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# Global Labour in Distress, Volume II

## Earnings, (In)decent Work and Institutions

*Edited by*
Pedro Goulart · Raul Ramos
Gianluca Ferrittu

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Editors

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# Article Note

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| 46 | Craig, L. How Employed Mothers in Australia Find Time for Both Market Work and Childcare. *J Fam Econ Iss* 28, 69–87 (2007). https://doi.org/10.1007/s10834-006-9047-2 |
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| 49 | Caraway, T.L. Labor Standards and Labor Market Flexibility in East Asia. *St Comp Int Dev* 45, 225–249 (2010). https://doi.org/10.1007/s12116-010-9061-0 |
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# Preface

The end to the Cold War and a unipolar world coincided with the retrenchment of the State and a move towards a more market-based economy. Since then, what developments occurred in the world of labour? Globalization and technology provoked a major change in the economic production, while schooling has been expanded and democratized throughout the globe, with developing countries at different stages now educating most of their youths. But what about labour conditions and the inequality of earnings? How resilient has been labour to adapt to these changes? How did labour institutions and policies evolve?

Over the last 30 years, the power of labour showed, at best, contradictory signs or even became considerably frailer. Following the earlier elections of Thatcher and Reagan and contributing to the declining formal labour protection, developed countries experienced falling union rates and social concertation practices. Segmented labour markets led often to polarization of labour earnings and conditions. Progresses in living standards and in different spheres in human development, noticeably in Asia and particularly China, made starker the inequality in the global south. Since the 1990s, there has also been a deceleration in the liberalization of migration policies that predominated since WWII, while international migration has remained remarkably stable contributing to the higher complexity and diversity of labour markets. What would be coined as the "Washington Consensus" neglected labour conditions in developing countries.

Labour institutions were thus challenged throughout the period. Informal labour, female, and youth and child labour received increasing attention and resources. However, recurrent crises, high unemployment,

youth unemployment and underemployment, low wages and, in general, falling wage shares have been motives for discontentment and even upheaval of many. Intersectionality often comes to make more severe the situation of some. A more globalized and interconnected world also made inequalities more visible, discomforting and conflictive. In sum, the age post-1991 was marked by *global labour in distress*.

This two-volume book aims to frame these issues by composing a 30 years perspective, which allows for an uncommon depth of analysis. By doing so, *Global Labour in Distress* collects selected high-influential journal articles on labour issues around the globe since 1991 and compiles them with brief unpublished masterpieces defined by highly recognized experts, providing a complementary view from today's perspective. Building on the editors' expertise on economics, demography and development studies, the journal articles were selected from a pool of highly reputed Springer journals among the academic community. Their varied disciplinary approaches provide a multidisciplinary perspective to labour issues.

The selection was based on a pool of 15,047 journal articles of 1474 issues of 11 scientific journals, as identified in Table 1. For the selection of the articles, the editorial team searched for topics related to: Labour markets and globalization; Jobs and technological change; Labour agency and resilience; Labour earnings and inequality; (In)decent work; Continuity and change of labour institutions; Gender, in a crosscutting manner. In a first stage, the editors chose *circa* 60 papers, to, in a second stage, reduce it to the final list. In the selection of the papers, we privileged the quality of the papers, the variety of topics and the diversity of affiliations/institutions.

The final volumes gather "[a]n amazing line up of great authors", in the words of one contributor. Fifty-six chapters, from 91 authors affiliated to institutions from 22 countries, covering different regions of the world. After the start of the project, one of the authors was actually awarded the Nobel Prize in Economic Sciences, we leave it to the reader to identify who. The geographical variety of each section is fundamental given the importance of studying the context. The two volumes feature complementary topics on labour issues, but sometimes with opposing views.

Each volume is structured in three main sections and analyses well-defined but also complementary topics on labour issues. All sections include an introduction by the editors followed by a compilation of selected articles selection and masterpieces. In the first volume, *Globalisation, Technology and Labour Resilience*, the first section is about developments that occurred in the world of labour related to the integration of labour markets and globalization, bridging international migration drivers and policy and the

**Table 1** Springer journals included in the selection

| *Areas* | *Journals* | *Number of articles* |
|---|---|---|
| Economics | Empirical Economics<br>Journal of Family and Economic Issues<br>Journal of Economic Inequality<br>Journal of Population Economics | 12 |
| Development | Applied Spatial Analysis and Policy<br>European Journal of Development Research<br>Studies in Comparative International Development | 11 |
| Demography and other social sciences | European Journal of Population<br>Journal of Labor Research<br>Population and Environment<br>Social Indicators Research | 7 |

level of internationalization of production. The second section analyses technological change and innovation, discussing structural transformation and frugal innovation, employment and jobs adaptation, multinationals and survival entrepreneurship. Finally, the third section discusses the change in labour agency and resilience concerning major changes in international and national institutional landscapes, discussing informalization of labour and underemployment, the politics of workplace well-being, and the effects of crises and their recovery.

