either paid by persons and are a function of personal income, or are paid by corporations and not passed on in higher prices.

27.2 Indirect Taxes

The final complication to be considered is the distinction between direct and indirect taxes. If indirect taxes are levied on all expenditure, they need not be distinguished from direct taxes when the effect of taxes on the level of national income is considered. Assuming that any difference between exports and imports is small compared with the size of national income, aggregate income is approximately equal to aggregate expenditure, and indirect taxes levied uniformly on all expenditure can be included with direct taxes on income in the equation $T = tY$. But indirect taxes are not levied on all expenditure. It is rare for indirect taxes to be paid, to any great extent, on government expenditures. In many countries, the bulk of the money raised through indirect taxes comes from land taxes and taxes on consumption expenditures.

Land taxes may be treated as lump sum taxes, that is, as taxes which do not depend on any endogenous variables. In the not very long run, total land tax receipts are likely to rise in proportion to national income. Not only will the value of the land rise over the long run as national income increases, but the costs of the services financed from land taxes are likely to rise as national income rises, and the tax rates are likely to be adjusted if necessary, so that tax receipts cover the cost of these services. This is particularly true in the case of local rates, which, in Australia, are the most important type of land tax. However, the relationship between land tax receipts and national income does not hold in the short run. If, in any particular year, policy causes a change in national income from the level it would otherwise have had, that change will have no effect on land tax receipts. In a fiscal policy model, land tax receipts should be treated as exogenous or lump sum taxes.

Changes in indirect taxes levied on consumption expenditures would not affect aggregate demand in the short run if the changes were not passed

on, but absorbed by corporate profits. Experience shows that most changes are passed on, so that fiscal policy analysis cannot ignore the distinction between direct and indirect taxes. Consider then a model in which there are land taxes T^1, and indirect taxes on consumption expenditure T^c, which are not absorbed by corporate profits. It is assumed that there are no other indirect taxes, but the algebra could be repeated to give similar results if there were, for example, indirect taxes on investment expenditure. For simplicity, the corporate sector is ignored; but if it is introduced with the assumption that corporate profits are a constant proportion p of income, and that they have only a lagged influence on both dividends and investment, the results reached in this section are unchanged, except that wherever c occurs, $c(1-p)$ must be substituted for it.

Once indirect taxes are introduced, national income can be measured at market prices or at factor cost. The algebra is a little less cumbersome if attention is focused on national income at factor cost. We will reserve the symbol Y for this variable and use Q for national income at market prices, or national product. The model is given by the following equations:

$$Y = Q - T^1 - T^c \tag{10}$$

$$Q = C + I^f + I^s + X - M + G \tag{11}$$

$$C = a + c\,(Y - T^d) \tag{12}$$

$$T^d = tY \tag{13}$$

$$I^s = bY - K \tag{14}$$

$$M = n + mY \tag{15}$$

$$T^c = iC \tag{16}$$

T^1 is exogenous. T^d is now the total receipts of personal income tax and t the personal income tax rate: i is the rate of taxation on consumption expenditure. The other symbols have the same meaning as they had earlier in this chapter.

In this model, Y is given by:

$$Y = \frac{(1-i)a + X + I^f - n - K + G - T^1}{1-(1-i)(1-t)c - b + m}$$

The government expenditure multiplier is the same as for the case in which there were no indirect taxes, except that in the denominator of the multiplier the term $-(1-t)c$ *is* replaced by the term $-(1-i)(1-t)c$. Since $1-i$ must

be between zero and one, this increases the value of the denominator of the government expenditure multiplier and reduces the value of the multiplier itself. It is clear that the larger i, the smaller the government expenditure multiplier.

The multiplier for land taxes is negative, but the same in absolute size as the government expenditure multiplier. Land taxes represent all indirect exogenous, or lump sum, tax receipts. Hence, if all taxes are indirect lump sum taxes, the balanced budget multiplier appears to be equal to zero. This paradoxical result is correct, but it must be remembered that we are discussing multipliers relating changes in policy variables to national income at factor cost, not gross national product or national income at market prices.[8] Since indirect taxes are subtracted from gross national product or national income at market prices to obtain national income at factor cost, when all taxes are land taxes the balanced budget multiplier relating changes in the budget to changes in gross national product is equal to one.

Let us now examine the effect of changes in the various tax rates in the model given by equations (10) to (16). Consider a change equal to Δt in the rate of personal income tax. The new level of income, $Y + \Delta Y$, is given by:

$$Y + \Delta Y = \frac{(1-i)a + X + I^f - n - K + G - T^1}{1-(1-i)(1-t-\Delta)c - b + m}$$

Put $\Delta Y = Y\left(\frac{Y+\Delta Y}{Y} - 1\right)$

then $\Delta Y = -k\Delta t(1-i)cY$

where k is the government expenditure multiplier after the change in the rate of personal income tax, and Y is the level of income before the change. Again, the introduction of indirect taxes results in the marginal propensity to consume being multiplied by the term $(1 - i)$. As the government expenditure multiplier k is less than it is when there are no indirect taxes, and as $(1 - i)$ is positive but less than one, indirect taxes reduce the size of the change in income caused by a change in the rate of personal income tax; and do so the more, the larger the rate of indirect taxation. To give an example, in Australia i is approximately 0.13, and the inclusion of the term $(1 - i)$ in the formula for k reduces k by approximately 6 per cent.[9] However, if there were no indirect taxes, and if total taxation revenue were to remain at the present level, it is likely that t would be larger. This would also reduce the size of k, probably also by about 6 per cent. On the other hand, $(1 - i)$ appears directly in the formula $\Delta Y = -k\Delta t(1 - i)cY$. Ignoring any effect on k, the existence of indirect taxes reduces the size of the effect on national income of a change in t, by a percentage equal to the marginal percentage

rate of indirect taxation. Thus if i is 0.13, as it is in Australia, the effect on national income of a change in the rate of personal income tax is 13 per cent less than it would be if all taxes were either lump sum taxes or direct taxes.

A change in i is not completely analogous to a change in t, because i appears in the numerator as well as in the denominator of the expression for Y. Nevertheless, similar algebraic steps can be used to find the equation for ΔY. It is:

$$\Delta Y = -k\Delta i[(1 - t)cY + a]$$

This is the same as the equation for ΔY given a change in t, except that the constant term in the consumption function appears in the multiplicand. The bigger this constant term a, the bigger the effect on national income of a change in indirect tax rates. In most economies, the constant term a will be small compared with $(1 - t)cY$, but it is unlikely to be zero. Thus, starting from a position in which i and t are equal, the effect on national income of a change in indirect taxation rates will be greater than the effect of an equal change in direct taxation rates. This is somewhat surprising, since direct taxation is levied on personal income, which normally is greater than consumption. The exact formulae for the effects of changes in i and t depend on the structural equations of the model, but, whatever the structure of the particular model used, it is clear that a change in indirect taxation rates does not have a smaller effect than an equal sized change in direct taxation rates, just because indirect taxes are levied on a smaller proportion of national income than direct taxes.

It could be argued that it is better to assume that imports and inventory investment depend on national income at market prices, rather than on national income at factor cost. If this is done, so that in equations (14) and (15) Y is replaced by Q, the various formulae we have derived become more complex, but there is very little difference in the practical consequences. With Q substituted for Y in equations (14) and (15), the multiplier relating government expenditure to national income at factor cost is given by:

$$k = \frac{1}{1-(1-i-bi+mi)(1-t)c-b+m}$$

The equation for the effect of a change in the rate of personal income tax is:

$$\Delta Y = -k\Delta t(1 - i - bi + mi)cY$$

and the equation for the effect of a change in the rate of indirect taxation is:

$$\Delta Y = -k\Delta i(1 + b - m)[(1- t)cY + a]$$

Changing indirect taxation rates must of necessity change the price level, since we have assumed that these changes are passed on in higher prices. All the analysis in this chapter implicitly assumes that there are no changes in prices, so that one does not need to distinguish between real variables and those measured in current money values. Taxation equations are in current money value terms but expenditure equations, such as the consumption function, are almost certainly in real terms. Ignoring the price changes caused by changes in indirect taxation rates introduces errors into the analysis, but these are likely to be extremely small. Although they may cause significant changes in relative prices, changes in indirect tax rates normally cause very small changes in the general level of prices.

If both direct and indirect tax rates are changed simultaneously the total effects on national income are slightly smaller than the sum of the effects of changes in either tax rate alone.[10] The effects of changes in taxation rates and government expenditures can be added together to give the total effects of all budgetary changes on national income.

If a given sum of money is raised by taxation it makes no difference, at least at the level of aggregation of this analysis, whether it is raised by direct or indirect taxes. It does make a difference to national income at factor cost, but this is only because direct taxes are included in this definition of national income, but indirect taxes are not. In the model set out on the previous page, total consumption is equal to:

$$a+\frac{c}{1-c-b+m}[I^f+X+a-n-K+G-c(T^1+T^c+T^d)]-c(T^1+T^c+T^d)$$

so that it makes no difference to consumption expenditure whether a given sum of money is raised by land taxes, consumption taxes or direct taxes. National income at factor cost is equal to:

$$\frac{1}{1-c-b+m}[I^f+X+a-n-K+G-c(T^1+T^c+T^d)]-T^1-T^c$$

If indirect taxes are added to this, to get national income at market prices, again it would make no difference which method of taxation was used to raise a given sum of money. All this ignores the effect of indirect taxes in raising prices. Inasmuch as indirect taxes are passed on in higher prices, raising a given sum of money by indirect taxes will cause real national income to be slightly lower and money national income to be slightly higher than if the same sum of money were raised by direct taxation.

Cash social service benefits are sometimes, somewhat illogically, treated as negative indirect taxes. If social service benefits are, as is usual, exempt from income tax, they may have the same effects on consumption and income as a negative direct tax; but only if the propensity to consume

from such benefits is the same as that from other personal income. In Australia, the most important social service benefits are old age pensions. It is more realistic to assume that these are all spent; and the same may be assumed of social service benefits in general. If the propensity to consume from social service benefits is one, these benefits have the same effect on consumption and income as the constant term in the consumption function.

In summary we may say that the effects of indirect taxes, and changes in indirect tax rates, on national income are much the same as those of direct taxes and changes in the rates of direct taxes. The fact that indirect taxes are levied on a smaller proportion of national income than direct taxes does not mean that a change in the rate of indirect taxation has smaller effects on national income than an equally large change in the rate of direct taxation. In general, the lower the rate of direct taxation, the larger the effects of changes in the rate of indirect taxation; and the lower the rate of indirect taxation, the larger the effects of changes in the rate of direct taxation.

27.3 Automatic Stabilisers and Fiscal Drag

The structure of a modern economy is such that any rise or decline in national income initiated by a change in one of the exogenous variables—for example, exports—is not as great as it would be in an economy with no government sector or fiscal system. In particular, tax payments absorb some of the change in income, and lower the multiplier that is applied to the change in the exogenous variable. This has given rise to the term 'automatic stabiliser'. A fiscal automatic stabiliser is a fiscal mechanism which, without any discretionary action or decision on the part of the policy maker, reduces the level of income in a period of expansion, or increases it in a period of depression, below or above the level it would have had in the absence of this mechanism.

The most important automatic stabiliser is the taxation system. Taxes which depend on income or expenditure, indeed any taxes which are not lump sum taxes, reduce the value of the multiplier below the value it would have if there were no government sector or if all government receipts were from lump sum taxes. The effectiveness of the tax system, or any other mechanism, as an automatic stabiliser can be measured by the proportion of a decline or increase in income which is offset by the automatic stabiliser. If we christen this proportion B, in the case of the tax system B is equal to one minus the ratio of the actual multiplier to the multiplier which would hold if all taxes were lump sum taxes. To show this, let k be the actual multiplier and k' the multiplier with lump sum taxes. Any change in an exogenous variable, such as exports, ΔX, will increase income by $k\Delta X$. In the absence of the automatic stabiliser, the increase would have been $k'\Delta X$, so that $B = 1 - \frac{k}{k'}$.

B must be between zero and one. If the actual multiplier is the same as the multiplier with lump sum taxes, B is zero and the automatic stabilisers have no effect. If B equals one, the whole of any change is offset, and income never varies. Consider the case of the model set out in equations (10) to (16): k is equal to $\dfrac{1}{1-(1-t)(1-i)c-b+m}$

If all taxes had been lump sum taxes, the multiplier would have been equal to $\dfrac{1}{1-c-b+m}$. Hence:

$$B = 1 - \frac{1-c-b+m}{1-(1-t)(1-i)c-b+m}$$

$$B = \frac{c(t+i-n)}{1-(1-t)(1-i)c-b+m}$$

$$B = kc(t+i-it)$$

If the model of equations (10) to (16) is taken as depicting the Australian economy, c must be taken to include consumer expenditure on housing investment, and must be multiplied by $(1 - p)$ to allow for the corporate sector. So adjusted, c is about 0.65, i is roughly 0.13, t 0.22, $1 - b + m$ is 1.18, and k 1.4.[11] These values imply a value of about 0.29 for B. That is, just over a quarter of any change in income is offset by the automatic stabilisers.

Two common fallacies about automatic stabilisers should be noted and exposed. The first is that it is the progressive nature of the tax system that makes that system an automatic stabiliser. It is not whether a tax system is progressive or regressive: it is the marginal rate of taxation that is significant. As long as this is positive, the tax system will act as an automatic stabiliser. The more progressive the tax system, the higher the marginal rate of tax is likely to be, but this is not necessarily so. A proportional tax, for example, a sales tax, is an automatic stabiliser just as much as a progressive income tax. Which will stabilise the most depends on the marginal tax rates in each case.

The second common fallacy is that the government sector must be large before the tax system can have significant effects as an automatic stabiliser. This is a fallacy because it is the marginal rate of taxation which is significant, not the average rate. It is true, however, that marginal tax rates are likely to be very small unless the government sector is large, and that historically the taxation system became important as an automatic stabiliser as marginal tax rates were increased to finance a growing government sector.

In principle, the taxation system operates no differently as an automatic stabiliser than do other features of the structure of the economy that exert a stabilising influence. The taxation system may not even be the most important stabilising influence. In Australia the most important stabilising influence is imports. The marginal propensity to import is such that nearly half of any change in income is offset by a rise in imports. That is, changes

in exogenous factors cause changes in the national income of Australia that are little more than half as great as they would be if Australia was a closed economy, or if imports were rigidly controlled and not allowed to fluctuate in response to changes in domestic demand.

Although taxes are the most important fiscal automatic stabilisers, they are not the only ones. There are also automatic stabilisers on the expenditure side, but their effects are very small. The most important are unemployment benefits. In 1961–62, the year at the height of the recession, the total amount paid in unemployment benefits was only $18 million more than the amount paid in the previous boom year. This is a very small sum compared with Australia's national income.

In one respect, the name 'automatic stabiliser' is something of a misnomer. Automatic stabilisers do not have the same effects as stabilisers on a ship. If full employment is taken as the equivalent of an 'even keel', automatic stabilisers do not help return an economy to an even keel. In fact they hinder any return to an even keel. They tend to lessen any change from the existing situation. Thus they moderate any decline into a depression, but they also make it more difficult to move an economy out of depressed conditions towards full employment. In a growing economy, automatic stabilisers tend to hold down the rate of growth of aggregate demand. This effect is known as fiscal drag. It is not necessarily a bad thing. In fact, it is a boon as long as the government is prepared to increase government expenditure or cut taxes sufficiently to keep aggregate demand growing at the same rate as the productive potential of the economy.

Notes

1. The larger deficit does not mean that the budget has given a larger stimulus than that planned to the economy, so much as that the structure of the economy has moderated the decline in income; see the section on automatic stabilisers.
2. Readers who are familiar with calculus may prefer the following derivation of the formula to that given in the text. If k is the government expenditure multiplier $\frac{dy}{dt} = -kcY$, hence $\partial Y = -kcY\partial t$ and $\frac{\partial Y}{Y} = -kc\partial t$. However, this formula is an approximation unless k and Y are dated as specified in the text.
3. The proof is as follows:

$$Y + \Delta Y = \frac{a + I + G + \Delta G}{1 - c + ct + c\Delta t}$$

$$\Delta Y = \frac{a + I + G + \Delta G}{1 - c + ct + c\Delta t} - Y$$

$$\Delta Y = Y\left[\frac{(1 - c + ct)(a + I + G + \Delta G)}{(a + I + G)(1 - c + ct + c\Delta t)} - 1\right]$$

$$= Y\left[\frac{(1-c+ct)\Delta G-(a+I+G)c\Delta t}{(a+I+G)(1-c+ct+c\Delta t)}\right]$$

$$= Y\left[\frac{\frac{\Delta G}{Y}-c\Delta t}{1-c+ct+c\Delta t}\right]$$

$$= k\ (\Delta G - cY\Delta t)$$

4. It is not necessary that $c + b - m$ is less than one if an 'explosive situation' is to be avoided. All that is necessary is that $c + b - m - ct$ is less than one.
5. An alternative proof using calculus is more succinct:

$$\frac{dT}{dt} = Y + t\frac{dY}{dt}$$
$$= Y - tkcY$$

   This is positive if $tkc < 1$, but $k = \frac{1}{1-c-b+m+ct}$, hence $tkc < 1$ when $c + b - m < 1$.
6. Unless they are passed on immediately in the form of higher prices.
7. $c(1 - p)$ can be regarded as the marginal propensity to consume modified to allow for corporate saving.
8. Since there is no depreciation in our model, these two are the same.
9. See Nevile, J. W., 1970, *Fiscal Policy in Australia: Theory and Practice*, Melbourne: Cheshire, chapter 5.
10. The difference is equal to $2k\Delta t\Delta icY$.
11. See Nevile, J. W., 1970, *Fiscal Policy in Australia: Theory and Practice*, Melbourne: Cheshire, chapter 5. The model of equations (10) to (16) only approximately depicts the Australian economy; hence the values for the various parameters, and for *B,* are only approximately correct. More exact values are given in Chapter 5.

28

Capacity Utilization, Inflation, and Monetary Policy: The Duménil and Lévy Macro Model and the New Keynesian Consensus

Marc Lavoie and Peter Kriesler

The article considers the adjustment toward long-run equilibrium within the Duménil and Lévy macro model, with modifications. Findings show that long-run convergence to fully adjusted positions with normal utilization is not achieved when a more realistic reaction function is proposed. Classical equilibrium occurs when a vertical Phillips curve is substituted, but the model is isomorphic to the "new consensus" model and to features of "new" endogenous growth theory.

In an extremely interesting article, Duménil and Lévy (1999) explore the adjustment mechanism of an economy toward a long-run equilibrium with capacity utilization at normal levels: a *fully adjusted position* as the Sraffians would call it, or a *classical long-term equilibrium* as Duménil and Lévy have it. This article clarifies a statement that they had made earlier, when they claimed that "while it is possible to be Keynesian in the short term, one is required to be classical in the long term" (Duménil and Lévy 1995: 136–37), a statement that would certainly be endorsed by some Marxist authors today, for instance, Shaikh (2003, 2005). Short-run equilibrium within Duménil and Lévy's model is of the Keynes/Kalecki type, with variability in levels of capacity utilization. One distinctive feature of their model is that it is not the forces of competition that push the economy to a fully adjusted position, but rather aspects of the macro economy coupled with the behavior of the central bank. In many ways, their analysis of the adjustment process is similar to the analysis of the so-called "new consensus" among neoclassical economists (or "new neoclassical synthesis"), which has been defined by a number of "new" Keynesian economists (such as Taylor 1999; Romer 2000; Walsh 2002; Woodford 2002), where the return to potential output is achieved through

Revised from *Review of Radical Political Economy*, 39(4): 586–598, 2007, 'Capacity Utilization, Inflation, and Monetary Policy: The Duménil and Lévy Macro Model and the New Keynesian Consensus,' by Lavoie, M. and Kriesler, P. With kind permission from SAGE Publications. All rights reserved.

the necessary intervention of the monetary authorities.[1] This article seeks to look at Duménil and Lévy's underlying framework, comparing it with the new consensus framework, to identify their most essential similarities.

28.1 The Duménil and Lévy Model

The important aspect of the model for our purpose is their specification of the traverse which moves the economy from the Keynesian short run to the classical long-run equilibrium, defined as a position where "capacity utilization rates are 'normal'" (Duménil and Lévy 1999: 685).[2]

The short-run model takes prices as given, and allows capacity utilization to vary. In long-run equilibrium, prices are equal to prices of production with uniform rates of profit, and capacity is equal to normal or target rates.

The underlying mechanism driving their traverse is the reaction function of the central bank in the face of inflation. In Duménil and Lévy (1999) the instrument of monetary policy is the central bank's control over the money supply. However, in section 2.4.3 of their 1999 article, they make it clear that the analysis of the money supply as the appropriate policy instrument is merely a simplification, and that the rate of interest can be readily substituted within their model. Indeed, they do this in section 4.4 of their earlier, more extended, draft versions of the published 1999 article (Duménil and Lévy 1994, 1997). This is the course we follow, to more clearly contrast the model with that of the new consensus, where it is assumed, as in post-Keynesian models, that monetary control is essentially exercised through discretionary modifications of the interest rate by the monetary authorities. In Duménil and Lévy, monetary policy is adjusted as a result of any actual inflation rate. This, as we shall see, will assure stability of the general price level while "this stability of the general level of prices ensures gravitation of the general level of activity around a normal level" (Duménil and Lévy 1999: 697).

The reaction function of the central bank is assumed to be:

$$\Delta r = \beta_1 \, \pi \tag{1}$$

where π is the inflation rate and r is the rate of interest. All βs are and will be positive parameters.

In both the 1994 and 1997 versions, Duménil and Lévy note that they "will not discuss here whether r should be the nominal or the real rate of interest." In view of current discussions over monetary policy, it seems best to suppose that the real rate of interest is pushed up by the monetary authorities whenever price inflation exceeds some target level, so that it is best to interpret r as a real rate, with β_1 a positive parameter.

As in most macroeconomic models, Duménil and Lévy—equation (16) in both the 1994 and 1997 versions—assume that investment, or more

precisely the growth rate of capital, is inversely responsive to changes in the rate of interest:

$$g^i = g_0 - \beta_2 r + \beta_3 u \tag{2}$$

where g^i is the growth rate of capital (the rate of accumulation); g_0 represents the autonomous components of growth; u is the rate of capacity utilization; and r is the real rate of interest (as long as g is interpreted as the real rate of accumulation).

Equation (2) is analogous to an IS curve, with an inverse relation between the rate of interest and the level of economic activity u, since the equilibrium level of the rate of capacity utilization itself depends positively on the autonomous component of growth and negatively on the rate of interest. The equilibrium rate of capacity utilization can be obtained by confronting the above investment function in equation (2), with the standard classical saving function, which can be written as:

$$g^s = s_c R \tag{3}$$

where s_c is the propensity to save out of profits and R is the profit rate on capital.

As is well known, the profit rate can be decomposed into three components: m, the share of profits (which is a proxy for the strength of the corporate class, through the value taken by the markup over wage unit costs); u, the rate of capacity utilization; and v, the capital to capacity ratio, which is assumed to be given by technology. As a result, the saving equation can also be rewritten as:

$$g^s = s_c mu/v \tag{4}$$

This of course implies that the normal rate of profit is $R_n = mu_n/v$, where m is the assumed exogenous variable that is sorted out by class conflict. The short-run equilibrium rate of capacity utilization, equating equations (2) and (4), is then given by:

$$u = (g_0 - \beta_2 r)/(s_c m/v - \beta_3) \tag{5}$$

or more simply as:

$$u = u_0 - \beta_4 r \tag{6}$$

where $u_0 = g_0/(s_c m/v - \beta_3)$ and $\beta_4 = \beta_2/(s_c m/v - \beta_3)$.

So, whenever there is inflation ($\pi > 0$) in the Duménil and Lévy model, real interest rates rise, and hence, as a consequence, rates of capacity utilization fall. This feedback mechanism will eventually lead to reductions

in inflation rates, because Duménil and Lévy (1999) assume that the inflation rate is a linear function of the discrepancy between the actual rate of capacity utilization, as computed in equation (4), and some normal level of capacity utilization.[3] They have:

$$\pi = \beta_5(u - u_n) \tag{7}$$

where u is still the realized level of capacity utilization and u_n is the optimal level of capacity utilization targeted by enterprises (the normal rate).

Equation (7) represents a standard old-fashioned Phillips curve (it is *not* a vertical Phillips curve), where there is a straight linear trade-off between the inflation rate and the level of economic activity, without any possibility of shift in the relationship as there are no constant terms. In addition, the equation implies that inflation is nil only when the realized rate of capacity utilization is equal to the normal rate of capacity utilization. The model thus operates in some kind of competitive world, where prices are highly flexible and where they increase whenever demand exceeds normal capacity, while they decrease whenever demand falls below normal capacity. This equation, along with equation (1), implies that the rate of interest

> . . . is constant in a classical long-term equilibrium, since the capacity utilization rate is normal [$u = u_n$] and there is no inflation [$\pi = 0$]. . . . The coincidence between the absence of inflation and the prevalence of a normal capacity utilization rate is related to the behavior of enterprises. Because enterprises consider the utilization of productive capacity in the setting of their prices, price stability is associated with a normal capacity utilization rate. . . . Within our analysis, prices are a function of disequilibria between supply and demand. (Duménil and Lévy 1999: 698–99)

What happens is that the addition of the central bank reaction function and the inflation mechanism, equations (1) and (7), transforms an otherwise Kaleckian–Keynesian investment function, equation (2), into a classical (Marxist–Sraffian) investment function, where "a deviation of the capacity utilization rate from its normal value would lead to a variation of investment, instead of a constant investment" (Duménil and Lévy 1999: 692).[4]

Although monetary variables play a role in the determination of the level of economic activity in the short run, according to Duménil and Lévy they have no real effects in the long run. The basic role of monetary variables is to push the economy to its fully adjusted long-run equilibrium, though they play no role in the determination of that equilibrium. In other words, we have the long-run neutrality of money:

> Long-term equilibrium can be defined independently of money, but monetary mechanisms are responsible for the convergence of short-term

> equilibria to long-term equilibrium: they are crucial *vis-à-vis* the stability in dimension of long-term equilibrium. (Duménil and Lévy 1999: 710)

The Duménil and Lévy traverse analysis represents an interesting mixture of heterodox and neoclassical theory. As we will see in the next section, the set of equations (1), (6), and (7) is very much reminiscent of the new consensus model. So is their conclusion that the system will tend to a long-run equilibrium with normal capacity (the equivalent to the NAIRU assumption), with monetary variables having no impact on real variables in the long run.

Another important element of the Duménil and Lévy analysis is their long-run neutrality of money. They argue that while the monetary system plays a role in pushing the economy to its long-run equilibrium, it does not influence that equilibrium in any way.[5] This has important implications for their underlying story. It is the assumed separation between the forces determining equilibrium and the stability factors pushing the economy to that equilibrium that bring forth their conclusion.

28.2 A Modified Keynesian Duménil and Lévy Model

However, their conclusion needs to be modified if we allow, in the Duménil and Lévy model, the inflation rate target of the central bank to differ from zero, in particular, as is usually the case, to be greater than zero. In this case, the long-run equilibrium will change depending on the inflation target, and therefore on the central bank's setting of interest rates, so that monetary policy will indirectly influence the long-run equilibrium. This restores the argument of most heterodox economists that monetary policy and the monetary system matter even in the long run. In this case the long-run equilibrium position cannot be derived independently of the adjustment path of the economy.

As we will see, the key point of departure with the new consensus model is the replacement of the latter's vertical long-run Phillips curve with a more Keynesian Phillips curve, which does allow for long-run trade-offs between inflation and the level of economic activity. Price stability, in the Duménil and Lévy model, is restored because of the reaction function of the central bank. However, Duménil and Lévy's reaction function makes central banks much more rigorous in their anti-inflationary policy than most other commentators would have them. Despite the fact that there is some argument as to the appropriate inflation target (Solow and Taylor 1999), most economists (neoclassical and others) accept that central banks may target a nonzero inflation rate, while Duménil and Lévy impose a target rate of inflation exactly equal to zero.[6] In fact, if a target rate of inflation greater than zero were allowed, then the long-run equilibrium of the economy would be at a level of capacity greater than the normal rate.[7] This follows in a straightforward manner from equation (7), where $\pi > 0 \Rightarrow u > u_n$.[8]

The heterodox nature of the Duménil and Lévy model, provided some more realistic features are added to it, can be readily seen if we modify equations (1) and (7) by introducing an inflationary target π^T greater than zero in equation (1), writing now:

$$\Delta r = \beta_1 (\pi - \pi^T) \tag{8}$$

and by introducing into equation (7) an element of cost inflation π_c,[9] based on some institutional or structural features, now rewritten as:

$$\pi = \beta_5(u - u_n) + \pi_c \tag{9}$$

In long-run equilibrium, $\Delta r = 0$ and $\pi = \pi^T$. Substituting the value of π taken from equation (9), we obtain the long-run value of the actual rate of capacity utilization:

$$u^* - u_n = (\pi^T - \pi_c)/\beta_5 \tag{10}$$

It then becomes obvious that, all else equal, a higher target rate of inflation will be associated with a higher long-run rate of capacity utilization and a higher rate of growth. And indeed, equation (10) is essentially the result obtained by Setterfield (2004), in a model he calls the post-Keynesian alternative to the new consensus.[10] It is equally clear that a classical long-run equilibrium, with normal rates of capacity utilization, will be achieved only in the special case where $\pi^T = \pi_c$, that is, when the target rate of inflation set by the central bank turns out to be equal to cost inflation. In general, this will not necessarily be the case, even if one ventures to suppose that cost inflation ought to be determined in the long run by inflation expectations, which themselves should be anchored by the target inflation rate set by the central bank.

In other words, the reason that the Duménil and Lévy model tends to a specifically classical long-term equilibrium is not the underlying nature of the model or the adjustment process. Rather this specific result is achieved as a consequence of the choice of a very peculiar inflation target ($\pi^T = 0$), tied to a very peculiar inflation process ($\pi_c = 0$). This is indeed recognized by Duménil and Lévy (1999: 712) themselves when they say:

"Economic policies may direct the system toward targets other than the stability of the general price level. . . . It would be easy to show in the model that, if such targets are defined, long-term equilibrium will be shifted to another position deviating from the normal utilization of capacity." In fact, this is true if either condition is modified, as per equations (8) or (9). In addition, these modifications mean that monetary policy will not be neutral in the long run. The traverse to the classical long-run equilibrium, based on

the foundations of a non-vertical long-run Phillips curve, looks very fragile indeed.

28.3 A Modified New Consensus Duménil and Lévy Model

If Duménil and Lévy do want to recover their long-run classical equilibrium in all cases, then they need to adopt the vertical long-run Phillips curve first proposed by Milton Friedman. This is precisely what new consensus authors have done, believing that

> There is substantial evidence demonstrating that there is no long-run trade-off between the level of inflation and the level of unused resources in the economy—whether measured by the unemployment rate, the capacity utilization rate, or the deviation of real GDP from potential GDP. (Taylor 1999: 29–30)

In the short run, the inflation rate falls when unemployment is above NAIRU, and increases when unemployment is below it. This is now most often expressed in terms of output gaps: the spread between actual output and potential output. Any deviation of capacity, real GDP, or unemployment from their normal levels leads to *changes* in the inflation rate. If capacity utilization is kept above its normal level, this will quickly lead to accelerating inflation. Expressed in terms of capacity utilization, the supply constraint of new consensus models—the vertical Phillips curve—is given by equation (11):

$$\Delta\pi = \beta_6 (u - u_n) \tag{11}$$

Like Friedman (and Duménil and Lévy), defenders of the new consensus view believe that monetary policy can have real effects in the short run as summarized in a conventional IS schedule, so that equation (6) applies as well to the new consensus model, provided we ignore the additional terms that are included in the more sophisticated versions of the equation (which incorporate expected terms and autonomous shocks, as in Woodford 2002):

$$u = u_0 - \beta_4 r \tag{6}$$

Both Friedman and the new Keynesian authors strongly argue that this indicates the need for monetary policy rules. The only difference is that, while for Friedman the rule sets optimal money supply growth, for new consensus authors "the interest rate rather than the money supply is the key instrument that should be adjusted" (Taylor 1999: 47). The proposed rule

would have the central bank responding to both price and aggregate demand shocks (or expected shocks). So, interest rates should be changed if inflation deviates from its target or if real GDP deviates from potential GDP. There are many variants of these rules, the best known being the so-called Taylor rule, which in terms of rates of utilization, is presented as:

$$i = \pi^T + \beta_7(\pi - \pi^T) + \beta_8(u - u_n) + r_n \tag{12}$$

where i is now a nominal interest rate while r_n "is the implicit real interest rate in the central bank's reaction function" (Taylor 1999: 50) or, in Wicksellian terms, the central bank estimate of the "natural" (real) rate of interest.

Another possible rule is to express the central bank reaction function in difference terms. Generalizing Duménil and Lévy's equation (8), the typical new consensus central bank reaction function can be written in the way suggested by Setterfield (2004, 2005), as a difference equation where the real interest rate set by the central bank reacts to both the "inflation gap" and the "output gap":

$$\Delta r = \beta_7 (\pi - \pi^T) + \beta_8 (u - u_n) \tag{13}$$

Setterfield (2005) shows that a model made up of equations (6), (11), and (13) is always stable and converges to a normal rate of capacity utilization at the target inflation rate.[11] However, the second term of the central bank reaction function, given by $\beta_8 (u - u_n)$, plays a crucial role in stability analysis. Without it, the economy would run into a limit cycle, circling the target inflation rate without ever achieving it. What happens is that the second term of equation (13) provides derivative control, a well-known stabilizing feature.[12] Substituting $(u - u_n)$ by its value in equation (11), we obtain the following reaction function:

$$\Delta r = \beta_7 (\pi - \pi^T) + (\beta_8/\beta_6)(\Delta\pi) \tag{14}$$

With equation (14), we see that equation (13) implies that the central bank reacts to the level of, and the change in, the inflation rate. In other words, for a given current inflation rate, the central bank would impose a more punitive increase in real interest rates when inflation is quickly rising.

For Duménil and Lévy to be able to recover their conclusion that economists ought to be Keynesian in the short run but classical in the long run, they need to adopt the three new consensus equations: equations (6) (which they already have), (11), and (13). With these, monetary policy forces will always be such that there is a long-run tendency toward normal rates of capacity utilization, and hence toward fully adjusted positions (the classical long-run position), a result that is achieved in addition at the target rate of inflation set by the central bank.

28.4 The Similarities with the New Endogenous Growth Models

The resemblances between Duménil and Lévy's results and the new consensus on monetary theory are reinforced when the new consensus model is reinterpreted in terms of the so-called new endogenous growth model. In the latter, in contrast with the traditional neoclassical Solow-Swan growth model, the natural rate of growth is endogenous and achieves higher levels when the economy propensity to save is higher. For instance, in Rebelo (1991), the endogenous growth rate in steady state equals $g^* = sR$, where s is the exogenous average propensity to save while R is the technologically given profit rate on capital (tangible and human).

In Duménil and Lévy (1999: 705), the endogenous growth rate in fully adjusted positions, achieved when $u = u_n$, is given by:[13]

$$g^* = s_c R_n = s_c m u_n / v \tag{13}$$

As in new endogenous growth models, a lower propensity to save s_c eventually reduces growth rates, and so do higher real wages (or lower normal profit rates R_n), since they reduce the overall proportion of income that can be saved.

> In a short-term equilibrium, a lower saving rate of capitalists has the same effect as a larger real wage, that is, results in larger capacity utilization rates in the two industries and a larger growth rate; whereas in a long-term equilibrium the profit rate is not affected and a lower saving rate diminishes the growth rate. (Duménil and Lévy 1999: 705)

The interesting feature of the Duménil and Lévy model is that their model, in contrast with the new endogenous canonical growth model (see Dutt 2003), takes the effects of effective demand and class conflict into consideration, as would Keynesian or Kaleckian growth models. However, the inclusion of the specific features of their inflation equation and central bank reaction function produces a traverse toward a long-run classical model, with all the conclusions generally agreed on by neoclassical authors. For instance, lower propensities to save will eventually generate inflation through standard Keynesian demand-led effects, and hence through the reaction function of the central bank; it will induce the central bank to set higher real interest rates and slower rates of accumulation (as in new endogenous growth models). We thus have a situation where a lower propensity to save leads to higher real interest rates, as in the loanable funds story, and to slower rates of accumulation, as in new endogenous growth models.

The value taken by the real interest rate in the fully adjusted position can be obtained by substituting u for its long-run value u_n in equation (5). We get:

$$u_n = (g_0 - \beta_2 r)/(s_c m/v - \beta_3) \tag{14}$$

from which we derive the fully adjusted value of the real rate of interest, or what Wicksellians would call the natural rate of interest:

$$r_n = (g_0 + \beta_3 u_n - s_c m u_n/v)/\beta_2 \tag{15}$$

It is then obvious that a lower propensity to save s_c (or a smaller share of profits m) is associated with a higher natural rate of interest: the real rate that will be achieved in the long run, once the fully adjusted position has been reached.

In addition, higher real wages (when assuming no technical progress) may generate favorable short-run effective demand effects, but in the long run these higher real wages will bring about a slowdown in accumulation and higher unemployment rates. So once again the iron law of supply-side accumulation takes over in the long run, as it would in the Rebelo new endogenous growth model.

28.5 Conclusion

If we compare the new consensus model with that of Duménil and Lévy, the similarities are obvious. Both have the same specification of the IS curve, and identical central bank reaction functions (save for a target inflation rate of zero). The difference between them hinges mainly on the specification of the Phillips curve. If a more general specification is included in the Duménil and Lévy (1999) model, then their conclusion that there is a tendency toward fully adjusted positions with normal rates of capacity utilization cannot be sustained, and long-run classical features cannot be sustained. If we add the standard vertical Phillips curve to the Duménil and Lévy model, which allows Duménil and Lévy to get in a more general way the results that they are actually looking for, then we get a perfect new Keynesian model, which combines the lessons of both the new consensus on monetary policy and those of new endogenous growth theory.

We are well aware that the microeconomics of Duménil and Lévy, as can be found in detail in Duménil and Lévy (1993), are distinct from neoclassical analysis and are appealing, but it remains rather surprising to discover that their macroeconomics appear to be so isomorphic to the most popular models of the new neoclassical synthesis. We have taken the Duménil and Lévy (1999) model as an exemplar, but as pointed out in the introduction, other authors within the Marxist tradition also believe that the classical long-run equilibrium does constrain possible macroeconomic dynamics. The fact that Duménil and Lévy's model arrives at conclusions that so clearly resemble those of the new neoclassical synthesis does not mean that the former is wrong. But this clearly establishes that if we are on the lookout for alternative macroeconomic policies (an alternative to received wisdom, as embedded for instance in the Washington consensus or in the right-wing

slogan TINA—"There Is No Alternative"), their justification might well have to be found elsewhere than in classical or Marxist macroeconomic theory.

By contrast, several post-Keynesian authors deny the validity of the lessons drawn either from the new consensus or from new endogenous growth theory, and thus offer some scope for an alternative, where expansionary monetary and fiscal policies, as well as a more powerful labor movement, can have beneficial long-run effects. This can be achieved in various ways: by letting the natural rate of growth, more specifically, the rate of technical progress, become endogenous, as in Dutt (2005), Lavoie (2004), and also as suggested by Shaikh (2003: 140); by letting the normal rate of utilization itself become endogenous, as in Dutt (1997) and Lavoie (1996); or by rejecting the vertical long-run Phillips curve, adopting instead a horizontal Phillips curve, or rather a Phillips curve with a horizontal segment, as suggested by Tobin (1995); McDonald (1995); Hein (2002); Freedman, Harcourt, and Kriesler (2004); Palacio-Vera (2005); Fontana and Palacio-Vera (2007); and Kriesler and Lavoie (2007).

About the latter suggestion, it is rather ironic to note that whereas the vertical long-run Phillips curve is ever more entrenched in mainstream textbooks, an ever-growing number of empirical studies run against this consensual view, starting with the work of Eisner (1996), according to whom the Phillips curve in the United States was flat for low-range and middle-range rates of unemployment. Economists working at various federal reserve banks have concluded, independently, that the Phillips curve is nonlinear, with three segments, the middle-range segment of the Phillips curve, corresponding to mid-range growth rates or mid-range unemployment rates, being flat (Filardo 1998; Barnes and Olivei 2003; see also Flaschel, Kauermann, and Semmler 2005). These latter results are consistent with the idea of a *range of equilibrium rates of unemployment,* that is, a region of intermediate rates of unemployment where inflation tends to stay constant. This, added to the hysteresis literature and the idea that the NAIRU or the natural rate of unemployment is attracted toward the actual level of unemployment, as determined by aggregate demand—a conclusion also supported by a meta-analysis of empirical work (Stanley 2004)—yields much room for demand management policies.[14] Thus, we are rather optimistic about the possibility of improving the economy through proper macroeconomic policies, and we tend to take for our own the following proposition that was advanced by Wynne Godley (1983: 170) more than twenty years ago:

> Indeed *if* it is true that there is a unique NAIRU, that really is the end of discussion of macroeconomic policy. At present I happen *not* to believe it and there is no evidence of it. And I am prepared to express the value judgment that moderately higher inflation rates are an acceptable price to pay for lower unemployment. *But I do not accept that it is a foregone conclusion that inflation will be higher if unemployment is lower.*

Notes

Authors' note: We wish to thank Geoff Harcourt, Dominique Lévy, Malcolm Sawyer, Mario Seccareccia, and Mark Setterfield for their helpful comments at various stages of the article. This article was presented at the annual conference of the Eastern Economic Association in New York in March 2005 and at a seminar organized by Professor Jacques Mazier at the University of Paris Nord 13, in May 2005. We are also thankful to the three referees of the journal—Christophre Georges, Jon Goldstein, and Gary Mongiovi—who provided insightful comments.