The second volume *Earnings, (In)decent Work and Institutions* follows a similar structure. It is also structured into three main sections. The first one addresses earnings and inequality, bridging trade globalization and COVID-19 pandemic effects, the geography of poverty, horizontal inequality and inequality of opportunity, unions' impact on wages and the gender gap. The second one focuses on the analysis of recent trends in decent work, discussing labour standards, unemployment and minimum wages, and gender issues and work-family balance. Last, the third section discusses the role of labour market policies and its interactions with institutions, and it combines pieces on growth and labour standards, social protection policies and policy tools.

Lisbon, Portugal — Pedro Goulart
Barcelona, Spain — Raul Ramos
Lisbon, Portugal — Gianluca Ferrittu

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As always, this endeavour has only been possible by the contribution of many.

First and foremost, we need to thank the 88 contributors that have produced so many enriching views on labour and who so selfless agreed to join this effort. A special word goes to the very few that agreed but for unforeseen reasons were not able to join in the end.

The community around the selected journals, the editors and reviewers are also to be praised as our selection benefited from their constant and careful mostly unpaid work. Science, although imperfect and incomplete, has allowed us a long way in understanding social phenomena.

We would like to thank Spencer Henson, Natalia Lorenzoni and Wendy Olsen for helpful comments on an earlier phase and to Catarina Grilo.

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On a personal note, we also need to thank our families who have abdicated part of our precious time together. At this moment, we are thinking particularly on:

To my father, uncle, aunt and Zé who are dearly missed, to my mother and her strength, to C. for 21 wonderful years and to A. who wanted to help by drawing pictures to illustrate the book (Pedro Goulart).

To my wife and lovely daughters and to my parents from whom I learned first-hand experience on some labour-related issues like child work or rural to urban migration, but also resilience. Thanks for everything (Raul Ramos).

To my parents, M. And P., my sisters, G. and S., and my lovely G., for their unconditional support and love. To my grandad L., who is always with me (Gianluca Ferrittu).

# Contents

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**Introduction: Policies for All Seasons: The Post-Cold War Era**

# Introduction: Policies for All Seasons: The Post-Cold War Era

*Pedro Goulart, Raul Ramos, and Gianluca Ferrittu*

## 1 Introduction

I saw you working the whole day
Building cities for others
Carrying stones, wasting
Much strength for little money

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I saw you working the whole day
Much strength for little money

(Sérgio Godinho, Que força é essa, 1972)

We start with a Portuguese song denouncing the often unfair exchange within the labour market. Many other iconic figures by artists representing labour hardships and sometimes coping strategies and joy have marked the imaginary of many throughout time. Van Gogh's painting *Worn Out* (1882) showing an 'old working man (…) in his patched bombazine suit with his bald head' (description by Van Gogh himself) is at the museum with the same name. Charlot's factory worker in *Modern Times* (Chaplin in 1936) has moved millions in the cinemas with scenes on professional disease hazard or the accidental demonstration leader. The photograph *Lunch Atop a Skyscraper* (1932) impresses by the contrasts shown on power, vulnerability, and joy and has become a famous commercialised poster.[1] More recently, emphasis in representations has been on silent or invisible groups such as minorities, women, and children on issues such as slavery, discrimination, or exploitation, either in more pamphleteering or in subtle manners. For example, Mason Curry's Daily Rituals series on artists and women inspire by sharing the lives of known professionals. What attracts people's interest on their individual difficulties is their perceived similitude to the lives of many.

These symbols also portray challenges to governments of their time as these urge for better policies. What should be a national and international stance on income inequality or on inequality of opportunity? What are the different forms of indecent work and how to address it? What are the challenges and opportunities of the institutional settings on labour? In short, what values do we prefer and what policies are more effective and when?

## 2 A Changing World

In the years following 1989 (the fall of the Berlin Wall) and 1991 (the end of the Soviet Union) there was progress in living standards and in different spheres of human development, noticeably in Asia and particularly China. Table 1 registers the progress in leading economies. The post-Cold War

[1] Other artists include Lewis Hine, Sebastião Salgado, or Sabine Weiss (photographers); Vitor Hugo, John Steinbeck, or Emile Zola (writers); and John Ford or Ken Loach (film directors) among many others.