1. In the new consensus model, as pointed out by Setterfield (2004: 39), since money supply targeting is eliminated, there is no Pigou effect anymore, and hence flexible prices cannot be relied on to return to full-capacity output (or to the natural rate of unemployment). Indeed, in a survey of members of the American Economic Association, Fuller and Geide-Stevenson (2003) found that 35 percent of the economists disagreed with the statement that a self-correcting mechanism exists that brings output back toward potential output. Those that disagree probably either believe that the *discretionary* actions of the central bank provide this mechanism or think that output does not usually return to potential output.
2. The issue of whether such a long-run equilibrium corresponds to full employment or to a constant level of unemployment will not be addressed here, since it was not discussed in the Duménil and Lévy model and since it is not addressed usually by Kaleckian models. For proposals about how long-run equilibria with demand-led growth rates could equate supply-determined growth rates (the "natural" rate of growth), see Stockhammer (2004) and Dutt (2006). Presumably, like many post-Keynesians, Duménil and Lévy assume that the "natural" growth rate adjusts to the realized trend rate, through changes in immigration, labor participation, and rates of technical progress.
3. This follows from their equation (1) (689) and their definition of inflation (706).
4. Because we are in a growth model, Duménil and Lévy mean that the rate of accumulation must change. Mathematically, taking the differential of equation (2), and adding equations (1) and (7), one gets:

$$dg^i = -\beta_2\beta_1\beta_5(u - u_n) + \beta_3 du$$

   so that the rate of capital accumulation tends to decrease as long as the actual rate of capacity utilization is larger than its normal rate.
5. A similar critique of Duménil and Lévy's approach was provided by Deprez and Dalendina (1994: 72).
6. Indeed such a zero-inflation target is tied by Woodford (2002: 38) to Knut Wicksell's proposed rule for setting interest rates.
7. And hence the realized profit rate R would end up being different from the normal profit rate R_n in the long-run equilibrium.
8. Interestingly, long-run capacity utilization lower than normal levels is only possible if central banks target deflation. When viewed in this light, the model lacks realism.
9. As was already suggested in Lavoie (1996: 125) when discussing Duménil and Lévy (1994). This could correspond to the so-called conflicting-claims inflation theory emphasized by a large number of heterodox authors.
10. The alternative being made up, broadly speaking, of equations (6), (8), and (9).

11. Amusingly, before the new consensus became fashionable, Humphrey (1990) provided a similar demonstration when describing what he considered to be Wicksell's contribution.
12. The two-equation differential system becomes:

$$\begin{bmatrix} \Delta r \\ \Delta \pi \end{bmatrix} = \begin{bmatrix} -\beta_8\beta_4 & \beta_7 \\ -\beta_6\beta_4 & 0 \end{bmatrix} \begin{bmatrix} r \\ \pi \end{bmatrix}$$

where the trace is $-\beta_8\beta_4 < 0$ while the determinant of the Jacobian is $+\beta_7\beta_6\beta_4 > 0$, so that the model always converges; otherwise, without derivative control, the trace would be zero.

13. This is a standard result among authors in the Marxist tradition, as can be deduced from Marglin (1984: 136) or Shaikh (2005), and as pointed out long ago by Nell (1985). On this, see Lavoie, Rodríguez, and Seccareccia (2004).
14. Indeed Fuller and Geide-Stevenson (2003) found that 32 percent of the economists surveyed disagreed with the statement that "there is a natural rate of unemployment to which the economy tends in the long run."

References

Barnes, M. L., and G. P. Olivei. 2003. Inside and outside bounds: Estimates of the Phillips curve. *New England Economic Review:* 3–18.

Deprez, J., and P. D. Dalendina. 1994. The monetary determinants of (in)stability: Some contrasts of Duménil/Lévy and the Post-Keynesians. *Review of Radical Political Economics* 26 (3): 66–75.

Duménil G., and D. Lévy. 1993. *The economics of the profit rate*. Aldershot, UK: Edward Elgar.

———. 1994. Being Keynesian in the short term and classical in the long term: The traverse to classical long-term equilibrium. Preliminary draft, CEPREMAP, April.

———. 1995. A post-Keynesian long-term equilibrium with equalized profit rates? A rejoinder to Amitava Dutt's synthesis. *Review of Radical Political Economics* 27 (2): 135–41.

———. 1997. Being Keynesian in the short term and classical in the long term: The traverse to classical long-term equilibrium. CEPREMAP, working paper 9702.

———. 1999. Being Keynesian in the short term and classical in the long term: The traverse to classical long-term equilibrium. *The Manchester School* 67 (6): 684–716.

Dutt, A. K. 1997. Equilibrium, path dependence and hysteresis in post-Keynesian models. In *Markets, unemployment and economic policy: Essays in honour of Geoff Harcourt,* vol. 2, ed. P. Arestis, G. Palma, and M. Sawyer, 238–53. London: Routledge.

———. 2003. New growth theory, effective demand, and post-Keynesian dynamics. In *Old and new growth theories: An assessment,* ed. N. Salvadori, 67–100. Cheltenham, UK: Edward Elgar.

———. 2006. Aggregate demand, aggregate supply and economic growth. *International Journal of Applied Economics,* 20 (3) (July): 319–36.

Eisner R. 1996. The retreat from full employment. In *Employment, economic growth and the tyranny of the market: Essays in honour of Paul Davidson,* vol. 2, ed. P. Arestis, 106–130. Cheltenham, UK: Edward Elgar.

Filardo, A. J. 1998. New evidence on the output cost of fighting inflation. *Federal Reserve Bank of Kansas City Quarterly Review* 83 (3): 33–61.

Flaschel, P., G. Kauermann, and W. Semmler. 2005. Testing wage and price Phillips curves for the United States. Working paper, Comparative Empirical Macroeconomics (CEM), New School University.

Fontana, G. and A. Palacio-Vera. 2007. Are long-run price stability and short-run output stabilization all that monetary policy can aim for? *Metronomica*, 58 (2) (May): 269–98.

Freedman, C., G. C. Harcourt, and P. Kriesler. 2004. Has the long-run Phillips curve turned horizontal? In *Growth, distribution and effective demand: Alternatives to economic orthodoxy,* ed. G. Argyrous, M. Forstater, and G. Mongiovi, 144–62. Armonk, NY: M.E. Sharpe.

Fuller, D., and D. Geide-Stevenson. 2003. Consensus among economists: Revisited. *Journal of Economic Education* 34 (4): 369–87.

Godley, W. 1983. Keynes and the management of real national income and expenditure. In *Keynes and the modern world,* ed. D. Worswick and J. Trevithick, 135–77. Cambridge: Cambridge University Press.

Hein, E. 2002. Monetary policy and wage bargaining in the EMU: Restrictive ECB policies, high unemployment, nominal wage restraint and inflation above the target. *Banca del Lavoro Quarterly Review* 222: 299–337.

Humphrey, T. M. 1990. Fisherian and Wicksellian price-stabilization models in the history of economic thought. *Federal Reserve Bank of Richmond Economic Review* 76 (3): 3–12.

Kriesler, P., and M. Lavoie. 2007. The new consensus on monetary policy and its post-Keynesian critique. *Review of Political Economy* 19 (3) (July): 387–404.

Lavoie M. 1996. Traverse, hysteresis and normal rates of capacity utilization in Kaleckian models of growth and distribution. *Review of Radical Political Economics* 28 (4) (December): 113–147.

———. 2004. The new consensus on monetary policy seen from a post-Keynesian perspective. In *Central banking in the modern world: Alternative perspectives,* ed. M. Lavoie and M. Seccareccia, 15–34. Cheltenham, UK: Edward Elgar.

Lavoie, M., G. Rodríguez, and M. Seccareccia. 2004. Similitudes and discrepancies in post-Keynesian and Marxist theories of investment: A theoretical and empirical investigation. *International Review of Applied Economics* 18 (2): 127–50.

Marglin, S. A. 1984. Growth, distribution and inflation: A centennial synthesis. *Cambridge Journal of Economics* 8: 115–144.

McDonald, L. M. 1995. Models of the range of equilibria. In *The natural rate of unemployment: Reflections on 25 years of the hypothesis,* ed. R. Cross, 101–52. Cambridge: Cambridge University Press.

Nell, E. 1985. Jean Baptiste Marglin: A comment on "growth, distribution and inflation." *Cambridge Journal of Economics* 9 (2): 173–178.

Palacio-Vera, A. 2005. The "modern" view of macroeconomics: Some critical reflections. *Cambridge Journal of Economics* 29 (5): 747–67.

Rebelo, S. 1991. Long-run policy analysis and long-run growth. *Journal of Political Economy* 99: 500–21.

Romer, D. 2000. Keynesian macroeconomics without the LM curve. *Journal of Economic Perspectives* 14 (2): 149–69.

Setterfield, M. 2004. Central banking, stability and macroeconomic outcomes: A comparison of new consensus and post-Keynesian monetary macroeconomics. In *Central banking in the modern world: Alternative perspectives,* ed. M. Lavoie and M. Seccareccia, 35–56. Cheltenham, UK: Edward Elgar.

———. 2005. Central bank behavior and the stability of macroeconomic equilibrium: A critical examination of the new consensus. In *The new monetary policy:*

Implications and relevance, ed. P. Arestis, M. Baddeley, and J. S. L. McCombie, 23–47. Cheltenham, UK: Edward Elgar.

Shaikh, A. 2003. Labor market dynamics within rival macroeconomic frameworks. In *Growth, distribution and effective demand: Alternatives to economic orthodoxy,* ed. G. Argyrous, M. Forstater, and G. Mongiovi, 127–43. Armonk, NY: M. E. Sharpe.

———. 2005. Economic policy in a growth context: A synthesis of Keynes and Harrod, version 3. Working paper, Department of Economics, New School University, New York.

Stanley, T. D. 2004. Does unemployment hysteresis falsify the natural rate hypothesis? A meta-regession analysis. *Journal of Economic Surveys* 18 (4): 589–612.

Stockhammer, E. 2004. Is there an equilibrium rate of unemployment in the long run? *Review of Political Economy* 16 (1): 59–78.

Solow, R. M., and J. B. Taylor, eds. 1999. *Inflation, unemployment, and monetary policy.* Cambridge, MA: MIT Press.

Taylor, J. B. 1999. Monetary policy guidelines for employment and inflation stability. In *Inflation, unemployment, and monetary policy,* ed. R. M. Solow and J. B. Taylor, 29–54. Cambridge, MA: MIT Press.

Tobin, J. 1995. The natural rate as new classical macroeconomics. In *The natural rate of unemployment: Reflections on 25 years of the hypothesis,* ed. R. Cross, 32–42. Cambridge: Cambridge University Press.

Walsh, C. E. 2002. Teaching inflation targeting: An analysis for intermediate macro. *Journal of Economic Education* 33 (4): 333–46.

Woodford, M. 2002. *Interest and prices: Foundations of a theory of monetary policy.* Princeton, NJ, and Oxford: Princeton University Press.

29

The New Consensus on Monetary Policy and Its Post-Keynesian Critique

Peter Kriesler and Marc Lavoie

This chapter seeks to look at the underlying framework of the New Consensus models, providing a Post-Keynesian critique. In the light of this critique, the model is reformulated, with its basic structure intact, but with alternative post-Keynesian specifications of the Phillips curve being considered. It is shown that such modifications, either allow a long run trade-off between the rate of inflation and the level of output, the rate of capacity utilization and, therefore, unemployment, or, in our preferred specification, changes in output and capacity have no implications for inflation over a large range of capacity utilization.

29.1 Introduction

A New Consensus (or New Neoclassical Synthesis) has arisen among neoclassical economists, which has been defined by a number of New Keynesian economists (such as Woodford, 2002) and already presented in heuristic form (Romer, 2000; Taylor, 2000; Walsh, 2002; Bofinger *et al.*, 2006). This new view seeks to redefine the application of monetary policy by respecifying the most appropriate monetary rule. In other respects it represents a return to Milton Friedman's analysis of the expectations augmented Phillips curve. This chapter looks at the underlying framework of the New Consensus model, providing a Post-Keynesian critique. In the light of that critique, the model is reformulated, with its basic structure intact, but with alternative Post-Keynesian specifications of the Phillips curve being considered. It is shown that such modifications either allow a long-run trade-off between the rate of inflation and the level of output (or the rate of capacity utilization and, therefore, unemployment), or, in our preferred specification, changes

Revised from *Review of Political Economy*, 19(3): 387–404, 2007, 'The New Consensus on Monetary Policy and Its Post-Keynesian Critique,' by Kriesler, P. and Lavoie, M. With kind permission from Taylor and Francis Online and Marc Lavoie http://www.tandfonline.com/doi/full/10.1080/09538250701453097. All rights reserved.

in output and capacity have no implications for inflation for a large range of capacity utilization rates.

29.2 The 'New Consensus'

It seems ironic to call this approach 'new' consensus, as the underlying view of the economy has not changed, in essence, since Monetarism Mark 1 associated with Milton Friedman. Like Friedman, New Consensus authors accept an upwards sloping short run Phillips curve but view the long run Phillips curve as being vertical at NAIRU, or at some similar supply-side determined concept, with monetary policy having no impact on real activity in the long run:

> There is substantial evidence demonstrating that there is no long-run trade-off between the level of inflation and the level of unused resources in the economy—whether measured by the unemployment rate, the capacity utilization rate, or the deviation of real GDP from potential GDP. Monetary policy is thus neutral in the long run. An increase in money growth will have no long-run impact on the unemployment rate; it will only result in increased inflation. (Taylor, 1999, pp. 29–30)

In other words, the inflation rate falls when unemployment is above NAIRU, and increases when unemployment is below it. This is now most often expressed in terms of output gaps – the spread between actual output and potential output – or in terms of capacity utilization. Expressed in terms of capacity utilization, the supply constraint of New Consensus models is given by equation (1):

$$\Delta\pi = \gamma_1(u - u_n) + \epsilon_1 \tag{1}$$

where π is the inflation rate, u is the realised level of capacity utilization, u_n is the optimal level of capacity utilization, γ_1 is a positive parameter (all Greek letters represent parameters) and ϵ_1 is a non-recurrent inflation shock. (The equations corresponding to the various models discussed in this chapter are summarized in the Appendix.)

This equation is the basis of the upward-sloping short-run Phillips curve and the vertical long-run Phillips curve, where any deviation of capacity, real GDP or unemployment from their normal levels leads to *changes* in the inflation rate. If capacity utilization is kept above its normal level, this will quickly lead to accelerating inflation. In other words, there is no long-term trade-off between any given rate of inflation and some measure of the output gap.

Like Friedman, defenders of the New Consensus view believe that monetary policy can have real effects in the short run as summarized in a

conventional IS schedule. As in most macroeconomic models, they assume that investment, and hence capacity utilization, are inversely responsive to changes in the rate of interest. Provided we ignore the additional terms that are included in the more sophisticated versions of the equation, which incorporate expected terms and autonomous shocks, as in Woodford (2002), we have:

$$u = u_0 - \beta r \tag{2}$$

where u_0 represents an autonomous component of aggregate demand and r is the real rate of interest.

Both Friedman and New Keynesian authors strongly argue that this indicates the need for monetary policy rules. The only difference is that, while for Friedman the rule sets optimal money supply growth, for New Consensus authors 'the interest rate rather than the money supply is the key instrument that should be adjusted' (Taylor, 1999, p. 47). The proposed rule would have the central bank responding to both price and aggregate demand shocks (or expected such shocks). So, interest rates should be changed if inflation deviated from its target (π^T) or if real GDP deviates from potential GDP. There are many variants of these rules, but the best-known is the so-called Taylor rule, which, in terms of rates of utilization, is presented as:

$$i = \pi + a_1(\pi - \pi^T) + a_2(u - u_n) + r_n \tag{3a}$$

where i is now a nominal interest rate while r_n 'is the implicit real interest rate in the central bank's reaction function' (Taylor, 1999, p. 50). We can say that, in Wicksellian terms, it is the central bank estimate of the 'natural' (real) rate of interest.

This can also be rewritten in real terms by taking note that $i - \pi = r$, so that equation (3a) becomes:

$$r - r_n = a_1(\pi - \pi^T) + a_2(u - u_n) \tag{3b}$$

In the long-term, as defined by neoclassical authors, $\pi = \pi^T$ and $u - u_n$, so $r = r_n$. As has been pointed out by numerous authors, the New Consensus central bank reaction function does not guarantee that the target inflation rate will ever be achieved however. This is recognized by Taylor (1999, p. 51) himself, when he says that if the central bank acts on an incorrect estimate of the natural rate of interest, 'then the steady state inflation rate will not equal the target inflation rate.' The rate of capacity utilization can converge to its normal level without the steady state inflation rate converging to the target rate set by the central bank. For instance, if the implicit real interest rate estimate is too high, the actual steady state rate of inflation will be too

low relative to the target, and hence the central bank will need to revise downwards its estimate of the 'natural' rate of interest.

This problem can be avoided if the central bank reaction function is expressed in difference terms. Indeed, this is how Setterfield (2004, 2005) identifies the typical New Consensus central bank reaction function:

$$\Delta r = a_3(\pi - \pi^T) + a_4(u - u_n) \tag{3c}$$

Setterfield (2003) shows that a model made up of equations (1), (2) and (3c) is always stable and converges to a normal rate of capacity utilization at the target inflation rate.[1] However, the second term of the central bank reaction function, given by $a_4(u - u_n)$, plays a crucial role in stability analysis. Without it, the economy would run into a limit cycle, circling the target inflation rate without ever achieving it. What happens is that the second term of equation (3c) provides derivative control, a well-known stabilizing feature since, substituting $(u - u_n)$ by its value in equation (1), we obtain the following reaction function:

$$\Delta r = a_3(\pi - \pi^T) + (a_4/\gamma_1)(\Delta\pi) \tag{3d}$$

With equation (3d), the central bank reacts to the level of, and the change in, the inflation rate.[2] In other words, for a given current inflation rate, the central bank would impose a more punitive increase in real interest rates when inflation is quickly rising.

In summary, New Consensus authors rely on a vertical long-run Phillips curve that prevents the possibility of any level of economic activity bar that corresponding to potential output or normal use of capacity. Although monetary variables play a role in the determination of the level of economic activity in the short run, they have no real effects in the long run. The basic role of monetary variables is to push the economy to its long run equilibrium, although they play no role in the determination of that equilibrium. In other words, we have the long-term neutrality of money. In addition, the loanable funds framework is vindicated with the New Consensus model: reduced saving and larger government deficits lead to higher real rates of interest in the long run.

29.3 The Post-Keynesian Response

Post-Keynesian economists are critical of a number of important features of the New Consensus model described above. We can divide these criticisms into two distinct areas. First, many Post-Keynesians are critical of the IS curve, which underlies the analysis, and of the related assumption of the efficiency of monetary policy in the short run and monetary neutrality in the long run. Second, all Post-Keynesians reject the concept of a vertical

long-run Phillips curve. Points 1–3 below deal with the first of these issues, while the second is the subject of the remaining points.

1. Post-Keynesians, following Keynes, reject the simple interest rate/investment relation implied in the IS model, as represented in equation (2) above. They believe, as Keynes (1936, p. 173), that between monetary policy and economic activity, 'there may be several slips between the cup and the lip.' There are a number of reasons for this. Firstly, most Post-Keynesians believe that the relation between interest rates and investment is more complex than the simple functions (linear or otherwise) assumed in the IS relation. In addition, many economists, following Keynes (1936, pp. 202–208) once again, do not think that there is a one for one relationship between the short term interest rate set by the central bank, and the long-term interest rates or the lending rates that affect the components of aggregate demand (see, for example, Pollin, 2003 and Villieu, 2004 within the context of the New Consensus story). In fact, Kalecki argues, partly for this reason, that it is the quantity of credit rather than its price which influences investment (Kriesler, 1997). Nevertheless, tight monetary policy associated with increased short term rates will also be associated with increased credit tightening and a corresponding fall in the animal spirit of banks, so that, at least with contractionary monetary policy, it may be reasonable to assume that there will be some effect on aggregate demand (Wolfson, 1996).

   Empirically, evidence suggests that the interest elasticity of investment is non-linear and asymmetric (Taylor, 1999). While an increase in interest rates is likely to reduce investment in times of economic booms ($u > u_n$), the reverse is not true, as is well illustrated by the case of Japan in the 1990s. Reductions in interest rates are unlikely to stimulate investment in times of recession. In the words of the old adage: you can lead a horse to water but you can't make it drink. Many economists think that using monetary policy in a recession is like pushing on string (Nevile & Kriesler, 2002).
2. Partly for this reason, Post-Keynesians believe, as do many monetary economists, that monetary policy takes a considerable amount of time to have any effect, especially on the inflation rate, unless interest rates are changed by drastic amounts (that may jeopardize the stability of the financial system). Monetary policy is known to be a particularly blunt instrument, with long and variable lags. Monetary policy acts upon inflationary forces by weakening aggregate demand and labour conditions (Arestis & Sawyer 2004a, 2004b). In addition, several Post-Keynesians contend that, before high rates take their toll, real interest rate hikes lead to higher inflation rates, through interest cost push (Galbraith, 1957, pp. 130–131; Kaldor, 1982, p. 63; Taylor, 2004, pp. 88–90). This was first discussed by Tooke, and is often associated with the so-called Gibson paradox, also known in the

States as the Wright– Patman effect and in Latin America as the Caravallo effect. It can be shown that this effect may jeopardize the neat converging features of the New Consensus (Hannsgen, 2004).

3. In contrast to some New Keynesian authors who believe that 'short-run non-neutrality and long-run neutrality are . . . as well accepted as any proposition in monetary economics' (Mankiw, 1999, p. 72), Post-Keynesians reject the so-called neutrality of money in both the short run and the long run. In Post-Keynesian terms, this means that short-run movements in the real interest rate set by the central bank will have both short-run and long-run real effects. In other words, Post-Keynesians reject the notion of a uniquely-determined 'neutral', 'equilibrium' or 'natural' real rate of interest.
4. Post-Keynesians deny that logic requires that in the long run the actual rate of capacity utilization ought to converge towards an exogenously given normal rate of capacity utilization. As Amitava Dutt (2003, p. 87) points out, Kaleckian economists 'argue in favour of an endogenous determination of capacity utilization even in the long run on the ground that firms may not have a unique level of capacity utilization but be content if it remains within a band, or that "normal" or "desired" capacity utilization itself may be endogenous.'
5. Post-Keynesians reject the notion of a supply-determined natural growth rate. This critique applies equally to the classical model and to the endogenous growth models, where saving leads the way, and to the New Consensus model, where the natural rate is determined by population growth and technological progress, as in the Solow model (Taylor, 2000, p. 91). Post-Keynesians believe that if the concept of a natural growth rate is to be of any assistance, it is determined by the path taken by the actual growth rate, as pointed out very early in Kaldor (1960, p. 237). 'In sum,' writes Setterfield (2002, p. 5), 'the natural rate of growth is ultimately endogenous to the demand-determined actual rate of growth. ... The natural rate is not an attractor in demand-led growth models.' The most likely candidate for endogenous changes in the natural rate of growth induced by high growth rates of demand is the rate of technical progress. This argument was made by Joan Robinson in her magnum opus:

> But at the same time technical progress is being speeded up to keep up with accumulation. The rate of technical progress is not a natural phenomenon that falls like the gentle rain from heaven. When there is an economic motive for raising output per man the entrepreneurs seek out inventions and improvements. Even more important than speeding up discoveries is the speeding up of the rate at which innovations are diffused. When entrepreneurs find themselves in a situation where potential markets are expanding but labour hard to find, they have every motive to increase productivity. (Robinson, 1956, p. 96)

6. Post-Keynesians reject the vertical long-run Phillips curve and/or its associated single NAIRU.[3] In addition, many are even sceptical about short-run trade-offs between GDP/capacity and inflation. There are two reasons for this. First, there is a large range of capacity utilization rates which are consistent with an absence of demand-led pressures, for reasons tied to the absence of decreasing returns over a large range of production levels (Lavoie, 2004, p. 24). Second, it is believed that with 'co-ordinated wage bargaining a constant inflation rate becomes compatible with a range of employment levels, and the NAIRU as the short run limit to employment is no longer unique' (Hein, 2002, p. 314).

29.4 Amending the New Consensus

A number of ways of modifying the New Consensus analysis to incorporate explicitly Post-Keynesian considerations have been suggested. To start with point 5, both Kaldor (1982) and Lavoie (2004) identify a hidden equation in the New Consensus model. This relates to the question of why low inflation is regarded as desirable. There is nothing inherent in the model, as presented so far, which favours one inflation rate over any other. Implicit then must be an additional relation, according to which there is some optimal inflation rate which maximises the economy's natural growth rate. Deviations from this optimal inflation rate will reduce the natural growth rate of the economy.

> Assuming that the behaviour of the 'real' economy is neutral with respect to monetary disturbances, why should the elimination of inflation be such an important objective as to be given 'over-riding priority'? In what way is a community better off with constant prices than with constantly rising (or falling) prices? The answer evidently must be that, in the view of the Government, inflation causes serious distortions and leads to a deterioration in economic performance, etc. In that case, however, the basic proposition that the 'real' economy is impervious to such disturbances is untenable. (Kaldor, 1982, pp. 41–42)

Deviations from this optimal inflation rate will reduce the natural growth rate of the economy. Lavoie suggests a Post-Keynesian modification to this where, instead of the natural growth rate being dependent on the difference between actual and optimal inflation, it will be determined by the path of the actual growth rate. This is due to the assumption that increases in effective demand will lead to increases in the natural growth rate, and vice versa. As a result, despite assuming a vertical Phillips curve, as given by equation (1) or some variation of it based on the discrepancy between the actual growth rate and the natural rate of growth, the New Consensus model amended by this Post-Keynesian feature will exhibit strong path dependency, 'with the

possibility of multiple equilibria, that make long-run supply forces dependent on short-run disequilibrium adjustment paths induced by effective demand' (Lavoie, 2004, p. 26).

When discussing the New Consensus, New Keynesian authors usually refer to a vague term, the output gap. But what is the *output gap*? Should it be measured as a discrepancy between actual capacity utilization and normal or optimal capacity utilization, as we assumed it was in equations (1)–(3) of Section 2? Or should it be measured instead in terms of the discrepancy between the actual and the natural rate of growth, as in Lavoie (2004) or Setterfield (2004)? Or finally, should we take the output gap as being the discrepancy between the actual unemployment rate and the NAIRU (or the natural rate of unemployment)? All this would seem to depend on what is the ultimate determinant of demand inflation. Unemployment rates could be relevant if scarcity or power struggles in the labour market are the main cause of inflation. If pressures on capacity are the main cause on inflation, then capacity rates would seem to be the relevant indicator. Finally, some may argue that GDP growth is often tightly linked to capacity utilization and is the best indicator of future pressures on inflation, and hence the best indicator for central banks that are keen to use pre-emptive strikes, based on expected inflation rather than current inflation. This problem is reinforced by the fact that central banks usually do not make forecasts of utilization rates, whereas they do forecast output growth.

Dutt (2006) has recently shown that the use of the first or the third definition of the output gap will yield different dynamics. Dutt analyses (at least) three different cases, that may be illustrated with the help of three graphs, the first two of which can be found in Fontana & Palacio-Vera (2005). Assume a natural rate of growth of the economy, $g_n = n + a$, equal to the growth rate of the active population and that of productivity. If the output gap and inflation dynamics depend on the rate of unemployment, with the central bank setting real interest rates to achieve eventually the (assumed *unique*) NAIRU, Figure 29.1 will trace the relevant transition path. As shown, a negative demand shock, imposed perhaps to achieve a lower target rate of inflation, will have no long-run detrimental effect on the absolute value of capacity output and the stock of capital. There will be high rates of unemployment in the short run, and thus some transitional wastage of unutilized labour resources, but the economy will be back to its unique NAIRU after some time. This will be achieved through rates of growth that will exceed the natural rate during the latter periods of the transition.[4] This is the standard neoclassical position, as it can be found in Filardo (1998, p. 35) for instance, in models that allow for short-term unemployment. As pointed out by Palacio-Vera (2005), the mechanism that used to be relied upon by neoclassical authors was the real money balances effect: in its extreme version, wages and prices being assumed to be flexible over the long run, they would fall as long as full employment would not be achieved. With New

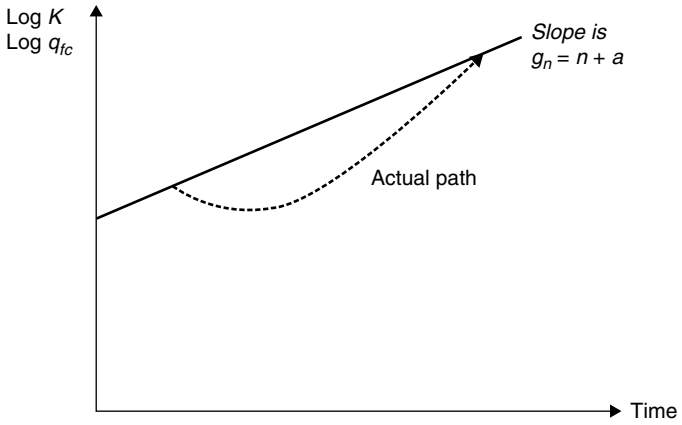

Figure 29.1 The standard neoclassical assertion: demand shocks have no long-run effects on the rate of unemployment and capacity output

Consensus authors, according to whom inflation is persistent, deflation is unlikely and money is endogenous, the mechanism is an appropriate discretionary central bank reaction function.

Figure 29.2 illustrates the case where the output gap is a function of the discrepancy between the actual and the natural growth rates. It also illustrates the case where equations (1)–(3) based on the rate of utilization still hold, but where in addition we have the relationship

$$g = g_n + \mu(u - u_n) \tag{4}$$

so that the efforts of the central bank to bring back capacity utilization to its normal level also bring the rate of accumulation back to its natural level.

In this case, as in the previous case, the economy (capacity output) eventually grows once again at its natural rate, thus allowing the rate of unemployment to remain at a steady-state level in the long run, but this steady level is now higher than it was before the negative demand shock was inflicted on the economy. A negative demand shock has a negative effect on the absolute amount of capacity, although trend growth of capacity is the same as it was before. In this case, a higher steady-state rate of unemployment can only be avoided if the transitional high rates of unemployment induced a reduction in the proportion of the population that remains active (or that remains within the region), as in Cornwall (1977), or if it induced a reduction in the capital to labour ratio. This kind of result is also achieved in the Kaleckian model proposed by Stockhammer (2004), where negative demand shocks induce lower real wages and rising profit margins, which speed up accumulation, until the economy is back to its natural growth rate,

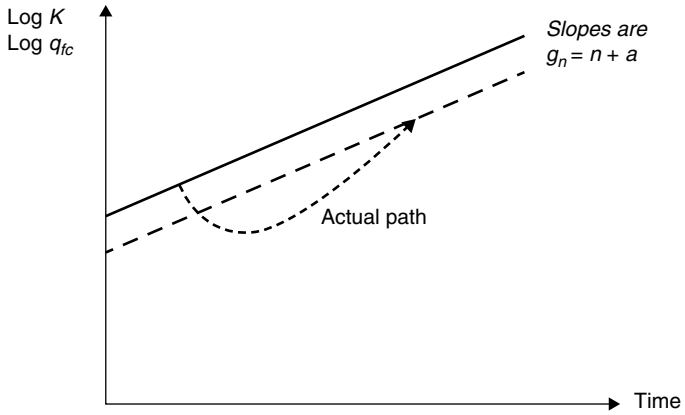

Figure 29.2 Demand shocks have long-run effects on the rate of unemployment and capacity output

but at a higher rate of unemployment, and also in the Post-Keynesian model put forth by Isaac (2005).

As pointed out above, the logic behind such a model is that inflation rates depend on the discrepancy between the actual and the natural rates of growth, or in other words between the growth rate of labour and the growth rate of active population. This means that inflation depends on the *change* in the rate of unemployment, rather than on the *level* of the rate of unemployment. From very early on, empirical evidence about the Phillips curve showed the relevance of *changes* in the rate of unemployment (Bowen & Berry, 1963) for wage and price inflation, and this has been found time and time again (Gordon, 1989; Bloch *et al.*, 2004). Inflation stabilizes when there are no more changes to the actual rate of unemployment. The implication is that even though the central bank may be concerned about unemployment rates, rather than GDP growth rates, since wage and price inflation will stabilize once the economy is back to its natural rate of growth or to its normal rate of capacity utilization, the central bank will understand the higher steady-state rate of unemployment to be the new NAIRU. The higher NAIRU will then be attributed, ex post, to changes in supply-side factors such as higher tax rates or some measurement of labour flexibility, and the central bankers will convince themselves that their restrictive monetary policies had no negative long-run impact on employment.[5] Thus, in the case illustrated in Figure 29.2, there is hysteresis in the rate of unemployment, and this hysteresis is purely demand-led, tied to the reduction in absolute output capacity generated by the restrictive monetary policy, in contrast to the explanations usually offered by neoclassical authors, according to which the hysteresis effects are generated by union insiders and a lazier active population.[6]

Finally a third case can be illustrated, the one proposed by Lavoie (2004, 2006) and Dutt (2006), as shown in Figure 29.3. In this case, a negative demand shock (or tighter monetary policy) has a long-run effect both on the absolute value and *the rate of growth* of capacity output, *as well as on the natural growth rate* of the economy. This occurs even though the central bank is behaving as described by the New Consensus model, with equations (1)–(4). What happens is that there is now one additional equation, which reflects the effect of the recession on the rate of growth of productivity, along the lines suggested by authors such as Kaldor and Robinson, as indicated in the previous section. Formally, there is an increase in the rate of growth of productivity as long as the natural rate of growth does not catch up with the actual rate of accumulation (the rate of productivity growth will decline as long as the natural rate of growth exceeds the actual rate), which we can write as:

$$\Delta g_n = \phi(g - g_n) \tag{5}$$

Thus, in such a world, after the negative demand shock, the rate of unemployment will also converge towards a steady-state level, but one which is higher. In addition, the rate of growth of the economy will be permanently lower. This is consistent with the empirical results of León-Ledesma & Thirlwall (2002). The implications of this third case are of course much more dramatic, and perhaps have not yet been emphasized enough. The costs in terms of output lost are growing exponentially and are not limited to the transitional phase. Beyond hysteresis of the rate of unemployment, what we have is hysteresis in the rate of growth of the economy. This possibility

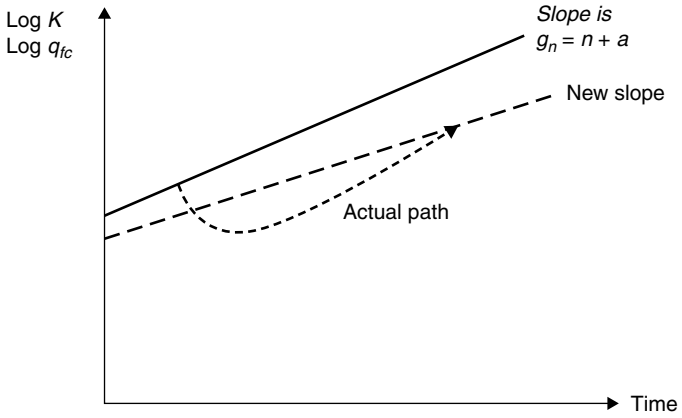

Figure 29.3 Demand shocks have long-run effects on the rate of unemployment and the rate of growth of capacity output

certainly reinforces the relevance of demand-driven Keynesian or Kaleckian growth models, as pointed out by Setterfield (2002).

29.5 Amending the Phillips Curve

We now develop our sixth critique of the New Consensus model. As pointed out earlier, New Consensus authors still rely on a long-run vertical Phillips curve, where demand inflation is the key. In his alternative to the New Consensus model, Setterfield (2004) concentrates on the nature of the Phillips curve, pointing out that demand-type considerations are not the only influence on the inflation rate. Cost considerations, as well as institutional variables reflecting the wage and price setting process will have significant influence on the inflation rate. As a result, he replaces the vertical Phillips curve of equation (1) with one representing these more intricate explicators of inflation:

$$\pi = \gamma_2 \pi_{-1} + \gamma_3 u + \pi_c \tag{1a}$$

where: $0 < \gamma_2 < 1$ and π_c 'is a vector of institutional variables that affect aggregate wage and price setting behaviour' (Setterfield, 2004, p. 40).

Setterfield shows that with this kind of Phillips curve, as given by equation (1a), added to New Consensus equations (2) and (3), one obtains once more a multiplicity of possible long-run rates of growth and capacity utilization, where $\pi = \pi_{-1} = \pi^T$. Comparisons of long-run positions show that higher inflation targets allow for higher rates of capacity utilization and higher growth rates.

However, further modifications need to be made in order to capture more fully the essence of Post-Keynesian analysis. In particular, many (but not all) Post-Keynesians are dubious about the notion that inflation needs to rise with increased capacity utilization. As mentioned in point 6, they argue that, for large ranges of output, there seems to be little impact on inflation. This is compatible with Post-Keynesian pricing models of mature economies. In these economies, for most sectors, price is determined as a mark-up over costs. Regardless of which notion of cost is used, prime, variable, normal or full, cost pressures will remain constant over a large range of capacity utilization, as long as commodity prices can be held down (as Kalecki and Kaldor would argue). So with labour productivity constant, and with mark-ups also tending to remain constant, there need not be any increased pressure on prices with expansions of capacity over that range.

In other words, changes in capacity utilization need only be inflationary at levels of capacity near full utilization. Similarly, only at very low levels of capacity would we expect some reduction of the inflation rate. In other words, there would only be a trade-off between inflation and unemployment at very low and very high levels of capacity utilization, with the inflation rate constant for levels of a large intermediate range of capacity. In this case, the

Phillips curve would be horizontal for large ranges of output and employment (Freedman *et al.*, 2004; Palacio-Vera, 2005; Semmler & Zhang, 2004).

This would lead to the replacement of the Phillips curve equations (1), or (1a), with an equation of the following type:

$$\pi = \gamma_4(u - u_m) + \gamma_5(u - u_{fc}) + \pi_n \tag{1b}$$

where u_{fc} represents full capacity utilization, above which the inflation rate rises, u_m is some low level of capacity utilization, below which the inflation rate falls, $\gamma_4 = 0$ for $u \geqslant u_m$ and $\gamma_4 > 0$ for $u < u_m$, $\gamma_5 = 0$ for $u \leqslant u_{fc}$ and $\gamma_5 > 0$ for $u > u_{fc}$, and π_n represents the rate of inflation associated with the normal range of output, subject to supply side shock.

For a large range of capacity utilization u such that $u_m < u < u_{fc}$, we have that $\Delta\pi = 0$, as shown in Figure 29.4. We may wish to call this graph the Prices-Utilization-Possibilities curve, or PUP (since the curve looks like a puppy). In this case, if the current inflation rate is the target rate, central bank policy should set the interest rate at a *fair* rate, based on income distribution considerations, in particular the distribution between debtors and creditors, and allow fiscal policy to set the output/capacity level, as more recently recommended by Arestis & Sawyer (2003); or else its reaction function would be of the Taylor rule type, so that it would maintain monetary policy as an instrument in manipulating effective demand to acceptable levels. In other words, with r_f being the fair rate of interest, which is replacing the natural rate of interest r_n, equation (3b) would become:

$$r = r_f + \alpha_5(\pi - \pi^T) + \alpha_6(u - u_{fc}) \tag{3e}$$

so that if $\pi = \pi^T$, and $u < u_{fc}$, monetary policy would be expansionary.

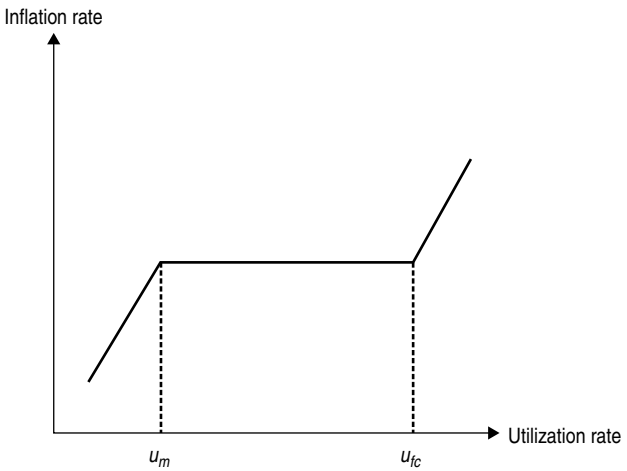

Figure 29.4 The PUP curve: the post-Keynesian short-run Phillips curve

From the above discussion, we can see that there are at least two ways to modify the vertical (expectations augmented) long run Phillips curve, derived from upward sloping short run curves. The first is in the more traditional manner suggested by Setterfield, where the inflation rate of the previous period (the effects of expectations) is only partially transmitted to the current inflation rate. This relation yields a series of upward sloping short run Phillips curves, which transmit into an upward sloping long run Phillips curve, allowing for the possibility of an inflation/capacity utilization trade-off over the long run.

The second way is to argue that for a large range of output (capacity utilization rates) higher levels of utilization will not lead to higher rates of inflation for given inflationary expectations. In other words, the (short-run) expectations augmented Phillips curve is flat for a certain range. As there is no change in actual inflation over that range, there will be no change in inflationary expectations (with the target inflation rate set by the central bank possibly playing a key role).

We can compare the PUP formulation to the standard version of the short run expectations augmented Phillips curve, which runs as:

$$\pi = \pi^e + \gamma_6(u - u_n) + \epsilon_1 \tag{1c}$$

For our model, from equation (1b), over the normal range of output, we have:

$$\pi = \pi_n + \epsilon_1$$

which is the same inflation rate as from equation (1c) if we amend the upward sloping short-run Phillips curve, i.e. $\gamma_6 = 0$.

So over this range of output, increases in the level of capacity utilization will have no impact on the inflation rate in the short run. However, the flat short-run Phillips curve means that there is no reason for inflation to change (over this range) in the long run. In other words, the mechanism whereby the upward sloping short-run Phillips curve is transmitted to a vertical long-run Phillips curve will not hold in the case of a horizontal Phillips curve, as increased output will not, in the short run, be inflationary. In this case, the long-run Phillips curve will also be horizontal over the relevant range, as shown in Figure 29.5. In such cases, what is crucial is cost-inflation, as reflected in the rising costs of commodities, as well as the credibility of the target inflation rate set by the monetary authorities.

There are some obvious policy lessons to be drawn from this horizontal segment of the long-run Phillips curve. Central banks that have driven down utilization rates below the u_m level shown in Figures 29.4 or 29.5, in their desire to reduce inflation rates to their target level, should not keep rates of utilization around this u_m level. It would seem, from the experience gathered in knocking down inflation rates, that u_m is the utilization rate equivalent of the NAIRU, the non-accelerating inflation rate of capacity utilization, or what we called u_n in equations (1)–(3). But that would be a

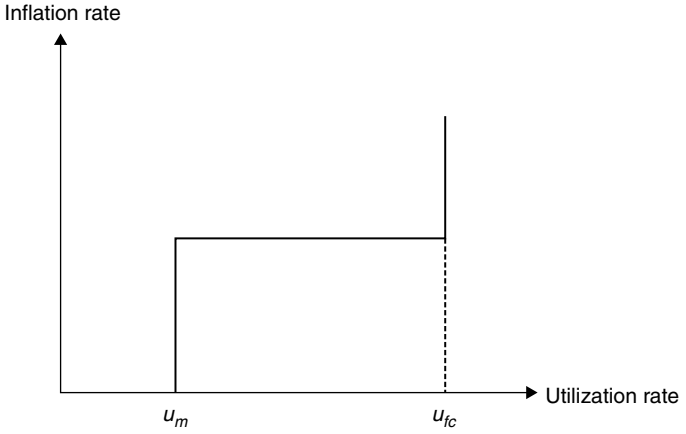

Figure 29.5 The post-Keynesian long-run Phillips curve

mistaken interpretation. There exists in fact a multiplicity of such rates of utilization u_n, within the u_m to u_{fc} range. Indeed, to each rate of capacity utilization on the flat segment of the PUP curve would correspond a different real rate of interest. For instance, following equation (2), the real interest rate associated with a target rate of capacity utilization $u_n = u_m$ would need to be much higher than the real interest rate associated with the alternative higher target of $u_n = u_{fc}$. There is thus a multiplicity of such 'natural' rates of interest as neoclassical authors would call them. It would be quite possible for the economy to operate near the u_{fc} rate of utilization, without any increase in the rate of inflation, but with lower rates of unemployment (and possibly higher rates of output and capacity growth), thus avoiding an enormous waste of unused physical and human resources, a point also emphasized by Fontana & Palacio-Vera (2005).

There is empirical support for the horizontal Phillips curve. In a series of articles, Robert Eisner (1995, 1996) has made some econometric estimations for the American economy showing that while the short-run Phillips curve had the usual shape when rates of unemployment were high (with rates of utilization below u_m in Figure 29.1), it was completely flat for middle range and high range rates of unemployment (between utilization rates u_m and u_{fc}; presumably the American economy did not often find itself beyond u_{fc}). Low rates of unemployment – and hence through Okun's equation, high rates of capacity utilization – had no accelerating impact on inflation whatsoever.

Somewhat similar empirical results were also achieved by Filardo (1998, p. 45), an economist at the Kansas City Reserve Bank. He defines three zones, corresponding to a weak, a balanced, and an overheated economy, and discovers that a so-called balanced economy has a flat Phillips curve. As long as the output gap is within a limited range, any deviation from normal

capacity has no effect whatsoever on the rate of inflation. The short-run Phillips curve that he draws, in terms of output gaps or rates of utilization, is exactly identical to the PUP curve of Figure 29.4.[7]

Bloch *et al*. (2004) also provide empirical support for the flat Phillips curve, at least in the case of the US economy. They show what has been argued in the previous section, that wage inflation is responsive to *changes* in the rate of unemployment rather than in the level of unemployment, thus repudiating the neoclassical Phillips curve. In addition, they show that profit mark-ups on unit prime costs in the manufacturing sector do not rise with higher economic activity; on the contrary, they tend to be countercyclical. The Phillips curve would thus appear to be flat. The crucial inflationary factor, which can lead to vertical shifts of the horizontal segment of the Phillips curve, is thus the price of primary commodities: the prices of these commodities are very sensitive to world demand. Increases in the prices of commodities, that is, increases in the cost of the inputs of finished goods, get fully reflected into higher prices of finished products. Price inflation then passes through fully to wage inflation, thus generating a price-wage spiral, as workers try to catch up. There is indeed a flat segment of the Phillips curve, as long as all countries do not expand in step.

29.6 Conclusion

Most Post-Keynesian economists reject key elements of the New Consensus model. In particular, they disagree with the underlying IS curve as well as the vertical long-run Phillips curve. It has been shown that accepting all the basic equations of the New Consensus model amended with the suggested Post-Keynesian modifications or additions will fundamentally change the model's conclusions. In particular, our specified amended Phillips curve will yield Kaleckian results, with important roles for fiscal and monetary policy in influencing the level of output, capacity utilization and employment. There exists a multiplicity of utilization rates with stationary inflation.

On the basis of the various amendments that have been proposed, Post-Keynesians assert that restrictive monetary policies and pre-emptive strikes against inflation may not be necessary within a large range of capacity utilization. Slowdowns to fight inflation do have a cost, which can be measured as either higher permanent rates of unemployment or lower participation ratios to the labour force. In addition, these self-imposed recessions may lead to lower average future growth rates in economic activity. We thus fully agree with Dutt's (2005, p. 31) assessment that 'policies to check the growth of aggregate demand during expansion without clear strong inflationary tendencies have a cost in terms of long-run growth rates'. At best, despite these restrictive anti-inflationary monetary policies, the economy will eventually manage to recover trend growth, but at a higher rate of unemployment. The argument above has raised serious questions about the advisability of such restrictive policies.

Acknowledgments

The first version of this paper was written during the Summer of 2004, when Peter Kriesler visited the Robinson Center in Ottawa. That version was presented at the third Australian Society of Heterodox Economists conference, which was held at the University of New South Wales, in Sydney, in December 2004. The authors wish to thank the participants to this conference, as well as Mario Seccareccia and Jung Hoon Kim, for their helpful comments. Marc Lavoie wishes to thank the Center for Full Employment and Price Stability (C-FEPS) at the University of Missouri in Kansas City, for its financial support at the time the paper was written.

Notes

1. Indeed, officials at the Bank of Canada have explained to one of us that the central bank need not know the 'natural' rate of interest. If the inflation rate settles at a rate higher than the target rate, the central bank only has to raise the real rate until the target inflation rate is achieved, a behaviour which corresponds to equation (3c).
2. The importance of this second term for stability analysis is confirmed by the numerical analysis of Alonso-González & Palacio-Vera (2002).
3. Indeed, some neoclassical authors reject the NAIRU. Solow (1990) for instance claims that calculating the NAIRU as being the simple average of the actual rates of unemployment over the previous five years does a better job than calculating a NAIRU based on standard supply-side factors. Any rate of unemployment held for a sufficiently long length of time will generate stable inflation after a period of accelerating or decelerating inflation.
4. It should be pointed out that the famous Solow neoclassical growth model is of little use in analysing the dynamics of the problem at hand, since the model starts out by assuming full labour employment and full capacity output. By definition, unemployment cannot arise in that model.
5. As shown by Setterfield et al. (1992), by modifying the definitions of various supply-side variables, and by adopting one or another mechanism to define expected inflation, there are nearly infinite possibilities in arriving at a conveniently measured NAIRU allowing the central bank to claim that the current rate of unemployment is close to equilibrium.
6. A further reason for a hysteretic rate of unemployment may arise if the central bank also adjusts its view of what it considers to be the normal rate of utilization of capacity. This is linked to our fourth critique of the New Consensus, as described in the previous section. Multiple equilibria may also arise when normal rates of capacity utilization are endogenous and move with actual rates, as shown by Lavoie (1996) and Dutt (1997).
7. We discovered this after labouring to describe this alternative Post-Keynesian Phillips curve. The student of one of us, Peng Wang, has preliminary results that confirm Filardo's view. Based on US data of 1970–2003, Wang finds that the Phillips curve is flat for rates of capacity of utilization that stand between 77 and 83%.

References

Alonso-González, L. A. & Palacio-Vera, A. (2002) Monetary policy, Taylor's rule and instability, *Metroeconomica*, 53, pp. 1–24.

Arestis, P. & Sawyer, M. (2003) Reinventing fiscal policy, *Journal of Post Keynesian Economics*, 26, pp. 3–26.

Arestis, P. & Sawyer, M. (2004a) Monetary policy when money is endogenous: going beyond the New Consensus, in: M. Lavoie & M. Seccareccia (Eds) *Central Banking in the Modern World: Alternative Perspectives* (Cheltenham: Edward Elgar).

Arestis, P. & Sawyer, M. (2004b) On the effectiveness of monetary policy and of fiscal policy, *Review of Social Economy*, 62, pp. 441–463.

Bloch, H., Dockery, A. M. & Spasford, D. (2004) Commodity prices, wages, and US inflation in the twentieth century, *Journal of Post Keynesian Economics*, 26, pp. 523–545.

Bofinger, P., Mayer, E. & Wollmerhäuser, T. (2006) The BMW model: a new framework for teaching macroeconomics, *Journal of Economic Education*, 37, pp. 98–117.

Bowen, W. G. & Berry, R. A. (1963) Unemployment and movements of the money wage level, *Review of Economics and Statistics*, 45, pp. 163–172.

Cornwall, J. (1977) *Modern Capitalism: Its Growth and Transformation* (London: Martin Robertson).

Dutt, A. K. (1997) Equilibrium, path dependence and hysteresis in Post-Keynesian models, in: P. Arestis, G. Palma & M. Sawyer (Eds) *Markets, Unemployment and Economic Policy: Essays in Honour of Geoff Harcourt*, Vol. 2 (London: Routledge).

Dutt, A. K. (2003) New growth theory, effective demand, and Post-Keynesian dynamics, in: N. Salvadori (Ed.) *Old and New Growth Theories: An Assessment* (Cheltenham: Edward Elgar).

Dutt, A.K. (2006) Aggregate demand, aggregate supply and economic growth, *International Review of Applied Economics*, 20, pp. 319–336.

Eisner, R. (1995) Our NAIRU limit: the governing myth of economic policy, *American Prospect*, 6, March 21, pp. 58–63.

Eisner, R. (1996), The retreat from full employment, in: P. Arestis (Ed.) *Employment, Economic Growth and the Tyranny of the Market: Essays in Honour of Paul Davidson*, Vol. 2, (Cheltenham: Edward Elgar).

Filardo, A. J. (1998) New evidence on the output cost of fighting inflation, *Federal Reserve Bank of Kansas City Quarterly* Review, 83(3), pp. 33–61.

Fontana, G. & Palacio-Vera, A. (2005) Are long-run price stability and short-run output stabilization all that monetary policy can aim for? Paper presented at annual meeting of the Eastern Economic Association, New York, March 2005.

Freedman, C., Harcourt, G. C. & Kriesler, P. (2004) Has the long-run Phillips curve turned horizontal? In: G. Argyrous, M. Forstater & G. Mongiovi (Eds), *Growth, Distribution and Effective Demand: Alternatives to Economic Orthodoxy* (Armonk: M. E. Sharpe).

Galbraith J. K. (1957) Market structure and stabilization policy, *Review of Economics and Statistics*, 39, pp. 124–133.

Gordon, R. J. (1989), Hysteresis in history: was there ever a Phillips curve?, *American Economic Review*, 79, pp. 220–225.

Hannsgen, G. (2004) Gibson's paradox, monetary policy, and the emergence of cycles, Levy Economics Institute Working Paper No. 410.

Hein, E. (2002) Monetary policy and wage bargaining in the EMU: restrictive ECB policies, high unemployment, nominal wage restraint and inflation above the target, *Banca Nazionale del Lavoro Quarterly Review*, 222, pp. 299–337.

Isaac, A. G. (2005) Varieties of fiscal stimulus: a conflicting claims analysis, in: P. Berglund & M. Vernengo (Eds) *The Means to Prosperity: Fiscal Policy Reconsidered* (London: Routledge).

Kaldor, N. (1960) *Essays on Economic Stability and Growth* (London: Duckworth).

Kaldor, N. (1982) *The Scourge of Monetarism* (Oxford: Oxford University Press).

Kalecki, M. (1944) Professor Pigou on 'The Classical Stationary State'. A comment, *Economic Journal*, 54, pp. 131–132.

Keynes, J. M. (1936) *The General Theory of Employment, Interest and Money* (London: Macmillan).

Kriesler, P. (1997) Keynes, Kalecki and *The General Theory*, in: G.C. Harcourt & P. Riach (Eds) *The Second Edition of Keynes's General Theory*, Vol. 2 (London: Routledge).

Lavoie M. (1996) Traverse, hysteresis and normal rates of capacity utilization in Kaleckian models of growth and distribution, *Review of Radical Political Economics*, 28, pp. 113–147.

Lavoie, M. (2004) The new consensus on monetary policy seen from a Post-Keynesian perspective, in: M. Lavoie & M. Seccareccia (Eds) *Central Banking in the Modern World: Alternative Perspectives* (Cheltenham: Edward Elgar).

Lavoie, M. (2006) A Post-Keynesian amendment to the new consensus on monetary policy, *Metro-economica*, 57, pp. 165–192.

León-Ledesma, M. & Thirlwall, A. P. (2002) The endogeneity of the natural rate of growth, *Cambridge Journal of Economics*, 26, pp. 441–459.

Mankiw, N. G. (1999) Comment, in: R. M. Solow & J. B. Taylor (Eds) *Inflation, Unemployment, and Monetary Policy* (Cambridge, MA: MIT Press).

Nevile, J. & Kriesler, P. (2002) Tools of choice for fighting recessions, in: E. Carlson & W. Mitchell (Eds) *The Urgency of Full Employment* (Sydney: Centre for Applied Economic Research).

Palacio-Vera, A. (2005) The 'modern' view of macroeconomics: some critical reflections, *Cambridge Journal of Economics*, 29, pp. 747–767.

Pollin, J. (2003) Une macroéconomie sans LM: quelques propositions complémentaires, *Revue d'Economie Politique*, 113, pp. 273–293.

Robinson, J. (1956) *The Accumulation of Capital* (London: Macmillan).

Romer, D. (2000), Keynesian macroeconomics without the LM curve, *Journal of Economic Perspectives*, 14, pp. 149–169.

Semmler, W. & Zhang, W. (2004) Monetary policy with nonlinear Phillips curve and endogenous NAIRU, Working Paper #55, Center for Empirical Macroeconomics, Bielefeld University.

Setterfield, M. (2002) Introduction: a dissenter's view of the development of growth theory and the importance of demand-led growth, in: M. Setterfield (Ed.) *The Economics of Demand-led Growth: Challenging the Supply-side Vision of the Long Run* (Cheltenham: Edward Elgar).

Setterfield M. (2003) Central bank behaviour and the stability of macroeconomic equilibrium: a critical examination of the New Consensus, Post-Keynesian conference in Ottawa, September 2003.

Setterfield, M. (2004) Central banking, stability and macroeconomic outcomes: a comparison of new consensus and post-Keynesian monetary macroeconomics, in: M. Lavoie & M. Seccareccia (Eds) *Central Banking in the Modern World: Alternative Perspectives* (Cheltenham: Edward Elgar).

Setterfield, M. (2005) Central bank behaviour and the stability of macroeconomic equilibrium: a critical examination of the New Consensus, in: P. Arestis, M. Baddeley & J. McCombie (Eds) *The New Monetary Policy: Implications and Relevance* (Cheltenham: Edward Elgar).

Setterfield, M., Gordon, D. V. & Osberg, L. (1992) Searching for a will o' the wisp: an empirical study of the NAIRU in Canada, *European Economic Review*, 36, pp. 119–136.

Stockhammer, E. (2004) Is there an equilibrium rate of unemployment in the long run? *Review of Political Economy*, 16, pp. 59–78.

Solow, R. M. (1990) *The Labor Market as a Social Institution* (Cambridge, MA: Basil Blackwell).

Taylor, J. B. (1999) Monetary policy guidelines for employment and inflation stability, in: R. M. Solow & J. B. Taylor (Eds) *Inflation, Unemployment, and Monetary Policy* (Cambridge, MA: MIT Press).

Taylor, J. B. (2000) Teaching modern macroeconomics at the principles level, *American Economic Review, Papers & Proceedings*, 90, pp. 90–94.
Taylor, L. (2004) *Reconstructing Macroeconomics: Structuralist Proposals and Critiques of the Mainstream* (Cambridge, MA: Harvard University Press).
Villieu, P. (2004) Une macroéconomie sans LM: un modèle de synthèse pour l'analyse des politiques conjoncturelles, *Revue d' Economie Politique*, 114, pp. 289–322.
Walsh, C. E. (2002) Teaching inflation targeting: an analysis of intermediate macro, *Journal of Economic Education*, 33, pp. 333–346.
Wolfson, M. (1996) A Post Keynesian theory of credit rationing, *Journal of Post Keynesian Economics*, 18, pp. 443–470.
Woodford, M. (2002) *Interest and Prices: Foundations of a Theory of Monetary Policy* (Princeton: Princeton University Press).

Appendix

The New Consensus model, Mark I

$$\Delta\pi = \gamma_1(u - u_n) \tag{1}$$

$$u = u_0 - \beta r \tag{2}$$

$$r = r_n + \alpha_1(\pi - \pi^T) + \alpha_2(u - u_n) \tag{3b}$$

The New Consensus model, Mark II

$$\Delta\pi = \gamma_1(u - u_n) \tag{1}$$

$$u = u_0 - \beta r \tag{2}$$

$$\Delta r = \alpha_3(\pi - \pi^T) + (\alpha_4/\gamma_1)(\Delta\pi) \tag{3d}$$

Setterfield's Model

$$\pi = \gamma_2\pi_{-1} + \gamma_3 u + \pi_c \tag{1a}$$

$$u = u_0 - \beta r \tag{2}$$

$$\Delta r = \alpha_3(\pi - \pi^T) + (\alpha_4/\gamma_1)(\Delta\pi) \tag{3d}$$

Our Model

$$\pi = \gamma_4(u - u_m) + \gamma_5(u - u_{fc}) + \pi_n \tag{1b}$$

$\gamma_4 = 0$ *for* $u \geqslant u_m$ and $\gamma_4 > 0$ for $u < u_m$

$\gamma_5 = 0$ *for* $u \leqslant u_{fc}$ and $\gamma_5 > 0$ for $u < u_{fc}$

$$u = u_0 - \beta r \tag{2}$$

$$r = r_f + \alpha_5(\pi - \pi^T) + \alpha_6(u - u_{fc}) \tag{3e}$$

30
The Rate of Interest

J. W. Nevile

30.1 The Definition of the Rate of Interest

In technical economic language interest is a payment for the use of capital with the rate of interest the price paid for this use. Except in some specialized contexts interest is a financial variable paid for the use of financial capital or money. Economists often talk of "the rate of interest". In practice there is not one rate of interest but many. Interest rates can be on loans of any length of time. Loans from overnight to 10 years are common, but some are indefinite with no commitment ever to repay the money. In addition to the amount paid for the use of capital, interest rates often incorporate a risk premium to compensate the lender for bearing the risk that the capital may not be repaid promptly, or at all. The risk of most national governments defaulting is practically zero, so the interest rate they pay can be taken as a measure of the pure interest part of an interest rate.

30.2 Interest and Profits

Since the interest rate is a financial variable one would expect that interest rates are determined by the demand for, and supply of, loans and other financial assets. However, the dominant view among economists has been that interest rates will tend towards a figure determined by profits. In equilibrium, that is in a situation where there is no tendency to change, the rate of interest is equal to the rate of profit on the use of new physical capital goods. Hence, despite disturbances caused by purely financial factors, interest rates are largely determined by non-financial or real factors. However, this only holds if one is prepared to assume perfect competition and perfect knowledge of all future prices.

Reprinted from entries in the *International Encyclopaedia of the Social Sciences* by Nevile J. W. with kind permission of Macmillan Reference USA, All rights reserved.

The modern form of the theory underlying this is based on the work of a Swedish economist Knut Wicksell. In his path-breaking book published in 1898 Wicksell was concerned to explain trends in prices. Wicksell calls the interest rate fixed by financial markets the money rate of interest and the interest rate determined by real factors the natural rate of interest. He starts with a situation in which the money rate is equal to the natural rate. Wicksell then assumes an increase in the natural rate due, say, to a new innovation increasing the productivity of capital goods. The money rate is assumed to remain unchanged. Since the new capital goods are more productive and the interest costs are unchanged profits will increase, leading to an increased demand for new capital goods in the next period. Like most other economists of his time Wicksell thought that the economy was always more or less in a state where there was full employment of both labour and capital. Hence, an increased demand for new capital goods will raise their prices. The incomes of those supplying capital goods will increase and they will spend more on consumer goods raising the prices of consumer goods. The money rate of interest has not changed so it is still profitable to borrow to cover any higher prices of inputs and the whole process will continue until the banking system raises interest rates to the extent required to make the money rate equal to the natural rate. The reverse process occurs if the money rate is greater than the natural rate and causes falling prices. In both cases equilibrium is only reached when the money rate of interest changes to be equal to the natural rate, which itself is equal to the profit rate on new capital goods.

This analysis of how a divergence between the natural and money rates of interest causes cumulative movements in prices can be adapted to explain changes in the rate of inflation from some rate widely accepted as normal. It can even include relaxation of the assumption of full employment as long as any lapses are temporary and are relatively quickly removed by the functioning of the economy. In this analysis interest is the price which equates the supply of funds from net savings with the demand for funds for investment in new capital goods. However, Colin Rogers (1989) showed that the capital controversies[1] undermined the basis of the natural rate.

30.3 Interest and Money

Keynes' enormously influential book published in 1936, among other things, turned the focus of interest rate theory onto financial markets. In contrast to Wicksell's analysis Keynes focused attention on why people want to hold money rather than other financial assets such as bonds. The reason for holding money is that it is completely liquid. One can use it immediately. Keynes listed three reasons for desiring liquidity or 'liquidity preference". One is a transaction motive, not only to make easy both commercial and personal exchanges but to cover production costs before goods can be sold. Another

is the precautionary motive: to have the ability to respond immediately to unforeseen future needs. The last one is the speculative motive: to try and make a profit by guessing or by thinking that one knows the future better than the market as a whole. Keynes thought that the major influence on interest rates in the short run was that arising from speculation.

Not surprisingly, given the institutional arrangements of his time, Keynes thought that the volume of money in a country was determined by the central bank. This supply of money together with the demand for money resulting from liquidity preference determined the rate of interest. Today institutional arrangements are very different. The ability of financial markets to create money is determined by the demand for money, with external constraints much less important. Central banks now rely on more direct ways of influencing interest rates, mainly using changes in the interest rate they charge banks who borrow from them. Nevertheless, Keynes' emphasis on monetary factors and the allocation of assets remains important.

Fitting together the two theories by using monetary factors to explain interest rates in the short run and real influences to explain interest rates in the longer does justice to neither theory. In both cases the determination of the rate of interest is an integral part of the bigger whole. Keynesian economists deny the proposition that the economy trends strongly towards the full employment position which is a crucial part of the theory in the Wicksellian tradition. If the Keynesian view is correct and there can be continuing equilibrium at less than full employment, then causation will run more from interest rates determined in financial markets to real variables like output and capital productivity than the reverse. The different theories have very different implications for monetary policy.

30.4 Interest Rates as a Link with the Future

Irrespective of how it is determined, the interest rate has a crucial role to play in the allocation of new capital goods. Businessmen will only buy new capital goods if the expected profit rate on those goods is equal to or greater than the rate of interest. The rate of interest sets the hurdle that determines which of the myriad of ways, in which new capital can be used, are realized. Thus, the interest rate determines now what types of new capital goods there will be in the future, when the output these capital goods help to produce comes on to the market.

So far we have not discussed the situation where the money borrowed is used to buy consumer goods not capital goods. Here too the interest rate has a role to play in linking the present and the future. A person may borrow to increase current consumption because future income is expected to be greater than present income or future needs to be less than present needs. Alternatively, the borrower may give more weight to consumption now than to consumption in the future. The price of consuming more now

is given by the interest rate. Generally, the higher the interest rate the less consumption is shifted from the future to the present, though the strength of the relationship may not be strong and for many individuals the desire to consume now may result in future consumption being discounted enough to outweigh any likely rate of interest. Also higher interest rates may make those consumers who own their houses with much of the mortgage repaid feel richer and able to consume more.

Interest rates can also play a role in decisions about government expenditure and other policy decisions such as the tariff on imports of a particular commodity or introducing restrictions on logging. Cost benefit analysis can be used to analyse policy decisions taking into account wider social criteria and not only narrow economic benefits and costs. There are many technical problems in estimating the various costs and benefits, which are taken into account in evaluating a particular policy change. The one that is relevant here arises because a large part of both costs and benefits will occur in the future. In many cases more of the costs are in the near future compared to the benefits, so the choice of the interest rate used to discount future flows of costs and benefits has a big effect on the result. Some argue that the after tax interest return on risk free government bonds less the rate of inflation should be used. Others argue that, as this is a market rate of interest, it incorporates a higher rate of discounting the future than is appropriate for a social discount rate.

30.5 Monetary Policy[2]

The precise way monetary policy operates depends on the institutional arrangements in financial markets, but there is now very widespread agreement that the immediate target of monetary policy is the level of interest rates. The dominant view among orthodox economists is that the underlying objective of monetary policy should be to contain inflation, often to keep it in a publicly announced target range. In Wicksellian terms this objective is to keep the money rate close to the natural rate.

In the traditional story interest rate changes affect inflation and economic activity through their influence on investment in new capital goods. The implication is that this investment is by businesses. In fact an interest change usually has a stronger direct effect on residential construction by households. It may also affect credit card usage and other forms of household debt.

A second way a change in interest rates can influence the economy is its effect on bank assets. The value of existing financial assets goes down when interest rates rise. When the value of their assets is less, banks are less willing to lend and there is a small or large credit squeeze. Many economists think that the availability of credit is more important than the level of the interest rate in transmitting the effects of changes in monetary policy.

Orthodoxy also allows that, when employment is markedly below full employment, monetary policy can help hasten the return to full employment For them monetary policy has a part to play in restoring full employment, although almost all economists agree that lags in monetary policy are both long and variable. Keynesian economists hold that, in the absence of policies to prevent it, a market economy can remain well below the full employment level indefinitely.

In countries with floating exchange rates monetary policy may also be used to support the exchange rate. A freely floating exchange rate, where transactions are not constrained by any controls on capital transactions, is a very flexible price responding quickly to changes in supply and demand. In the modern global economy the vast majority of foreign exchange transactions are to invest in those financial markets where the returns are high. The return to investing foreign funds in a country is the rate of interest obtained in the country plus the expected appreciation of the country's currency in foreign exchange markets (or less any expected depreciation). Thus, unless it is thought to be very temporary, a rise in interest rates will lead to a higher exchange rate or prevent or reduce a fall in exchange rates if depreciation is expected.

More generally, globalization has reduced the efficacy of monetary policy. For example if rising interest rates reduce the availability of credit from domestic sources, this will be offset to some extent by the willingness of foreigners to lend. The biggest problem is probably the risk that policy to expand economic activity by reducing interest rates may lead to expectations of a depreciation in the value of a country's currency. Some depreciation is usually helpful in these circumstances, but a large depreciation can have serious impacts especially on the distribution of income. The desire to avoid these may hamstring monetary policy in some circumstances. Nevertheless, the general view is that governments still have considerable freedom in domestic macroeconomic management, but since the efficacy of monetary policy is reduced significantly, more reliance may have to be placed on other policies.

A different aspect of the operation of monetary policy has attracted considerable attention; its effect on the relationship between short term and long term interest rates. This relationship is usually called the term structure of interest rates or the yield curve. Central bank operations directly influence short term interest rates. When the actions of the central bank raise short term interest rates, longer term rates may not rise much, since the rises at the short term end of the market are often considered temporary and liable to be reversed when policy changes. Normally interest rates rise as the term of the loan lengthens, probably due to increased uncertainty about the level of interest rates in the more distant future. Thus the yield curve slopes upwards as the loan lengthens. For the reasons given above, tight monetary policy can flatten, or even invert, the yield curve. Many studies

have documented a historical relationship linking a flat or inverted yield curve with a recession somewhat later. Interest has arisen in using the yield curve to predict the level of activity in the genuinely unknown future, but this is a much more difficult exercise.

30.6 The Inflation Tax

In economic theory the rate of interest used is usually, either implicitly or explicitly, the real rate of interest. It is assumed that the inflation tax is quickly taken into account by borrowers and lenders, and that the nominal rate of interest rises and falls more or less equally with the rate of inflation. The amounts lent and borrowed and the real incomes of lenders and borrowers are not changed, at least if the effects of income taxes are ignored. The use of the nominal rate of interest in contracts in the actual world is mainly considered when considering the effects of the taxation system on peoples' decisions. However, in the world of this economic theory not only does everything happen quickly but also there is perfect knowledge. In the real world neither of these conditions holds. Empirical research shows that nominal rates do not usually adjust quickly and fully when the rate of inflation changes. They do rise and fall with inflation to some extent, but often slowly and rarely to the full extent, at least for decades. Sometimes a rise in interest rates may even come before the rise in inflation rates. Raising interest rates is the principal weapon central banks use to combat inflation, which is usually their major concern. The lags in monetary policy are notoriously long, and central banks sometimes make a preemptive rise in interest rates when they expect a rise in inflation. When the inflation rate is falling the reverse could occur. However, because of their great concern about inflation, central banks are often quicker to raise rates than to reduce them.

The use of the nominal rate of interest causes inefficiencies in the operation of the economy by subsidizing borrowers at the expense of lenders. Its use in monetary policy may have undesirable consequences for the distribution of income. If the rate of inflation is stable and relatively low these consequences are small, but the more these two conditions are broken the more important are the consequences of using the nominal rate of interest.

30.7 Real Rate of Interest

The real rate of interest is the nominal rate adjusted for the loss, due to inflation, of the purchasing power of the amount lent, that is the nominal rate of interest less the rate of inflation. This statement is often called the Fisher equation after Irving Fisher, an American economist who developed it in a series of publications in the first thirty years of the twentieth century. Looking back at interest rates and inflation at the end of a period, it is possible to use statistics to calculate how the real rate of interest behaved over

that period. However, what is of major interest in economics is what decision makers think the real interest rate is going to be in the future period relevant to the decision being made. Thus, in economics, as opposed to economic history, the size of the real rate of interest is something people think will hold in the future. It cannot be measured precisely. Nevertheless, if at the end of a period the Fisher equation has not held, either the inflation rate was not what was expected at the beginning of the period or people did not fully take inflation into account and suffered, at least to some extent, from what is called money illusion. This latter view was the one held by Fisher himself. In his 1930 book he argued that the relationship between the real rate of interest, the money rate, and inflation was a long-run relationship which only held when the rate of inflation did not change much over a long period. He thought that when the rate of inflation fluctuated the rate of interest adjusted to some extent but not by enough to compensate fully, or even largely, for the changes in the rate of inflation. Fisher blamed money illusion for this.

Although the real rate of interest is normally defined by the Fisher equation, it has a large role to play in economic theory apart from any relationship between inflation and interest rates. The dominant school in economics holds that the real rate of interest is the price that brings into equality the demand and supply of savings. The demand for savings comes partly from those who want to obtain income in the future either by investing in physical capital goods or by increasing their ability and skills. Demand also comes from those who wish to consume more now, relative to their income in the future. The supply of savings comes from those who wish to consume more in the future relative to income then, those who are saving to buy a capital good in the future, and those who have borrowed in the past and are paying off loans. Overall, it is thought that these various components of demand and supply depend on things that only change slowly, such as demographics, the rate of productivity change, institutions, and culture. When the underlying demand for savings equals the underlying supply of savings and there is no tendency for the rate of inflation to change, the real rate of interest is called the equilibrium real rate of interest. This rate, which economists often have in mind when discussing real interest rates, sums up overall the degree to which future benefits and costs are discounted compared to those in the present. Depending on the context this is called the rate of time preference or the social discount rate.

Most modern economic theory assumes that money illusion is unimportant, that the economy moves quickly to a position of equilibrium, and that in equilibrium the real interest rate is stable. Taken together these propositions suggest that the real interest rate is less volatile than the money interest rate. However, empirical studies suggest that this is not the case and that, when the rate of inflation varies, the money interest rate adjusts less than it should if the above three propositions are correct. Given that it is

the expected rate of inflation when decisions are made that is relevant, the key issue in these studies is how to measure expected inflation. Some studies use survey data. Others assume a variety of mechanisms by which peoples' expectations are formed and use statistical techniques to measure the expectations so determined from the past data which formed expectations. Generally these studies show that, assuming a relatively stable real interest rate, the Fisher equation does not hold. Various ingenious propositions have been put forward to explain this, but the weight of the evidence confirms Fisher's view that money illusion has a significant role to play in the operation of the economy.

Notes

In 'western' economies the rate of interest affects more decisions that any other single price. This chapter is offered as a quick overview for those who are not well acquainted with technical interest rate theory. It is an amalgam of three entries in the *International Encyclopedia of the Social Sciences*, (Macmillan Reference USA, 2008) namely "Interest Rates", "Interest rates, Nominal" and "Interest rates, Real." It has been lightly edited to remove duplication and, in places, to improve the English.

1. A very vigorous discussion between economists in Cambridge England and economists in Cambridge Mass. USA. For a readable introduction to these see Harcourt and Cohen (2003).
2. This section outlines briefly material which is often relatively technical. Much of it is discussed at greater length in Kriesler and Nevile 2003.

References

Fisher, Irving. 1930, *The Theory of Interest: As Determined by Impatience to Spend Income and Opportunity to Invest*, Parts I and II, London: Macmillan. Reprinted Fairfield NJ: Augustus M Kelly, 1986.

Cohen, A.J. and G.C. Harcourt, 2003. "Whatever happened to the Cambridge Capital Controversies?", *Journal of Economic Perspectives*, vol. 17 no. 1, pp. 199–214.

Keynes, John Maynard. 1936. *The General Theory of Employment Interest and Money*, London: Macmillan.

Kriesler, Peter and J. W. Nevile. 2003 "Macroeconomic Impacts of Globalization". In *Growth and Development in the Global Economy*, ed Harry Bloch, pp. 173–189. Cheltenham: Edward Elgar,.

Rogers, Colin. 1989 *Money, Interest and Capital: A study in the foundations of monetary theory*, Cambridge University Press,.

Wicksell, Knut. 1898. *Interest and Prices*. Trans. R. F. Kahn. New York: August M. Kelly, 1936.

31

Comment on Professor Lerner's Paper: A Marxist View

Joseph Halevi

Lerner's argument can be divided into two parts, one dealing with the asymmetrical working of the price mechanism in the Keynesian system and one dealing with the measures necessary to keep the wage/productivity relation constant. The latter part is essentially dynamic in character and it ends with the proposal of issuing wage permits as a means to curb cost-push inflation. I shall not discuss the practical validity of the above suggestion but shall confine myself to the theoretical content of Lerner's argument. The Keynesian multiplier in its simplest form asserts that it is possible to move from a given degree of unused capacity output to full capacity (when the latter is supposed to coincide with full employment) without any major change in the cost-price relations. When the full-employment level of output is reached, any further increase in money income will be reflected in prices, since the existing level of capacity cannot accommodate the additional demand in real terms. The above mechanism suggests that prices do not regulate supply and demand, but the level of profits and the distribution of income instead. This is possible only because spare capacity exists; otherwise any adjustment must be brought via movements in prices. In an economy where prices have lost the role of equilibrating supply and demand, inflation cannot be curbed by curtailing the level of monetary expenditure, since to a reduction in spending there will be a corresponding fall in output and employment. According to Professor Lerner, however, the failure of the price mechanism is to be seen in the downward rigidity in money wages under static conditions, and in their rapid upward adjustment to the rate of inflation under dynamic ones. That is, wages do not fall behind the expected rise in prices.

The important point in Lerner's argument (with which I fully agree) lies in having stressed the fact that a cut in monetary spending first and foremost

Revised from *Social Research*, 46(2): 240–254 (first published), 'Comment on Professor Lerner's Paper: A Marxist Viewm,' by Halevi, J. With kind permission from John Hopkins University Press. Copyright © 1979 New School for Social Research. All rights reserved.

generates unemployment rather than a decline in the rate of inflation. This is possible only because prices are (rightly) viewed as being cost-determined. Under these circumstances the dynamic condition for price stability is given by wage increases proportional to productivity gains. The above is a widely accepted result in contemporary economic analysis.

31.1 General Remarks

I shall begin by arguing that wage flexibility is not a necessary prerequisite for achieving full employment. As a matter of fact, this view is not new, and it has been presented in a variety of ways. If, for instance, we assume recontracting to be an exception rather than a rule[1] and we start with an initial set of wrong relative prices, we ought immediately to consider false trading, hence disequilibrium, as the norm. There is no need to attach to wages any special behavior. Another way of looking at the problem is to take into account the formation of a concentrated sector in which markups are a function of a minimum target rate of profit.[2] In this case unit prices are up to a point inversely related to demand and positively related to changes in costs. The above approach has in my opinion the merit of reflecting the historical development of modern capitalism in which changes in the market structure took place prior to (if not independently of) the making of a strong trade-union movement, being chiefly determined by the uneven diffusion of technical progress. Yet, I think, these views do not explain why a private-enterprise system fails to achieve full employment of resources "abstracting" from "perverse behavior," market imperfections, and all the rest. I shall therefore argue that, even when wages have to fall in order to attain full employment, the (capitalist) economy may well react in an opposite direction.

In order to pursue this task, it is necessary to think of equilibrium not in "abstracto" but in relation to the structure of the economy. This is determined by output and labor coefficients existing at any one time and by the fact that production is specific and can be broadly divided into two non-homogeneous products: capital goods and consumption goods. Taken together, "specificity" and output and labor coefficients give us the degree of absorptive capacity of the system. This line of thought, while dating back to Marx and used by Kaldor in 1938 to explain the relationship between employment and fluctuations, has been only recently developed in a fully fledged theory by Professor Adolph Lowe in his fundamental work *The Path of Economic Growth,* on which the argument below is based.[3]

31.2 Effective Demand in a Static Structural Framework

Let us assume an economy under stationary or steady-state full-employment equilibrium. Suppose an exogenous increase in the annual rate of growth of the labor supply takes place. In order for the additional workers to be

employed, capital goods must be provided for them to work with. But this means that the output of the capital-goods sector will have to be increased. Since it is already working at full capacity, there will have to be, initially, a *more than proportional* increase in the saving ratio, so that the capital-goods industries can be expanded relative to the consumption-goods industries. Thus the economy experiences a decline in the supply of consumption goods in relation to the previous period and at the same time an increase in employment; given the money wage, consumption-goods prices must therefore rise.

The resulting windfall profits, however, should not be invested in the consumption-goods sector until the process of adjusting the composition of capital stock to the expanded labor force is completed. Hence monetary profitability as an indicator of investment demand does not here perform any equilibrating role, and the shift in capital funds has to be brought about through sectorial capital taxation.

Consider now the case in which an increase in the supply of labor does lower the money wage. Employment can expand only after the change in the composition of capital equipment has made the investment-goods sector capable of growing at a higher rate.[4] Meanwhile, due to the reduced wages, a surplus of consumption goods has been accumulating. Under conditions of perfect and simultaneous price flexibility, consumption-goods prices would fall, thereby restoring the previous situation and preventing the resource shift from taking place. If on the other hand prices were rigid, the inventory accumulation might appear undesired to the capitalists in the consumption-goods sector so that the level of activity will be slowed down, triggering a Keynesian recession, in the absence of an increase in investment in the capital-goods industries. An increase in investment will be possible only if entrepreneurs in the latter sector will interpret the reduction in sales of consumption goods stemming from lower wage rates as an indicator of larger capital requirements. This is doubtful since it implies that capitalists invest as a class with the macroeconomic goal of providing employment.

It can be argued that in such a situation the government might step in through traditional Keynesian deficit spending policies. However, sustaining the level of effective demand means essentially preventing the latter from falling, but it does not imply directing the sectorial composition of investment in the required proportion. Therefore unless the government intervenes in prima persona in the allocation of investment goods there is no assurance that the necessary shift in resources will materialize in either case.

I have dwelt on this example (taken from Lowe's model) at some length because it brings to the fore two elements: (1) Even when wages fall neither perfect price flexibility nor the accumulation of inventories in the consumption-goods sector will generate a reaction such that the additional supply of labor will be absorbed. In fact, as Lowe correctly points out, in order for the economy to move on a higher path of capital accumulation entrepreneurs

should no longer act on the basis of the "maximization" of pecuniary profits. (2) The management of effective demand by stimulating private investment has a limited validity in relation to full-employment goals. Actually, when it is necessary to free resources, Keynesian policies may constitute a hindrance rather than a stimulus. The alternative, however, is not a more laissez-faire economy but state intervention in the sphere of private investment.[5]

A possible criticism to the above reasoning is that the underlying model is both unduly complicated and too simplistic. Its complexity arises from the rigidity of labor and output coefficients which do not allow a fall in wages to be ipso facto matched by higher employment levels. Instead, a slow and by no means smooth and automatic transitional mechanism is required. Its simplicity may be seen in the fact that a two-sector model is in no way representative of the real economy. In the next section, however (devoted to the relationship between wage increases and productivity), it will appear that these very factors constitute the strong points of a Marx-Lowe type model as soon as we compare it with post-Keynesian dynamic ones on which current policy recommendations, including Lerner's, are explicitly or implicitly made.

31.3 The Wage Productivity Relation in a Structural Framework

The main concern of post-Keynesian growth models is to be seen in the definition of the set of conditions under which full employment can be maintained over time given the rate of growth of population and productivity.

Starting with given capital input coefficients (that is, the amount of capital equipment necessary to produce a unit of output), it has been found that the share of investment over national income cannot exceed a certain proportion determined by the above three parameters. It follows then that, at full employment, wages should increase along with productivity, otherwise either the problem of effective demand will make its appearance or prices will decrease. Since, however, the share of investments, hence the saving ratio, may exceed or fall short of the required proportion, adjustments will have to be made through changes in the distribution of income on the basis of upward and downward price flexibility. In this way a curious and paradoxical situation arose in the Western literature. It was assumed that government spending would solve the problem of effective demand in the short run while price flexibility would maintain the balance between demand and capacity in the long run.

There is a fallacy in this, however. The argument has been constructed on the basis of a "one commodity output," which is both investible and consumable. Thus any increase in the saving ratio is ipso facto transformed into higher real investment, likewise any fall in the saving ratio takes the form of higher consumption. The general case, however, is that of a

system whose output is divided into a set of nonsubstitutable goods. As a result, the decision to change the composition of capital equipment will be taken ex ante whereas prices should adjust after the fact, and only by a fluke will this correspond to full-employment requirements. In this context I would like to stress once again that government activities in the West, far from coordinating the structure and the level of investment, may even add further "rigidities" to the already existing ones, by stimulating investment in a wrong direction (as already pointed out by Lowe).[6] To quote Michał Kalecki (which leads us directly to the relationship between wages and productivity):

> Nowhere in Western models appears the problem of "long run development bottlenecks." When national income grows at a high rate the expansion of certain industries lags behind that of demand for their products because of certain organizational or technological factors. . . . The resulting gaps have to be made good by foreign trade and to maintain the balance of the latter either some exports have to be increased or some imports replaced by home production. These operations will be usually accompanied by higher outlays of capital and labour and in this way affect profoundly the problems of economic growth.
>
> The contradiction between consumption in the short period and in the long run and the long run bottlenecks . . . are in fact the central problems of a realistic theory of growth in a socialist economy.[7]

Leaving aside for the time being the question of the balance of trade, Kalecki's remarks fit particularly well in a framework such as Lowe's. That is, since the capitalist economy does not display any equilibrating mechanism vis-à-vis full employment, to increase wage rates exactly with productivity is valid only in the special case where *productivity changes are uniform and the share of investment corresponds to the requirements of full employment,* given the composition of capital equipment. In short, to avoid inflationary strains it is necessary for wages to be tied to consumption-goods output and not to the weighted average of productivity in both sectors. If, for instance, labor productivity increases more in the capital-goods rather than in the consumption-goods sector, raising wages by the weighted average of productivity changes in both will, on the one hand, generate excess-demand inflation in consumption-goods markets while, on the other hand, profit margins will increase in the capital-goods sector.