**Table 1** Economic growth per capita

| *Region/country* | *1961–1973* | *1974–1991* | *1992–2007* | *2008–2019* |
|---|---|---|---|---|
| China | 2.9 | 6.6 | 9.8 | 7.4 |
| Euro Area | 4.3 | 2.2 | 1.7 | 0.6 |
| European Union | 4.2 | 2.1 | 2.0 | 0.9 |
| Japan | 7.8 | 3.3 | 0.9 | 0.6 |
| USA | 3.0 | 1.8 | 2.1 | 1.0 |
| World | 3.2 | 1.3 | 2.0 | 1.5 |

Note: Annual percentage growth rate of GDP per capita based on constant local currency

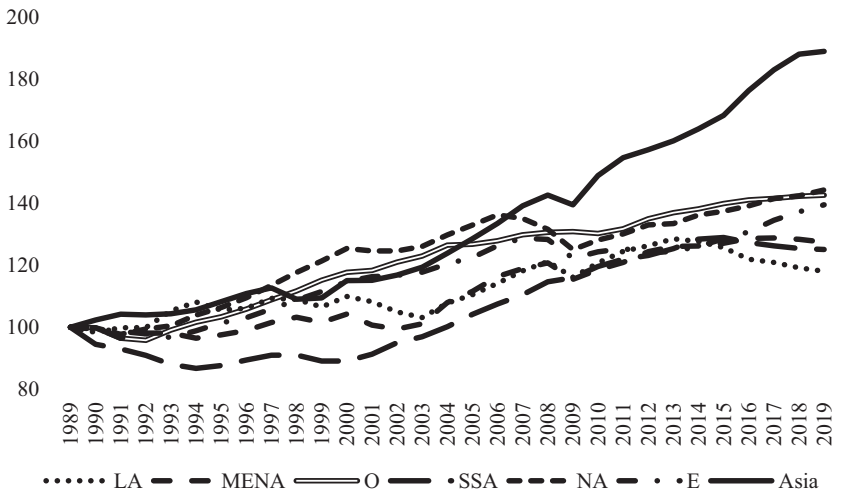
Source: World Bank

world was also marked by the decline in economic growth of the then called industrialised countries. The slump is particularly evident in Japan, in contrast with its earlier catch-up phase. Average economic growth in the USA and European Union fell by half after the Great Recession and even more so in the Euro Area. China took the leadership in growth in its race for becoming the world's largest economy.

But it is not only China that grew. Figure 1 depicts the variation in national income per capita since 1989 across continents with Asia almost doubling its average income, growing five times faster than Latin America, almost four times faster than Africa and MENA region, and two and a half times faster than Europe, North America, and Oceania. This meant a greater divide within the Global South, contrasted with the slow progress for Latin America, Africa, and MENA regions. The world grew but unequal (between regions).

The new century was particularly generous in economic growth for Asia and Africa. Nonetheless, there were relevant reversals in average income for most regions: Africa (1989–1994; 1998–2000; 2015–2019), Latin America (2000–2003; 2013–2019), MENA (2000–2002; 2017–2019), Europe (1991–1993; 2007–2009), and even North America (2006–2009). These reversals disturbed a sustained growth path, disturbing macroeconomic balances and ordinary lives.

In spite of all these changes, levels in income per capita reveal a clear unequal pattern of the world production—see Table 2. North Americans have on average almost ten times the production available to Sub-Saharan Africans.




Note: National income measured at PPP and constant prices.

Source: Authors' calculations based on WID database.

**Fig. 1** Variation in national income per capita (1989 = 100). (Note: National income measured at PPP and constant prices. Source: Authors' calculations based on WID database)

**Table 2** National income per capita

| *Region* | *1989* | *1999* | *2009* | *2019* |
|---|---|---|---|---|
| Asia (excluding Middle East) | 3587 | 3926 | 5006 | 6783 |
| Europe | 24,681 | 27,527 | 30,183 | 34,443 |
| Latin America | 12,734 | 13,570 | 14,782 | 15,036 |
| Middle East and Northern Africa | 17,353 | 17,625 | 20,044 | 22,124 |
| North America | 36,002 | 43,716 | 45,024 | 51,970 |
| Oceania | 21,910 | 25,241 | 28,675 | 31,259 |
| SSA | 4400 | 3920 | 5104 | 5504 |

Note: National income measured at PPP and constant prices

Source: Authors' calculations based on WID database

The post-Cold War period saw considerable economic changes, but the key question is how did these changes be perceived regarding the effectiveness of policies? In short, what policies did economists and policymakers believed in throughout the period? What did they imply for the world of labour?