Productivity increases in capital-goods industries have a completely different effect on the economy than those in consumption-goods industries. They chiefly change the saving ratio for any given growth rate. In this way they do influence the level of real wages, but only indirectly and after a certain time. It is necessary first to have a shift in the composition of capital equipment with wages remaining unchanged in the transitional period. It

is quite possible, however, that to a higher labor productivity in the capital-goods sector will correspond a lower level of investment with higher unit profits, giving rise to stagnation tendencies. The same phenomenon can occur in the consumption-goods sector if productivity in the latter were to rise more than the average. Prices may not fall in the same proportion, which, in a closed economy, will lead to a slow down in the aggregate investment rate. It must be noted that in my scheme (borrowed from Lowe) the inflationary pressure on consumption goods can be mitigated by a change in the structure of capital equipment in favor of the latter, provided the saving ratio does not fall below the full-employment level. This leads to the problem of the formation and utilization of the surplus (a topic dealt with by Paul Baran in his famous *The Political Economy of Growth*[8]), which raises an important point about the relationship between inflation and deficit-spending policies when the latter leave the determination of what and where to invest to capitalists' decisions. Baran's argument is all the more remarkable since it was expounded in a period of relative price stability.

He begins by criticizing the view according to which *any* type of spending is to be welcomed, on the grounds that it maintains or increases the level of demand and employment. He correctly notices that any expansion of investment induced by government expenditure will eventually increase productive capacity, which in turn will outpace the level of effective demand. Thus further and larger deficit management would be necessary.

Now, if public spending is directed toward nonproductive activities (in Baran's view, armaments) the expansion in money incomes will not be matched by a proportional flow of output, in particular consumption goods, hence an inflationary situation will arise. The important point is that inflation is seen as dependent mainly on *where* investment is directed and only to a lesser extent on the wage/productivity relation. In fact, if the wage bill were to expand along with the average increase in productivity plus the net augmentation of employed labor, but consumption goods were to expand *less,* inflation would take place anyhow. Thus the wage bill should increase only pari passu with the expansion of consumption-goods output (inclusive of housing). In our case, then, unit wage rates must expand less than the average productivity. Yet the inflationary strains will not disappear altogether, since they will be felt in all those branches of the industry roughly operating under competitive conditions where supply is inelastic and where the notion of nonimmediate substitution also holds.

It is easy to see how Baran's analysis blends with the argument developed in this paper and with Kalecki's observation on long-run bottlenecks. Keynes, too, was aware of the problem of the structure of investment in relation to the level of effective demand, but he took a somewhat ambiguous position toward it. On one hand he acknowledged that "there is no clear evidence from experience that the investment policy which is socially advantageous coincides with that which is most profitable."[9] On the other

hand, however, he maintained that there is no reason to assume that "the system seriously misemploys the factors of production which are in use"; hence: "It is in determining the volume not the direction of actual employment that the existing system has broken down,"[10] thus dismissing any necessity to socialize economic activity. Since the last propositions are cast in much stronger terms than the first one, I would assume that they reflected Keynes's thought more closely.

Today with the use of a pure reproduction model formed by non-homogeneous goods and nonshiftable capital equipment, it is possible to prove that at any one time a definite relationship exists between the volume of output and its structural composition, if full employment has to be maintained. Furthermore, as I tried to show in the first section, the adjustment process is by no means continuous and automatic. Yet the sources of the factors impeding the structural adjustments have to be found in the socio-economic characteristics of the advanced capitalist economies. Thus Kalecki, by assuming the distribution of income given and exogenously determined, pointed at the degree of monoply as the barrier to changes in the composition of investment. The constancy of the markup on wages becomes the cause of the problem of effective demand. More exactly, it is because of the oligopolistic features of the economy that the shift in investment from capital goods to the consumption-goods sector may fail to take place to the required extent. In this context the level of income and employment is tied to changes in the level of investment rather than to those in productive capacity. The latter type of change is indeed a characteristic of centrally planned socialist economies where a fall in investment can be accompanied by an increase in output and employment. This phenomenon would happen (in fact, has happened) if more investment were devoted to consumption-goods rather than capital-goods industries. There is an important corollary to the above statement, namely, that consumption-goods prices will be lower and the wage/productivity ratio higher due to the change in the composition of output.

31.4 Closing Remarks

The argument suggests, contrary to Lerner's hypothesis, that there is no unique relationship between wages and productivity in relation to prices as long as we do not define how and where investment goods are allocated. If prices are indeed positively related to increases in the wage/productivity ratio, this is because in an oligopolistic economy investment decisions are made with purposes other than those of providing a rate of accumulation necessary to keep full employment along with the satisfaction of social needs. Kalecki provided the theoretical basis for understanding the process described above. Baran sought to explain the socioeconomic foundations underlying it, pointing out among other things the contradiction between deficit-spending policies

and full employment and the role played by armaments. There is no need, however, to resort to armament expenditure as the chief explanation (although it points to a basic feature of American capitalism). Exports play the same role; as Kalecki put it, "Without such markets (export) profits are conditioned by the ability of capitalists to consume or to undertake capital investment."[11] This is particularly true in the light of capitalist countries' tendency to export quite independently from what is needed (in relation to imports) to achieve full employment. In this case the non-uniqueness of the wage/productivity relation also holds but in reverse: whenever foreign demand falls significantly a wage policy is advocated to foster price competition; since, however, in many cases this does not eliminate the fall in exports, wage curbs are nonetheless accompanied by cuts in output and employment at home.

This is not to deny that sometimes (as I believe is the case now for Italy) the level of wages is too high in relation to the full-employment rate of investment. Yet as long as the latter does not flow back to the community in the form of social accumulation it is impossible to implement any type of wage/ income policy. In Western Europe the labor movement is directly or indirectly aware that capitalist investment, a chief source of jobs, is nevertheless based on considerations which have nothing to do with long-run stability. This is why social contracts and wage policies are bound to fail (as they have) in the absence of some form of socialist planning.[12]

31.5 A Political Footnote

I ended my comment on Professor Lerner's essay with a statement about the political awareness among the working-class forces in Western Europe that income or wage policies as well as "social contracts" are not tied to investment programs aimed at the satisfaction of both full-employment and social needs at large. Quite the contrary is true: the level of home investment is increasingly seen as a passive (dependent) variable, whereas exports are looked upon as the truly independent one. This is best exemplified in the so-called New Economics of Cambridge, in which the level of domestic demand acts as a constraint on exports, thus becoming a hindrance to (profit) expansion. The vicious circle generated by export-led policies is well known: once the level of domestic demand has been compressed or limited, the chances that imports will be reduced and exports increased by the desired amount are weaker, the more the same policies are adopted by all countries with the avowed goal of exporting to the *same* areas. In the case of failure the wage/productivity relation can no longer be taken as parametric but will have to be revised downward if the policy is to be maintained. All the same, in the case of success the relative impoverishment at home is likely to hit the export industries in the competing countries, causing stagnationist tendencies with negative effects on the level or on the rate of

increase in employment. The main contradiction involved becomes clear. Exports represent the truly independent variable of the system, the indicator of its profitability. Yet to the extent to which this policy is carried out by *all* the countries it can be achieved only through stop-go policies at home.[13] From the viewpoint of the working-class movement the above shows on one hand that the level of social well-being could have been higher had exports been considered as a *dependent* variable. On the other hand, it shows that stable prosperity at home depends on stable prosperity abroad *provided* the vicious circle of stop-go policies is altogether defeated.

It is against this socioeconomic background that the crisis of what I think has been the basic political pillar of postwar Europe has to be evaluated, namely, the breakdown of social reformism, which can be summarized as follows:

From the late 'fifties to the early 'seventies it was taken for granted that social welfare and full employment were not incompatible with the working of a capitalist economic set up, especially with the drive for exports. The general argument was that the state sector would supply advanced social services at a level superior to those in Eastern Europe without generating a conflict with the private sector. Of course it did not pass unnoticed that the economic development was taking place in a structurally uneven way, entailing the industrial decay of Wales, Scotland, and northern France along with the maintenance of a large gulf between southern Italy and the north. However, the exceptional high rate of growth of per capita income along with an effective social-welfare system somewhat mitigated the above chronic imbalances at the political level.

The picture completely changed in the early 'seventies. The recession largely due to the simultaneous effect of export policies produced a situation in which the system of social services came under attack and began to be progressively dismantled. The avowed goal, as clearly stated by two Oxford economists in a recent book,[14] is to free home resources (i.e., reduce the purchasing power of the working population and state expenditure on these services) in order to boost the economy in its export component once again without even mentioning the chronic imbalances generated by that very policy.

It is interesting to see that the crisis of social reformism manifests itself as a political crisis of the social democracy and not of the conservative parties. This is because while the social democracies provided the mass support for welfare programs, their implementation took place largely under conservative governments; today the social democracies are largely involved in curtailing them.

The crisis of the social democracies also stems from the fact that they accepted in most cases wage or income policies assuming that no contradiction existed between the latter and the social-welfare system.

This has proved to be wrong, and in the meantime the renewed drive for exports is no longer mitigated by an ever increasing level of employment

and income. Quite the contrary. This sharpens the uneven features in which development is taking place, since no solution to the chronic imbalances is in sight even for the long run. There is therefore in many European countries a strong and *healthy* pressure to discuss the problem of the allocation of investment in its sectorial and regional dimensions.[15] Only in this context can some form of wage restraints be devised when necessary. Yet this type of wage policy stands in complete opposition to the ones followed so far. In fact, to implement the former the latter have to be unambiguously defeated.

Notes

1. Cf. A. G. Hines, "The (Neo)-Classical Resurgence and the Reappraisal of Keynes' Theory of Employment," in T. M. Havrilesky and J. T. Boorman, eds., *Current Issues in Monetary Theory and Policy* (Arlington Heights, Ill.: AHM Publishing Corporation, 1976), pp. 29–39.
2. Cf. Paolo Sylos-Labini, *Trade Unions, Inflation, and Productivity* (Lexington, Mass.: Saxon House/Lexington Books, 1974), pp. 65–86; H. H. Wachtel and P. D. Adelsheim, "How Recession Feeds Inflation: Price Markups in a Concentrated Economy," *Challenge,* September/October 1977.
3. Cf. Nicholas Kaldor, "Stability and Full Employment," in his *Essays on Economic Stability and Growth* (London: Duckworth, 1960), pp. 103–119; Adolph Lowe and Stanford Pulrang, *The Path of Economic Growth* (Cambridge: Cambridge University Press, 1976), pp. 95–100.
4. Cf. Michał Kalecki, "Full Employment by Stimulating Private Investment?", *Oxford Economic Papers* 7 (March 1945): 83–92.
5. This is because under stationary or steady-state conditions the change in the structure of capital equipment is initially achieved through an unchanged level (rate) of capital-goods output. The difference lies in the fact that less investment is poured into the consumption-goods sector and pro tanto more investment is allocated in the capital sector.
6. For an empirical analysis, see J. C. R. Dow, *The Management of the British Economy 1945–60* (Cambridge: Cambridge University Press, 1964), particularly Part IV.
7. Cf. Michał Kalecki, "Theory of Growth in Different Social Systems," *Scientia,* May/June 1970.
8. Paul Baran, *The Political Economy of Growth* (New York: Monthly Review, 1957).
9. J. M. Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936), p. 157.
10. *Ibid.,* p. 379.
11. Cf. Michał Kalecki, *Selected Essays on the Dynamics of the Capital Economy* (Cambridge: Cambridge University Press, 1971), p. 86.
12. Cf. D. M. Nuti, "On Incomes Policy," *Science and Society* 33 (Fall 1969): 415–425; R. Heidner, *Lontagarfonder* (Stockholm, 1975).
13. J. Robinson and F. Wilkinson, "What Has Become of Employment Policy?", *Cambridge Journal of Economics,* March 1977, pp. 5–14.
14. Cf. Robert Bacon and Walter Eltis, *Britain's Economic Problem: Too Few Producers* (London: Macmillan, 1976), pp. 117–158.
15. Cf. B. Rowthorn and D. M. Nuti, "Politica commerciale attiva non é sinonimo di autarchia," *Rinascita* (Rome), no. 30 (July 1977): 20–22.

32

Observations on Kaldorian and Post-Keynesian Approaches to Inflation

Joseph Halevi

This chapter discusses the Kaldorian and Post-Keynesian approaches to inflation. The main thrust of the chapter is a critique of the notion of a fixed markup. Through the use of a two sector capital goods-consumption goods model with sectoral degrees of capacity utilisation, it is shown that the markup itself varies according to changes in the sectoral structure of the economy, including nonuniform changes in the sectoral rates of utilisation. It is suggested that viewing inflation as stemming from money wage increases relatively to productivity is not as robust as it might appear in some of the Post-Keynesian literature.

32.1 The Kaldorian Story: A Point of View

In the economic literature Post-Keynesian economics has been presented mainly as an alternative to neoclassicism (Eichner and Kregel, 1975). Yet in my view the thrust of the arguments put forward by Nicholas Kaldor, the founder of the Post-Keynesian approach, are ultimately directed against Marx, not necessarily in an anti Marxian sense, but rather as an alternative explanation of the socioeconomic evolution of the capitalist system. Like the classical economists, Kaldor views the capitalist system as the natural form of economic activity, a fact proven also by the significant degree of stability it displays:

> in the history of advanced capitalist societies periods of severe unemployment were exceptional and not the rule... this is unlikely to have been a mere coincidence; it strongly suggests that forces must have been at work which operated on the relationship between effective demand and

Revised from *Economies et Sociétés*, No. 8, 33–46, December 1991, 'Observations on Kaldorian and Post-Keynesian Approaches to Inflation,' by Halevi, J. With kind permission from Institut de Sciences Mathématiques et *Economiques Appliquées*. All rights reserved.

> supply, or between the propensity to invest and to save, in such a way as to yield an equilibrium level of employment that was fairly close, if not equal to, the full employment level (Kaldor, 1959, quoted from Kaldor, 1964, p. 169).

This is a very different picture from Marx's view where development is based on the periodic recurrence of booms and slumps. The linchpin of Kaldor's theory is the consideration that in a Keynesian stage the capitalist economy becomes emancipated from the regulatory mechanism represented by the Reserve Army of the unemployed and, instead, it is constrained by the level of effective demand. The crucial factor which accounts for the analytical disappearance of the Reserve Army is the growth of the stock of capital relatively to active population. In Marx, Kaldor argues, the employable work force has to be tendentially greater than the employment capacity of capital equipment (Kaldor, 1957). In this way the surplus population by exerting a downward pressure on the real wage, enables the economy to maintain a high rate of investment, given the classical assumption that all profits are saved and invested. Real wages, and the wage share over national income, are governed by the cyclical movement of the surplus population and not by productivity increases. Thus, there is a strict inverse relationship between the share of investment and the share of wages over national income.

However if, at some point, productivity increases become the dominant element in the dynamics of accumulation and growth, variations in real wages need not follow the Marxian pattern. Real wages can expand along with productivity and capitalists are free to determine the level of investment for any given propensity to save out of profits. Under these circumstances the stock of capital can actually grow even beyond the point where it will absorb the whole of the labour force. Such a situation will clearly lead to a breakdown in investment as it implies a structural inability to absorb additional investment, if it were not counterbalanced by price flexibility. In this context the adjustment mechanism between the propensity to invest and the propensity to save leading to "an equilibrium level of employment" operates as follows.

Whenever the full capacity growth rate of the economy exceeds the full employment natural growth rate, prices will fall in relation to wages – thereby raising the overall propensity to consume. Capitalists may still save a fixed percentage of their profits without hindering the adjustment process, since the latter depends on the flexibility of prices vis-à-vis money wages. The higher propensity to consume will expand the level of effective demand for consumption goods, while the lower propensity to save will reduce the relative growth of the capital goods production. True, in the Kaldorian conception of the world, there is no instantaneous equilibrium, therefore the forces at work are only of a long term nature. This means that in the short

run active Keynesian policies are necessary in order to facilitate the above mentioned adjustment process. At any rate, the dynamics of capitalist accumulation is portrayed as proceeding fairly smoothly provided the appropriate Keynesian policies are adopted.

32.2 The Problem of Inflation

The Post-Keynesian view of inflation stems directly from the above conception of a relatively smooth growth path.

In Kaldor, who is by far the most alert and coherent thinker of that school of thought, inflation acquires a double edged role. The first, and perhaps the most important role, consists in preventing a secular fall – so to speak – of the marginal efficiency of investment. In other words, inflation, by reducing the real value of the interest rate, controls the rentier spirit inherent in every capitalist. This view, which Kaldor took from Robertson, requires that investment projects be financed on the basis of a long term rate which is not indexed to inflation or is only slowly adjusted to it. This would be institutionally conceivable only if – to use Robertson's expression – prices were rising "gently". A gentle inflationary pressure is not possible without institutional controls. It is at this point that the second dimension of inflation can be brought in.

As explained previously, the two pillars of the Kaldorian story consist of an expansion of real wages at the same rate as productivity growth and of a given propensity to save out of profits. In this context the share of profits over national income is subject to two restrictions: one in which that share cannot be lower than a certain rate of profit on capital (multiplied by the capital output ratio) because of risk, and one in which the share of profit cannot be lower than a certain degree of monopoly because of imperfections in the competitive process. In general the higher of the two will apply (Kaldor, 1956). Within these limits the dynamics of real wages are determined by the combined effect of two forces: growth of real wages along with increases in productivity, which can be considered a sort of steady state growth if productivity rises uniformly overtime, and changes induced by the price flexibilities inherent in Kaldor's distributive process. Outside the bounds established by the interaction of these two forces rises in money wages will not affect the share of profit over national income. In particular, money wage increases above productivity will be met by a rise in prices because the "scope for wage increases is limited by what can be granted out of the profits earned at the *existing* prices" (Kaldor, 1959, in 1964, p. 193). In this case inflation, or rather the social forces generating it, is disruptive since it prevents the macroeconomic adjustment process from working. It follows that income and wage policies are the necessary instruments for the operation of the Kaldorian distributive mechanism

(Kaldor, 1957, 1959). Moreover, according to Kaldor, income policies are a necessary instrument of social discipline for the implementation of full employment policies, because neither employers nor unions are likely to incorporate into their bargaining strategies the rise in prices induced by their actions.

It is not difficult to see that this approach is not general but tied to a specific historical phase of modern capitalism; a phase in which the conceptualisation put forward by Kaldor seemed to fit the actual pattern of growth and development. We are referring here to the period that – in Europe, at least – goes from the end of the Korean war till 1971. In that period many factors appeared to justify the original Post-Keynesian view of the modus operandi of capitalism: for well over a decade after the Korean war European industrialised nations tended towards full employment without major structural impediments and bottlenecks, with inflation coming mostly from the cost side, initially at a leisurely pace (a good thing) and later at an accelerating rate accompanied by a parallel acceleration of wage increases.

This state of affairs led two overoptimistic Marxists to declare that workers were by now becoming so strong as to precipitate capitalism into a profit-squeeze crisis. The message clearly was that if the working class was capable of halting the economic functioning of the system, by raising wages up to the point where little surplus was left for investment and accumulation, then the next natural step would have been to assume political control (Glyn and Sutcliffe, 1973). In Kaldorian terms by contrast, the slow down in growth rates at the end of the 1960's could be interpreted either as part of the tendency inherent in the adjustment towards the full employment growth rate, provided that the process itself is not derailed by wage inflation, or, indeed, as an excessive strength of labour unions thereby excercising a pressure on the markup at *existing* prices. For this reason, if the markup comes under constant pressure by money wages rising above productivity gains, firms will be hard put to find a rational basis for their investment decisions. It follows that whenever firms are unable to stabilise the wage-cost/productivity relation, investment plans are hindered with negative consequences on output and employment. In institutional terms this sort of instability does not imply that capitalism is pushed with its back to the wall. It simply means that the stability of industrial investment is jeopardised with negative Keynesian consequences on the economic position of the workforce which cannot but affect adversely the political strength of the labour movement as well. In other words, if the description of the British situation put forward by Glyn and Sutcliffe was correct – an analysis which deeply influenced left wing economic thought in other countries as well, notably Italy – the Kaldorian answer would be that the labour movement's strength undid the two restrictions mentioned above.

With the share of profits falling below the deemed minimum the tendency to full employment will break down and the economy will plunge into stagnation.

Compared to the romantic view put forward by the two British Marxists, which may well be seen as a product of the Dagenham strikes and the campus politics of 1968–1969, Kaldor's sturdy political realism wins hands down. Neither May '68 in France nor the five year long hot Autumn in Italy, let alone the much smaller and fragmented strike wave in Britain, have ever expressed a situation in which the labour movement was on the threshold of a radical change in class relations in its favour. If anything, the evolution of the capitalist economy was moving towards an interim period in which the crisis of accumulation was about to bring about a counter reformist change in the institutional structures of the society. But this is also precisely where Kaldorian realism runs aground.

32.3 Critical Remarks

In my opinion, the whole theoretical apparatus developed by Kaldor is strictly connected to the assumption that crises need not be an integral part of the process of capitalist accumulation. If investment is helped along and money wage increases are anchored to productivity increases, then the system would gravitate towards the full employment path as prescribed by the Kaldorian distributive mechanism. This represents an attempt to build a long period theory of the working of capitalism taking as a starting point the specific full employment conditions which prevailed in the 1950s and 1960s. If the appropriate institutional steps are taken, chiefly among them wage policies, full employment and profitable growth can coexist for ever and ever.

This basic axiom remained valid even when Kaldor had to take into account the manifestation of inflation and recession in the world economy (Kaldor, 1976). Briefly, inflation is seen as stemming from the asymmetry in the price mechanism: industrial products, which are produced under diminishing costs, are priced oligopolistically whereas raw materials, which are produced at increasing costs, are priced according to the state of supply and demand. Any increase in the price of raw materials is passed onto industrial prices so that raw material producers cannot offset increasing costs by changing the structure of relative prices in their favour. Since the balance of payment relation between the industrial world and raw material producers is viewed as the main determinant of the international system of payments, raw material countries tend to face a chronic deficit which hampers the expansion of world's demand for industrial products. This stalemate could be unlocked, according to Kaldor, if it were possible to set up an international monetary system backed by a basket of raw material commodities. Like Keynes's clearing union, the task of the institutional arrangement

envisioned by Kaldor would be the productive recycling of balance of payment surpluses.

In this way primary producers would not be compelled to restrict their demand for imported finished products. For their part industrial producers, seeing that effective demand for their goods is indeed forthcoming, would be inclined to accept the markup which would satisfy the shift in the distribution of the worlds income towards raw material countries. This is nothing but the closed economy one sector model of income distribution extended to a two sector/two world case rendered more sophisticated by uneven relative returns to scale. Once more we see here realism combined with a belief – à la Voltaire – in the rationalism of reformist institutional arrangements. The realism lies in the fact that the relationship between raw material producers and industrialised oligopolistic capitalism, is correctly described. The eternity of reformism lies in the fact that the analysis of the structural relations giving rise to inflation and recession is not open to the possibility that behind the structural linkages there can be socioeconomic relations which would make the implementation of the reformist program unfeasible.

Whether applied to a single economy or to a two sector/two world economy, Kaldorian policy prescriptions are based on the belief that it is possible to attain the desired functional distribution of income under capitalist relations. This is incorrect also from the stand point of the Kaldorian model. As soon as we move from a one commodity world to a two sector model there is virtually no safe transition to an equilibrium full employment path – even if a suitable change in the propensity to save and in the distribution of income has occurred (Halevi and Kriesler, 1991; Halevi, 1985; Hicks, 1985). This is the well known problematique of the Traverse, as developed by Hicks and especially by Lowe (1976). Here suffices to say that if a smooth adjustment from the desired distribution of income to the desired composition of output between capital and consumption goods is not possible, then persistent unused capacity will become the norm. In other words, the realistic reformism of Kaldor has to give way to the realistic criticism of capitalism developed by Kalecki (1971).

In relation to the issue of inflation and distribution the persistence of unused capacity has important implications for the view that the markup is, from the firm's perspective, a stable parameter. This position has become an absolute tenet for the American Post-Keynesian writers (Moore, 1979; Weintraub, 1978) and can be found also in the more nuanced approach followed by Sylos-Labini (1974). For these authors the markup is an empirical regularity, so that the proximate cause of inflation is the rate of increase of money wages. Is it really so? May it not be the case that these Post-Keynesians are measuring something else than the markup? To attempt an answer to these questions we must clarify the structural links between the sectoral markups and the composition of output in a simple capital goods-consumption goods two sector model.

If we take the simplest of all cases – no consumption out of profits and no savings out of wages – we see that, with unused capacity, the markup in the consumption goods sector is related to the ratio in which the initial capital stock is distributed between the two sectors. Furthermore, the same markup is also related to the ratio of capacity utilisation in the capital goods sector over that of the consumption goods sector multiplied by the respective labour-capital coefficients. The initial distribution of the stock of capital is given by definition, while the labour-capital coefficients can be taken as given for the short period only. What cannot be taken as given even in the short period is the ratio of the sectoral rates of capacity utilisation. To assume that they do not change or that they change in a uniform manner trivialises the significance of sectoral linkages. Hence, any change in the relative utilisation rates changes the markup in the consumption goods sector, which is therefore influenced by the sectoral composition of effective demand. Interestingly enough, capacity utilisation rates do not enter into the determination of the markup in the capital goods sector, at least if we derive prices and markups from the Marxian conditions of sectoral flows. The markup in the capital goods sector comes out to be related only to the ratio between the newly produced machines reploughed in the capital goods sector over those shipped to the consumption goods sector. In the short period this can be considered as given, but it is definitely a variable from one period to the next.

In conclusion, when we describe the basic productive apparatus of the economy in terms of two or more sectors of production and we explicitly introduce coefficients of capacity utilisation, the markup seems to become more intimately connected with the sectoral macrochanges affecting the economy. In particular, in the consumption good sector, it is connected with variations in the relative degrees of capacity utilisation. In the capital goods sector it is linked with the sectoral distribution of the newly produced equipment. As a consequence, it is difficult to hold onto the assumption that the markup is a given parameter. All this cannot be evinced from Kaldorian modeling because capacity utilisation plays a very minor role in his theoretical exposition. When it does, it appears in the form of a rate of utilisation for the representative firm, *i.e.* valid for the whole economy. This means that nonuniform changes in sectoral utilisation rates are excluded by definition. Of course, if we were to take the ratio of sectoral utilisation rates as a constant we would obtain a fixed markup for the consumption goods sector. This still leaves unanswered the question of why should we take for given the distribution of the newly produced machines. In other words, taking the ratio of sectoral utilisation rates as given implies a kind of steady state situation for the short run. It amounts to assuming that every change in the level of activity is uniformly distributed over the two sectors. By the same token, if the distribution of the newly produced machines is taken as given, then the system would very likely be in a long run steady state.

In our simple two sector framework there are two different kinds of markups: the consumption goods sector markup which can vary even in the short period according to short run changes in the relative utilisation rates; then there is the capital goods sector markup which varies according to the sectoral distribution of machines. The last markup is crucial in the determination of the long term growth of the economy. In this context a theory of wage inflation based on the fixity of the markup is no theory at all. It is rather an economic tenet (dogma) used for the purpose of presenting a monetary theory totally isomorphic to monetarism (Loranger and Halevi, 1986).

The assumption of a fixed markup – presented as an empirical regularity – is a necessary condition for obtaining a sequence in which any increase in money wages per unit of output leads to a rise in the supply of money and in the price level (Nell, 1990). How would Post-Keynesians, then respond to the observation that the markup itself is heterogeneous since its structural components differ between sectors? To keep the fixity hypothesis, they would have to assume that changes in those components cancel each other out. Such a procedure would be however untenable because it would rely on a very special form of steady state dynamics. Thus, if unused capacity is explicitly introduced into the system and non-uniform variations are taken into account, the phenomenon of inflation cannot be uniquely ascribed to money wage increases relatively to productivity rates.

What are the implications of looking at variable markups, in the short run, *via* changes in relative utilisation rates, and in the long run *via* changes in the sectoral distribution of the newly produced machines? The implications are that prices are subject to variations due to structural factors. This does not mean however that prices tend towards equilibrium prices in a market clearing sense; in other words, they are not flexprices in the conventional meaning of the term. If our hypothetical economy is conceived in terms of a productive apparatus based on two sectors – the capital goods and the consumption goods sector – and we include the sectoral ratios of capacity utilisation, prices can still vary because of non-uniform changes in the sectoral utilisation rates and in the sectoral distribution of newly produced machines. Yet, they need not vary in the proportions and in the direction required by market clearing conditions. The price variability due to structural changes is not the same thing as the particular price flexibility of traditional general equilibrium theory.

References

Eichner A. and Kregel J., "An Essay in Post-Keynesian Theory: A New Paradigm in Economics", *Journal of Economic Literature,* vol. 13, No 4, 1975.

Glyn A. and Sutcliffe R., *Capitalism in Crisis,* New York, Pantheon, 1973.

Halevi J., "The Contemporary Significance of Baran and Sweezy's Notion of Monopolistic Capitalisms", In Jarsulic M. (ed.) *Money and Macro Policy,* Boston, Kluwer-Nijhoff, 1985.

Halevi J. and Kriesler P., "Kalecki, Classical Economics and the Surplus Approach", *Review of Political Economy,* vol. 3, No 1, 1991.
Hicks J., *Methods of Dynamic Economics,* Oxford, Clarendon Press, 1985.
Kaldor N., "Alternative Theories of Distribution", *Review of Economic Studies,* vol. 33, No 2, 1956.
Kaldor N., "L'évolution capitaliste à la lumière de l'économie keynésienne", *Economie Appliquée,* vol. 10, 1957.
Kaldor N., "Economic Growth and the Problem of Inflation", *Economica,* August and November 1959. Reprinted in Kaldor N. (1964), *Essays on Economic Policies I,* New York, W.W. Norton and Company.
Kaldor N., "Inflation and Recession in the World Economy", *Economic Journal,* December 1976.
Kalecki M, *Selected Essays on the Dynamics of the Capitalist Economy,* Cambridge, Cambridge University Press, 1971.
Loranger J. and Halevi J., "La théorie du mark-up comme explication de l'inflation", *L'Actualité économique,* vol. 62, No 2, 1986.
Lowe A., *The Path of Economic Growth,* Cambridge, Cambridge University Press, 1976.
Moore B., "The Endogeneous Money Stock". *Journal of Post-Keynesian Economics,* vol. 2, No 1, 1979.
Nell E. "The Quantity Theory and the mark-up equation", *Economie Appliquée,* vol. 43, No 2, 1990.
Sylos-Labini P, *Inflation, Trade Unions and Productivity,* Farnborough Hants, Saxon House, 1974.
Weintraub S., *Capitalism's Inflation and Unemployment Crisis,* Reading, Mass., Adison-Wesley, 1978.

33

Theorizing about Post-Keynesian Economics in Australasia: Aggregate Demand, Economic Growth and Income Distribution Policy

Paul Dalziel and J. W. Nevile

There was much in common in the development of post-Keynesian economics in Australia and New Zealand, but there were also many differences. Both countries shared a common heritage in higher education. In the first twenty-five years after World War II, both countries adopted broadly Keynesian policies and experienced very low levels of unemployment. Increasingly over these years more theorizing about macroeconomic policy had what now would be called a post-Keynesian content, but this label was not used till after the event. In both countries, apart from one important factor, the experience of actual monetary policy and theorizing about it were similar. Keynesian ideas were more rapidly adopted in Australia than in many other countries. Not surprisingly for a couple of decades after 1936, analysis of policy and its application was Keynesian rather than post-Keynesian, with fiscal policy playing the major role. The conduct of both monetary and fiscal policy depends on the theory of inflation. This chapter examines post-Keynesian economics in Australasia, focusing on aggregate demand, economic growth, and income distribution policy.

33.1 Introduction

There was much in common in the development of post-Keynesian economics in Australia and New Zealand, but there were also many differences. Both countries shared a common heritage in higher education. Until after World War II most students going abroad for tertiary education went to the United Kingdom, with Cambridge a popular choice. Similarly, until after World War II most academic staff recruited from abroad for short or long periods were from the United Kingdom. In the first twenty-five years after

Revised from *The Oxford Handbook of Post-Keynesian Economics Volume 2*: *Critiques and Methodology*, 412–435, 2013, 'Theorizing about Post-Keynesian Economics in Australasia: Aggregate Demand, Economic Growth, and Income Distribution Policy,' by Dalziel, P. and Nevile, J. W. With kind permission from Oxford University Press. All rights reserved.

that war both countries adopted broadly Keynesian policies and experienced very low levels of unemployment. Increasingly over these years more theorizing about macroeconomic policy had what now would be called a post-Keynesian content, but this label was not used till after the event. In both countries, apart from one important factor, the experience of actual monetary policy and theorizing about it were similar. The important difference was the disappearance in New Zealand of an incomes policy, which was always present in Australia, either explicitly or in a de facto form through the operation of arbitration and conciliation tribunals.

The institutions and economic history of the two countries differed in other important respects, affecting which topics figured prominently and also when common topics were prominent, for example, inflation and incomes policies. Moreover, post-Keynesian economists were much more numerous in Australia. Mainly this was due to relative size, but also there was a quicker and wider acceptance of the ideas in *The General Theory* in Australia, with people with a connection to Cambridge prominent, though others were also very important.

Finally, before launching into the discussion of theorizing in the two countries, a more precise description of the content of the chapter is necessary. The first part of the title is too broad and is qualified by the second part. The key words here are "aggregate" and "policy." The focus is on theorizing about macroeconomic policy. Theory directly underpinning fiscal and monetary policy, including inflation theory, is the core. Income distribution is also important, both for its own sake and also because of the emphasis in post-Keynesian theory on the need for incomes policies. Although this choice of subject matter reflects the nature of the majority of post-Keynesian theorizing in both countries, the supply side is not ignored, and some significant contributions to policy-oriented growth theory are discussed. However, some major contributions to post-Keynesian theory are excluded, particularly in the case of Australia, for example, the work on public finance by Peter Groenewegen, and that on industrial organization by Neville Norman. Also, there has not been space to pay much attention to the substantial empirical work on labor markets that enables the discussion of incomes policies to be so impressive. This research is both by post-Keynesian economists such as Robert Dixon and Peter Riach and by others who would reject that label. Finally, the discussion in this chapter ends with work written before the onset of the global financial crisis in 2007.

33.2 Australia

33.2.1 Theorizing about Post-Keynesian Policy in Australia before *The General Theory*

The antecedents of post-Keynesian policy in Australia were in minimum wage policy. As early as 1890 a minimum wage bill was introduced in

Queensland by the premier, Sir Samuel Griffith, and Victoria followed this example three years later (Plowman 1995). The theoretical basis of these lay in human rights to a living wage rather than economics. However, after Federation, a "new protection" was introduced by Alfred Deakin, the second prime minister of Australia, which adopted the principle of using tariffs to ensure that manufacturers were able to pay the legislated minimum wages without suffering injurious competition from imports. This idea was discussed and elaborated over the next twenty-five years, notably by Brigden and Benham.

Brigden (1925) explicitly looked at the economics of Deakin's "new protection," concluding that, if one takes as given the growth of population that had occurred, protection had increased the standard of living in Australia. Benham (1926a) published a reply to this article that questioned the factual basis of Brigden's underlying assumptions, such as that of diminishing returns to agriculture in Australia. Brigden (1927a, 1927b) and Benham (1926b, 1927) continued this, with Giblin (1927) also chipping in with an article. This discussion strongly influenced the famous report commissioned in 1927 by Bruce, the then prime minister, to advise him on tariff issues (Brigden etal. 1929).[1] This lively discussion occurred while Keynes, along with other British economists, strongly denied that protection could help reduce unemployment. In *The General Theory* (1936, 334) Keynes recanted, quoting with disapproval his former claim that "The claim to cure Unemployment involves the Protectionist fallacy in its grossest and crudest form" (originally published in 1923).

The other notable piece of theorizing was Giblin's foreign trade multiplier (Giblin 1930). Published a year before Kahn's *Economic Journal* article, it showed how a change in export receipts would lead to a finite change in real income, with the size of the multiplier dependent on the ratio of expenditure on imports to total expenditure. Giblin assumed that total expenditure was at the full employment level. Thus, it is not surprising that Keynes found the Kahn multiplier a more attractive starting point for the development of the multiplier in *The General Theory.* Nevertheless, it was an important piece of "post-Keynesian" theory showing how, under a fixed exchange rate regime, a reduction in export income reduced aggregate demand by a greater amount determined by what is now known as the multiplier. Karmel (1960) is an excellent analysis of the significance of Giblin's multiplier analysis.[2]

33.2.2 Fiscal Policy

Keynesian ideas were more rapidly adopted in Australia than in many other countries.[3] Not surprisingly for a couple of decades after 1936, analysis of policy and its application was Keynesian rather than post-Keynesian with fiscal policy playing the major role. As Coombs ([1954] 1971) put it, "The first result of the emergence of the Keynesian analysis was rather to push

monetary policy as such into the background" (10).[4] Given the pent-up demand after the war and the depression of the 1930s, in both the public and private sectors, for fixed investment, it might be expected that inflation would be the major concern. This was not quite the case. The balance-of-payments constraint also weighed on the mind of policymakers, and a major recession occurred as early as 1952. Nevertheless, fiscal policy was the major weapon used to deal with all three policy objectives. For the next twenty-five years fiscal policy was largely based on what Lerner (1943) called "functional finance." Government expenditure and revenue was determined with the aim that total expenditure in the economy produced full employment but not inflation, without any concern about whether the resulting budget was in surplus or deficit.

However, there was growing realization of the complexity of the task of maintaining full employment without inflation, and more attention was paid to using monetary policy to deal with the liquidity effects of fiscal policy. The theory underpinning fiscal policy itself gradually developed. Salter (1959) on internal and external balance is a notable early example relevant to both fiscal policy and inflation and is discussed later in the section on inflation. Increasingly sophisticated versions of multiplier theory were developed, culminating in Nevile (1970), which used indexes of tax rates rather than tax revenues as the policy-determined variables on the revenue side.

Also, the importance of psychological effects were increasingly recognized (Nevile 1970). At least by the 1960s, it was recognized that the widespread belief that the government both could and would keep brief any departure from full employment created a climate of expectations, or "animal spirits," which was a major factor in ensuring that departures from full employment were actually brief.

In the 1960s there was a substantial effort made to provide quantitative estimates of the key parameters in the implicit, or better explicit, model of the economy underlying fiscal policy decisions. This started with an unsophisticated model of the Australian economy (Nevile 1962).[5] The model was extended and refined for the "Vernon Committee." Though this second version was never published, a cut-down version was used in the first simulation study of the Australian economy (Duloy and Nevile 1965). The model was then further developed and was published (Nevile 1970) as a model of the Australian economy that focused on the effects of the various instruments of fiscal policy on economic activity in Australia.[6] The 1970 model was revised and updated until 1982 (when the author became the dean of his faculty). However, the only major change in its structure was a fundamental revision of the equation for prices, which is discussed briefly in the section on inflation. In the various versions of these models investment equations assumed that firms could borrow at the going rate of interest the funds, if any, needed to finance all desired investment, though this might

affect prices and interest rates in the following period. Stegman (1982) estimated a switching investment equation in which desired investment may be subject to an immediate financial constraint.

The 1970 model revealed hitherto unsuspected facts about the effects of fiscal policy instruments on the Australian economy. The two most important were that changes in indirect tax rates had more powerful effects than changes in direct tax rates and that, although (government) expenditures on current goods and services and on building and construction both have very low import content and more or less the same effects on private consumption, the one-year impact multiplier is significantly greater in the case of building and construction expenditure.[7]

With the neoclassical resurgence in the 1970s and succeeding decades "sound finance," in which expenditure was balanced by revenue over a year or some other arbitrary period, was again adopted by many economists and policymakers as the overriding guide to good fiscal policy. After the mid-1970s much of post-Keynesian writing on fiscal policy was designed to counter neoclassical arguments against budget deficits.[8] Among the neoclassical arguments, crowding-out theory and the twin deficits hypothesis are of particular importance, as each has had a substantial impact on actual policymaking.

Crowding-out theory maintains that an increase in the deficit will cause a fall in private investment expenditure of (almost) the same size as the rise in the deficit. If the government borrows to finance the deficit, this, it is argued, will force up interest rates, reducing private investment. Moreover, even if the various multiplier effects are such that economic activity increases, more money will be demanded by the public to carry out this increased economic activity. They will try to borrow this extra money, forcing up interest rates further until the increase in gross domestic product is reversed. This assumes that the monetary authorities are successful in maintaining a constant stock of money. Even if the monetary authorities were successful in doing this, any increase in private expenditure will also lead to a rise in interest rates just as much as would an increase in the deficit. However, even before financial deregulation the monetary authorities did not maintain a constant volume of money, and since financial deregulation, the volume of money is endogenous. Crowding-out theory depends crucially on false empirical assumptions.

The second influential argument, the twin deficits hypothesis, maintains that if a budget deficit is created or increased, the balance-of-payments current account deficit will increase by a very similar amount so that all the expansionary impact will go overseas through increased imports. Thus, the twin deficits and crowding-out hypotheses cannot both be valid. The social accounting identities ensure that imports will increase if other things do not change, but this proves nothing unless one has a theory to support the implied ceteris paribus assumption. Supporters of the twin deficits hypothesis

usually have no theoretical foundations for their arguments, and those that have been put forward hold only in very long-period equilibrium situations, making them largely irrelevant to anticyclical policymaking. Moreover, empirical evidence does not support the twin deficits hypothesis. For example, in G7 countries on average, budget deficits more than doubled from 1990 to 1993 and the current account deficits fell to zero. This was not an isolated incident. A similar story applies to the years 1980 to 1983.

However, not all the post-1970 writing in Australia was defensive. From 1975 to 1999 Nevile prepared and published frequently estimates of the structural deficit. These included discussions of the theoretical principles underlying the estimates (see, e.g., Nevile 1990). Harcourt and Kerr ([1979] 2001)[9] and Nevile (1983) published articles about the role of the government in the economy. The scope of the two papers was different, but the conclusions did not differ all that much. Both laid emphasis on continuing problems with respect to both unemployment and inflation and advocated typical post-Keynesian policies to deal with them. Harcourt and Kerr generally argued for a more interventionist role for government than did Nevile. One important example is their consideration of what to do if firms are "unwilling to take up even the much smaller amount of private investment expenditure that is envisaged for them" (94). History shows that the reluctance of firms in the private sector to invest was a major problem in the functioning of the incomes policies of the Labor government in the 1980s (Kriesler and Halevi 1995).