## 3 Changing Paradigms

For more than one and a half centuries academics and politicians have been discussing how the economy should be organised, particularly the basic issues of production and redistribution. Two well-known opposing examples include Karl Marx and Margaret Thatcher whose stances are illustrated by the following mottos. Marx's (1875) 'From each according to his ability, to each according to his needs' highlights the dominance of collective interests over the individual, and a redistribution without related to one's merit. Thatcher's (1987) offers a contrasting statement: '(…) there's no such thing as society. There are individual men and women and there are families. And no government can do anything except through people, and people must look after themselves first (…)'. While Thatcher gives the primacy to individuals and families who only depend on themselves in a world with an absent State, Marx stresses the collective needs to detriment of a hollow individual. The wide spectrum beaconed by these two mottos is populated by many other authors, presenting different world views, and prescribing different policies. Country policies also vary, but not as much, constrained by real-world politics.

The world considerably changed in the last three decades. With the changing power relations with the end of the Cold War, there was a change in economic understanding and prescriptions. What was interesting in the recipes prescribed after 1991 are the stark differences in trending policies in the sub-periods. With the fall of the Soviet bloc in 1991, the market economy lived its heyday, even if key heralds such as Reagan and Thatcher were already out of office. The triumphalism would follow on, geared towards market solutions and doubts about the inefficiency of State services.

The change in these views from full pro-market and pro-trade stances to nuanced approaches would accelerate with the Great Recession and, in parallel, the growing influence of China. First, the Great Recession and its impact on the developed world challenged earlier beliefs and values at the centre stage of where much of the economic thought is produced and

determined (Ban, 2015; Glaeser et al., 2017). Second, China offered alternative policy avenues for countries, including trade and funding schemes incorporating what some called South-South Globalisation (Murshed et al., 2011). The State was recalled for several areas, targeting efficacy, and tackling inequality, with interventions in policies such as educational policies, health policies, industrial policy, labour policies, redistributional policies, and social policies. Greater expectations need greater resources.

## 4 Taxing as a Tool

If the State has now more responsibilities, the issue is then how the State can fund these policies. The capacity of a State to tax has been fundamental for the construction of modern societies. Table 3 presents the levels of tax revenues in OECD countries from 1965 to the present. Governments within OECD have relevant funding levels that can vary between 24 and 47% of GDP. From 1965 to 1991 there was a considerable increase in the unweighted average tax revenue, 7–9 percentage points depending on the method. From 1991 to the present, the increase was only 2 percentage points.

Following their development path and the maturity of their governance system, countries such as UK and USA seem to have stabilised their tax revenues since 1965. Preferences regarding taxation seem not to vary much, being around 24–27 (USA) and 30–34% (UK) of GDP. Other countries would stabilise after 1975: 25–29% (Australia) and 39–43% (Belgium, Norway) of GDP. The varying level by country corresponds to the variety of services provided/funded by the State, some countries taxing more but providing more, others taxing less but providing less.

For other countries, however, the changes in the period of concern are considerable. On the rise, latecomers such as Greece, Korea, Turkey, and Portugal consolidated their revenues to match additional expenses since 1991. After the Great Recession, Greece, Slovak Rep., Mexico, Japan, and Germany strongly reinforced their tax revenues (over 3.5 percentage points) and Portugal, Netherlands, Estonia, Latvia, France, Switzerland, Austria, and Italy too (equal or above 2 percentage points). In the opposite direction, Ireland and Hungary have decreased considerable tax revenues measured relatively to the GDP since 1991.

As countries grew throughout the decades, most were increasing their ability to tax, with the direction of causality probably running both ways.

**Table 3** Tax revenue as % of GDP

| *Country* | *1965* | *1975* | *1991* | *2006* | *2019* |
|---|---|---|---|---|---|
| Australia | 20.6 | 25.4 | 26.7 | 29.4 | n.a. |
| Austria | 33.5 | 36.3 | 39.7 | 40.4 | 42.4 |
| Belgium | 30.8 | 38.9 | 41.6 | 43.2 | 42.9 |
| Canada | 25.0 | 31.1 | 35.5 | 32.7 | 33.5 |
| Chile | n.a. | n.a. | 17.8 | 22.0 | 20.7 |
| Czech Republic | n.a. | n.a. | n.a. | 33.8 | 34.9 |
| Denmark | 29.1 | 36.8 | 43.8 | 46.5 | 46.3 |
| Estonia | n.a. | n.a. | n.a. | 30.5 | 33.1 |
| Finland | 30.0 | 36.1 | 44.5 | 42.1 | 42.2 |
| France | 33.7 | 35.0 | 41.6 | 43.3 | 45.4 |
| Germany | 31.7 | 34.3 | 34.9 | 34.9 | 38.8 |
| Greece | 17.1 | 18.7 | 25.3 | 31.1 | 38.7 |
| Hungary | n.a. | n.a. | 44.6 | 36.4 | 35.8 |
| Iceland | 25.7 | 29.5 | 30.8 | 40.1 | 36.1 |
| Ireland | 24.5 | 27.9 | 32.9 | 31.4 | 22.7 |
| Israel | n.a. | n.a. | n.a. | 34.2 | 30.5 |
| Italy | 24.6 | 24.4 | 36.7 | 40.5 | 42.4 |
| Japan | 17.6 | 20.1 | 27.9 | 27.0 | n.a. |
| Korea | n.a. | 14.5 | 18.1 | 22.6 | 27.4 |
| Latvia | n.a. | n.a. | n.a. | 28.8 | 31.2 |
| Lithuania | n.a. | n.a. | n.a. | 30.1 | 30.3 |
| Luxembourg | 26.4 | 31.4 | 31.4 | 35.7 | 39.2 |
| Mexico | n.a. | n.a. | 12.3 | 11.6 | 16.5 |
| Netherlands | 30.5 | 37.7 | 41.7 | 36.0 | 39.3 |
| New Zealand | 24.5 | 30.0 | 34.3 | 35.3 | 32.3 |
| Norway | 29.4 | 38.8 | 40.4 | 42.7 | 39.9 |
| Poland | n.a. | n.a. | 34.0 | 33.6 | 35.4 |
| Portugal | 15.7 | 18.9 | 27.5 | 31.3 | 34.8 |
| Slovak Republic | n.a. | n.a. | n.a. | 29.3 | 34.7 |
| Slovenia | n.a. | n.a. | n.a. | 38.7 | 37.7 |
| Spain | 14.3 | 17.9 | 31.8 | 36.0 | 34.6 |
| Sweden | 30.9 | 38.3 | 47.1 | 46.1 | 42.9 |
| Switzerland | 16.5 | 22.5 | 23.6 | 26.4 | 28.5 |
| Turkey | 10.6 | 11.6 | 15.2 | 23.4 | 23.1 |
| United Kingdom | 30.1 | 34.2 | 31.7 | 32.7 | 33.0 |
| United States | 23.6 | 24.7 | 25.9 | 26.8 | 24.5 |

Source: OECD

Governments in developing countries, however, have lower funding levels, which can result in teethless states, being unable to address key needs. Throughout the world, many countries have been progressing in this regard (Genschel & Seelkopf, 2016). In contrast, the levels of funding of

**Table 4** Tax to GDP ratio in Africa

| *Tax to GDP ratio* | *Countries* |
|---|---|
| > 30% | Seychelles, Tunisia |
| 25–30% | South Africa, Morocco |
| 20–25% | Cabo Verde, Mauritius, Lesotho |
| 15–20% | Namíbia, Togo, Malawi, Kenya, Eswatini, Rwanda, Burkina Faso, Egypt, Senegal, Mauritânia |
| 10–15% | Cameroon, Mali, Ghana, Cote D'Ivoire, Botswana, Uganda, Madagascar, Níger |
| 5–10% | Congo, Congo Dem. Rep., Chad, Equatorial Guinea, Nigeria |

Source: OECD (2018)

other countries hardly allow doing much, even if in several cases they have been improving. Table 4 presents data for Africa, where this issue is more prevalent. Revenues vary among countries 5–35 percentage points of GDP, with an unweighted average of 12–15%. Tunisia, South Africa, or Morocco have considerably more tax capacity than most, being the State able to reclaim a quarter of the GDP for its expenses.[2] Remember these are lower shares of a smaller pie or GDP compared with developed or middle-income countries. Two caveats do apply. In this narrative of more taxes for development a crucial assumption, certainly not always met, is that the State spends better that money than taxpayers would do otherwise. Another important point relates to the dilemma between what is preferable: teethless states or the potential problems of funding certain characters that actually might bite one's own population.