Probably because of the severe depression at the beginning of the decade, there was an increased interest in the 1990s in post-Keynesian theory relevant to aggregate demand policy. This continued in the next century. The published papers covered a wide range of subjects. The most important topics with respect to fiscal policy are listed below with some illustrative references. Probably, Geoff Harcourt's 1992 Donald Horne address "Markets, Madness and a Middle Way" has been the most widely read, but it is hard to single out others, and the list of references after each topic is in alphabetical order.

- Expectations and unemployment (Nevile and Kriesler 2008a)
- Full employment as a human right (Kriesler and Nevile 2007a, 2007b)
- Policy packages (Harcourt [1993] 2001a; [1993] 2001b; [1994] 2001; [1997] 2001; 2007), (Mitchell and Watts 2002), (Nevile and Kriesler 2002)
- Theory of Fiscal Policy (Hart 2005, 2007), (Kriesler and Nevile 2000)

33.2.3 Monetary Policy

The operation of monetary policy in the Australian economy for the first thirty years after World War II took place in a world different from today's deregulated global economy. For more than two decades after 1945 monetary policy was largely based on quantitative measures operating directly

on the volume of money. Not surprisingly, financial institutions subject to these constraints lost business to new institutions not subject to them and sought to protect their position. Together these actions reinforced a rapid change in monetary institutions that would have occurred in any case. In 1945 banks were the dominant financial institution. Since then nonbank financial institutions have also become important, often undergoing spurts of growth when the economy itself was experiencing strong growth. For example, in the period between the slump of 1951/52–1952/53 and that of 1960/61–1962/63 the share of total assets of financial intermediaries held by banks fell from 70 percent to 57 percent (Coombs [1969] 1971, 65). Immediately after 1945 the development of nonbank financial institutions was the result of the nonbank public wishing to reduce the proportion of their assets held as bank deposits and government securities. Then it was encouraged by the financing needs of the durable consumer goods industry, growth in the mining industries, and more general industrial development. Not surprisingly the banks responded by greatly diversifying the types of business in which they engaged and their relationships with nonbank financial institutions (Coombs [1969] 1971). The theory on which monetary policy in these decades was based was, as the governor of the Reserve Bank at the time commented, largely descriptive and not adequate as a basis for policy decisions (Coombs [1969] 1971, 64 and 74).[10]

Especially after the visit of Milton Friedman in 1975, the 1970s saw a change in the priority of economic policy to one of "fighting inflation first," with an accompanying change in the theoretical basis of monetary policy to a Friedman-style Monetarism. The Reserve Bank implemented monetary policy by targeting the rate of growth of money as measured by M3. This proved to be unsuccessful. The growth in the volume of money proved much harder to control than Monetarism argued it was, and clearly other factors were at least as important as monetary growth in determining the inflation rate (Argy and Nevile 1985). Both these results were in line with contemporary post-Keynesian theory.

With the deregulation of financial institutions in Australia in the late 1970s and 1980s and particularly the floating of the exchange rate in 1982, the volume of money became endogenous,[11] with monetary policy based on applied interest rate theory or how interest rates affect the flow of funds through the economy and foreign exchange markets. The growth of a largely unregulated global financial sector gave a stagflationary bias to the world economy, putting all the weight of adjustment on countries with current account deficits (Kriesler and Nevile 2003). At the same time globalization also eroded the effectiveness of monetary policy. More than ever before, monetary policy became a blunt and uncertain instrument (Milbourne 1990). The transmission channels became increasingly unreliable, first, in terms of the lag between when the central bank implements changes in interest rates and when these impact on the economy, and, second, in terms

of the size of that impact. Not only is monetary policy associated with "long and variable lags," but there is significant uncertainty as to the size of its impact. This led in Australia, as elsewhere in the world, to renewed interest in the theory underpinning monetary policy.[12]

Changes in interest rates will affect the economy through three main channels. The most direct is through the more interest elastic components of aggregate demand. Tight monetary policy and associated rises in interest rates lead to reductions in these components of demand. This, via a multiplier process, leads to further reductions in aggregate demand, output, and employment, reducing (demand-pull) inflationary pressure. But many post-Keynesian economists question the strength of any relationship between interest rates and the main components of domestic private expenditure and suggest that this channel is of dubious efficacy.

A second channel by which monetary policy may influence the economy is through bank balance sheets. Changes in interest rates will lead to changes in the value of banks' net assets, which will, in turn, influence their willingness to extend credit. Loose monetary policy, associated with falling interest rates, will, ceteris paribus, improve the value of bank assets and will increase their willingness to extend credit. The reverse is true with tight monetary policy. Many post-Keynesian economists believe that it is through the impact on the availability of credit that the effect of monetary policy is felt on the economy. However, the increased mobility of international capital flows has, to a large extent, undermined the efficacy of this channel. With the increased mobility of international capital, enterprises are no longer limited to domestic markets in their quest for financial resources. Tight monetary policy may lead to domestic credit rationing, but this is likely to lead to an increase in offshore borrowing, undoing the effect of monetary policy.

The final transmission mechanism results from the impact of changes in interest rates on foreign exchange rates. Inflows of mobile international capital, seeking the highest expected return, will increase with a rise in the interest rate differential between Australia and the rest of the world. Other things being equal, tight monetary policy will lead to appreciation of the currency. By reducing the domestic price of imports and the overseas price of exports, this will reduce both cost and demand inflationary pressures, as well as output and employment. However, this mechanism is subject to two important conditions. The first is that the changed domestic interest rate actually does change international interest rate relativities, which is not always the case. The second is that market expectations, particularly with respect to future exchange rate movements, will be of equal importance in influencing capital flows and can prevent any increase (see, for example, Dalziel 2002c).

Although changes in the exchange rate will directly influence domestic inflation rates through their impact on the domestic cost of imported goods

and perhaps exports, the impact on output and employment will depend on the price elasticities of exportables and importables. In the case of a relatively small open economy, like Australia, which mainly exports raw materials and imports mainly intermediate goods, neither exports nor imports are likely to be price elastic (Kriesler and Halevi 1995). Hence, the main impact of interest rate changes through the exchange rate will be on the price level rather than on output and employment.[13]

33.2.4 Inflation and Incomes Policies

The conduct of both monetary and fiscal policy depends on the theory of inflation. The work of Salter (1959) on internal and external balance was an early important contribution. Salter generally stressed the need to treat capital as a collection of different capital goods, but realized that if Australia's terms of trade are not affected by events in the Australian domestic economy, it is valid to treat all tradable goods as one composite good. Thus, he was able to draw a diagram with traded goods on the horizontal axis and nontraded goods on the vertical axis. Equilibrium occurs where the transformation curve between tradable and nontradable goods is tangential to an indifference curve.

Incomes policies also depend on inflation theory, but equally important are the institutional objectives that have a significant effect on wage rates and wage and profit shares and the policy objectives with respect to these variables. Harcourt (1965) discusses the factors that determine price setting and the distribution of income between wages and profits. Hancock (1961) has a detailed discussion of the operations of the Commonwealth Conciliation and Arbitration Commission and the various aims of its members mainly since 1953, but going back to 1945 where helpful.

The report of the Vernon Committee in 1965 is discussed more fully in the section on economic growth, but it argued strongly for a goal of price stability—not in the often used sense of low inflation but with the meaning of no upward trend in prices.[14] The arguments for this were one of the weakest parts of the report, as some members of the committee admitted when the arguments were critically assessed by the unions in the first national wage case before the Commonwealth Conciliation and Arbitration Commission after the publication of the committee report. However, the Vernon Committee's report provoked an excellent, largely empirical, paper by Russell (1966).

However, generally the development of appropriate theory lagged behind the insights of Salter and Russell. As late as 1970 the theory used to underpin anti-inflationary policy was usually a Samuelson/Solow type menu with a constant short-run trade-off between unemployment and inflation. Nevile (1970) provides an embarrassing example. Moreover, little thought was given to any systematic effects between the chosen position on the short-run menu and the long-run relationship between inflation and

unemployment. This changed greatly in the early years of the 1970s. Post-Keynesian economists produced more sophisticated equations for prices and for wage earnings equations. For example, in Nevile (1975) the price equation incorporates such post-Keynesian principles as markup pricing,[15] a distinction between demand-pull and cost-push inflation and a partial application of the principle of increasing money wage earnings in proportion to rises in labor productivity.

Also, more work was done on the long-run Phillips curve. Most post-Keynesians did not accept that this was vertical, believing that growth in potential output is path determined. Some even came to argue that the long-run curve may be horizontal (see Freedman, Harcourt, and Kriesler (2004) and Kriesler and Lavoie 2005 and 2007). A notable contribution to the analysis of wage inflation was A. W. (Bill) H. Phillip's own (1959) paper estimating a Phillips curve for Australia.

In the early 1970s, as the rate of inflation started to rise rapidly, there was a renewed interest in incomes policies by post-Keynesian economists around the world. In Australia we were off to a flying start. There had been substantial debate in the 1960s about the principles to be used by federal and state arbitration tribunals and wage-fixing bodies in determining award wage rates, with post-Keynesian economists advocating that money wage rates should be set so that average money earnings rise in proportion to the average rise in labor productivity. Karmel (1959) and Russell (1965) are notable examples.[16] The Karmel/Russell/et al. principle was included in income policies advocated by post-Keynesians as early as 1974 (see, e.g., Nevile 1974), and it provided a valuable benchmark when it was not. With the rapid rise in the inflation rate, there was increased interest in the causes and consequences of inflation, with post-Keynesian economists regarding the costs as more important than the shoe-leather costs of orthodox theory (see, e.g., Harcourt [1974] 2001).[17]

Because of our arbitration and conciliation institutions, labor market economics has always been a major focus in Australian economics, and this provided solid support for work on incomes policies. With the election of a Labor government in 1983 there was renewed interest in this. Watts and Mitchell (1990a and 1990b) and Dixon (2003) are good examples of the resulting large number of papers. A conservative government came to power in 1996. The changes in industrial relations laws it introduced, and especially the more radical ones in the three years before it lost office at the end of 2007, produced another flurry of papers. King and Stilwell (2005) is a good example of those written by post-Keynesian economists. Nevile and Kriesler (2008b) and Isaac (2008) look at particular aspects of these laws that have longer-run deleterious effects on society as a whole in addition to their immediate labor market effects.

Over the twenty-five years before the global financial crisis, when post-Keynesian incomes policies were deployed it proved possible to

reduce both unemployment and the rate of inflation. Post-Keynesian theory produced policies that were more successful in keeping unemployment low without rising inflation than were policies based on neoclassical theory.

33.2.5 Economic Growth

The purpose of all the theory discussed above is to provide foundations for policy to improve welfare, not only through a better distribution of income and wealth but also through economic growth. Three Australian contributions relevant to macroeconomic policy have been prominent. One, that potential output is path determined, includes work on the traverse. It is not peculiar to Australia and is only briefly discussed here. Halevi and Kriesler (1992) is a good example of the Australian contribution. The general conclusion of research on this topic in Australia, as well as overseas, can be summed up in a quote from Kriesler (2003):

> Without some demonstration that there are forces in the economy which push it into equilibrium without influencing the position to which the economy is gravitating it is difficult to see any useful role for such theory. However, such a demonstration is unlikely, as without a visible hand the invisible hand is likely to guide us on to the wrong path [i.e., one which the economy will not take].
> (359)

The second contribution is about the effects of technological and structural change on economic growth. After Menzies almost lost the 1961 election, largely because unemployment reached 2.5 percent, he set up a Committee of Economic Enquiry to help pacify the hostile electorate.[18] The committee's report focused strongly on economic growth, with inflation and the balance of payments the two major constraints. It argued that the rate of (labor) productivity growth required to achieve its goal would be difficult to achieve due to structural imbalances in the Australian economy.

In the view of the committee, two major structural changes were required. The first was increased expenditure on physical capital for both "widening" and "deepening" purposes (see paragraph 17.42). This would require a rise in domestic saving to avoid balance-of-payments problems and would probably involve an increase in public sector savings, through higher taxation, and investment incentives in the private sector. The second structural recommendation was an all-out effort to increase exports, both to help the balance of payments (see paragraph 17.60) and also to increase the rate of productivity growth. As part of the latter goal more specialization within the manufacturing sector was recommended, with encouragement of the growth of larger, export-oriented manufacturing firms (see paragraphs 12.126 to 12.131 and 17.83 to 17.85).

The committee argued that to achieve its goals it was important to increase the level of what is now known as human capital by improving management skills, increasing expenditure on research and development in Australia, utilizing more fully the education and skills of women, and improving education and training more generally. One part of this was to set up an advisory council on economic growth, to continue in effect the work of the Vernon Committee

It was known by those close to the inside workings of the committee that the recommendations about productivity growth, as well as much elsewhere in the report, were inspired by J. G. Crawford, the deputy chairman, who was an extraordinarily influential public servant for many years. Crawford was professor of economics at the Australian National University at the time of the Vernon Report. Very similar arguments about the need for productivity growth and how to achieve it were made by Crawford's long-time colleague Coombs ([1963] 1971), though in this context Coombs did not explicitly discuss inflation as a constraint. Leadership in forming the Vernon Committee's substantial concern about inflation came from its secretary, F. Horner, a Treasury officer.[19]

The prime minister, Menzies, was dismissive of the report of the committee. However, this was as much a part of the ongoing "turf war" between the departments of Treasury and Trade as a rejection of the whole body of ideas in the report. Many of these influenced government thinking under Menzies as well as during two later Labor governments.

Most of the other contributions to the debate on structural change were at the micro level, but Stegman (1993) argued that the sectoral composition of private sector investment was the major cause of the balance-of-payments constraints on more rapid growth and fuller employment. This was because the policy to encourage export-oriented investment, through depreciation of the Australian dollar on the foreign exchange markets, was ineffective in removing the balance-of-payments constraint in a country with a small capital goods sector.

Before leaving this topic, a further rather ironic point will be made. Australians love to call the neoclassical growth model the Solow-Swan model. Actually, Swan (1956) was more post-Keynesian than neoclassical. It explicitly assumed it was policy that maintained aggregate demand at the level of potential output and looked at the latter's growth rate in the long period. After an introductory section in which there are no fixed factors of production, Swan uses a Ricardian model in which the only possible equilibrium rate of growth (apart from zero) was when technological progress exactly offset the effects of diminishing returns. However, Swan (1956) does use a neoclassical production function throughout and thus, in Swan's words, "enjoys the neo-classical as well as the Ricardian vice" (334).

The third prominent contribution is one of the major contributions of Australia to post-Keynesian economics and a brief description of it is a

fitting way to end section 1. Salter (1960) suggested a very illuminating reason for the well-known fact that the rate of productivity growth is more rapid when output growth is rapid. In his own words:

> Instead of a given change in technical knowledge, we must think of a rate of improvement…this continuous change in techniques is allied to a slow adjustment process caused by durable capital equipment. In such circumstances the flow of new techniques outstrips the ability of the system to adjust.
> (6)

Thus, the more rapidly an economy is growing, the younger is the average age of its capital stock and the greater is the proportion of the capital stock that incorporates the latest technology. This may not be the only reason for the relationship between productivity growth and the rate of growth of output. Schumpeterian reasons spring to mind. Nevertheless, the "Salter effect" is often of major importance.

33.3 New Zealand

In the postwar period across the Tasman, labels such as Keynesian, neo-Keynesian, or post-Keynesian played little role in academic or policy research. At the end of 1938, the New Zealand government had responded to a foreign exchange crisis by imposing a comprehensive system of import licensing that was to remain in place for half a century (Lattimore and Wooding 1996, figure 33.1). Against that background, economists in New Zealand were generally concerned with better understanding issues connected to international trade and business cycles (which had given rise to the original policy crisis) and arguing for less government regulation of large parts of the domestic economy (Hawke 1985; Easton 1997). As noted by Dalziel (1998, 105), not only did the government directly regulate much economic activity, it was also involved as a major provider of services in industries as diverse as banking, insurance, legal services, superannuation services, railways, air travel, bus travel, shipping, engineering and construction, architectural services, port and airport services, electricity and gas, telecommunications, primary produce marketing, coal mining, forestry, oil refining, steel production, printing, broadcasting, hotel accommodation, computing services, postal services, and weather forecasting.

An outstanding example of a New Zealand academic economist writing during that period was Conrad Blyth, who took up the chair of economics at the University of Auckland in 1972 (see Buckle 2004a and 2004b, which is the basis for the material in this and the following paragraph). Blyth studied economics and history in his undergraduate degree at the University of Otago before completing an MA in economics in 1951. After some teaching

experience at his alma mater, Blyth moved to Cambridge University for doctoral research on capital theory (see Blyth 1954, 1956a, 1956b and 1960), being awarded his PhD in 1958. His acknowledgments in these four articles include thanks to Richard Goodwin, Richard Kahn, Nicholas Kaldor, and Joan Robinson.

Blyth returned to New Zealand in 1960 as the foundation director of the New Zealand Institute of Economic Research, where he established a quarterly survey of business opinion that still continues as an important source of data to test theories of business cycles. Blyth spent a period back in the United Kingdom as deputy director in the National Institute of Economic and Social Research from 1968 to 1971 before accepting the position as professor of economics at the University of Auckland. Special mention should be made of his coauthored article describing a linear programming general equilibrium model of New Zealand's economic development (Blyth and Crothall 1965). The model was intended to provide a set of targets for policymakers; the authors suggested, for example, that "with resources and export prices similar to those in existence in 1954–55, a target chosen then which would have given the highest incomes per head and maintained full employment, would have been based on an exchange rate of £90 N.Z. = £100 Sterling, would have aimed to raise real wages by 17 per cent, and would have concentrated new investment in manufacturing industries with a high local raw material content and low labour-capital ratios" (358). Consistent with the eclectic approach generally adopted by New Zealand economists at the time, the paragraph concluded: "It is important to realise that these results represent a target. How the target is achieved, whether by classical free trade, by tax and subsidy policies, or by controls, is another matter."

In the light of the fierce debates about economic policy that erupted in New Zealand after the change of government from National to Labour in 1984, it would be remiss not to mention A. W. H. Phillips (1914–1975). Although Bill Phillips spent only a short time at the end of his professional life in New Zealand, he was easily New Zealand's most famous economist of his generation. His 1958 *Economica* article on what became known as the "Phillips curve" was the most heavily cited macroeconomics title of the twentieth century, and his 1959 estimate for Australia was mentioned earlier in this chapter. Summaries of his life and contributions have been offered, among others, by Blyth (1975), Bergstrom et al. (1978), Leeson (1994, 2000), and Bollard (forthcoming) and authoritative accounts of the subsequent Phillips curve literature are provided by Gordon (forthcoming) and Granger and Jeon (forthcoming). The original Phillips curve involved a nonlinear relationship between inflation and unemployment. Once unemployment began rising sharply in New Zealand during a period of explicit monetary disinflation in the second half of the 1980s, this Phillips curve relationship was the basis for the emergence of a distinct post-Keynesian voice for the first time in New Zealand academic and public debates.

The origins and details of New Zealand's decade of economic reforms between 1984 and 1994 have been well explained, including by Bollard and Buckle (1987), Easton (1989), Evans et al. (1996), Silverstone et al. (1996), Kelsey (1997), Boston et al. (1999), Dalziel (2002a), and Dalziel and Lattimore (2004). At the change of government in the July 1984 general election, there was a widespread consensus that this was an opportunity to move away from the strongly interventionist economic policies of the postwar period, which had intensified under the direction of the previous prime minister and minister of finance, Sir Robert Muldoon. There were differences of judgment, however, about the desirable speed and direction of reform, with the government's officials in the civil service advocating radical and widespread change (see especially Treasury 1984). A group of seven economists at Victoria University of Wellington led by John Zanetti took exception to the Treasury approach, expressed in strong terms that were unprecedented in a public debate between two groups of New Zealand economists (Zanetti et al. 1984, 28):

> Yet Treasury's argument throughout, on diverse topics ranging from floating exchange rates to privatisation of health care, is almost uniformly framed as though the conditions assumed in the neoclassical model are in fact met in the current New Zealand context, except in those passages where institutional factors and government regulations are seen purely as obstacles to the attainment of General Equilibrium efficiency. As a result, Treasury is frequently tempted to express conclusions from the abstract model as though they were statements of empirical fact. In so doing, it is in danger of misleading its political masters into believing that the facile solutions to inflation and the [external] deficit which are attainable in neoclassical models are characteristic of the actual world with which they have to deal.

Consistent with the wider consensus, the seven economists argued that "there are sensible arguments in favour of removing many government regulations" but warned that "to want to plunge into an orgy of deregulation in the expectation that the economy will slide smoothly into the elegant harmony of general equilibrium is naïve and impractical" (28). A further exchange took place in the next volume of *New Zealand Economic Papers* (Treasury 1985; Nicholl 1985; and Zanetti 1985), but by then unemployment was beginning to rise to high levels by New Zealand standards. For three decades following World War II, there was virtually no unemployment in New Zealand (registered unemployment was less than half a percent of the labor force). By March 1986, however, the official unemployment rate had reached 4 percent. It rose to 7.1 percent by December 1989, to 8.8 percent twelve months later, and to 10.9 percent at its peak in September 1991. Proponents of the reforms argued that this was part of the costs of reforming the economy, made worse

by a failure to liberalize labor markets early in the reform process (see, for example, Evans et al. 1996). A distinctly post-Keynesian view argued instead that it was a consequence of using monetary policy to achieve price stability without any supporting incomes policy such as the Wages Accord that was in place in Australia.

The leader in promulgating this view was Jan Whitwell (1944–1993), who published a series of papers invoking a post-Keynesian model of monetary policy in a small open economy (Whitwell 1987, 1990, 1992, 1995). Her analysis rested on three points in opposition to the model adopted by monetary policymakers. First, Whitwell argued that the evidence did not support the proposition that the central bank could control a monetary aggregate (primary liquidity in the case of New Zealand) in order to control inflation; if anything the relationship was the reverse (the financial system creates credit-money to accommodate the level of inflation). This argument was supported by evidence from the United Kingdom and New Zealand that monetary aggregates had accelerated away from the grasp of the monetary authorities.

Second, Whitwell was skeptical about the ability of "credible" monetary policies to lower inflationary expectations as proposed by new classical theories of monetary disinflation. She argued that the key issue was the inertia of nominal wages and prices, which meant that inflationary expectations (as well as monetary growth) tended to converge on the actual rate of inflation. Under these circumstances, Whitwell labeled New Zealand's monetary policies after 1984 as anti-employment rather than anti-inflationary.

Third, Whitwell argued that the primary transmission mechanism from monetary policy to inflation operated through the exchange rate. Tight monetary policies were implemented through a higher domestic interest rate. This attracted a net capital inflow of speculative finance, raising the demand for domestic currency on foreign exchange markets, and so causing an appreciation of the exchange rate. This reduced the price of imported goods, aided by falling rates of inflation internationally, which fed directly into a lower rate of growth in the consumer price index.

This analysis explained the high costs in terms of lost employment and output during New Zealand's disinflation, but Whitwell was also concerned about long-term hysteretic consequences. An extended period of overvalued exchange rates put the tradable manufacturing sector under enormous pressure, forcing many domestic producers out of export markets altogether. Further, it was unlikely that a prolonged, policy-induced recession that left workers idle and depleted their human capital could engender a higher rate of economic growth. Whitwell (1990, 118) concluded that "strong charges must be laid against the fourth Labour Government for the disastrous unemployment outcomes which have followed directly from its sustained attempt to establish a monetarist order in a small, open economy."

At the same time as Whitwell was developing her critique, another New Zealand economist was also grappling with understanding the country's

rising unemployment. Paul Dalziel had just begun his academic career at the University of Otago when the reforms commenced in 1984. He prepared a review of the international literature on theories of monetary disinflation, subsequently published as Dalziel (1991a; see also Dalziel 2000). His survey distinguished four models, Monetarist, neo-Keynesian, New Classical, and post-Keynesian. Against a background of significant wage-price inflation, high real interest rates, rising unemployment, and a deepening economic recession, the post-Keynesian model of inflation as a symptom of income distribution conflict and of disinflation being achieved through recession and high unemployment restricting the power of firms and workers to press their nominal income claims, offered important insights for understanding New Zealand's monetary disinflation in the late 1980s and early 1990s.

Dalziel moved to Lincoln University in 1990, and the following year Peter Earl took up the chair of economics at Lincoln after the untimely death of Professor Tony Raynor. Earl arrived in New Zealand with a world-class reputation in post-Keynesian economics as a result of his work on behavioral economics and economic psychology (Earl 1988a, 1988b, 1990a), consumer economics (1986), and monetary economics (Dow and Earl 1982; Earl 1990b). Over the next decade, Earl was enormously productive in *these* areas, particularly in editing a large number of collective volumes (Earl 1996, 2001, 2002; Dow and Earl 1999; Earl and Frowen 2000; Earl and Kemp 1999; Lee and Earl 1993) as well as publishing his well-received microeconomics textbook (Earl 1995). A highlight of his career at Lincoln University was the supervision of the PhD thesis of Jason Potts, which was jointly awarded the Schumpeter Prize for best book when it was published as Potts (2000).

Dalziel's initial research projects sought to extend post-Keynesian research in two dimensions. The first dimension was to produce a formal model of inflation as the result of income distribution conflict (Dalziel 1990, building on authors such as Rowthorn 1977, Carlin and Soskice 1990, and Marglin 1984; see Harcourt 2006). The model extended a previous model presented by Turnovsky and Pitchford (1978) and was later adopted in Palley's (1996, 185–97) textbook. In the model workers set the nominal wage rate to achieve a target share of real per capita income, based on their estimate of the current price level. Similarly, firms set the price level to achieve a target markup, based on their estimate of current wages. The model defines income distribution conflict when the two targets are not compatible and shows how inflation resolves the conflict depending on which party has market power. The second dimension was to incorporate the government into the model by defending Pasinetti's Cambridge theorem from critics who argued that it could not be extended to include government spending and taxation (Dalziel 1989, 1991b, 1991c, 1992).

Earl arranged for Dalziel to have two periods of sabbatical leave in Cambridge University as the guest of Geoff Harcourt, in 1994 and again in 2001 shortly before Dalziel succeeded Earl as professor of economics at

Lincoln in 2002. This allowed Dalziel to develop a method for analyzing the Keynesian multiplier, liquidity preference, endogenous money flows, saving, current account deficits, inflation, and economic growth in a single model (Dalziel 1996a, 1996b, 1999–2000; Dalziel and Harcourt [1997] 2001). This model was controversial among post-Keynesian scholars because it allowed inflation (albeit inflation in asset prices) to be caused by endogenous credit-money growth (albeit created by the private banking system), contrary to a central post-Keynesian tenet that the causal relationship is always from inflation to the stock of money. Dalziel's research program culminated in his 2001 book, *Money, Credit and Price Stability,* and his subsequent attempt in Dalziel (2002b) to set the agenda for further post-Keynesian research on monetary policy.

Nearly a decade further on, the global economy finds itself having to deal with the horrific consequences of an unchecked asset price bubble the collapse of which rocked the foundations of financial institutions all around the world. Understanding relationships between credit money and asset inflation remains an important objective of ongoing post-Keynesian research.

Notes

1. Samuelson (1981a) and (1981b) and Manger (1981) provide an excellent discussion of the details of this fascinating story.
2. However, Karmel should not be associated with the comments in this paragraph, which were based on a reading of Giblin (1930). In particular, Karmel would have emphasized the greater attention paid to complex economic theory in Kahn's version as the reason why it was more suited to Keynes's needs than that of Giblin.
3. Among early advocates of Keynesian ideas, Giblin, Copland, Reddaway, Coombs, Crawford, Swan, and Downing were perhaps the most influential.
4. When considering the theory underlying policy in the first twenty-five postwar years, Coombs's publications are particularly valuable. Not only was he one of the so-called "seven dwarves" on the Commonwealth Advisory Committee that advised on economic aspects of fighting the war. The committee then provided the theoretical structure underlying measures not only for the transition from a war economy to one for a country at peace but also for postwar economic problems more generally. Then from January 1949 to July 1968 he was governor of the Reserve Bank of Australia (or its predecessor, the central banking section of the Commonwealth Bank). Many of his speeches while governor were published as pamphlets. While the year and occasion of any speech referenced are given, all page numbers refer to his book of essays (Coombs 1971), which is a much more convenient source for most readers.
5. Trevor Swan, while working full time as the immediate personal advisor to John Dedman, minister for war organization of industry and minister for postwar reconstruction, constructed an even smaller model over the years 1943 to 1945 (Butlin and Gregory 1989). This model is a direct simplification of the theory in Keynes (1936), with employment determined by expected aggregate demand and aggregate supply. The parameters were not estimated econometrically. It was finally published posthumously as Swan (1989).

6. This model was followed by two large models, one produced in the Reserve Bank and the other a combined Treasury and Australian Bureau of Statistics exercise. Both these were Keynesian in a general sense, but the leader of the team at the Reserve Bank, at least, would have rejected any post-Keynesian label.
7. The explanation in the case of tax rate changes is very complex. The relevant theory requires an article in its own right. The reason for the higher building and construction multiplier is simple. It has a bigger effect on inventory investment in the private sector.
8. Nevile (2000) contains a survey of these neoclassical arguments and the counters to them.
9. This was the basis of "Economic Policy and the Future of Australia," Discussion Paper No. 6, ALP National Committee of Enquiry, 1979.
10. Despite this there were some gems of wisdom that are still of great relevance. Perhaps the most important is Coombs's ([1962] 1971) heavily emphasized warning that, if the growth of capital markets is much greater than the rate of economic growth, there will be a speculative bubble that will eventually burst with painful consequences. In his colorful language, "if we insist on enjoying a periodic binge, then we will certainly have a hangover" (56). Geoff Harcourt pointed out to me the Marxian character of this pronouncement. This may reflect the fact that Harold Laski had a major influence on Coombs's PhD.
11. The current governor of the Reserve Bank and his immediate predecessor pointed this out in Macfarlane and Stevens (1989).
12. The following paragraphs are an edited and shorter version of material in Kriesler and Nevile (2003). Analysis of a specific aspect of interest rate determination can be found in Aspromourgos (2007).
13. It could even have a perverse effect on employment if labor-intensive industries are relatively disadvantaged. There is evidence that this happens to some extent in Australia (Pope 1981). Other perverse effects of exchange rate changes are discussed in Meade and Russell (1957), though there the focus is on the possibility of a favorable change in the terms of trade worsening the current account balance.
14. Coombs ([1959] 1971) had argued for this, but also argued that relying on monetary policy as the main way of achieving this would cause intolerable levels of unemployment. He still held to this in Coombs ([1965] 1971).
15. It also allowed for the possibility of a systematic rise in the markup when demand was strong and a fall when it was weak. Cook and Jones (1954) found that this occurred in Western Australian manufacturing.
16. Russell argued that real wages should be linked to productivity and Karmel that the link should be to nominal wages. However, in 1959 Karmel explicitly assumed that the government could and should keep inflation at a zero rate. When he abandoned the assumption of a constant price level, Karmel kept the nominal link between wages and productivity, leading, as Geoff Harcourt remembers, to "huge rows."
17. This article also includes in the appendix a description of the anti-inflation policy plan known as "the Adelaide Plan."
18. The report of this committee, commonly known as the Vernon Committee, was published as Commonwealth of Australia (1965).
19. Comments about influences on the contents of the Vernon Committee report are based on the memories of Nevile, who was a consultant to the committee.

References

Argy, V., and J. W. Nevile. 1985. Introduction to *Inflation and Unemployment: Theory, Experience and Policy Making,* ed. V. Argy and J. W. Nevile, 1–8. London: Allen and Unwin.

Aspromourgos, A. 2007. "Interest as an Artefact of Self-Validating Central Bank Belief." *Metroeconomica* 58 (4): 514–35.

Benham, F. 1926a. "The Australian Tariff and the Standard of Living: A Reply." *Economic Record*. 2 (May): 20–42.

Benham, F. 1926b. "The Efficiency of Australian Manufacturing." *Economic Record 2,* November, 240–43.

Benham, F. 1927. "The Australian Tariff and the Standard of Living: A Restatement." *Economic Record* 3 (November): 238–48.

Bergstrom, A., A. Catt, M. Peston, and B. Silverstone, eds. 1978. *Stability and Inflation: A Volume of Essays to Honour the Memory of A. W. H. Phillips*. Chichester: John Wiley.

Blyth, C. 1954. "The 1948–49 American Recession." *Economic Journal* 64 (255): 486–510.

Blyth, C. 1956a. "The United States Cycle in Private Fixed Investment, 1946–50." *Review of Economics and Statistics* 38 (1): 41–49.

Blyth, C. 1956b. "The Theory of Capital and Its Time Measures." *Econometrica* 24 (4): 467–79.

Blyth, C. 1960. "Towards a More General Theory of Capital." *Economica* 27 (2): 120–36.

Blyth, C. 1975. "A. W. H. Phillips, M.B.E.: 1914–1975." *Economic Record* 51 (3): 303–7.

Blyth, C., and G. Crothall. 1965. "A Pilot Programming Model of New Zealand Economic Development." *Econometrica* 33 (2): 357–81.

Bollard, A. Forthcoming. "Man, Money and Machines: The Contributions of A. W. Phillips." *Economica,* doi:10.1111/j.1468-0335.2009.00813.x.

Bollard, A., and Buckle R., eds. 1987. *Economic Liberalisation in New Zealand*. Wellington: Allen and Unwin.

Boston, J., P. Dalziel, and S. St. John, eds. 1999. *Redesigning the Welfare State in New Zealand: Policies, Problems and Prospects*. Auckland: Oxford University Press.

Brigden, D. 1925. "The Australian Tariff and the Standard of Living." *Economic Record* 1 (November): 29–46.

Brigden, D. 1927a. "The Australian Tariff and the Standard of Living: A Rejoinder." *Economic Record* 3 (May): 102–16.

Brigden, D. 1927b. "Comment on Mr. Benham's Restatement." *Economic Record* 3 (November): 249–51.

Brigden, D., et al. 1929. *The Australian Tariff: An Economic Enquiry.* Melbourne: Melbourne University Press.

Buckle, R. 2004a. "Conrad A. Blyth—Distinguished Fellow of the New Zealand Association of Economists." *New Zealand Economic Papers* 38 (2): 147–50.

Buckle, R. 2004b. "Conrad Blyth Awarded Distinguished Fellow of the NZAE." July 1. Retrieved January 10, 2013, from http://www.nzae.org.nz/nzae-news/distinguished-fellow/conrad-blyth-awarded-distinguished-fellow-of-the-nzae/.

Butlin, N. G., and R. G. Gregory. 1989. "Trevor Winchester Swan 1918–1989." *Economic Record* 65 (December): 369–77.

Carlin, W., and D. Soskice. 1990. *Macroeconomics and the Wage Bargain: A Modern Approach to Employment, Inflation and the Exchange Rate*. Oxford: Oxford University Press.

Commonwealth of Australia. 1965. *Report of the Committee of Economic Enquiry.* Canberra: Commonwealth of Australia.

Cook, A., and E. Jones. 1954. "Full Cost Pricing in Western Australia." *Economic Record* 30 (November) 272–74.
Coombs, H. (1954) 1971. "The Development of Monetary Policy in Australia." English, Scottish and Australian Bank Research Lecture, University of Queensland Press, Brisbane. Reprinted in Coombs, *Other People's Money: Economic Essays,* 9–26. Canberra: Australian National University Press.
Coombs, H. (1959) 1971. "A Matter of Prices." Presidential Address, Thirty-Fourth ANZAAS Congress. In Coombs, *Other People's Money: Economic Essays,* 116–28. Canberra: Australian National University Press.
Coombs, H. (1962) 1971. "Other People's Money." Sir John Morris Memorial Lecture, Adult Education Board of Tasmania. In Coombs, *Other People's Money: Economic Essays,* 44–63. Canberra: Australian National University Press.
Coombs, H. (1963) 1971. "Some Ingredients for Growth." Shann Memorial Lecture, University of Western Australia. In Coombs, *Other People's Money: Economic Essays,* 138–50. Canberra: Australian National University Press.
Coombs, H. (1965) 1971. "Maintaining Stability in a Rapidly Growing Economy." Lecture to the Eighteenth International Banking Summer School, Melbourne. In Coombs, *Other People's Money: Economic Essays,* 151–59. Canberra: Australian National University Press.
Coombs, H. (1969) 1971. "Financial Institutions-Patterns of Change." Giblin Lecture, ANSAAS Congress, Adelaide. In Coombs, *Other People's Money: Economic Essays,* 64–74. Canberra: Australian National University Press.
Coombs, H. 1971. *Other People's Money: Economic Essays.* Canberra: Australian National University Press.
Dalziel, P. 1989. "Cambridge (U.K.) versus Cambridge (Mass.): A Keynesian Solution of Pasinetti's Paradox-Comment." *Journal of Post Keynesian Economics* 11 (4): 648–53.
Dalziel, P. 1990. "Market Power, Inflation and Incomes Policies." *Journal of Post Keynesian Economics* 12 (3): 424–38.
Dalziel, P. 1991a. "Theoretical Approaches to Monetary Disinflation." *Journal of Economic Surveys* 5 (4): 329–57.
Dalziel, P. 1991b. "A Generalisation and Simplification of the Cambridge Theory with Budget Deficits." *Cambridge Journal of Economics* 15 (3): 287–300.
Dalziel, P. 1991c. "A Note on Dalziel's Model of Long-Run Distributive Equilibrium: Reply." *Journal of Post Keynesian Economics* 14 (1): 121–24.
Dalziel, P. 1992. "Does Government Activity Invalidate the Cambridge Theorem of the Rate of Profit? A Reconciliation." *Journal of Post Keynesian Economics* 14 (2): 225–31.
Dalziel, P. 1996a. "The Keynesian Multiplier, Liquidity Preference and Endogenous *Money." Journal of Post Keynesian Economics* 18 (3): 311–31.
Dalziel, P. 1996b. "Central Banks and Monetary Control: When Credit-Money Finances Investment." *Économies et Sociétés: Monnaie et Production* 10 (2–3): 119–37.
Dalziel, P. 1998. "New Zealand." In *Domestic Adjustments to Globalization,* ed. C. E. Morrison and H. Soesastro, 103–34. Tokyo: Center for International Exchange.
Dalziel, P. 1999–2000. "A Post Keynesian Theory of Asset Price Inflation with Endogenous Money." *Journal of Post Keynesian Economics* 22 (2): 227–45.
Dalziel, P. 2000. "On the Evolution of Money and Its Implications for Price Stability." *Journal of Economic Surveys* 14 (4): 373–93.
Dalziel, P. 2001. *Money, Credit and Price Stability.* London: Routledge.
Dalziel, P. 2002a. "New Zealand's Economic Reforms: An Assessment." *Review of Political Economy* 14 (1): 31–46.

Dalziel, P. 2002b. "The Triumph of Keynes: What Now for Monetary Policy Research?" *Journal of Post Keynesian Economics* 24 (4): 511–27.
Dalziel, P. 2002c. "Monetary Policy and the Exchange Rate." *New Zealand Economic Papers* 36 (2): 199–207.
Dalziel, P., and G. C. Harcourt. (1997) 2001. "A Note on 'Mr Meade's Relation' and International Capital Flows." *Cambridge Journal of Economics* 21 (5): 621–31. Reprinted in Harcourt, *50 Years a Keynesian and Other Essays,* 72–87. Houndmills: Palgrave.
Dalziel, P., and R. Lattimore. 2004. *The New Zealand Macroeconomy: Striving for Sustainable Growth with Equity.* 5th edition. Melbourne: Oxford University Press.
Dixon, R. 2003. "Reductions in Aggregate Unemployment as 'a Free Lunch.'" *Economic and Labour Relations Review* 14 (1): 104–26.
Dow, S. C., and P. E. Earl. 1982. *Money Matters: A Keynesian Approach to Monetary Policy*. Oxford: Robertson.
Dow, S. C., and P. E. Earl, eds. 1999. *Essays in Honour of Brian J. Loasby.* 2 vols. Cheltenham: Edward Elgar.
Duloy J., and J. W. Nevile. 1965. "The Effects of a Reserve Price Scheme for Wool on the Balance of Payments and Gross National Product." *Economic Record* 41 (June): 254–61.
Earl, P. 1986. *Lifestyle Economics: Consumer Behaviour in a Turbulent World.* Brighton: Wheatsheaf.
Earl, P., ed. 1988a. *Behavioural Economics*. 2 vols. Aldershot: Edward Elgar.
Earl, P., ed. 1988b. *Psychological Economics: Development, Tensions, Prospects*. Dordrecht: Kluwer Academic.
Earl, P. 1990a. "Economics and Psychology: A Survey." *Economic Journal*. 100 (402): 718–55.
Earl, P. 1990b. *Monetary Scenarios: A Modern Approach to Financial Systems*. Aldershot: Edward Elgar.
Earl, P. 1995. *Microeconomics for Business and Marketing: Lectures, Case Studies and Worked Essays*. Aldershot: Edward Elgar.
Earl, P., ed. 1996. *Management, Marketing and the Competitive Process*. Cheltenham: Edward Elgar.
Earl, P., ed. 2001. *The Legacy of Herbert Simon in Economic Analysis*. 2 vols. Cheltenham: Edward Elgar.
Earl, P., ed. 2002. *Information, Opportunism and Economic Coordination*. Cheltenham: Edward Elgar.
Earl, P., and S. Frowen, eds. 2000. *Economics as an Art of Thought: Essays in Memory of G*. L S. Shackle. London: Routledge.
Earl, P., and S. Kemp, eds. 1999. *The Elgar Companion to Consumer Research and Economic Psychology.* Cheltenham: Edward Elgar.
Easton, B., ed. 1989. *The Making of Rogernomics*. Auckland: Auckland University Press.
Easton, B. 1997. *In Stormy Seas: The Post-war New Zealand Economy.* Dunedin: Otago University Press.
Evans, L., A. Grimes, and B. Wilkinson with D. Teece. 1996. "Economic Reform in New Zealand 1984–95: The Pursuit of Efficiency." *Journal of Economic Literature* 34 (4): 1856–1902.
Freedman, C., G. C. Harcourt, and P. Kriesler 2004. "Has the Long-Run Phillips Curve Turned Horizontal?" In *Growth, Distribution, and Effective Demand: Alternatives to Economic Orthodoxy.* Essays in Honor of Edward Nell, ed. G. Argyrous, M. Forstater, and G. Moniovi, 144–62. New York: M.E. Sharpe.