Apart from the level of taxation, two key issues are rising: the sectoral and geographical inequality of taxation. The former relates to what productive factor to tax, labour, or capital. Tax systems often tax less capital than labour, favouring declining labour demand with not always obvious gains in productivity, and could, therefore, be changed for a more labour-friendly approach (Acemoglu et al., 2020). The latter, the geographic inequality of taxation, addresses issues on raising funding for development and managing international flows following the periodical proposals asking whether it is time for a world tax (Tobin, 1978, 1996; Ul Haq et al., 1996; Garcia-Arias, 2013; Vives, 2017).

[2] For an alternative datasource, see Prichard (2016) for a presentation of UNU-WIDER Government Revenue Dataset.

The impacts of changing paradigms on labour and labour markets have been heterogeneous across individuals and social groups, and countries. As a consequence, informal labour, female, and youth and child labour received increased attention and policy resources. However, disruptive macroeconomic changes such as recurrent crises, and related high unemployment, youth unemployment and underemployment, or systemic inequalities such as gender pay gap, unequal or low wages have been motives for social and political conflicts. Further, a more globalised and interconnected world also made inequalities more visible, discomforting, and conflictive. How did these economic and policy reforms interact with labour market dynamics? What about labour institutions? Surveying the effects of changing paradigms on employment and income distribution is thus clearly a fundamental academic and policy interest.

## 5 Concluding Remarks

The second volume of this book collects a variety of views and methods to understand inequality, decent work, and institutions. We hope scholars, policymakers, students and others appreciate the diversity of policies presented, choosing to incorporate context and resources in identifying suitable and credible solutions. We hope young scholars find it useful in identifying their own career trajectory immune to hype themes (McKloskey, 2000). While different world view stances are healthy, hype themes function as pro-cyclical policies and can actually be dangerous for one's career and a country's economy and academy. Informed and broadminded evidence will allow for improved policymaking and policy prescriptions addressing the always present challenges to people's well-being.

We end as we started. Since 1991, the prevailing policy prescribed changed according to context, resources, and fashions. In the past, the unipolar world from 1991 onwards, following the fall of the Soviet Union, led to full pro-market and pro-trade stances. With the Great Recession in 2007–2009, there was a considerable return of the role of the state. In sum, the role of life-changing events should not be underestimated and prospective scenarios are always tricky. Following the COVID-19 crisis in 2020–2021, with persons revisiting the purpose of life, organisations reorganising work, and the spectre of inflation haunting economies, how will the world change?

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PART I

# Inequality

# Income Inequality and Effectiveness in Redistribution

*Pedro Goulart, Gianluca Ferrittu, and Raul Ramos*

## 1 Introduction

For centuries, economic thinkers have tried to respond to the relevant societal challenges of their times (Backhouse, 2002). As context and problems change, also do their priorities. By 1991, concerns about inequality occupied a niche in the profession, but these were not a widespread

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research concern. Following a trend towards favouring market-based solutions, the next years accentuated the tone. The end of the Cold War also meant the end of competition between blocks for best living standards. The earlier race to the top between west and east, where purchasing power and mass consumption were cornerstones, was substituted by globalisation (macro) and a meritocratic and individually centred system (micro). As a consequence, inequality decreased between countries and increased within countries.

Kanbur and Lustig (1999) in a paper presented at the Annual Conference of the World Bank predicted the return of inequality to the development agenda, but inequality remained relatively circumscribed and in spite of breakthroughs from authors such as Atkinson, Bourguignon, or Milanovic, among others. See, for example, the seminal contribution from Alesina and Rodrik (1994). Instead, the mainstreaming of inequality issues followed the Great Recession and the impact on Europe and North America, boosting academic work and public concern on the topic (Mijs, 2021).[1] The change in the wider public perception on the timeliness of the topic and an individual and collective preference towards more egalitarian approaches culminated in the adoption of SDG 10 "Reduce inequality within and among countries" in 2015. This was not covered by the earlier MDGs. In academic terms, Piketty's influential contribution *Capital in the Twenty-First Century* (Piketty, 2014, 2015) and the creation of the World Inequality Database initiative (2015) were important landmarks. This author became a reference to other academics and the public at large, for example: *After Piketty?* (Atkinson, 2014); "The Piketty Phenomenon and the Future of Inequality" (Wade, 2014); *After Piketty: The Agenda for Economics and Inequality* (Boushey et al., 2017).

Micro-evidence has also been useful to understand the underpinnings of inequality. The relative pay of workers has implications, for example, for job satisfaction. Low-wage workers with wages above the minimum wage report lower job satisfaction in the case of perceived wage compression (Storer & Reich, 2021). Card et al. (2012) find that the "negative comparisons matter more than positive comparisons for a worker's perceived job satisfaction". This suggests there is a fine balance between less inequality and/or wage transparency/secrecy. For developing countries, the

[1] A search in google scholar for "inequality" literature provides that more than half of total hits occur 2008 onwards. A search for "income inequality" still finds that more than one-quarter of the all-time literature is after the Great Recession.

seminal work of Nobel-prized Deaton (2018) has proposed different strategies to measure inequality from the distribution within a society to within the household.

## 2 Inequality Post-1991

Figures 1 and 2 provide evidence of the variation of income share by continent. The emphasis is the bottom 50% and the middle 40%, in contrast to most of this strand of the literature that has focused on top income. Figure 1 shows an increasing inequality (within regions), particularly in North America and Asia, with the income share in the worse-off half declining steadily. In Europe, the income share decreased (inequality increases) from 1989 to 1992.

Analysing in more detail the national income share of "Bottom 50%", we find that 50% of the population earns only 9–19% of national income, with the majority of regions converging towards an average of 12%. The extremes were more or less stable, with Europe relatively better-off and MENA and Oceania relatively worse-off. North America "Bottom 50%" saw a steady decline from 17 to 12% share of the income throughout the

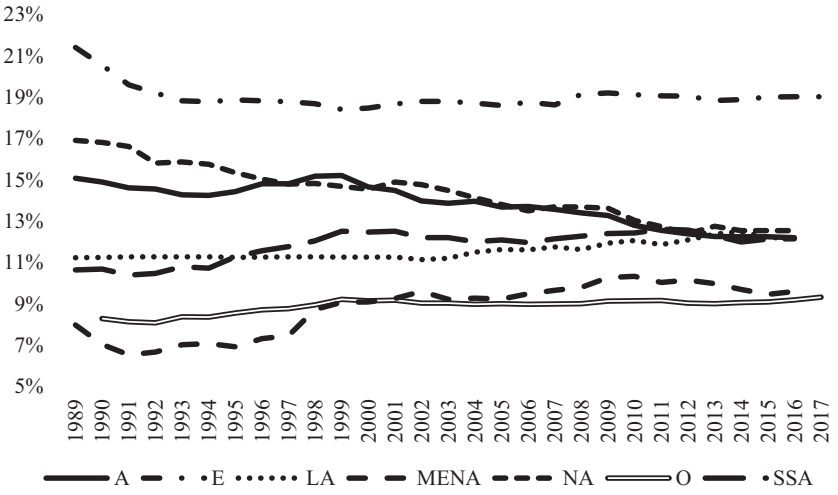


**Fig. 1** National income share of "Bottom 50%". (Source: WID database)

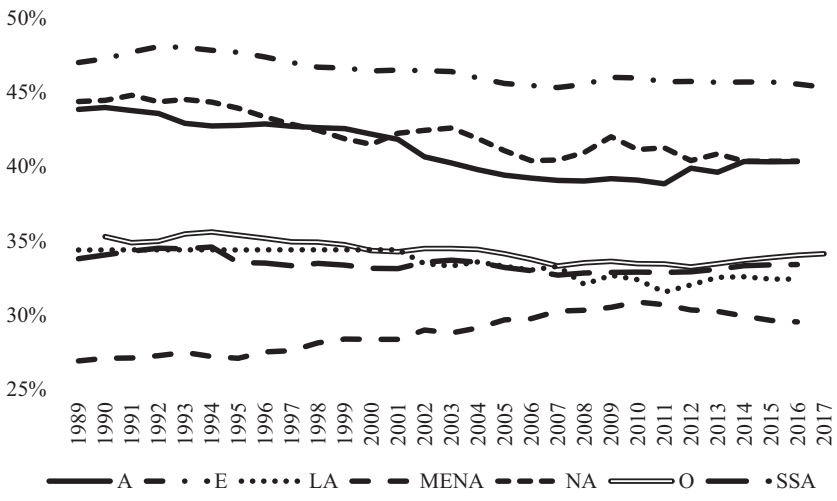


**Fig. 2** National income share of middle class. (Note: Middle class measured as "Middle 40%", from 50th to 90th percentile. Source: WID database)

period. In Asia, the "Bottom 50%" share (slice) decreased from 15 to 12%, although compensated by the record growth of national income (the pie got bigger) depicted in Figure 1 in Chapter "Introduction: Policies for All Seasons—The post-Cold War Era" (of this volume). Africa (1994–1999), Latin America (2008–2014), MENA (1995–2002; 2005–2010), and Oceania (1994–1999) registered important periods towards more equality.