Giblin, L. 1927. "The Australian Tariff and the Standard of Living: A Note on Mr. Benham's Statistics." *Economic Record* 3 (May): 148–57.
Halevi, J., and P. Kriesler. 1992. "An Introduction to the Traverse in Economic Theory." In *Beyond the Steady State: A Revival of Growth Theory,* ed. J. Haveli, D. Laibman, and E. Nell, 225–34. Basingstoke: Macmillan.
Halevi, J., and P. Kriesler. 1993. "Structural Change and Economic Growth." In *The Australian Economy under Labor,* ed. G. Mahony, 3–14. St Leonards, NSW: Allen and Unwin.
Hancock, K. 1961. "Wages Policy and Price Stability in Australia." *Economic Journal* 71 (September): 543–60.
Harcourt, G. C. 1965. "A Two-Sector Model of the Distribution of Income and the Level of Employment in the Short Run." *Economic Record* 41 (March): 103–17.
Harcourt, G. C. (1974) 2001. "The Social Consequences of Inflation." *Australian Accountant* 44 (October): 520–28. Reprinted in Harcourt, *Selected Essays on Economic Policy,* 183–99. Houndmills: Palgrave.
Harcourt, G. C. (1993) 2001a. "Markets, Madness and a Middle Way." *Cambridge Review* 114 (February): 40–45. Reprinted in Harcourt, *Selected Essays on Economic Policy,* 232–46. Houndmills: Palgrave.
Harcourt, G. C. (1993) 2001b. "Macroeconomic Policy for Australia in the 1990s." *Economic and Labour Relations Review* 4 (2): 167–75. Reprinted in Harcourt, *Selected Essays on Economic Policy*, 247–54. Houndmills: Palgrave.
Harcourt, G. C. (1994) 2001. "A 'Modest Proposal' for Taming Speculators and Putting the World on Course to Prosperity." *Economic and Political Weekly* 25 (17): 2490–92. Reprinted in Harcourt, *Selected Essays on Economic Policy*, 255–62. Houndmills: Palgrave.
Harcourt, G. C. (1997) 2001. "Pay Policy, Accumulation and Productivity." *Economic and Labour Relations Review* 1 (December): 78–89. Reprinted in Harcourt, *Selected Essays on Economic Policy*, 263–75. Houndmills: Palgrave.
Harcourt, G. C. 2001. *Selected Essays on Economic Policy.* Houndmills: Palgrave.
Harcourt, G. C. 2006. *The Structure of Post-Keynesian Economics: The Core Contributions of the Pioneers*. Cambridge: Cambridge University Press.
Harcourt, G. C. 2007. "Markets, Madness and a Middle Way Revisited." *Economic and Labour Relations Review* 17 (June): 1–10.
Harcourt, G. C., and P. Kerr. (1979) 2001. "The Mixed Economy." In Labor: *Directions for the Eighties,* ed. J. North and P. Weller, 184–95. Sydney: Ian Nowak. Reprinted in Harcourt, *Selected Essays on Economic Policy*, 81–95. Houndmills: Palgrave.
Hart, N. 2005. "The Role and Effectiveness of Fiscal Policy." *Economic and Labour Relations Review* 16 (1): 17–41.
Hart, N. 2007. "Endogenous Money and Interest Rate Targeting: Implications for Fiscal Policy." *International Review of Business Research Papers* 3 (2): 133–46.
Hawke, G. R. 1985. *The Making of New Zealand: An Economic History.* Cambridge: Cambridge University Press.
Isaac, J. 2008. "Collective Bargaining under Trade Practices Law." *Economic and Labour Relations Review* 19 (November) 39–56.
Karmel, P. 1959. "Some Reflections on Inflation, Productivity and Growth." *Economic Record* 35 (December): 349–71.
Karmel, P. 1960. "Giblin and the Multiplier." In *Giblin: The Scholar and the Man,* ed. D. Copland, 164–74. Melbourne: Cheshire.
Kelsey, J. 1997. *The New Zealand Experiment: A World Model for Structural Adjustment? 2nd edition.* Auckland: Auckland University Press and Bridget Williams.

Keynes, J. M. 1936. *The General Theory of Employment, Interest and Money.* London: Macmillan.

King, J., and F. Stilwell. 2005. "The Industrial Relations 'Reforms': An Introduction." *Journal of Australian Political Economy* 56 (December): 5–12.

Kriesler, P. 2003. "Traverse." In *The Elgar Companion to Post Keynesian Economics,* ed. J. King, 355–59. Cheltenham: Edward Elgar.

Kriesler, P., and J. Halevi. 1995. "Corporatism in Australia." In *The Political Economy of Full Employment,* ed. P. Arestis and M. Marshall, 217–37. Aldershot: Edward Elgar.

Kriesler, P., and M. Lavoie. 2005. "A Critique of the New Consensus View of Monetary Policy." *Economic and Labour Relations Review* 16(1): 7–15.

Kriesler, P., and M. Lavoie. 2007. "The New View on Monetary Policy: The New Consensus and Its Post-Keynesian Critique." *Review of Political Economy* 19 (3): 387–404.

Kriesler, P., and J. W. Nevile. 2000. "IS-LM and Macroeconomics after Keynes." In *Money Macroeconomics and Keynes: Essays in Honour of Victoria Chick,* ed. P. Arestis, M. Desai, and S. Dow, vol. 1: 103–14. London: Routledge.

Kriesler, P., and J. W. Nevile. 2003. "Macroeconomic Impacts of Globalization." In *Growth and Development in the Global Economy,* ed. H. Bloch, 173–89. Cheltenham: Edward Elgar.

Kriesler, P., and J. W. Nevile. 2007a. "Economic Perspectives on Workers' Rights." In *Australian Charter of Employment Rights,* ed. M. Bromberg and M. Irving, 127–34. Victoria: Hardie Grant Books.

Kriesler, P., and J. W. Nevile. 2007b. "The Right to Work." In *Australian Charter of Employment Rights,* ed. M. Bromberg and M. Irving, 135–44. Victoria: Hardie Grant Books.

Lattimore, R., and P. Wooding. 1996. "International Trade." In *A Study of Economic Reform: New Zealand,* ed. B. Silverstone, A. Bollard, and R. Lattimore, 315–53. Amsterdam: North-Holland.

Lee, F. S., and P. E. Earl, eds. 1993. *The Economics of Competitive Enterprise: Selected Essays of P.W.S. Andrews.* Aldershot: Edward Elgar.

Leeson, R. 1994. "A. W. H. Phillips M. B. E. (Military Division)." *Economic Journal* 104 (424): 605–18.

Leeson, R., ed. 2000. *A. W. H. Phillips: Collected Works in Contemporary Perspective.* Cambridge: Cambridge University Press.

Lerner, A. 1943. "Functional Finance and the Federal Debt." *Social Research* 10 (1): 38–51.

Macfarlane, I., and G. Stevens. 1989. "Overview: Monetary Policy and the Economy." In *Studies in Money and Credit,* ed. I. Macfarlane and G. Stevens, 1–9. Sydney: Reserve Bank of Australia.

Manger, G. 1981. "Summing up the Australian Case for Protection: Comment." *Quarterly Journal of Economics* 96 (1): 161–67.

Marglin, S. A. 1984. "Growth, Distribution, and Inflation: A Centennial Synthesis." *Cambridge Journal of Economics* 8 (2): 115–44.

Meade J. E. and E. A. Russell. 1957. "Wage Rates, the Cost of Living, and the Balance of Payments." *Economic Record* 33 (April) 23–28.

Milbourne, R. 1990. "Money and Finance." In *The Australian Macro-economy in the 1980s,* ed. S. Grenville, 222–76. Sydney: Reserve Bank of Australia.

Mitchell, W., and M. Watts. 2002. "Restoring Full Employment: The Job Guarantee." In *The Urgency of Full Employment,* ed. W. Mitchell and E. Carlson, 95–114. Sydney: Centre for Applied Economic Research, University of New South Wales.

Nevile, J. W. 1962. "A Simple Econometric Model of the Australian Economy." *Australian Economic Papers* 1 (September): 79–94.
Nevile, J. W. 1970. *Fiscal Policy in Australia: Theory and Practice.* Melbourne: Cheshire.
Nevile, J. W. 1974. "Inflation in Australia: Causes and Remedies." *Economic Papers* E1 (March): 6–16.
Nevile, J. W. 1975. *Fiscal Policy in Australia: Theory and Practice.* 2nd edition. Melbourne: Cheshire.
Nevile, J. W. 1983. "The Role of Fiscal Policy in the Eighties." *Economic Record* 59 (March): 1–15.
Nevile, J. W. 1990. "Structural Deficits and Fiscal Policy Stance in Australia, 1966–67 to 1988–89." *Australian Economic Review* 29 (4th Quarter): 24–32.
Nevile, J. W. 2000. "Can Keynesian Policies Stimulate Growth in Output and Employment?" In *The Unemployment Crisis in Australia: Which Way Out?* ed. S. Bell, 149–74. Cambridge: Cambridge University Press.
Nevile, J. W., and P. Kriesler. 2000. "Full Employment, a Neglected but Indispensable and Feasible Human Right." *Economic and Labour Relations Review* 11 (Supplement): 117–36.
Nevile, J. W., and P. Kriesler. 2002. "Tools of Choice for Fighting Recessions." In *The Urgency of Full Employment,* ed. W. Mitchell and E. Carlson, 73–93. Sydney: Centre for Applied Economic Research, University of New South Wales.
Nevile, J. W., and P. Kriesler. 2008a. "Expectations and Unemployment." In *Keynes and Macroeconomics after 70 Years: Critical Assessments of "The General Theory",* ed. L. R. Wray and M. Forstater, 355–59. Cheltenham: Edward Elgar.
Nevile, J. W., and P. Kriesler. 2008b. "Minimum Wages, Unions, the Economy and Society." *Economic and Labour Relations Review* 19 (November): 25–38.
Nicholl, P. 1985. "Opening 'the Books': A Response." *New Zealand Economic Papers* 19: 117–22.
Palley, T. I. 1996. *Post Keynesian Economics: Debt, Distribution and the Macro Economy.* Houndmills: Macmillan.
Phillips, A. W. H. 1958. "The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861–1957." *Economica* 25(2): 283–99.
Phillips, A. W. H. 1959. "Wage Changes and Unemployment in Australia, 1947–1958." Economic Society of Australia and New Zealand Economic Monograph No. 219.
Plowman, D. 1995. "Protecting the Low Income Earner: Minimum Wage Determination in Australia." *Economic and Labour Relations Review* 6 (2): 252–87.
Pope, R. 1981, "Revaluation: Help or Hindrance to Australian Manufacturers?" CAER Paper No. 14, December. University of New South Wales, Kensington.
Potts, J. 2000. *The New Evolutionary Microeconomics: Complexity, Competence and Adaptive Behaviour.* Cheltenham: Edward Elgar.
Rowthorn, R. E. 1977. "Conflict, Inflation and Money." *Cambridge Journal of Economics* 1 (3): 215–39.
Russell, E. A. 1965. "Wages Policy in Australia." *Australian Economic Papers* 1 (June–December): 1–26.
Russell, E. A. 1966. "Wage Policy, Costs and Prices." University of Adelaide, Eleventh Summer School of Business Administration, 14–24.
Salter, W. E. G. 1959. "Internal and External Balance: The Role of Price and Expenditure Effects." *Economic Record* 35 (71): 226–38.
Salter, W. E. G. 1960. *Productivity and Technical Change.* Cambridge: Cambridge University Press.

Samuelson, P. A. 1981a. "Summing Up the Australian Case for Protection." *Quarterly Journal of Economics* 96 (1): 147–60.

Samuelson, P. A. 1981b. "Justice to the Australians." *Quarterly Journal of Economics* 96 (1): 169–70.

Silverstone, B., A. Bollard, and R. Lattimore, eds. 1996. *A Study of Economic Reform: New Zealand*. Amsterdam: North-Holland.

Stegman, T. 1982. "The Estimation of an Accelerator Type Investment Function with a Profitability Constraint by the Technique of Switching Regressions." *Australian Economic Papers* 21 (December): 371–91.

Stegman T. 1993. "Aggregative Investment and Its Sectoral Composition: The Failure of the Restructuring Policy." In *The Australian Economy under Labor,* ed. G. Mahony, 87–101. St Leonards, NSW: Allen and Unwin.

Swan, T. W. 1956. "Economic Growth and Capital Accumulation." *Economic Record* 32 (November): 334–61.

Swan, T. W. 1989. "The Principle of Effective Demand: A Real Life Model." *Economic Record* 65 (December): 378–98.

Treasury. 1984. *Economic Management*. Wellington: Government Printer.

Treasury. 1985. "Opening 'the Books': A Reply." *New Zealand Economic Papers* 19: 95–115.

Turnovsky, S. J., and J. D. Pitchford 1978. "Expectations and Income Claims in Wage Price Determination: An Aspect of the Inflationary Process." In *Stability and Inflation: A Volume of Essays to Honour the Memory of A. W. H. Phillips,* ed. A. R. Bergstrom, A. J. L. Catt, M. H. Peston, and B. D. Silverstone, 155–78. Chichester: John Wiley.

Watts, M., and W. Mitchell. 1990a. "Australian Wage Inflation: Real Wage Resistance, Hysteresis and Incomes Policy: 1968(3)–1988(3)." *Manchester School of Economic and Social Studies* 58 (June): 142–64.

Watts, M., and W. Mitchell. 1990b. "An Analysis of the Impact of Incomes Policy in Australia on the Male Inter-industry Wage Structure." *Journal of Industrial Relations* 32 (September): 353–66.

Whitwell, J. 1987. "Monetary Policy with a Deregulated Financial Sector." In *Economic Liberalisation in New Zealand,* ed. A. Bollard and R. Buckle, 261–82. Wellington: Allen and Unwin.

Whitwell, J. 1990. "The Rogernomics Monetarist Experiment." In *The Fourth Labour Government,* ed. M. Holland and J. Boston, 101–22. 2nd edition. Auckland: Oxford University Press.

Whitwell, J. 1992. "Money and Inflation: Theories and Evidence." In *The New Zealand Economy,* ed. K. S. Birks and S. Chatterjee, 192–222. 2nd edition. Palmerston North: Dunmore Press.

Whitwell, J. 1995. "Monetary Disinflation with Inflation Inertia: Central Bank Autonomy in an Open Economy." GSBGM Working Paper No. 15/95, Victoria University of Wellington.

Zanetti, G. N. 1985. "Opening 'the Books': Reply." *New Zealand Economic Papers* 19: 123–25.

Zanetti, G. N., I. G. Bertram, P. A. Brosnan, R. A. Buckle, M. J. Pope, R. J. Stephens, and G. M. Wells. 1984. "Opening the Books: A Review Article." *New Zealand Economic Papers* 18: 13–30.

34
Marxism and Post-Keynesian Economics

Joseph Halevi

34.1 Introduction

The thesis presented here runs as follows: Post-Keynesian economics has contributed to identify within the framework of the theory of effective demand, the conditions of sectoral disproportionalities on which a significant part of Marxian theories of accumulation and crisis are based. This happened not as a result of an explicit dialogue with the Marxian debates about sectoral proportions, but as a consequence of the analytical evolution of Post-Keynesian theories. In order to evince the connection between the Post-Keynesian theory of growth and distribution and the Marxian approach to the question of disproportionalities, it is necessary to accept the basic Kaldorian hypothesis concerning the level of development of the stock of capital relatively to total population, then it is necessary to reject the Kaldorian adjustment mechanism in favour of Hicks's disequilibrium Traverse (Hicks, 1965,1985; Kaldor, 1956,1957). From the above it follows that I view Kaldor's and Hicks's contributions to growth theory as the central analytical core of Post-Keynesian economics. In fact, it will become apparent that the conceptual range of validity of Hicks's structural disequilibrium falls within Kaldor's hypothesis about the level of development of the stock of capital in a mature economy.

The guiding concept underlying this paper is the Marxian notion of *degree of development of the productive forces*. This notion refers to the technical and material basis characterising production in different modes of production (eg. capitalism as opposed to feudalism), as well as in the different phases within a given mode of production. In this context, Kaldor's characterisation of the level of development of the stock of capital in a mature, hence Keynesian, economy represents an expansion of the Marxian concept

Revised from *History of Economics Review*, No. 8, pp. 46–58, Summer 1992, 'Marxism and post-Keynesian Economics,' by Halevi, J. With kind permission from The History of Economic Thought Society of Australia. All rights reserved.

applicable to a particular stage of the evolution of the capitalist system, not necessarily envisaged by Marx.

34.2 The Marxian Story: Marx

In Marx there are a number of theories of cycles and crises. For the purposes of this paper I will single out two of them: cyclical accumulation, and sectoral imbalances. The first is very well known and needs only a brief summary. Capitalist accumulation is driven by the creation of surplus value under competitive conditions, the latter means that the system tends, through periodic fluctuations, to move towards a uniform rate of profit. For Marx, the technical basis of capitalist production is such that its capacity to accumulate will invariably expand at a greater rate than the natural increase in the supply of labour. Hence, accumulation requires an endogenous creation of a reserve army of workers, even when the possibilities to draw labour from non fully capitalistic sectors have run out. Consequently, the mechanism which regulates accumulation and, with it, the formation of the labour force, has to be found in the link between variations in the rate of accumulation and in the distribution of income. It is easier at this point to assume that no wages and all profits are saved. Under full capacity conditions, a one to one relation is established between changes in the rate of profit (= the rate of growth) and changes in the share of profits over total output for any given set of techniques of production. Whenever the rate of accumulation is high and sustained enough as to lead to an exhaustion of the reserve army, real wages will rise reducing the rate of profit, the rate of accumulation and the share of profit (= the share of investment) over total output.

In these circumstances capitalists, because of classical competition, will attempt to change the technical basis of production through labour saving investment, which Marx assumed also to be capital augmenting. In the short run, labour saving investment in a situation of a much reduced rate of profit, will cause an increase in the reserve army and a downward pressure on the real wage. The share of profits rises again setting the stage for a recovery in the rate of profit. In fact all the surplus is automatically invested, which leads – after a certain amount of time – to a recovery in accumulation on an enlarged technical basis. It is precisely in the interim period that the crisis manifests itself in full through the bankruptcies of those firms which were unable to reduce their costs of production, which, in Marx, means that they were unable to pay their debts. Yet this crisis contains the seeds for its solution, since widespread bankruptcies imply the creation of a large mass of unemployed people with negative impact on real wages and a positive one on the rate of profit. In the longer period however, the system is bound to experience, from cycle to cycle, a secular rise in the organic composition of capital and therefore to undergo a secular decline in the rate of profit.

Marx's achievement lies in having eliminated all the naturalistic elements which marked the theory of population of the Classical economists. The factors governing the movements of the economically relevant component of population are made to depend on the process of accumulation itself. It must be noticed that Marx in developing his cycle cum crisis theory in Volume One of *Capital* (Chapter 25), worked with the classical one sector *corn* model which has been correctly described by Hicks (1965) as a primitive growth model. For Hicks the primitiveness of the Classical growth model consists in that its one sector nature makes it difficult to take into account an undesired accumulation of inventories. If we were to apply Marx's analysis of the cycle conducted in Volume One to the two sector scheme of reproduction developed in Volume Two of *Capital,* we would have to conclude that – during the crisis – mass unemployment and the ensuring fall in the effective demand for consumption goods could act as signals for the capitalists in the capital goods industries that the time is ripe for an expansion of their own investments. Mass unemployment while leading to a fall in consumption demand causes a decline in the real wage thereby lifting the potential rate of profit, which can be transformed into an actual increase only if investment expands. Given that the consumption goods industries are in a depressed state, the expansion in investment activity should come – initially at least – from the capital goods sector. But, from the scheme of reproduction presented in Volume Two, another scenario is equally possible: the fall in the purchasing power of workers by creating unwanted unused capacity in the consumption goods sector will also reduce the demand for capital goods with a negative impact on the rate of capacity utilisation in the capital goods sector.

In my view, Marx, although aware of the role of wages as a component of effective demand, did not integrate it in his long run theory of growth and cycles. The basic reason for this is to be seen in three factors: firstly, in the strait-jacket imposed by the Classical corn model which he used in Volume One to which Hicks's critical remarks fully apply; secondly, in his belief in the classical view of competition; thirdly, in the incomplete character of Volume Two given his untimely death. This last factor explains why so many of his insights into the issue of sectoral proportions have remained isolated in relation to the main corpus of his work.

34.3 The Marxian Story: The Marxists and Tugan Baranovsky

Volume Two of *Capital* had a very profound impact on the economic thought of the Social Democrats, in particular in Germany, Austria, and Tsarist Russia virtually until the First World War. The analytical structure of their thought was grouped around the reproduction schemes out of which sprang two debates: the breakdown controversy (Sweezy, 1942),

and the controversy over capitalist development in Russia (Lenin, 1903). In my opinion it would be impossible to appreciate the influence of Marx's reproduction schemes on the pre 1914 Social Democracy without mentioning that for European Marxists the model economy was no longer Marx's Britain, but Germany. Capitalist accumulation in this country was seen as based on a right integration between banks and industries, on cartels and on the formation of a very large capital goods (heavy industry) sector. In this historical context Marx's two sector model became the analytical instrument for debating whether or not the expansion of the capital goods sector ahead of the consumption goods one could lead to sustained growth or to a crisis of overproduction / underconsumption. The disproportionality approach stemmed precisely from this kind of preoccupations.

Tugan Baranovsky (1905) – a non Marxist Ukrainian, yet an admirer of Marx's logic – was the main theorist of the disproportionality strand. On the logical plane his approach was superior to that of the partisans of the theory of crisis due to underconsumption (Kautsky) or to that of Rosa Luxemburg, who stressed the role of imperialism as a means to create a market for surpluses which would otherwise go unsold.

Tugan understood very well the connexion between profits and accumulation in a two sector model. Today, after Von Neumann, these links seem to be self evident, yet it must be borne in mind that the full analytical dissection of two sector models dates only from the 1960s. Before the end of the 19th Century, Tugan realised that in a Marxian model of expanded reproduction total profits are equal to the value of total capital goods output. The larger the ratio of this output relatively to the output of consumption goods the higher the share of profits over the value of total production. Furthermore, he also argued that the rate of profits need not fall even if the degree of mechanisation (the Marxian organic composition of capital) were to rise indefinitely.

In substance, Tugan Baranovsky, working solely with Marx's schemes which are expressed in terms of labour values, understood that the Marxian framework contains two polar cases: a pure labour theory of value when the rate of profit is zero; and a pure capital theory of value when the wage rate is zero. All this is very well known today (Pasinetti, 1977; Sraffa, 1960) but in those years even the necessary theorems in matrix analysis did not exist. The second case means that if the labour vector could be reduced to zero, which is the same thing as setting the wage rate equal to zero, total production would be equal to total profits at the maximal rate of profit. By groping towards the case of a pure capital theory of value Tugan argued that capitalism could theoretically achieve through automatization a stage in which virtually all output would coincide with that of the capital goods sector, without entering into any kind of crises. The condition for the smooth transition to a pure capital theory of value is that to every decline in employment, and therefore

in the socially necessary output of consumption goods, there should correspond a shift in investment towards the capital goods sector by the amount that would otherwise have gone to the consumption goods sector. In other words, if mechanisation reduces the quantity of labour needed to produce a given amount of output, a compensatory mechanism should take place in the capital goods sector. The role of the compensatory mechanism is not to provide employment but to create the necessary sectoral shift for capital to be fully utilized.

This is what Tugan called sectoral proportionalities. It is interesting to see that in Tugan Baranovsky, balanced proportions are not those yielding a steady state rate of growth. Quite the contrary. The balancing condition refers only to the size of the shift towards the capital goods sector, while the growth rate will actually be rising. Tugan Baranovsky concluded that even if the system were to end up activated by only one worker, no crisis should occur from the side of consumption demand as long as the shrinkage of the consumption goods sector is perfectly offset by an expansion of the capital goods sector. From his analysis Tugan Baranovsky deduced that crises and industrial fluctuations are due to sectoral disproportionalities, since in reality conditions for smooth shifts to the capital goods sector are never obtained. In Harrodian terminology, we could say that for Tugan the warranted rate of growth can be as high as labour saving technical progress allows the internal rate of accumulation of the capital goods sector to be. Yet, there is no reason to assume that multitude of capitalists will actually move their investment to that sector in the required proportions. His book *Theory and History of Commercial Crises in England* (1901) interpreted the whole business cycle in those terms.

If Volume Two of *Capital* attracted the attention of the bulk of the Social Democratic movement in Europe, Tugan's utilisation of the reproduction schemes had a further effect on European social thought, especially in the German and Russian speaking areas of the continent. Tugan's approach influenced Lenin's critique of the Populists, Hilferding's analysis of disproportionalities in a regime of cartels and, via Hilferding, Schumpeter's view that a trustified capitalist system can be more stable than a competitive one (Schumpeter, 1928). Tugan Baranovsky, condensed in his work two strands of European social and scientific thought, namely, the role of consumption under conditions of accumulation and the question of automation. These two aspects have been dealt with separately, and with much greater analytical precision, by Von Neumann. The latter's contribution to growth theory is well known to economists. By reducing labour to the status of means of production – like oxen in an agricultural economy – Von Neumann showed that a maximal growth rate can exist and it yields a steady state. The second aspect links up with Von Neumann's research on the theory of automata, where he showed, as early as in 1948, that it is possible to design a self reproducing machine (Von Neumann, 1965).

While Tugan Baranovsky's logic is impeccable his argument implies a questionable theoretical approach concerning the social character of capitalism. Capital, is in Marx a social not a technical relation, namely, the existence of capital requires the existence of wage labour. In the Marxist framework, means of production and money are not in themselves capital; they will constitute capital only if they are confronted with a set of people whose livelihood is derived from selling their labour power. It is the purchase of labour power by the capitalist which allows means of production and money to function as capital. This is why for Marx the formation of a market of free labourers – free to sell their labour power and free from the ownership of the means of production – plays such an important role in his theory of accumulation. It is the existence of wage labour which permits the objective determination of wage rates relatively to productivity rates which, in turn, gives to the rate of profit a very precise function in the working of capitalism as a socio-economic system.

In Tugan Baranovsky, by contrast, the labour market disappears completely, since with full automation only one worker will push the button with which automata will just reproduce themselves. True, the rate of profit will be at its maximum, since labour inputs will no longer exist, but it will have no social meaning, unless a full institutional theory is provided to show how humankind can coexist alongside such a technical system. Tugan not only did not provide us with the required theory but he kept treating his own system of machines producing machines as if it were socially and institutionally comparable to Marx's capitalism. Thus Tugan Baranovsky succeeded in eliminating consumption demand from the theory of cycles and crises by eliminating the labour force from the picture. The absence of an appropriate institutional and juridical theory – which should have taken, at this point, centre stage – regarding the social organisation of such a system, implies that his "economy" is outside the orbit of the capitalist system with nothing to replace it in its stead.

The critical remarks made in the foregoing paragraph should not be taken to mean that the form of the capital-labour relation put forward by Marx is immutable over time. In other words, within the framework of a society based on wage labour there can be a transformation of the dynamic process which determines the distribution of income and the rate of accumulation. A possible source of this transformation is the development over time of the stock of capital in relation to the employable labour force induced by increases in the productivity of labour. In Marxian terms, modifications in the role of wage labour could, ultimately, be caused by the development of the forces of production engendered by accumulation. It is at this point that Kaldor's contribution may be brought in. This will enable us to recapture – via Hicks – the issue of disproportionalities in a manner consistent with the problem of effective demand.

34.4 Kaldor's Story: The Evolution of Capitalism

Kaldor's most quoted essay on the theory of income distribution is the famous 1956 *Review of Economic Studies* paper titled "Alternative Theories of Distribution". For my purposes, however I will refer to a subsequent paper which, because of the context in which it was delivered, tackled head on Marx's cyclical theory as expounded in Volume One of *Capital* and summarized in the second section of this paper. In a lecture given at the University of Peking (Beijing) in 1956, Kaldor presented a typology of capitalist transformation in which the Marxian stage appears as belonging to the initial phase of industrialisation (Kaldor, 1957). According to Kaldor the Marxian phase of accumulation pertains to an epoch in which growth is conditioned by three factors: (i) by moderate increases in productivity, (ii) by the gravitation of wage rates around subsistence through oscillations due to the periodic exhaustion and replenishment of the reserve army of labour, (iii) by a tendency of the capital output ratio to rise so as to counter the tendency of the share of profit to rise. The third factor is nothing but a reformulation of Marx's view about the long term fall in the rate of profit. In this historical period investment is not governed by any form of stock adjustment principle, since the amount invested will be what the surplus (i.e. profits defined as Y-W) allows it to be. If the surplus rises relatively to output so will investment and vice versa. Changes in the share of the surplus go hand in hand with the cycle of the reserve army. Consequently, the existence of a surplus population relatively to the stock of capital is, in the long run, a prerequisite for this mechanism to operate as a law. That is, as a permanent phenomenon in the process of growth. Unused capacity plays no analytical role in this context, although during the trough of the cycle less efficient firms will close down. Yet the ensuing spare capacity has no persistent impact on the tendency toward recovery which, in turn, results from the effect of mass unemployment on the wage rate.

The Marxian (Volume One) phase will end when the reserve army will cease to act as a regulator of the share of investment over national income, and therefore as a regulator of the trade cycle based on variations in the distribution of income. The dynamics of real wages is now determined by the growth of the productivity of labour while investment decisions in the aggregate are determined by the need to adjust the stock of capital relatively to effective demand. Thus, given a stable difference between productivity rates and real wages, accumulation and growth can continue unperturbed along a given warranted path up to the point where the accumulated stock of capital can employ the whole of the working population. If, in the neighbourhood of full employment, money wages begin to rise, instead of a fall in the share of profits the economy will experience a rise in the price of wage goods. Kaldor's reasoning is entirely in terms of a one sector model, but here he implicitly uses in a Kaleckian manner Marx's equilibrium condition of

effective demand for the wage goods sector stated in Volume Two of *Capital*. Translated in price and quantity relations, Marx's condition for the wage goods sector is as follows:

$p_w\ a_w\ E_w = wE$
Where p_w is the price of wage goods, a_w the productivity of labour in the wage goods sector and E_w is the sector's level of employment, while E is total employment and w is the money wage rate.

At any given moment of time there is a division of the product between profits and wages where total demand for wage goods must be equal to total supply. If money wages are below what this distribution would require, prices would fall leading to an increase in effective demand for consumption goods; whereas if money wages were higher prices would rise. For any given a_w/w ratio, the price of wage goods will depend on the ratio between total employment and the employment in the wage goods sector. In turn the employment ratio is determined by the relative movements in the degree of capacity utilisation (Halevi, 1985; Halevi and Kriesler, 1991). But Kaldor never analysed this side of the problem because he clung to the representative firm model which implies one sector only (Harcourt, 1963).

To the Peking audience, Kaldor explained the difference between Marx's approach and his own by using also the labour theory of value. In the Marxian case, if the socially necessary labour time to produce the basket of wage goods is 60% of the total amount of time bestowed in production, capitalists cannot undertake an amount of investment exceeding 40% of national income. The share of wages cannot be below 60% because workers's incomes are assumed to be at subsistence. By contrast, if productivity increases reduce the socially necessary labour time for the production of the wage goods basket to 40%, while the share of profits is 50%, the price mechanism will increase the share of wages to 50% as well. In the former case profits are determined as residuals after fixing the share of wages, while in the second it is the wage rate that is determined as a residual. Any further increase in wages above 50% will be met by a price inflation rather than by a fall in the share of profits. Analytically, the difference between the two cases lies in that in Marx the share of investment and the share of profits are taken to be virtually identical; whereas in Kaldor the share of investment is equal to the share of profit multiplied by the propensity to save out of profits. The propensity to save out of profit is given, that is, it is fixed independently of variations in the distribution of income. It is this factor, formally simple but conceptually quite profound since it changes the *modus operandi* of capitalist investment, which allows for real wages to increase along with labour productivity.

Capital accumulation breaks, at this point, free from the constraint of the reserve army of labour, so that the stock of capital can grow until it

meets the labour constraint. For Marx, the reserve army of labour represents the population law internal to the capitalist system thereby allowing it to expand by means of regular cycles. For Kaldor, the reserve army sets a limit to the growth rate of the stock of capital relatively to total population. It must be pointed out that these sort of ideas, aiming at identifying a maturity phase in capitalism's historical evolution, were not exclusively Kaldor's. Sweezy (1953) and Kalecki (1954) also produced an interpretation of the maturity of capitalism basing it on the degree of development of capital equipment relatively to total population, coupled with assumptions concerning the oligopolistically induced rigidity in the distribution of income. This led them to conclude that in its maturity phase the economy, if left to itself, was likely to be subjected to a persistent tendency towards stagnation. Kaldor, however, did not take the stagnationist approach. Instead he suggested an adjustment mechanism based on variations in the distribution of income around the full employment zone. Given the propensity to save out of profits and given the capital output ratio, the share of profits will fall, through a decline in prices relatively to wages, whenever the initial share of profits tends to be higher than what is required by the Harrodian full employment growth rate. Conversely prices will rise and the share of wages will fall if the actual share of profits is below the level required by the Harrodian full employment rate.

In this context all the discussions between Kaldor's approach and the MIT approach to growth can be left aside. The important point here is that Kaldor's theory represents simultaneously an alternative to Marx (Volume One) – while retaining the capitalistic character of investment and accumulation – and an answer to the instability hypothesis contained in Harrod. Yet, up to what point is the adjustment mechanism plausible? The answer to this question may, in fact, be found in Hicks's *Capital and Growth*.

34.5 Hicks: The Problem of Disproportionalities Restated

Hicks's *Capital and Growth* (1965) was, in my opinion, the product of the capital theoretic debates seen in the light of growth theory and of Joan Robinson's contribution in particular (1956). No single element of *Capital and Growth* was new, just like *Value and Capital* whose components were taken from Marshall and Lindahl.[1]

The capital theoretic debates showed that in a two sector model the postulated monotonic inverse relation between the capital labour ratio and the rate of interest will exist only if the capital labour ratio in the consumption goods sector is higher than that in the capital goods sector. In parallel with, but independently from, the capital controversy, the writings of a number of Japanese economists such as Shinkai, Uzawa, Inada, showed that the dynamic stability condition of the quantity side of a two sector model depends on the same assumption about the relative capital labour ratios.

Hence, if the Neoclassical relation between aggregate capital intensity and the rate of interest could be criticised because of its special assumption about relative sectoral intensities, the same critique could be levelled against the economic meaningfulness of the dynamic stability conditions of growth models. This is exactly what Hicks has accomplished in *Capital and Growth,* a book which culminates in the Traverse. Yet, instead of limiting himself to purely formal observations, Hicks used the fact that the capital intensity condition was not in general valid, in order to bring out the shortcomings of the political economy implied in one sector growth models, be their nature Kaldorian or Solowian.

The Traverse of *Capital and Growth* is about structural disequilibrium, that is, about the fundamental reasons why the system is unlikely to adjust to a full employment growth path in the case of a discrepancy between the growth of the stock of capital and that of population. Hicks derived the inspiration to look into the complexities of structural relations from the Austrian School, from Von Hayek in particular as well as from a little known Neo Austrian monograph published well before *Capital and Growth* (Lachmann, 1956). With hindsight it appears normal that an essay which begins with a critique of Classical "corn" type models, would reach its peak in the discussion of whether an appropriate capital structure can be attained. In this respect also the reference to the Austrian School seems natural, given that in *Prices and Production* (1932) Von Hayek did stress the specificity of each form of equipment. Yet there is more to it than the insights that can be gotten from a particular school of thought. *Capital and Growth* and its sequel *Methods of Dynamic Economics* (1985), testify to Hicks's long march away from the Temporary Equilibrium method developed in *Value and Capital*. The latter method is seen as too restrictive since it requires that markets be in equilibrium also in the very short period. However:

> even in a very competitive economy such very short-run equilibration is hard to swallow; in relation to modern manufacturing industry, it is hard to swallow indeed. It was inevitable that the time should come when it had to be dropped (Hicks, 1985, p. 81).

Hicks's first step was to adopt the assumption that prices have only to be such as to cover costs of production at a given rate of profit. The system thereby becomes a fixprice economy and once applied to a long term equilibrium, it becomes a Harrod type growth model. Under fixprices all quantities are treated as homogeneous since they are aggregated by volume indices. But, Hicks points out that:

> of course we know that in fact these things are not homogeneous; each of them is a collection of different things, which at least for some purposes need to be distinguished. From that point of view the fixprice assumption

> has made things too easy. It has left out the *structure* of the productive system (Hicks, 1985, p. 132).

The emphasis on structure serves the purposes of highlighting the flimsy character of the adjustment mechanism proposed by the two competing one sector growth models whenever a change occurs in the equilibrium growth rate. As already mentioned, in Kaldor the adjustment takes place through a change in the aggregate propensity to save via a change in the distribution of income. In Solow, by contrast, it takes place via a change in the capital output ratio for any given aggregate propensity to save. Hicks's scepticism is not primarily motivated by the need for formal completeness. Instead it stems from a critical perspective on the political economy of applied Keynesianism, or, better still, from a critique of the Keynesian ideology:

> But let us now suppose that the Harrod difficulty has been got over: that a suitable change in the propensity to save, for whatever reason, has occurred – will that be the end of the trouble? The magic that used to be attributed to a Keynesian fiscal policy assumed that it would; but there is a school of economists, whose voices were for long almost drowned among the fanfare of the Keynesian orchestra, who have been maintaining all along, that it is not. (Hicks, 1985, p. 131).

The structural model with which Hicks analysed the Traverse is the standard single technology fixed coefficients one. It is heterogeneous only in relation to the physical distinction between capital goods and consumption goods. Quite apart from the Austrian ideas that stimulated Hicks to study the implications for growth theory of structural relations, the model can be perfectly assimilated to Marx's schemes of reproduction. Indeed, there is hardly any difference between Hicks's construction and the Marx inspired mathematical growth model put forward by Gregorii Fel'dman (1928) in the U.S.S.R. Their main difference lies in the initial conditions depicting the degree of development of the economy. For Fel'dman the capital stock corresponds to an economy with a low degree of industrialisation, implying an ample reservoir of labour as well as a low share of the capital stock installed in the capital goods sector over the total stock. In Hicks the stock of capital is initially in equilibrium with the employable labour force. The economy is therefore a mature one in the sense of Kaldor.

The problem of the Traverse arises whenever the growth rate of capital stock, call it G and the growth rate of population, call it g, begin to differ for whatever reason. Clearly, from a mathematical point of view convergence or nonconvergence conditions can be analysed by looking at both $G>g$ and $G<g$. Yet if we accept Kaldor's political economy it is $G>g$ that matters. More precisely, Kaldor's definition of the Keynesian phase consists in that the stock of capital can, at full capacity, employ the available population.

In these circumstances a modem economy can be assumed to possess the technical capacity to expand the output of capital goods faster than population growth. This state of affairs is also reflected in Harrod's preoccupation with the warranted rate being persistently higher than the natural rate. Harrod even went on to specify that such a preoccupation applied only to developed economies. Thus, contrary to Hicks' procedure, which focussed on the case G<g, I will concentrate on G>g. Analytically the results are the same in both cases, since we are dealing with a symmetrical construction. Yet, the case G>g will allow us to link the issue of disproportionalities with the problem of effective demand for capital goods.

The special case character of a monotonic inverse relation between the aggregate capital labour ratio and the rate of interest is shown by the value of the determinant of the coefficient matrix of rank 2 characterising the price equations of the two sector model. The value of the determinant should be such that the capital labour ratio in the consumption goods sector, call it n, be greater than that of the capital good sector, call it m. The matrix of the quantity equations is the same as that of the price equations. Hence n>m is a necessary condition for convergence of G toward g for a given G>g. However, if n>m is a special case solution for the relation between capital intensity and the rate of interest, it is also a special case as far as convergence is concerned. If we were to follow Hicks we are left only with the opposite case of n<m. In this instance, if G>g a new full employment full capacity equilibrium can be found but with a still higher share of capital goods replowed into the capital goods sector. It follows that G will grow even more, thereby widening the discrepancy vis a vis g. Eventually this process will lead to an explosion of the capital goods sector and to an implosion of the consumption goods sector. It is a case of cumulative disproportionality, in which the problem of effective demand does not manifest itself immediately but only at some later state and in a very weird manner. The implosion of the consumption goods sector under fixed coefficients of production is as arbitrary as Tugan Baranovsky's result in which both the labour force and the consumption goods sector are eliminated by means of automation.

The cumulative divergence solution is, from a theoretical point of view, as bad as the convergence solution, if not worse. Why should the economic system continue to invest until one sector implodes and the other explodes? This kind of formally driven extremism can be found neither in Marx, nor in Keynes nor in Harrod. In Harrod, for example, whenever the warranted rate of growth exceeds the natural one investment will fall without any disappearance of the consumption goods sector. Now, if we want to find *within a two sector model* a solution more akin to Harrod's result than to the extravagant case of cumulative explosion, we would have to consider the case of a vanishing determinant. This means that n=m. We can call this case the Marxian case because uniform sectoral capital labour ratios are equivalent to uniform organic compositions of capital. In these

circumstances, if G>g and the system starts from a situation of full employment and full capacity, an overproduction of capital goods will immediately appear. In fact, no matter where they are allocated, no equilibrium can be found between machines and labour. The ensuing excess capacity can be met only by cutting down on investment demand with full Keynesian consequences. The disproportionality between the production of capital goods and that of consumption goods is nothing but the mirror image of the disproportionality between the stock of capital and the available labour force. Furthermore the problem of overproduction of capital goods emerges already in the short run, that is as soon as the new capital goods come into being without entailing a destruction of the consumption goods sector. The decline in investment activity due to overproduction of capital goods will reduce the level of consumption demand thereby generating excess capacity in the consumption goods sector as well, which is something quite different from an implosion.

I have come to these conclusions by looking appreciatively at Hicks's endeavour while modifying his approach to the Traverse problem. I have been struck by the fact that a truly one commodity model allows for an immediate absorption of any excess supply. If corn is both consumable and investible and if the amount of corn set aside for replowing is too large in relation to the number of agricultural workers operating at a given productivity of labour, then the excess corn can be ipso facto transformed into consumption, at least in principle. By contrast a two sector model with uniform organic composition of capital – n=m – remains physically a heterogenous system although in value terms it is equivalent to a pure corn model. There is therefore a difference, in my opinion, between Volume One of *Capital,* where in Chapter 25 accumulation is portrayed as being carried out apparently on the basis of a uniform organic composition of capital, but in reality on the basis of a one commodity economy, and Volume Two, where uniformity in the organic composition does not impede the analysis of disproportionalities and of overproduction.

As a final note I should mention that Hicks did not look at the case of a vanishing determinant. Perhaps he thought that uniform capital labour ratios are unrealistic, so to speak. But all the three cases are unrealistic. The problem lies with the nature of the two sector model itself, whether it is Marxian, or Neoclassical. Each case is a special one because the model admits only one technological configuration at a time. With two sectors only we will have either m>n, or m<n, or n=m; but we cannot have all of them at once. In this paper the link between Marx, Tugan Baranovsky, Kaldor and finally Hicks, is given precisely by the fact that their discourses run from a one to a two sector model. In this context it is epistomologically correct to take into full account the reciprocal impact of the different assumptions made within virtually the same model. Thus one should only try to see what are the insights, relatively to the theoretical questions discussed, that may

be obtained by looking at each of the three cases, while being aware that those insights are purchased at the price of some atrocious assumptions.

In more general terms the task in growth theory should be to get out as quickly as possible from the limitations imposed by the narrowness of models which while performing an important clarifying role have run out of time. It seems to me that the multi commodity growth theory based on the notion of vertically integrated sectors is a step in the right direction (Pasinetti, 1981).

Note

Department of Economics, University of Sydney, NSW 2006, Australia. This paper is the synthesis of 4 seminars given at: the Institut de Sciences Economiques et Mathematiques Appliquees, in Paris in September 1990, at the University of the Philippines in Manila in February 1991, at the University of New South Wales and at the University of Sydney in April 1991. Acknowledgments for financial assistance, hospitality and support are extended to the above mentioned institutions.

1. The main achievement of *Value and Capital* was the incorporation of Lindahl's Temporary Equilibrium theory (TE) into a Walrasian framework. TE theory portrays dynamic movements as a sequence of short run equilibria. Hicks's adaptation of Lindahl's method enabled him to get around a crucial aspect of Walras's General Equilibrium, namely, the need to have uniform rates of return (Halevi, 1988).

References

Amato S., 'Tugan Baranovsky's Theories of Markets, Accumulation and Industrialization: Their Influence on the Development of Economic Thought and Modem Historiographic Research,' in Koropeckyi I.S. ed. *Selected Contributions of Ukrainian Scholars to Economics,* Cambridge, Mass, Harvard University Press, 1984.

Colletti L. and Napoleoni C. *Il futuro del capitalismo: crolh o sviluppo?* Bari, Laterza, 1970.

Fel'dman G., Kteorii tempov Narodnogo dokhoda, *Planovoe Khozyaistvo,* November–December, 1928.

Fukuoka M., 'Full Employment and Constant Coefficients of Production.' *Quarterly Journal of Economics,* vol. 69, 1955.

Gandolfo G., *Economic Dynamics, Methods and Models,* Amsterdam, North Holland, 1980.

Halevi J., 'Switching and Employment,' *Eastern Economic Journal,* vol. 11, no. 3, 1985.

Halevi J., 'Beyond Temporary Equilibrium,' *Economie Appliquée,* tome 41, no. 3, 1988.

Halevi J. and Kriesler P., Kalecki, 'Classical Economics and the Surplus Approach.' *Review of Political Economy.* Vol. 3 1991 pp. 79–92

Hicks J., *Capital and Growth,* London, Oxford University Press, 1965.

Hicks J., *Methods of Dynamic Economics,* Oxford, Clarendon Press, 1985.

Kaldor N., 'Alternative Theories of Distribution,' *Review of Economic Studies,* vol. 23. no. 2, 1956.

Kaldor N., Capitalist Evolution in the Light of Keynesian Economics, conference venue l'Universite de Pekin en 1956. Also In *Economie Appliquée* 1957 and in *Essays on Economic Stability and Growth,* London, Duckworth, 1960.

Kalecki M., *Selected Essays on the Dynamics of the Capitalist Economy,* Cambridge, Cambridge University Press, 1971.

Kalecki M., 'The Difference Between Crucial Economic Problems of Developed and Underdeveloped Non-Socialist Economies,' in *Essays on Developing Economies,* Hassocks U.K. Harvester Press. 1976.
Morishima M., *Theory of Economic Growth,* Oxford. Clarendon Press, 1968.
Pasinetti L., *Structural Change and Economic Growth.* Cambridge, Cambridge University Press, 1981.
Spaventa L., 'Rate of Profit, Rate of Growth in a Simple Production Model,' *Oxford Economic Papers,* vol. 22, no. 2, 1970.
Sweezy P., *The Theory of Capitalist Development,* 1942, nouvellel edition: New York. Monthly Review Press, 1968.
Sweezy P., A 'Crucial difference Between Capitalism and Socialism.' 1953, in Horowitz D., *Marx and Modern Economics,* New York, Monthly Review Press, 1968.
Tugan-Baranovski M., *Theoretische Grundiagen des Marxismus,* Leipzig, 1905.

35

Effective Demand, Capacity Utilisation and the Sectoral Distribution of Investment

Joseph Halevi

This paper discusses the use of Marx's schemes of reproduction in the analysis of the problem of effective demand. It is shown that following Marx's schemes, Kalecki was able to demonstrate that savings are determined by investment and that no financial limits exist to investment, at least in a formal sense. Such a model allows for a comparison between Kalecki's approach and that of Malinvaud. The paper carries the discussion of the reproduction schemes into the longer period. This is done by using the insights of a two sector model devel developed by Kaldor. The paper concludes by stressing that the use made by Kalecki and Joan Robinson of Marx's model is very fruitful for the analysis of short run and long run stability conditions in a monetary capitalist economy.

*

**

35.1 Introduction

The late Joan Robinson has always stressed the role played by the wage bill in the investment goods sector as profits for the wage goods sector. In this way, the mechanism of effective demand is shown via the realization of the surplus produced in the consumption sector, which in turn brings profits – and not just income – at the centre of the picture.

The above is perhaps the most significant mark left by Marx on Robinson's work. Indeed the specific role of the wage bill in the non wage goods sectors of the economy, allows one to see the double edged character of the rules of

Revised from *Economies et Sociétés*, 28(8): 25–45, 1994, 'Effective Demand, Sectoral Capacity Utilization and the Sectoral Distribution of Investment: Some Reflections Along a Kalecki-Sweezy Approach,' by Halevi, J. With kind permission from *Institut de Sciences Mathématiques et Economiques Appliquées*. All rights reserved.

the game under capitalist conditions. If the surplus of consumption goods produced per unit of labour increases, while the money wage rate and the size of the labour force in the rest of the economy remain unchanged, the improved profitability in the consumption sector will be turned into an accumulation of inventories in that sector.[1] More recently, Amit Bhaduri has levelled a criticism against Malinvaud's distinction between (Neo) Classical and Keynesian states of unemployment, basing it precisely on the Marxian condition of effective demand as used by Joan Robinson and Michał Kalecki.

The important point made by Bhaduri is that the problem of effective demand for consumption goods can be understood only by distinguishing – as Marx did – between consumables and investible goods. In Malinvaud, as well as in other "disequilibrium" models, it is the demand for consumption goods that plays the central role (Malinvaud, 1977). This consumption demand is seen as coming from households acting both as consumers and as workers and from the "Government". Yet it is nowhere specified that it is the additional wage bill in the non wage goods industries, caused by an expansion of output in these industries, which leads to a rise in *profitable* demand for consumables (Bhaduri, 1983).

It may be useful at this point to scrutinize the insights that one obtains by looking at the problem of effective demand via a Marxian construction in a more detailed way, beginning with the works of Michał Kalecki. It will be seen that on one occasion Kalecki developed a formulation which, *prima facie,* is not incompatible with that of Malinvaud. Yet when the intersectoral relations are taken into account we are no longer entitled, if we were to follow Kalecki, to talk about (Neo) Classical or Keynesian states of unemployment, as if the economy could switch from one regime to another.

35.2 Kalecki: Investment Determines Savings

The connection between Marx's schemes of reproduction and the problem of effective demand appears in Kalecki in two distinct, albeit related, manners. The first concerns the demonstration that investment generates its own savings. The second deals with the impact on profits and employment of changes in money wages under competitive as well as under oligopolistic conditions.

The determination of savings by investment has implications for the very concept of crowding out and, more importantly, for the question of whether there exists a financial limit to investment in any strategy of economic development.

At any one time the difference between the total sales of consumption goods and that part which constitutes the purchases by workers and capitalists in the consumption sector, forms the savings in this sector. It is clear

that these savings are nothing but the expenditure on consumption goods by capitalists and workers in the capital goods sector. Thus:

(35.i) $C_i = S_c$; where: C_i is the consumption expenditure in the investment sector.
S_c is the amount of savings in the consumption sector.

Since the value of output in each sector can be divided between savings and consumption and since the value of output of the capital goods sector is equal to the value of investment goods produced, we have:

(35.ii) $C_i + S_i = I = S_c + S_i = S$; where:
S_i is the savings in the capital goods sector.
I and S are aggregate investment and savings.

If the consumption goods sector were to be split between wage goods consumed solely by workers and "luxury" goods consumed only by capitalists, we would obtain for the wage goods sector:

(35.iii) $Y_w - W_w = W_i + W_{cc} = P_w$; where:
Y_w is the output of wage goods.
W_w is the wage bill in the wage goods sector.
W_i and W_{cc} are the wage bill in the investment and the "luxury" goods sectors.
P_w is the profit of the wage goods sector.

Equations (35.i) and (35.iii) are Marx's equilibrium conditions for simple and expanded reproduction, while equation (35.ii) can be used to argue that investment determines savings (Kalecki, 1976).

An increase in investment can take place with the economy being at full capacity, or, as it is the case in modern capitalism, with a substantial amount of spare capacity. In the case of a full utilization of capital stock, a rise in investment may simply reflect that increase which is compatible with a steady state growth rate. But, it may also reflect a rise aimed at generating a higher rate of capital accumulation. In this situation, the additional investment will automatically force additional savings in the consumption goods sector.

Other things being equal, an expansion of investment leading to a higher rate of capital accumulation can materialize only if a larger proportion of the newly produced capital goods is reinvested in the capital goods sector. From this reallocation, a part of savings will directly arise in the department producing means of production. Indeed on the basis of Marx's two sector model, we have:

(35.iv) $Y_i - C_i = I_i$ value of investment goods ploughed back into the investment sector.
$Y_i = I$

or:

(35.v) $S_i = p_i v Q_i$; where: p_i is the unit price of the capital good (the same price applies to the capital goods purchased by the consumption goods sector).
v is the % capital goods ploughed back.
Q_i is the quantity of capital goods produced.

Thus the act of reinvesting a greater percentage of the output of capital goods, automatically generates the savings necessary to its "financing". The other part of savings will emerge from the sales of consumption goods to capitalists and workers operating in the capital goods sector, as shown by (i). The increased percentage of the capital goods ploughed back will raise the ratio of the labour force employed in the capital goods sector relatively to the rest of the economy. For a given money wage and a given productivity of labour in the consumption goods sector, the corresponding rise in S_c will be met by an increase in prices of consumables. Likewise, considering only the wage good industries, there will be an inflationary swell of the profits in the wage goods branches of the economy so as to satisfy equation (35.iii). The above is nothing but "forced savings". It is worth noting that this phenomenon brings into sharp relief the Keynesian insight that investment determines savings rather than the other way around. Following Kalecki, the monetary side of the process can be summarized as follows: if investment is financed out of liquid reserves, there will be a transfer of deposits from some capitalists to others. If financial means are provided by short term bank credit the savings appearing as deposits will be available for the absorption of the issue of shares by the investing capitalists, who will be able to repay the bank credits. If long term credit is used instead, savings will swell the deposits or will be used to repay the credits made by banks (Kalecki, 1976, pp. 43–44). There are therefore no financial limits to investment. A concrete limit by contrast exists whenever the expansion of investment is met by full capacity in the consumption, especially wage goods, sector. The last observation has some importance for developing non socialist economies. The real problem there is the inflationary pressure caused by the relative inelasticity of the supply of wage goods. This inelasticity is also linked to the burden that the consumption of non essentials, mostly by capitalists, merchants, money lenders and the like, exerts on the apportioning of investment to the consumption goods sector.

In the case of an economy with unused capacity, a rise in investment translates itself into an increase in the rate of utilization of the capital goods sector, which will therefore tend to expand its employment. Given the money wage, the larger wage bill in that sector will increase the expenditure on wage goods so that S_c will rise in real terms if capacity margins are large enough.

35.3 Unused Capacity and Oligopoly

The preceding section was aimed at showing that investment determines savings independently of anything else, with and without spare capacity. A fact which becomes remarkably clear when analyzed in a Marxian framework.

For Kalecki as well as for Steindl and Sweezy, the normal condition of a mature capitalist economy is however represented by a significant amount of unused capacity, itself linked to the rise of oligopolies. It is important to observe that idle plant and equipment existed also during the cyclical phases of what Marxist writers have appropriately called competitive capitalism (Dobb, 1973). Yet this kind of unused capacity went hand in hand with a fall in prices and it is therefore consistent with Marx's own characterization of the trade cycle in which the connection between effective demand and the degree of utilization of capital stock plays a minor role (Marx, 1974, I. Ch. 25).

By contrast, a totally different picture emerges under oligopolistic conditions: unused capacity in the industrial sector is no longer accompanied by a downward flexibility in market prices. Furthermore, a basic duality arises in the process of the formation of market prices: the prices of industrial products are upwardly sensitive to costs of production rather than to demand and prices of agricultural goods as well as of raw materials follow fluctuations in supply and demand. This duality nowhere emerges in Marx's writings, who treated the market prices of all commodities as determined by supply and demand conditions; an approach which was in line with the historical characteristics of capitalism of his days.

The great depression of the 1930s can be taken as an example of the changes in the nature of the capitalist trade cycle. A comparison between the great depression and the depression of the 1870s shows the major modifications that intervened in the behaviour of prices and output.

For the 1929–32 period the movement in output and prices for some major industries in the U.S. economy is shown in table 35.2:

Table 35.1 Prices and output: industry and agriculture

	Industry			Agriculture	
U.S.A.	**Prices**	**Output**	**Wages**	**Prices**	**Output**
1873–79.....	–33%	–5%	–33%	–31%	Slight increase
1929–32.....	–23%	–48%	–18%	–54%	+1%

Source: Sylos-Labini, 1983, p. 446.

Table 35.2 Prices and output: iron & steel and cement

	Prices	Output		Prices	Output
Iron & Steel...	–16%	–76%	Motor Vehicles....	–12%	–74%
Cement.....	–16%	–55%	Textile Products..	–39%	–28%

Source: National Resource Committee, 1939, p. 386.

It is the above historical background, in which losses in production were much greater than the fall in prices, especially in branches approaching the conditions of oligopoly such as autos, steel and cement, which gives substance to the Kalecki-Steindl approach, where the question of capacity utilization becomes the central issue in the analysis of capital accumulation[2].

In Kalecki unused capacity appears as a long run phenomenon. More specifically in his advanced version of the trade cycle, Kalecki presented a model in which for a certain distribution of income between profits and wages and for a certain level of productive capacity, the system may display chronic underutilization of equipment (Kalecki, 1971). Chronic underutilization defines a long run phenomenon, the fact that it is made to depend to a large extent on the particular distribution of income prevailing at any one time, highlights the role of oligopolistic factors. Indeed in Kalecki's construction, the higher the share of profits, the higher will tend to be the degree of unused capacity, with negative effects on long term growth (Del Monte, 1975; Halevi, 1985). If this sort of conceptualization does capture at least some essential traits of modern capitalism, then it can be argued that the question of capital accumulation cannot be answered in the same way as Marx did. To put the matter in concise terms, limitations to accumulation do not stem from the growth of wage rates following the dwindling of the reserve army of labour during the peak of the upswing. Instead, those limitations emerge from an internal constraint of the investment process: the formation of oligopolistic structures caused by accumulation itself. This is the essence of Steindl's analysis of American capitalism from the first decade of the Century till the Great Depression. The rise, or stickiness, of profit margins associated with the consolidation of oligopolistic structures is seen as the main factor in the weakening of the forces of accumulation (Steindl, 1976).

It is interesting to see that by following a Kaleckian approach, one can arrive at a completely Marxist interpretation of Keynes's analysis of effective demand and can actually seize its scientific value: unemployment no longer performs the role of restoring the rate of accumulation, as it was the case with Marx's reserve army under condition of competitive capitalism. Hence, a fall in wages in the presence of unemployment will only reduce the level of effective demand further and, with it, employment and output.

35.4 Capacity Utilization and Wages in the Short Run

Kalecki's use of Marx's schemes of reproduction is indeed geared to illuminate the above mentioned connection between variations in wages and the level of effective demand. The framework is one in which the level of capital stock is given, so are capitalists' consumption and investment. Thus in Kalecki, Marx's schemes are used for an exercise applicable to a short period situation only. Marx's dynamics is pushed into the background, but this loss is compensated partly by gaining some insights about wages, effective demand and profits when unused capacity exists (Kalecki, 1971a). The short period framework makes the comparison with Malinvaud's model possible. Since capitalists' consumption and investment are given, changes in the level of output and employment come only from the wage goods sector, as in Malinvaud (Malinvaud, 1977). Kalecki always used three departments, one producing goods for capitalists' consumption and one producing wage goods; the third sector being the capital goods industry. To simplify things, we will make the consumption goods sector synonymous to the wage goods sector. If capitalists' consumption is taken as constant in absolute terms, it can be neglected as far as changes in the degree of capacity utilization are concerned. We can rewrite equation (35.iii) as:

(35.1) $W_i = wL_i = P_w$; where: W_i and L_i are the wage bill and the labour force in the non wage goods sectors (later to become investment goods).
w is the money wage.
P_w are profits in the wage goods sector.

Moreover, we can write the effective demand relation for the wage goods sector, assuming that workers do not save:

(35.2) $w(L_i + L_w) = pu_wQ_w$; where: L_w is the work force in the wage goods sector.
u_w is the utilization rate in that sector.
p is the unit price of wage goods.
Q_w is the full capacity output of wage goods.

Kalecki in his famous "Class Struggle and Distribution of National Income", assumed that workers do not save but that oligopolistic unused capacity exists in the wage goods industries. On this, he based his trade unions induced employment multiplier, as we shall see later. Since spare capacity exists also in the rest of the economy, it can be assumed that actual employment is less than full capacity employment:

(35.3) $L_i + L_w < L_F$; where: L_F is full capacity employment.

The relation between the degree of capacity utilization and industrial employment can be established by following a suggestion made by Kaldor in a model which will be used to complete Kalecki's short period construction and which will turn out to be very helpful in drawing some critical observations on the transition to the longer period (Kaldor, 1960). In a modern industrial society, he argued, complementarity prevails between labour and machines on one hand, while specificity prevails in the utilization of machines on the other hand. Hence, if for a given capital stock, the degree of utilization rises, complementarity between labour and machines will make employment increase *pro tanto*. In this context, the employment capacity of the capital stock in each sector is more or less known. Actual employment can be derived by applying to the labour-capital stock ratio in each sector the corresponding degree of utilization. Furthermore, since we are *de facto* dealing with a fixed coefficient two sector model, the capital stock in each of the two sectors can be expressed as a proportion of total capital stock. Thus employment at full capacity is:

$L_F = K[mk + n(l–k)]$; where: K is total capital stock.
k is the % of K installed in the non wage goods sector.
m is the labour-capital stock ratio in the non wage goods sector.
n is the labour-capital stock ratio in the wage goods sector.

Whereas actual employment is given by:

(35.4) $K[mku_i + u_w n(l–k)]$; where:
u_i is the rate of utilization in the non wage goods sector.

Capacity output of the wage goods sector can be written as:

(35.5) $Q_w = b(l–k)K$; where: b is the output coefficient of the capital stock installed in the wage goods sector.

By substituting (4) and (5) into (2) and by writing $(w/p) = z$, that is z is the real wage rate, we obtain:

(35.6) $$z = \frac{u_w b(1-k)}{[mku_i + u_w n(1-k)]}$$

From equation (35.6) it can be seen that (dz/du_w) is positive, namely that an increase in capacity utilization in the wage goods sector implies a higher real wage rate. It also implies a higher level of employment in the wage goods

sector, since under conditions of complementarity a higher u_w leads to an increase in employment. If capitalists' consumption and investment do not change, total employment will expand.

Before treating the case of changes in the rate of utilization in *both* sectors, it is worth noting that Kalecki's result is quantitatively similar to Malinvaud's case where real wages are positively related to employment. Yet in Kalecki this situation does not define any specific characteristic of the labour and product market behaviour in the sense used by Malinvaud. Indeed by following Malinvaud's line of thought, one is led to think that situations dominated by the inverse relation between the wage rate and the demand for labour do in fact exist (see Garegnani, 1983, for theoretical criticism of this supposed relation independently from ad hoc constructions).

Unlike Malinvaud, Kalecki gives a theoretical reason why investment may be taken as constant. Kalecki's justification is based on the Marxian equation where profits in the wage goods sector are constituted by the wage bill of the non wage goods sectors (equation (35.1)). A rise in money wages in the whole economy will not alter the aggregate volume of profits; it will merely shift profits from the rest of the economy to the wage goods sector. Given the fact that total profits remained unchanged, there is no reason to believe that investment decisions will be significantly altered. Kalecki's analytical thrust is aimed at showing that when oligopolistic unused capacity exists, Trade Union's activity has a positive employment effect.

It might be of some interest, at this point, to compare Kalecki's approach with the position taken by Marx in his well known booklet *Wages Price and Profit,* which is his speech at a workers' organization in London (Marx, 1968). Marx then confronted the view put forward by Citizen Weston, according to which the economic struggle of the working class was doomed to failure because capitalists would increase prices in the wake of any success on the wage front. Marx's counter argument runs along the lines of the law of accumulation he expounded in Chapter 25 of the first volume of *Capital,* in which the reserve army of labour is functionally related to accumulation.

Price determination, Marx argued, is not within the control of capitalists who, instead, are compelled to accumulate as much as they can because of competition. When wages rise, the primary impact will be on the relative share of the surplus and thus on the relative share of accumulation. The very increase in wages is in turn determined by the rate of accumulation, which Marx rightly considered to outpace by far the natural growth of population. Thus the struggle for wages must be seen as a physiological attempt, by the workers and their organizations, to prevent a deterioration of the value of labour power but it cannot affect the dynamics of wages which are governed by capital accumulation.

In Marx's analysis of the connection between wages and accumulation, via the expansion and contraction of the reserve army, the link between wages and effective demand does not emerge. In a preceding chapter of the first volume of *Capital,* Chapter 15 dealing with the question of Machinery,

that link did appear but only to argue against the view that the replacement of variable capital (workers) by constant capital (means of production) does not necessarily set capital free for investment. In that chapter, the point was made that once "set free" the workers no longer face the capitalist as variable capital, but they face him *qua* consumers. The loss of their wages will translate itself into a reduced demand for commodities leading to – *nota bene* – a fall in market prices. "Voilà tout" concludes Marx. The fact that Marx established a relationship between wages as representing demand and the prices of commodities demanded is not inconsistent with his analysis of the law of accumulation. In a context where capitalists are "price takers", the latter is thrusted forward by competition, i.e. by the process of the formation of a general and uniform rate of profits. That Marx considered accumulation to be propelled by the competitive tendency toward a uniform rate of profits, is best shown by the argument he advanced in the aforementioned booklet. Moreover, it cannot be said that Marx thought that the hypothesis of a uniform rate of profits was only a necessary assumption for the logical coherence of the analysis carried out in *Capital*. Again, the emphasis he put in his criticism of Weston, in what was a "policy" meeting, on the connection between accumulation and a process of competition leading to a uniform rate of profits, shows that that hypothesis was thought to operate in practice.

Kalecki's observations on the role of Trade Unions in generating employment is valid under conditions of persistent unused capacity. At the same time, such a situation reflects a weakening of the factors that stimulate accumulation. Given the link that classical writers, Marx in particular, established between accumulation and competition, the weakening of the former must be tied to the decline of the latter.

35.5 Changes in Sectoral Capacity Utilization

Kalecki did not discuss the question of capacity utilization in terms of the relative changes among the different sectors, i.e. capital goods and consumption goods. In his approach, a developed capitalist economy was so prone to accumulate excess capacity that intersectoral differences could be neglected. But if intersectoral variations in the respective utilization rates are considered, quasi dynamic aspects will emerge.

We can start with the same structure of capital stock and of employment as in the previous section, but now the discussion will strictly consider the capital goods and the consumption goods sectors. Differentiating equation (35.6) with respect to u_w and u_i we get:

$$dz > 0 \text{ if: } (u_i du_w - u_w du_i) > 0 \tag{35.7}$$

In other words, the real wage rate z will rise or fall depending on the relative change in the sectoral rate of capacity utilization. At the same time, any increase in capacity utilization will bring about an increase in employment

because of our assumption of a fixed number of workers per machine in the short run. This aspect, while not considered by Kalecki because of his view about the stagnationist tendency of mature capitalism, has been fully grasped by Kaldor.

For our purposes, the gist of his argument can be presented as follows. Assume that the capital goods sector is brought to operate at full capacity, say by means of government plans. If, given the money wage, the wage goods multiplier generated by the enlarged wage bill in that sector does not cause the wage goods sector to attain full capacity output, then a further expansion of economic activity in the wage goods sector should imply a higher real wage. By contrast, if capacity output in the wage goods sector is attained while there is still spare capacity in the capital goods sector, additional increases in economic activity in the latter sector should entail a lower real wage rate. In the framework of this paper the relation between employment at full capacity and the real wage rate cannot be established a priori. Instead, as shown by (7), it depends on sectoral movements in the degree of capacity utilization.

In the present Kaleckian-Kaldorian context, the possibility of a lower real wage at full capacity arises from the structural distribution of unused capacity. Just the same, a reduction of the money wage at given prices, will not per se induce an increase in the demand for labour. Such a reduction will have its primary impact on the degree of capacity utilization in the wage goods sector: its fall will cause a further rise in unemployment. If, on the other hand, prices were to decline along with a fall in money wages, the rate of capacity utilization and the level of employment in the consumption goods industries are likely to remain unaltered (Kalecki, 1939)[3].

35.6 The Sectoral Composition of Investment

The preceding section has pointed at a basic asymmetry: even if, at full capacity employment in *both sectors,* real wages were to be lower, a fall in wages before the system reaches full capacity will not induce a higher demand for labour. On the contrary, the rate of unused capacity in the wage goods sector will increase. When the economy is brought to fully utilize its capital stock in the short run, the question arises of how and in what proportion the newly produced capital goods have to be allocated among different sectors. It is at this juncture that Kaldor's paper becomes particularly important since it provides a link between the short period and the longer run. Kaldor's approach, formulated 47 years ago, is more insightful than recent attempts to extend the analysis of what should be called ' Truncated Walrasian Models' to growth theory (Hénin and Michel, 1982).

Kaldor argued that once the economy operates at capacity, the characteristics of the process of accumulation (output of capital goods and their sectoral allocation) are likely to be such that unused capacity will emerge again.

The conditions for this to happen depend on the size of L_F relatively to the available labour force – L_T – and on the capacity of the investment sector relatively to the consumption goods sector. The conceptual framework of both Kalecki and Kaldor is one in which productive forces have grown to such an extent that the capital equipment existing at any one time could, more or less, absorb the available labour force provided it were fully utilized. Hence:

(35.8) $L_F \geq L_T$; where: L_T is total available labour.

Under these circumstances, the growth capacity of the investment industries will easily exceed the natural increments in population. Indeed, as Keynes aptly observed, in economies well endowed with capital stock, the growth of population can be considered negligible (Keynes, 1936, Chapter 16). Kaldor stated, in our view correctly, that "instability or potential instability, is thus all the greater, *the larger the capacity of the investment industries, relatively to the consumption goods industries:* the higher is the rate at which investment *can* proceed at times of prosperity". (Kaldor, 1960, p. 116). This situation obtains when in a mature oligopolistic system, fluctuations in the level of activity are more pronounced in the capital rather than in the consumption goods industries. "Hence, if we start from a ' typical' state of subnormal activity, the percentage of unemployment and of unused capacity of equipment will be much larger in the former group than in the latter". (ibid. p. 106). The above means that when the economy is brought to work up to capacity, the real wage rate will be lower – as shown by (7)– and the share of profit will be higher[4]. Yet the structural outcome just delineated emphasizes the possibility for capital stock to expand at a much faster rate than the labour force. At this point, the problem of where to allocate capital goods arises. If labour expands very little, the newly produced capital goods will have to be installed mainly in the consumption goods sector if full employment and full capacity are to be maintained. In turn, such a reallocation of the structural composition of investment implies a significant shift in the distribution of income in favour of wages. Furthermore, the higher is the degree of unused capacity in the capital goods sector relatively to the consumption goods sector, the more likely is the case that at full capacity, the share of profit will be higher. Thus, the sharper will have to be the shift toward the share of wages when the new capital goods are reallocated in the consumption goods industries.

The analytical basis of the issue discussed above is today found in 'traverse' theory (Hicks, 1965; Lowe, 1976), of which Kaldor's paper represents a lucid anticipation. It is interesting to see that by following Kaldor's reasoning, the Robinsonian state of bliss emerges as a normative condition for the maintenance of full employment. However, once the material basis of capital accumulation has developed to such an extent that virtually all available

labour can be absorbed into production, and once the output capacity of the investment goods industries significantly exceeds the human resources necessary to operate the equipment produced, the tendency is not toward a smooth transition leading to a state of bliss, but rather it is toward a buildup of excess capacity followed by a breakdown in investment. It is equally interesting to see that Sweezy produced a Marxist interpretation of stagnation under economic maturity which runs parallel to that of Kaldor, with the difference that it stresses the role of monopolistic factors (Sweezy, 1968). Using Marx's subdivision of the economy between capital and consumption goods, Sweezy argued that when an economy possesses a developed capital goods sector, its subsequent expansion should be governed by the consumption goods sector. In other words, activity must shift from accumulators to consumers. However, such a change in priorities is obstructed by the existence of oligopolistic forces. Sweezy's view is not in contradiction with Kaldor's approach, since a shift to consumers makes sense only if investment priority in the capital goods sector is no longer needed to provide the working population with the equipment to work with. The merit in Sweezy's position lies in having lessened the emphasis on purely technical factors, by combining them with the economic role of oligopolies.

In short, if in Marx's analysis the economy does not have the material conditions to move toward a state of bliss because of the connection between competition, accumulation and the reserve army of labour, in Sweezy (but also in Kalecki, see Kalecki, 1971, p. 97) the state of bliss would be attainable, were it not for the impact of monopolistic elements on the level and composition of investment.

35.7 Concluding Remarks

The use of a Marxian sectoral approach to macroeconomic questions seems to be particularly fruitful in linking the short run to the longer run. From what has been said in the previous section, it also appears that the emergence of excess machinery in a Kaldor-Sweezy framework, ties the problem of effective demand to the issue of maladjustment between sectors resulting from monopolistic factors. In this context, the fact that the Robinsonian state of bliss comes out as a condition for keeping full employment over time, has relevant social implications as far as the actual *modus* operandi of the capitalist system is concerned. Sweezy has indeed captured the essence of the problem by observing that what ought to be a transition from accumulators to consumers, becomes a situation with endemic unused capacity and unemployment.

On a more analytical plane, looking at the longer run through a sectoral framework of a Kaldor-Sweezy kind, helps us see some incomplete aspects of the otherwise very insightful approach followed by Kalecki in his short run analysis. Kalecki uses Marx's schemes of reproduction to show that

investment determines savings, and that the wage bill in the non wage goods sector represents profitable demand for the wage goods industries. Yet we are not told how the profits in the wage goods sector are spent in purchasing capital goods from the investment sector. In Marx the exchange between the two departments plays a central role in the analysis of expanded reproduction. Indeed, equation (35.1) would become in Marx:

(35.9) $P_w = p_i(l–v)Q_i$; where: (l–v) is the % of capital goods Q_i sold to the consumption goods sector (wage goods).

The question of how profits P_w are spent and of what proportion of Q_i they fetch, is not irrelevant for the dynamic path of the economy. Kalecki wrote that if money wages are raised, profits in the wage goods sector will increase by wL_i where w is the increment in money wages. Total profits will remain unchanged because the losses in the other sector will be compensated by the gains in the wage goods industries. Thus, for a given propensity to save out of profits, the total value of investment will not change either. But this is valid in the very short period only, since if the additional profits are spent in the purchase of capital goods in such a way that the amount of equipment installed in the wage goods sector increases vis-à-vis the capital goods sector, then, in the longer period the amount of investment is bound to slow down. In a two sector model the 'investment function' has to be specified in such a way as to show how investment decisions determine the distribution of newly produced capital goods between the two sectors. This is the reason why at the beginning of section 4 of this paper, it was stated that the insights gained by Kalecki in using a Marxian macro model for short period purposes, are obtained by pushing Marx's dynamics into the background.

Investment decisions in the capital goods sector, especially how much has to be ploughed back, determine the future expansion of profitable demand for the wage goods sector. In fact, by logarithmically differentiating equation (35.1) we see that the rate of change in P_w is equal to the sum of the rate of change of money wages and of the labour force employed in the investment sector. Of these two components, the weaker, as far as future profitable demand is concerned, is the rate of change in money wages. This is so because a rise in money wages does not herald a composition of investment favourable to the expansion of profitable demand in the wage goods sector. By contrast, the stronger component, in a dynamic sense, is the expansion of the labour force employed in the investment goods industries. The higher the share of investment ploughed back, the higher will be the rate of increase in the labour force employed there. If technical 'progress' reduces the employment capacity of capital goods installed in the investment sector, the rate of replowing should evidently increase. In conclusion, investment decisions in the capital goods industries determine the expansion or

contraction of profitable demand in the wage goods sector. The upshot of this discussion is that capitalists in the consumption goods sector play a rather passive role (as understood by Marx and pointed out by Harcourt in a different context, Harcourt, 1963), their interests *qua* capitalists depend on the decisions of their colleagues in the investment sector. More interestingly, this dependency of the owners of wage goods factories gives to the process of accumulation a Tugan Baranovsky bias.

Clearly the above conclusion is in contradiction with the emphasis on oligopoly, stagnation and effective demand running throughout this paper. This simply means that a proper theory of accumulation incorporating Marx's concept of expanded reproduction and the impact of oligopolistic formations has yet to be produced.

Notes

1. The wage costs in the capital goods sector become therefore arguments of the demand function of the consumption goods sector. It is this sort of interdependence which makes it difficult to define objective demand functions in the sense attempted by Nikaido in his interesting book (Nikaido, 1976).
2. The characterization given by two french authors of the great depresssion as an expression of competitive regulation, is very peculiar indeed. Leaving aside the extremely unclear term 'regulation', in no way can the great depression be seen as a result of competitive forces. This applies also to France: the 1930s are years of monopolistic consolidation. A formidable paper by Michał Kalecki on the Blum experiment convincingly argues the case of the strengthening of monopolistic factors by looking at price behaviour (Boyer and Mistral, 1978; Kalecki, 1938).
3. One should take notice of the fact that Kalecki never used the flex-price case to argue for a tendency fo full employment. Quite the opposite is true. In his 1939 paper, Kalecki did consider price flexibility in the short run, only to show that such flexibility would not increase employment and it would leave, at best, the level of unemployment unaltered.
4. The possibility that at full capacity, of both sectors, real wages might end up being lower, results from the structure of Kaldor's model which is similar to that of Kalecki. Such a possibility is interesting only in so far as it shows that, per se, a lower real wage does not induce a higher demand for labour. In practice, wages do not have to decline at all, because taxation can be increased to such a level where it cuts into capitalists' consumption. The consumption goods sector will acquire therefore productive capacity to supply additional wage goods.

References

Bhaduri A., "Multimarket. classification of unemployment: a sceptical note", *Cambridge Journal of Economics,* Vol. 7, n° 3–4, 1983.

Boyer R. and Mistral J., *Accumulation, inflation, crises,* Paris, Presses Universitaires de France, 1978.

Del Monte A., "Grado di monopolio e sviluppo economico", *Rivista Internazionale di Scienze Sociali,* n° 3, 1975.

Dobb M., *Studies in The Development of Capitalism,* London, Routledge Kegan Paul, 1973.

Garegnani P., "Notes on consumption, investment and effective demand", in Eatwell, J. and Milgate, M. (eds.), *Keynes's Economics and The Theory of Value and Distribution,* London, Duckworth, 1983.
Halevi J., "The contemporary significance of Baran and Sweezy's notion of monopolitisc capitalism", in Jarsulic M. (ed.), *Money and Macro policy,* Boston, Kluwer-Nijhoff Publishing, 1985.
Harcourt G., "A critique of Mr. Kaldor's model of income distribution and growth", *Australian Economic Papers,* June, 1963.
Henin P. and Michel P., *Croissance et accumulation en déséquilibre,* Paris, Economica, 1982.
Hicks J., *Capital and Growth,* Oxford, Oxford University Press, 1965.
Kaldor N., "Stability and full employment", in *Essays on Economic Stability and Growth,* London, Duckworth, 1960.
Kalecki M., "The lesson of the Blum experiment", *Economic Journal,* March, 1938.
Kalecki M., "Money and real wages", in *Essays in Economic Fluctuations,* New York, Russel and Russel, 1939.
Kalecki M., "Trend and the business cycle", in *Selected Essays on The Dynamics of The Capitalist Economy,* Cambridge, U.K., Cambridge University Press, 1971.
Kalecki M., "Classe struggle and distribution of national income", in *Selected Essays on The Dynamics of The Capitalist Economy,* op. cit., 1971a.
Kalecki M., *Essays on Developing Economies,* Hassocks, U.K., Harvester Press, 1976.
Keynes J.M., *The General Theory of Employment Interest and Money,* London, MacMillan, 1936.
Lowe A., *The Path of Economic Growth,* New York, Cambridge University Press, 1976.
Malinvaud E., *Theory of Unemployment Reconsidered,* Oxford, Basil Blackwell, 1977.
Marx K., *Wages Prices and Profit,* Moscow, Progress publishers, 1968.
Marx K., *Capital,* Vol. 1, Moscow, Progress publishers, 1974.
National resource committee, *The Structure of The American Economy,* Washington, DC, 1939.
Nikaido H., *Monopolistic Competition and Effective Demand,* Princeton, N.J., Princeton University Press, 1976.
Steindl J., *Maturity and Stagnation in American Capitalism,* New York, Monthly Review Press, 1976.
Sylos-Labini P., "Some aspects of economic development in an advanced capitalist country", *Social Research,* Vol. 50, n° 2, 1983.
Sweezy P.M., "A crucial difference between capitalism and socialism", in Horowitz D. (ed.), *Marx and Modern Economics,* New York, Monthly Review Press, 1968.

36

Capitalism and Post-Keynesian Economics: Some Critical Observations

Joseph Halevi

36.1 Introduction

No positive economic doctrine has been able until now to escape from the trap of being valid only under very specific conditions, so special as not to be replicated even minimally in actual historical experience. Consider the two fundamental approaches of the 19th century: the Marxian and the Neoclassical one. They both attempt to tell a story about the long-term behaviour of the system. The former tries to identify objective laws of motion, the latter some kind of immanent behaviour to be taken as a normative reference for a real system. They both fail encountering similar analytical problems. In particular, the long-term validity of both approaches depends heavily on the homogeneous nature of the economy they depict.[1] Marx's long-term theory of capitalist accumulation is not free from the scourge of homogeneity either (see Appendix). Indeed I believe that there are in Marx two distinct and non-compatible macroeconomic theories. The first, of a Ricardian nature, is to be found in Volume One of *Capital* and culminates in the well known chapter (25) on the Reserve Army of Labour. Its essential elements are reproduced in *Wage Price and Profit*, a fact that has some importance. *Wage Price and Profit* is Marx's speech at the founding meeting of the First International. It can, therefore, be viewed as expressing his core thoughts when economic statements had to be stripped down to their essential points. The second approach is contained in Volume Two of *Capital*, largely put together by Engels, which gave rise to the most far reaching set of economic debates within the Second International. The centrepiece of Volume Two are the famous schemes of reproduction leading to the discussion of disproportionalities, of the non-continuous character of trade cycles – whereas the cycle outlined in chapter 25 of Volume One and in *Wage Price and Profit* is continuous and, without a rising organic composition of capital, would generate a limit cycle à la Goodwin – of breakdowns in the accumulation process. In concrete terms non-continuity means that once a breakdown occurs we do not know how

the system can get out of it. Like strategists we could map out all sorts of scenarios – and to do that we would need concrete knowledge about politics, classes and history, something which today is alien to economists of virtually all persuasions – but we cannot claim to have a reliable theory of long-term growth and cycle.

In other words, if one is a Neoclassical economist and follows the Blanchard-Fischer approach to macroeconomics, he/she must, as a matter of faith, take the Ramsey parable to be true. That is, our colleague would have to dogmatically assert that a society based on production and money and profits behaves, in the end, like a farmer whose problem is to decide how many eggs to eat and how many to leave for further hatching in relation to a precisely expected level of consumption (in terms of utility) – for herself/himself or for the children – at a precise date in the future. If, by contrast, our friend is a Classical economist he/she would have to believe that whatever amount of corn is left unconsumed will be automatically invested. Alternatively, he or she could state that whenever the amount of surplus value rises the rate of accumulation and the rate of profits will rise as well, unless the organic composition increases more than proportionately. Yet once we move away from Ramsey's farmer or from the Ricardian corn model, or from Marx's competitive uniform organic composition of capital model, we simply do not know and cannot know what will happen over time unless the system is already in a steady state. Even in the simplest of all possible cases – a two-sector fixed coefficients model – we are no longer able to determine how and whether the economy as a whole manages to traverse from one state to the next[2].

36.2 Kalecki in Context: The Second International, the Comintern, and the Issue of Accumulation and Crisis

The participants in the debate of the Second International understood very well, also in practical terms, the issue of heterogeneity and its implications for discontinuity[3]. They never assumed that machines could become, unlike corn, consumption goods ipso facto. They came very close to grasping the fact that if, for any reason, more corn is saved – say because the ratio of unpaid labour time has risen in the corn sector as well as in the sector producing tractors for itself and for the corn sector – it will not lead, per se, to a higher rate of capital accumulation for the system as a whole. It may, indeed, cause a fall in accumulation through the formation of unused capacity in the corn sector which will spread to the capital goods sector via a reduction in the demand for tractors. Furthermore, it was quite clear to the participants, even if they belonged to different tendencies, that the creation of a complex capital goods sector was linked to the emergence of large-scale industries and signalled a new stage in the expansion of the forces of production. However, given the scientistic culture of the period,

especially in Germany and Russia, they tended to search for absolute or definitive conditions for breakdowns or sustainability, eschewing history altogether. Even the question of monopolies and cartels was seen in those absolute terms condensed in the well known Hilferding-Schumpeter position according to which cartels generate stability once the fight over markets has subsided[4].

To my mind the works of Michał Kalecki and, over the years, of the editors of *Monthly Review* (Paul Sweezy, Paul Baran, Harry Magdoff) bring to the fore what was absent in the debates of the Second International. This is done by putting the issue of capacity utilisation at the centre of capitalism's contradictions, something that the people of the Second International failed to recognise. The question is not so much that of acknowledging that the economy does not automatically attain full employment and therefore that something must be done about it. In the Kalecki-MR approach the main concern is to identify the forces governing the capitalist system prior to, and independently of, policy considerations. This aspect will be seen more clearly in the third section of the paper. Here I will give some examples concerning Kalecki's analysis during the interwar years[5].

In the interwar period, certainly until the first half of the 1930s, two positions dominated within the European Socialist parties and within the Third International. One was that cartels produced stability, a position rather common among the Social democracies. Another, officially endorsed by the Comintern until the Dimitrov-Togliatti-Thorez Front Populaire strategy, viewed in the very depth of crisis its solution. Kalecki challenged both. In relation to the Social democratic position he argued that, concretely, capitalism is made of two components: a cartelised sector displaying constant profit margins and a competitive one where profit margins fluctuate with prices thereby rising in a boom and falling in a recession. Cartels compete not through prices but via the building up of productive capacity so that during a boom they engage in an investment race leading to excess capacity thus contributing to the demise of the boom itself. Given the stability of profit margins, the slowdown in demand relatively to capacity will be met by a reduction in output and employment engendering yet more unused capacity. The formation of unemployment in the cartelised sector causes a fall in the demand for consumption goods, whose industries are viewed as belonging to the competitive segment of the economy. Hence their prices and their profit margins will fall as well. It follows that the output of the competitive sector will not decline as much as that in the cartelised industries. Contrary to the Socialdemocratic and the Hilferding-Schumpeter positions, the economy with a cartelised segment will show greater fluctuations than a competitive system[7].

Instead of embodying a rationalism making it the forerunner of a planned society, a cartel based economy displays great difficulties in breaking out of

the impasse of the crisis. It is at this point that we can bring in Kalecki's critique of the Comintern position, expressed at the time by Eugene Varga in February 1932 in an article in the *Internationalle Presse Korrespondenz*. For Varga the fall in wages caused by the depression would reduce the cost of production thereby lifting the rate of surplus value[8]. Kalecki argued instead that if prices fell as much as wages did, nothing would really change, if, by contrast, money wages fell more than prices the likely result would the accumulation of unsold inventories in the consumption goods sector. Finally, if the fall in total profit was caused by a fall in output greater than the fall in prices – as was the case in the industrial sectors at the onset of the Great Depression – the value of output per unit of capital would decline actually lowering the rate of profits[9]. Quite appropriately Kalecki never attached policy considerations to his analysis but did outline the scenario that he considered most likely. Given the inability of highly concentrated economies to sort themselves out only a war time boom could do the trick.

The idea that the capitalist economy requires, in Kalecki's words, a "financial trick" to break out of a tendentially static position, is maintained during the post 1945 period. Here too, however, not much significance is assigned to full employment policies. The high level of employment is rather ascribed to the prerogatives of the capitalist groups among which armament expenditures figure prominently. The question for Kalecki becomes whether the system can be subjected to a crucial reform[10]. This will be discussed in a subsequent section.

36.3 Is there a Post-Keynesian Dialectical Conception of Capitalism? NO!

Post-Keynesians are great believers in economic policies regardless of the evolution of power relations operating in contemporary capitalism. In other words many of present day post-Keynesians would suggest and propose what they deem to be rational policies (for full employment) without studying first the 'laws of motion' of the economy; ie. the tendencies, the social and class configurations, the coagulation and the direction of capitalist interests etc.

The best way to approach the question is to look at the founder of both theoretical and applied post-Keynesiansim: Nicholas Kaldor. But which Kaldor?

There is a pre-war Kaldor less convinced of the self propelling capacity of capitalism. This shows up in his beautiful December 1938 *Economic Journal* paper called "Stability and Full Employment". Except for Maurice Dobb, who has alerted me to its importance through one of his papers, few have appreciated it[11]. The economy has the two traditional Marxian sectors, but

both have unused capacity. The transition from one short period to the next depends upon the speed at which relative rates of utilisation grow/contract during a given short period. Perfectly consistent with Kalecki when the latter argues that in socialist economy a fall in investment need not lead to unemployment but simply to an expansion of employment in the consumption goods sector relative to that of the capital goods sector (see the next section). Kaldor's 1938 paper is better than Harrod's famous 1939 one since it does not entail cycles along trend lines. In Kaldor's 1938 the structure is compatible with the Kaleckian emphasis on sectors and effective demand. It even goes beyond that since it moves towards an issue, which has been part of both American institutionalism and German-Russian Marxism: the relation between oligopolistic power and the heavy industry sectors.

I think that it is the best paper on disproportionality cum effective demand crisis. It forcefully introduces the notion that in a developed industrialised economy the stock of capital – at, and even before, full capacity – can employ the whole of the labour force. A developed capitalist economy has a developed capital goods sector, which can potentially generate a rate of accumulation higher than that allowed by the full utilisation of machinery and of labour. Knocking out old equipment via technical progress will not solve the problem unless by chance the reduced employment capacity of the new equipment turns out to be in the aggregate equal to the number of people released by scrapping older equipment. In general therefore unused capacity will make its appearance and with it the recession in the demand for investment good. Kaldor does consider the possibility of changing the distribution of income not by automatic means, such as price flexibility, but rather through direct state intervention. The 1938 paper is very close to the well-known Kalecki 1968 *Economic Journal* essay where, for a certain level of capital stock and a certain level of the degree of monopoly, the economy can fall into the trap of chronic unused capacity even in the presence of significant technical progress. In the Kalecki paper the degree of monopoly is represented by the share of profits over national income. In Kaldor's 1938 essay the degree of monopoly emerges as a structural relation between the investment and the consumption goods sectors. When this connection is understood both papers tell the same story: left to its own devices the capitalist economy is likely to get stuck in a state of stagnation since[12]:

> As investment activity continues at a high level, excess capacity of equipment is bound to make its appearance. [new paragraph] Once redundant capacity appears, it will be almost impossible to maintain activity undiminished, unless State investment activity is extended so wide as to replace private investment.

The structural picture disappears altogether in Kaldor the post-Keynesian, but not from Kalecki and Sweezy[13]. In the first 1956 paper the economy

is assumed at full employment, investment is given exogenously and the saving ratio always adjusts, via income distribution, to keep the system at full employment[14]. Methodologically, the problem with Kaldor is that he often tried to obtain general trends from particular situations. In 1938 he believed that the industrial system was stuck, in 1956 he thought capitalism could naturally expand on a full-employment path. This aspect emerges very well in his two-part paper on economic growth and inflation published in *Economica* in 1959. He says openly that unemployment in the history of capitalism was small stuff, hovering around 5%, with only the Great Depression being an exception. To quote him in full[15]:

> [I]n the history of advanced capitalist societies periods of severe unemployment were exceptional and not the rule; apart from periods of acute depression, unemployment did not appear to exceed a few per cent. on the average since the second half of the nineteenth century (In the forty years, 1881–1920, in the U.K. it averaged less than 5 per cent., including both boom and depression years). As the actual level of employment averaged 95% per cent. of the full employment level, this is unlikely to have been a mere coincidence; it strongly suggest that forces must have been at work which operated on the relationship between effective demand and supply, or between the propensity to invest and to save, in such a way as to yield an equilibrium level of employment that was fairly close, if not equal to, the full employment level.

The Keynesian explanation of the historical tendency of the capitalist system to approach full employment is to be found in the fact that:

> [I]n a competitive society (I ought to say a *fairly* competitive society – I do not mean perfect competition) variations in the strength of demand cause variations in the level of prices in relation to costs; these variations in turn have a powerful influence on the community's propensity to save or to consume, and thereby adjust the level of effective demand so as to make it coincide with the available supply, as determined by the resources available.

The inescapable conclusion of Kaldor's reasoning is:

> The very fact that prices rise or fall under the influence of demand creates an automatic tendency towards full employment, at any rate within certain boundaries.

Thus capitalism naturally tends to full employment (which must be interpreted as a statement about the essentially crisis free nature of capitalism), provided the income distribution adjustment is allowed to work itself out. In the short run some kind of Keynesian policies will be needed but the

system will be essentially governed by price flexibility relatively to wage costs. If wages increase too much prices will rise cutting them back to the level where the predetermined level of investment is compatible with a full employment distribution of income between wages and profits. By contrast if accumulation of the single product output were to rise too fast prices would fall relatively to wages raising the share of wages to the position required to attain full employment[16]. In this context the issue of inflation acquires relevance because if wage earners do not allow their wages to be cut by price increases when they grow too fast, the natural function of prices in adjusting the distribution of income in relation to full employment would be derailed.

Already during Kaldor's times there were people who were arguing that there was no automaticity in the high levels of employment attained by capitalism: Sweezy, Kalecki, and to some extent also Galbraith. Even before the seminal Baran-Sweezy book *Monopoly Capital* there existed publications pointing to the US dependence upon armament expenditure[17]. Moreover others like Triffin were pointing at the strange nature of the international financial system based on the dollar standard arguing that it could not last for long. Thus from the point of view of explaining the behaviour of capitalism Kaldor's post 1956 approach is irrelevant. Harrod was more aware of the situation with his book on the dollar crisis.

There is finally a third Kaldor appearing during the 1970s and culminating in his Italian Mattioli lectures published only a few years ago[18]. It is clear from the texts that he realised that his beloved Socialdemocratic corporatist paradigm was vanishing but he did not probe deeply into the reasons of the end of the long boom. The social transformations of capitalism never appear since he constantly refused to treat the capitalist economy as a power system. In fact he never refers to oligopolies as a systemic force. He sees full-employment growth to be perturbed by three forces: a growth in wages higher than productivity which fuels inflation, an asymmetry between raw material prices and finished products fuelling both inflation and recession, and the irrational force of monetarist policies. But even in the post 1975 period where he seemed to pay more attention to the issue of intersectoral balances, he remained faithful to his 1956 growth and distribution views which, in my opinion, have been dictated entirely by his Socialdemocratic beliefs. In fact, if the conflict between the producers of raw materials and of manufactured commodities could be regulated by means a buffer-stock based international currency and if wages could be disciplined relative to productivity, the smoothness of the adjustment process would be guaranteed.[19] Kaldor can be considered as the most systematic theoriser of what John Cornwall called *democratic capitalism*. A more extreme version of this approach is that represented by Sidney Weintraub for whom the fixity of the mark up was a 'fact' so that wage increases above the rate of growth of productivity could only cause inflation[20].

36.4 Kalecki and Sweezy: a Different Conception

For the post war period Michał Kalecki and Paul Sweezy provided us with a substantially different picture of capitalist's dynamics, indeed much closer to the 1938 paper by Kaldor[21]. The level of profits is determined by the level of investment, which, for any given distribution of income, will determine the level of output and employment. Hence, in Kalecki's words:[22]

> When investment reaches its top level during the boom the following situation arises. Profits and national income, whose changes are directly related to those of investment, cease to grow as well, but capital equipment continues to expand because net investment is positive. The increase in productive capacity is thus not matched by the rise in effective demand. As a result investment declines, and this causes in turn a fall in profits and national income.

By contrast in a non-capitalist framework it is possible to conceive of a situation where the downward cumulative causation is avoided because:

> The changes in the national income would not be tied to those of investment, but would follow the changes in productive capacity. If investment remained constant while the stock of fixed capital expanded prices would be reduced or wages raised. In this way the demand for consumption goods would increase in accordance with the expansion of the stock of capital.

This is, in Kalecki's contribution, the historically specific nature of the relation between profits and production in advanced capitalism. Kalecki viewed capitalism as a historically contradictory system. Economically because – to approximately cite him – the tragedy of investment is that it generates the crisis because it is useful. As expenditure it adds to profits and as new fixed capital it adds to capacity which clashes with profitability unless demand is propped up. The propping up of demand has to be consistent with profits. But if the propping up of demand turns out to be successful, full employment will weaken capitalists' power who, therefore, will retreat from full employment and revert back to sound finance policies. According to Kalecki during the 1950s and 1960s capitalism implemented a crucial reform through a financial trick based on budgetary polices and related armament spending. However, the crucial reform was by no means a permanent situation because it was based upon a persistent arms race and actual wars.

A similar view had been developed much earlier by Paul Sweezy in the essay published in the *Present as History*. Sweezy used Marx's characterization of the accumulation process in terms of two sectors to show that upon the completion of industrialization an economy necessarily attains a stage

of maturity. Under these conditions the endogenous capacity for the further expansion of investment will weaken since there is plenty of capital stock around[23]. Can a solution to stagnation be found within the institutional framework of capitalism? The answer given by Sweezy constitutes a critique of Kaldor's post-Keynesian theory of distribution before it even appeared. It is indeed a critique of *democratic capitalism* and of the possibility of a lasting crucial reform.

> In terms of our two-department schema, the result would be that the gap in total demand created by the disappearance of expansion demand in Department I would be made up by an increase in consumption demand on the one hand and an increase in expansion demand in Department II on the other (Sweezy in Horowitz, p. 320).

The hypothetical adjustment envisaged by Sweezy is exactly Kaldor's 1956 for whom "… a fall in investment, and thus in total demand, causes a fall in prices (relatively to the wage level) and thereby generates a compensating rise in real consumption. Assuming flexible prices (or rather flexible profit margins), the system is thus stable at full employment"[24]. Yet this is precisely the mechanism rejected by both Kalecki and Sweezy. In the words of the latter:

> But it is certainly impossible today to maintain that the capitalist price system works this way. [….] In other words, there is no reason to suppose that the approach of the end of the period of industrialization would set in motion a mechanism accelerating the growth of consumption at the expense of accumulation and thus taking up the slack which the disappearance of expansion demand in Department I would otherwise cause (Sweezy, ibid.).

In defence of Kaldor, but not of Weintraub who keeps the markup steady and blames inflation on workers' appetite, one could argue that the stability of full employment is arrived at by assuming that investment is at full employment in the first place. But in the *Economica* 1959 paper on growth and inflation the mechanism works also in the neighbourhood of full employment and, importantly, the economy is brought to gravitate around it by endogenous forces impacting upon the average saving ratio. Thus contrary to Kaldor's claims it is saving that ends up determining investment.

It can be useful at this point to inquire about how can investment be fixed at full employment remembering that profits are determined by the level of investment and, if capitalists do not consume, they are equal to it. If full employment requires a long-term decline of the ratio of the capital to the consumption goods sector it would entail a fall in the share of profits. This will run against capitalists' perception of a stable investment environment. It will therefore be as difficult to reduce investment to its

full-employment level as much as it is difficult to systematically raise it in developing economies. The stability and, possibly, the upward movement of the value of profits over the value of output is one of the main features of the capitalist enterprise as it also influences the financial evaluation of the companies. Thus if investment is to be adjusted downward it will be done not in relation to full-employment requirements but in relation to market realities at the ruling share of profits. The problem cannot be solved by State intervention either, unless the said intervention sterilises itself. Assume that the state intervenes in order to guarantee the adjustment described by Sweezy. It purchases the machines at a given price, so as not to upset capitalists' expectations about returns, and sets up new plants in the consumption goods sectors. This step would most likely be seen as encroaching upon the sphere of private capital in production, as well as reducing the mark up in the consumption goods sector at the expense of private profit margins. The reasonable solution can only be that suggested by James Meade when analysing the relation between machines and a growth rate exceeding the full employment one[25]:

> In the latter case, it will, of course, be very difficult to prevent a general slump in economic activity; for it will be difficult with existing machinery idle or used below capacity to maintain the incentives to invest in new additional machinery on a scale necessary to make use of all the savings (..) forthcoming from the national income if it is maintained at its full employment level. The economy will thus be prone to lapse into a stagnant state in which neither machinery nor men are fully employed.

Thus, unless one believes in the virtues of price flexibility in relation to wage costs, it is up to the government to avoid stagnation:

> For example, the government may have a public-works policy whereby it borrows the excess savings to spend on the excess supply of machines in order to hold them off the private market. The remainder of the output of new machines would no longer be in excess of the amount needed to match the growing labour force.

The rate of accumulation and the level of profits would be thus safeguarded by mopping up unwanted capital equipment. But for how long can this financial arrangement continue? Pretty soon corporations will realise that they are producing unwanted machinery stored up by the government which is also compelled to increase its debt relatively to total output. Thus in the course of time capitalists' consensus towards this sort of policies will breakdown. We are once more back to Sweezy's observation according to which when industrialization is completed its fruits tend to be dissipated in unemployment and stagnation.

Some contemporary post-Keynesians following up from the Kaldor-Weintraub tradition claim that it is possible to ensure a stable investment environment at full employment by means of traditional government expenditure and with wage controls addressing the issue of inflation[26]. But if we think in terms of stages of development and thereby view the advanced capitalist world as possessing a level of productive capacity which, if fully utilised, can employ the whole – and even more – of the able bodied population, the structural problem at full capacity is not inflation but the immanent tendency towards over accumulation. Inflation can, in this context, be seen as the corporate resistance to the decline in profits which would be indeed required to maintain full employment.

This is in fact how Kalecki viewed the role of the class struggle in the short run. If capitalists' power is very strong, corporations will transfer higher wages onto prices. Thus in France in 1936–38 to the political power of the labour movement expressed by the *Front Populaire* did not correspond an equal economic power since the increase in wages had been reabsorbed by an equal increase in prices[27]. In the post war period, due to the crucial reform, which brought about a high level of employment, workers can wage an offensive struggle by breaking through the inflationary resistance of capitalists. Under oligopolistic conditions unused capacity is the norm. If the function determining the mark up is unchangeable any variation in costs will be reflected in price changes. But this function may depend on international competition as well as on trade unions' activity. Since oligopolies extend well beyond national boundaries, the real break to tendentially rising markups can come mainly from the trade unions. If successful, wage struggles increase the level of employment by increasing the rate of capacity utilisation, without a major impact on the level of profits. Only their distribution will change substantially towards the consumption goods sector. Of course at full capacity the functions determining the mark up cease to operate. Yet for Kalecki this is a very remote possibility under capitalism[28].

If trade unions manage to break through capitalists' inflationary barrier up to the level of full capacity, the issue will not be that of inflation but that of directing the allocation of the surplus. The more industrially developed is the system the more the very essence of the capitalist economy will be called into question. To quote Sweezy again:

> As near as anything can be, profit is the be-all and end-all of capitalist society. It follows that when the economic functioning of capitalism calls for a drastic and steady decline in profit and/or a use of profit which runs directly counter to the will of the capitalists, the system is caught in a very real contradiction.
>
> Capitalism may be temporarily rescued from the contradiction by new industries; it may seek with more or less success an escape through imperialism and militarism; it may even undertake, again with more or less

> and certainly against the growing resistance of the capitalists themselves, to modify the functioning of the system through taxation and government spending. But one thing is certain: as long as it remains capitalism, it can never abolish the contradiction (Sweezy in Horowitz, p. 324).

36.5 Some Conclusions

Kalecki thought that the 'crucial reform' implemented by post war capitalism would last longer than it did, although in the late 1960s *Monthly Review's* articles were pointing to a systematic reappearance of the tendency towards stagnation, to day well recognised[29]. Unlike Kaldor and Cornwall's conceptions of *democratic capitalism* the 'crucial reform' had little to do with the virtues of Socialdemocracy. It was rather based on the connection between government expenditure which ensured a high level of employment and the rise of wages along with productivity which allowed workers' incomes to rise. One of the reasons why Kalecki viewed the crucial reform as unsatisfactory is that it was linked to imperialism and to a monopolistic control of the means of communications by big business[30]. These elements explain why he was sympathetic to the 1968–69 students' movement in Western Europe. He considered the students as a factor that would break the rules of the game and would rekindle the challenge to capitalist power in the advanced countries.

It follows that, even without going into the issue of financial instability which comes on top of the structural aspects discussed earlier, those who want to advocate post-Keynesian policies to day, would have to assess whether a new crucial reform is possible. Prior to this they will have to make their views clear in relation to the way they see the evolution of capitalism from, say, 1945 to 1971. Do they see it in Kaldor-Cornwall terms or in Kalecki-Sweezy-Magdoff terms? If they see it through Kaldor-Cornwall eyes then all that is needed to restore Socialdemocratic capitalism is a 'tax and spend' policy with an eye on wages to prevent inflation, and with some budget deficits to push the system along coupled with the implementation of Paul Davidson's proposal for a new international monetary system.

The Kaldor-Cornwall approach is based on the idea of a benevolent state and on the related absence of imperialism as a crucial feature of present day capitalism[31]. In essence, however, the neo-liberal characteristics of the capitalist states never faded. The history of the welfare state is turning out to be just an episode dictated by the Great Fear – to borrow a term used for the conditions leading to the French Revolution – raised by anti-imperialist national liberation movements, the existence of the USSR and of the People's republic of China and, in the United States, by the radicalism of the workers during the Depression.

The excellent historical scholarship which has been coming out of the United States in the last two decades confirms and enriches the

Kalecki-*Monthly Review* analysis according to which imperialism and military expenditures were the pillars of post 1945 capitalism[32]. This is particularly true for the post war history of Japan and of East and South-East Asia which have constituted the truly new geographical frontiers of 'successful' capitalist expansion. It is remarkable how in this area there is very little post-Keynesian scholarship[33]. Surely this must be linked to the neglect of historical analysis. But also on Europe there are major misgivings. The Kaldorian based infatuation with neocorporatist regimes of industrial relations misses their historically specific nature and fails to explain why they weakened so much, especially in relation to Germany. Moreover the identification of French indicative planning with Keynesian policies, also a Kaldor-generated myth, is positively misleading and historically wrong. It misses the unifying role played by financial capital, and therefore sound finance policies, in the consolidation, strengthening and grip on power of France's capitalist classes so well epitomised by the role of Jacques Rueff from the *Front Populaire* to the de Gaulle regime[34].

The issue of the State and its class characteristics seems therefore to be the weakest link in the post-Kaldorian literature. This factor leads to the mythology of the actual possibility, under present day capitalism, of a return to full employment and to an endless (post) Keynesian welfare state. The narrowness of this view has been recently highlighted by Harry Magdoff with the following words[35]:

> If the belief isn't engraved at the conscious level, it is well preserved at the unconscious. Reform proposals by progressives tend to seek ways to reestablish a Keynesian "harmony," when what we should be working for are changes that challenge capitalism and the ideology of the market system. The educators among us have a huge educating job ahead; to explain why challenging capitalism at every opportunity is in the best interest of the working classes of the world.

Appendix

I believe that Marx was the most scientific of all the economists who wanted to tell a long-run story – that he thought to be historically accurate – of how the system evolves. *Das Kapital* Volume One transforms – via Ricardo – class relations into a set of economic laws of motion. Behind every economic category there is a specific class: behind profits there is the capitalist class and behind wages there is the working class. The power relations between these two classes are contained in the process of value formation since part of the labour time bestowed in production is surrendered free as surplus value to the owners of capital.

Marx's theory of accumulation of Volume One variety aims at telling a scientifically objective story about historical tendencies of accumulation combining the short run with the long run. The short run side of it is the famous cyclical process of growth based on the Reserve Army of Labour. Here the classical inverse relations between the wage rate and the rate of profits does wonders as the fall in accumulation resulting

from a dwindling Reserve Army brings down the rate of profits. The typical capitalist is deemed to operate under competition which means that the capitalist is forced by the very process of competition "to constantly expand his capital, but expand it he cannot except by means of progressive accumulation"(*Capital*, Volume One page 555). It is indeed competition which compels the capitalist firm to invest every single penny left over after deducting wage payments. Notice that this logic requires that prior savings finance investment exactly like in Ricardo's theory. The competitive drive, in which Kaldor the post-Keynesians believed so much, prevents the capitalist from developing a mark up policy both for the defence of monetary profits and of accumulation strategies. When, at the founding meeting of the First International in London, citizen Weston (the first Kaleckian ante litteram) tried to argue that indeed capitalists do have power over prices, Marx strongly criticized him arguing that prices are unambiguously set by the labour theory of value, and wages by the relative pace of accumulation. The pace of accumulation determines the variation in the rate of employment relatively to the available work-force and this will determine whether the wage rate will rise or not relatively to the rate of profits. The crisis becomes therefore the positive solution to the profit squeeze induced by a too high rate of accumulation which engendered a rise in wages relatively to the rate of profits. Capitalists defend themselves not through prices but by means of technical innovations (assumed to be capital-augmenting) and those who can't will go bust. The low level of accumulation coupled with technological restructuring will generate unemployment to which we must add the unemployed coming from the firms who went bust. At last the Reserve Army of Labour is endogenously replenished! Unemployment will rise, the wage rate will fall so that rate of profits will rise as a consequence. Since the rate of profits governs the rate of accumulation we immediately know that the share and the rate of investment will rise and with it the growth rate. The crisis is indeed the solution to the impasse of a previously too high rate of accumulation since it allows accumulation to recover on an expanded technical basis. This process could go on indefinitely were it not for the long-run rise of the organic composition of capital brought about by the very restructuring undertaken at each turning point of the cycle.

Marx viewed the above theory not in terms of a model but as actually explaining reality. It all depends on saving (profits) preceding investment under conditions of classical competition. If it were possible to ascertain that these two conditions were met during the period that Marx studied we could argue that Marx's trade cycle represented a specifically identifiable phase in the history of capitalism: that of competitive accumulation. But we can't ascertain anything of this sort. We can only speculate without even being able to draw upon circumstantial evidence. Certainly, in relation to competition we would be hard put to argue for a relatively long phase of price competitive processes. In the first decade of the 20th century one German historian, Hermann Levy[36], perhaps the father of the monopoly capital version of industrialisation, actually maintained that competition is nothing but a brief transition period between phases of monopolistic dominance. Furthermore present day historical studies on the Gold Standard and British imperialism show in a rather convincing manner that Britain was steadily building within its empire a monopolistic zone for the commerce of its manufactured products[37]. List himself viewed the act which led Ricardo to rationalise competitive trade between Portugal and Britain as an expression of non-competitive relations. In Marx's economics the idea of competition is as important as the notion of labour value based exploitation. It is competition that compels capitalists to strive to make profits (saving) and to invest them. It is competition that enables capitalism to expand endogenously following precisely defined laws. Without competition capitalists may become so in spite of themselves, for reasons

not uniquely related to the endogenous forces of accumulation. Hence the capitalist system may be built from above rather than from endogenous economic impulses.[38]

From a conceptual point of view the creation of internal savings can happen only if the society is small and based on consumption so that savings are made in order to obtain greater consumption in a precisely known future. Normally a Ramsey saver is considered to be a single family unit of farmers deciding how much corn to eat and how much to set aside for the next harvest and therefore for future consumption. In a small society every family of farmers knows exactly what the others produce and knows that the labouring activities are geared mainly to self consumption. Here savings will take a Ramsey form. These kind of savings do not involve any money. But the Ricardo-Marx savings are supposed to involve money in a context of capitalist production where producers do not know each other nor do they really care about what specific commodities are being produced. Yet Marx's Ricardian based theory of cyclical accumulation works best when it is in a money-less system and especially when such a system is formed by one multipurpose commodity, corn. The Marx-Ricardo capitalists behave in an opposite but comparable way to the Ramsey savers as they attempt to withhold from consumption the largest possible amount of corn (profit = saving) in order to plough it back (invest) into production. Marx's laws of motion tell us that, under free competition, capitalists operate under a tight restriction which prevents them from always raising the share of corn withheld from consumption. Whenever the rate of ploughing back exceeds the rate at which capitalists can find workers to undertake the job, wages will rise engendering the profit and investment squeeze outlined earlier.

The emergence of the Ricardo-Marx mechanism of savings and investment as just the dual of Ramsey's intertemporal consumption decision, highlights the essentially non-monetary single-sector nature of the basic approach to accumulation put forward by the Classical economists. It was Marx himself who unwittingly criticised his own views a few pages before he presented them in chapter 25 of Volume One of *Capital*. In chapter 15 of Volume One, the famous chapter on machinery, he attacked the theory of compensation according to which workers displaced by innovations would be reabsorbed elsewhere in the economy. In response Marx constructed an example of carpet weavers replaced by mechanical looms. He then argued that once fired the carpet makers would no longer face the capitalists as labour costs, but only as defective consumers since the loss of their wages would reduce the demand for commodities. It is not difficult to see that Marx could make this point because he treated wages in money terms and considered consumption goods in relation to their specifically sectoral characteristics as use values not fitted for accumulation. Now in terms of effective demand for consumption goods, the decline in wage rates due to the rise of the Reserve Army of Labour has the same implications derived from the firing of carpet weavers. But in chapter 25 Marx, in building his macroeconomic theory of cyclical growth – which he calls *the law of capitalist accumulation* – relied on the Ricardian approach of a single sector corn economy, although couched in terms of the labour theory of value, where corn savings precede and determine corn investment. It is because of this special case that Marx could map out a set of laws on growth, cycles and crisis.

The political economy of class relations emerging from Marx's approach is quite stringent: workers' lives will be subjected to ever growing cycles until the falling rate of profits catches up with the cyclical process thereby unleashing a structural crisis. Thus workers have very little reason to stand by the system of exploitation and accumulation. Nowadays very few people would maintain that the falling rate of profits theory is valid in historical time given its logical problems and given that

it was conceived on the basis of a competitive process. Yet some authors continue to use the profit squeeze approach in order to explain the breakdown of the long boom while the ensuing unemployment is seen as the essential aspect of the recovery in the rate of profits and in accumulation[39]. To state this causal linkage those neo-post-Marxist authors have to treat the economy as a single homogeneous whole and have to exclude by assumption the negative impact of unemployment on the demand for commodities as well as the negative consequences, in terms of profits, of such an event for the investment sectors servicing the affected consumption goods industries. Moreover, as pointed out in a splendid critique of Duménil and Lévy by Carlo Benetti and Jean Cartelier[40], the insurmountable problems encountered in the construction of such an aggregate approach are similar to those found in traditional theory whenever it attempts to generalise its concepts to the system as a whole.

In Marx's own framework where the dynamic process is regulated by competition between capitals, involving heavy fluctuations in prices, the business cycle cum technical change, highlighted the permanent subaltern position of wage labour. But to day this position is not acceptable. Structural linkages are far more complex than thought during classical times so that the competitive process, even if it exists, is one of many other processes taking place alongside it. As a consequence to argue that a fall in wages is an indication of the restoration of accumulation and profitability is profoundly misleading.

Notes

1. As a result of a set of theorems by Debreu, Sonnenschein and Mantel we now know that a microeconomic text book ought to be closed and shelved at the very first attempt to present a general many agents-multi goods barter equilibrium, let alone a supply and demand diagram. In other words, it is impossible to establish that net demand functions are systematically related to prices in an inverse manner. The issue was intuitively understood by Hicks already in 1939 in *Value and Capital*, otherwise he would not have stated that the prerequisite for attaining his flex-price temporary equilibrium is the dominance of the substitution over the income effect. Debreu-Sonnenschein and Mantel showed that the income effect may indeed prevail so that the fundamental microeconomic price adjustment story comes to an end as soon as it is stated. This point has been lucidly made by Bernard Guerrien in his *Concurrence, flexibilité et stabilité*, Paris: Economica, 1989, and by Steve Keen in *Debunking Economics*, Sydney: Pluto Press, 2001. In the case of Ricardo and Marx the homogeneous nature of the system stems from the attempt to extend the clear-cut results obtained in a corn economy to a more complex system still operating under competition.
2. See Joseph Halevi and Peter Kriesler "Marx or Hicks? Structural proportions and crisis: the transition from the First to the Third Volume of *Capital*", in *Marxian Economics: A Reappraisal: Essays On Volume III of "Capital" Vol 2*. edited by Riccardo Bellofiore. New York: St. Martin's Press, 1998, Vol 2.
3. Still unsurpassed is the discussion of that debate by Paul Sweezy in his celebrated *Theory of Capitalist Development*, New York: Monthly Review Press, 1968; originally published in 1942. The best collection of most of the original texts is due toe Lucio Colletti and Claudio Napoleoni (eds.), *Il futuro del capitalismo: crollo o sviluppo?* (*The Future of Capitalism: Breakdown or Growth?*), Bari: Laterza, 1970.
4. Joseph Schumpeter, "The Instability of Capitalism", *The Economic Journal*, Vol. 38, No. 151. (Sep., 1928), pp. 361–386.

5. A more elaborate discussion of the consistency in which Kalecki modified some of his views in the post 1945 period is in Joseph Halevi, "Kalecki and Modern Capitalism", *Monthly Review*, June 1992.
6. German Socialdemocracy never abandoned that view and this is why it is technocratic but not Keynesian. The advent to power of the SPD in 1969 opened the way to the deflationary role taken by the Bundesbank. It is strange that so many post-Keynesians form Kaldor to Cornwall were so taken by the German system of industrial relations precisely when the Bundesrepublik used that system in order to enforce a massive change in the distribution of income away from wages and embark onto a neomercantilist policy of net surpluses which brought no Kaldorian cumulative causation to the rest of Europe. Notice that Kaldor believed that export oriented growth would generate a wider cumulative causation because the exporting countries would need imports linked to their exports. Now it is true that whenever South Korean or Taiwanese exports accelerated, Japanese exports expanded as well. But this was due to a precise heirarchical relatiion governed by Japan's monopoly capital. Hardly any industry or service in East Asia can do without Japanese industrial inputs. There is no magical cumulative causation in this.
7. See Michał Kalecki, "The Influence of Cartelization on the Business Cycle", in *Collected works of Michał Kalecki 1990–1997, Vol. 1* edited by Jerzy Osiatynski; translated by Chester Adam Kisiel. Oxford; New York; Toronto and Melbourne: Oxford University Press, Clarendon Press, (Part 2). Originally published in 1932 in the Polish Journal *Socialist Review*.
8. As if history did not matter, this is exactly what the late David Gordon has maintained regarding the possible exit of the US economy from the crisis of the 1970s. The same approach has been taken recently by Duménil and Levy in their study on the long-run behaviour of the rate of profits. See Appendix.
9. Michał Kalecki, "Is a 'Capitalist' Overcoming of the Crisis Possible?" in *Collected works of Michał Kalecki 1990–1997, Vol. 1* edited by Jerzy Osiatynski; translated by Chester Adam Kisiel. Oxford; New York; Toronto and Melbourne: Oxford University Press, Clarendon Press, (Part 2). It should be noticed that Kalecki's advantage over Varga lies in that he always thinks in monetary terms and prices are money prices not labour values (i.e. real prices) as implicitly postulated by Varga.
10. Michał Kalecki, Tadeusz Kowalik, "Observations on the 'Crucial Reform'" in *Collected Works of Michał Kalecki. Volume 2: Capitalism: Economic Dynamics*. Edited by Jerzy Osiatynski. Translated by Chester Adam Kisiel. Oxford; New York; Toronto and Melbourne: Oxford University Press, Clarendon Press. p. 467–76. 1991. Previously Published: 1971.
11. I think it is one of Kaldor's least cited essays.
12. Nicholas Kaldor. "Stability and Full Employment", *The Economic Journal*, Vol. 48, no. 192 (December, 1938), p. 653.
13. From a non-Marxian, but quite structural, perspective – although couched in Cassellian terms – a good antidote to Kaldor's 1956 is the paper by Masao Fukuoka, "Full Employment with Constant Coefficients of Production", *Quarterly Journal of Economics,* Vol. 69, no. 1 (February, 1955).
14. The first 1956 paper by Kaldor is the well-known "Alternative Theories of Distribution", *Review of Economic Studies*, Vol. 23, No. 2, 1955–56, pp. 83–100. There also a second essay based on a lecture given at Beijing University where, like the *Economica* 1959 articles, the political economy of the theory presented in the *RES* 1956 paper is fully spelled out. Here he even tried to make his approach intelligible in terms of the labour theory of value given the location of the lecture.

Unlike Kalecki and Sweezy, Kaldor does not see the exogenous determination of investment as a critical factor in the instability of capitalism's economic forces. If, he argues, capitalists attempt to fix the level of investment and of profits at 50% of the working time bestowed on production, but the cost of the social reproduction of the working class – the value of variable capital – is 60% of the amount of time spent on production, then profits will be brought down to 40%. Yet, if the socially necessary amount of time for the reproduction of the working class is 40% and capitalists still fix the share of profits at 50%, the remaining 10% will be absorbed by the rise in wages above the requirements of social reproduction. Nicholas Kaldor. "Capitalist Evolution in the Light of Keynesian Economics", in *Essays on Economic Stability and Growth* Nicholas Kaldor, London: Duckworth, 1960, pp. 243–58.

15. The set of quotations is taken from Nicholas Kaldor, "Economic Growth and the Problem of Inflation", in *Essays On Economic Policy I* Nicholas Kaldor, New York: Holmes & Meier, 1980, pp. 169–70. Originally published in *Economica* August 1959.
16. The story no longer works if many sectors or many firms are considered. G.C. Harcourt, "Acritique of Mr Kaldor's model of income distribution and economic growth", *Australian Economic Papers*, Vol. 2, no.1, June 1963, pp. 20–36; Joseph Halevi, "*Capital and Growth*: Its Relevance as a Critique of Neoclassical and Classical Economic Theories", *Indian Journal of Applied Economics – Special Issue in the Respectful Memory of John Hicks*, Vol. 7, No. 4, October–December 2001, pp. 79–98.
17. *The U.S. Economy in the 1950s* Harold Vatter, New York: Norton, 1963.
18 *Causes of Growth and Stagnation in the World Economy* Nicholas Kaldor. New York: Cambridge University Press, 1996.
19. In the end this is the view held by most post-Keynesians also by those who take a Kaleckian perspective on mark-up pricing: *Economic Breakdown & Recovery: Theory And Policy* John Cornwall; with a foreword by David Colander. Armonk, N.Y.: M.E. Sharpe, 1994.
20. *General Theory Of The Price Level, Output, Income Distribution, And Economic Growth* Sidney Weintraub. Philadelphia: Chilton Co., Book Division, 1959.
21. Michał Kalecki "Observations on the Theory of Growth", *Economic Journal*, March 1962. Paul Sweezy, "A Crucial Difference Between Capitalism and Socialism", in *Past and Present* Paul Sweezy. New York: Monthly Review Press 1953. Reprinted in *Marx and Modern Economics* David Howitz ed., New York: Monthly Review Press, 1968.
22. Michał Kalecki "Observations on the Theory of Growth", pp. 139–140.
23. Like Kaldor in 1938, Sweezy rejects the view that the solution can be found in an ever expanding creation of new economy industries: "For example, new industries generally produce an effect akin to that of industrialization, and if they are sufficiently numerous and important they may keep the system going at or near full capacity. But in each case the effects are bound to wear off sooner or later. The tendency to collapse is always there in an industrialized capitalist society." (Sweezy, in David Horowitz ed. *Marx and Modern Economics,* New York: Monthly Review Press, pp. 320–1).
24. Nicholas Kaldor, "Alternative Theories of Distribution", *Review of Economic Studies*, Volume 23, No. 2, 1955–56, p. 95.
25. *A Neo-Classical Theory Of Economic Growth* James Meade. London: George Allen and Unwin, 1962, pp. 47–48 footnote.
26. Philip Arestis, Malcolm Sawyer, "Keynesian Economic Policies for the New Millennium" *Economic Journal*, Vol. 108 (446). p 181–95. January 1998.

27. Michał Kalecki, "The Lessons of the Blum Experiment", *The Economic Journal*, Vol. 48, No. 189. (Mar., 1938), pp. 26–41.
28. Michał Kalecki, "Class Struggle and Distribution of National Income", Kyklos, Vol. 24, No.1, 1971, pp. 1–9.
29. *The Dynamics of U.S. Capitalism: Corporate Structure, Inflation, Credit, Gold, And The Dollar* [compiled] by Paul M. Sweezy and Harry Magdoff. New York: Monthly Review Press, 1972. See also Harold G. Vatter, John F Walker, Gar Alperovitz, "The Onset and Persistence of Secular Stagnation in the U.S. Economy: 1910–1990", *Journal of Economic Issues*. Vol. 29 (2). p. 591–600. June 1995.
30. In the post-war period Kalecki treated imperialism in a Kautsky rather than in a Leninist sense. He did not consider interimperialist wars to be possible any longer.
31. Moreover this approach trivializes the notion of democracy which many authors found at odds with the expansion of capitalism. See *Democratic Theory: Essays In Retrieval* C. B. Macpherson. Oxford: Clarendon Press, 1973; *Democracy Against Capitalism: Renewing Historical Materialism* Ellen Meiksins Wood. Cambridge: Cambridge University Press, 1995.
32. *Altered States: The United States And Japan Since The Occupation* Michael Schaller. New York: Oxford University Press, 1997; *The Pacific Alliance: United States Foreign Economic Policy And Japanese Trade Recovery, 1947–1955* William S. Borden. Madison, Wis.: University of Wisconsin Press, 1984.
33. See however: Peter Kriesler, Joseph Halevi, "Asia, Japan and the Internationalization of Effective Demand", *Economies et Societes*. Vol. 30 (2–3). p 301–20. Feb.–March 1996. Joseph Halevi, Peter Kriesler, "History, Politics and Effective Demand in Asia" in Joseph Halevi and Jean-Marc Fontaine eds, *Restoring demand in the world economy: Trade, finance and technology,* Cheltenham, U.K. and Northampton, Mass.: Elgar; pp. 77–92. 1998.
34. Alain Parguez,. "The Roots of Austerity in France", *Restoring demand in the world economy: Trade, finance and technology*. Joseph Halevi, Jean-Marc Fontaine, eds., Cheltenham, U.K. and Northampton, Mass.: Elgar; distributed by American International Distribution Corporation, Williston, Vt. p 182–96. 1998.
35. Harry Magdoff., "The same old state", *Monthly Review*, Jan 1998 v49 n8 p. 1–10
36. *Monopoly And Competition: A Study In English Industrial Organisation* Hermann Levy. London: Macmillan, 1911.
37. *Money And Empire: The International Gold Standard, 1890–1914* Marcello de Cecco. Oxford: B. Blackwell, 1974.
38. *Capitalism From Above And Capitalism From Below: An Essay In Comparative Political Economy* Terence J. Byres. Houndmills, Basingstoke, Hampshire: Macmillan Press; New York: St. Martin's Press, 1996. *Capitalists In Spite Of Themselves: Elite Conflict And Economic Transitions In Early Modern Europe* Richard Lachmann. New York: Oxford University Press, 2000.
39. *Capitalism since 1945* Philip Armstrong, Andrew Glyn, John Harrison. Oxford, UK; Cambridge, Mass.: Basil Blackwell, 1991; *The Economics Of The Profit Rate: Competition, Crises, And Historical Tendencies In Capitalism* Gérard Duménil and Dominique Lévy. Aldershot, Hants, England; Brookfield, Vt.: Edward Elgar, 1993.
40. Benetti, Carlo; Cartelier, Jean. "Une dynamique économique sans théorie?" (With English summary.). [Journal Article] *Recherches Economiques de Louvain*. Vol. 61 (3). p 289–300. 1995.

Index