As for Fig. 2, it portrays the change in the national income share of the "Middle 40%" that we loosely interpret as the middle class. It is relative better-off in Europe with 45–48% of national income, followed by North America and Asia with 40–45%. Latin America, Oceania, and sub-Saharan Africa present values between 32 and 35% and the less generous is MENA with 27–30%. In terms of variation, we can observe that the middle-class share was squeezed after 1991 and before the Great Recession in Europe, North America, and Asia, but not afterwards. This period did not represent progress for any region, with exception of MENA, where the middle 40% were the worst-off but saw their position improved, particularly from 1995 until 2010. The end of the gradual improvement in the MENA region coincided chronologically with the Arab Spring.

## 3 Tackling Inequality

Internal and external factors can be fundamental to reduce inequality within and between countries. Internal factors may include the situation of unions as these are crucial for justice within the organisation and society, even if at the cost of economic efficiency (Card et al., 2022, or Chapter "Unions and Wage Inequality" in this volume; Doucouliagos et al., 2017). Authors such as van der Hoeven (2022) highlight the importance of primary redistribution for inequality issues in Chapter "Income Inequality and Labour" in this volume. External factors can include transfers between countries. Both of these aspects are covered in further detail in sections C of the first volume of this book, when we discuss labour agency and resilience, and F of this second volume, when we discuss institutions. Lemieux (2008) present an encompassing set of competing explanations for wage inequality. Blanchard and Rodrik (2021) present a path-breaking volume on the cross-cutting role of the State to fight inequality, with prominent contributors in the bridged topics. In this chapter, we prefer to focus on the impact of internal transfers via taxes and transfers on inequality.

Markets lead often to unbalanced income distributions and State is called in many countries to balance it somewhat. The extent it does depends on the country's preferences regarding inequality, state capacity to tax, or governmental choices. Regarding higher-income countries, Scandinavian countries (+ Iceland) are usually named as preferring higher taxes but lower inequality, while the United States is associated with lower taxes but higher inequality. This is confirmed by 2018 data from OECD. Slovak and Czech republics, and Slovenia, present also particularly low inequality rates. Developing countries in the sample present higher inequality.[2]

Taxes and transfers have served as an important policy of income redistribution. Figure 3 depicts Gini coefficient post-transfers by country contrasted to their effort in reducing inequality. It provides evidence that countries with higher efforts in reducing inequality are positively associated with achieving higher equality post-transfers (lower Gini). With average Gini coefficient pre-transfers reaching 0.48 (0 to 1), taxes were able to redistribute 15 p.p. in average to reach a more balanced income

[2] Countries in the OECD sample that present a Gini coefficient higher than the United States by increasing order of post-transfers inequality for 2018: Turkey, Bulgaria, Mexico, Chile, Brazil, Costa Rica, and South Africa.

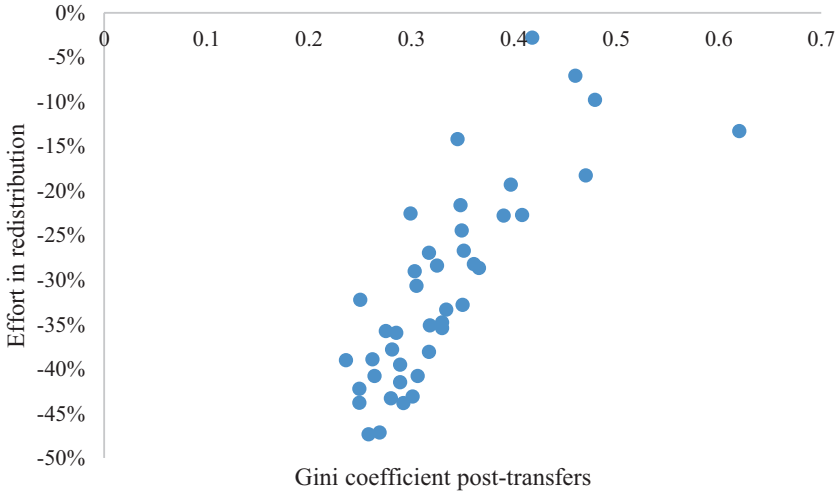


**Fig. 3** Inequality and redistribution. (Source: Authors' calculations based on OECD data. Note: Effort in redistribution is measured by the rate of the decrease in income inequality following $\frac{G_{AT} - G_{BT}}{G_{BT}}$, where G is Gini Coefficient, BT before transfers and AT after transfers)

distribution. During the Great Recession this value increased, particularly in the countries where crisis hit harder, but only 1 p.p. on average and receding after that. While the period mostly saw no average change in policies, country data suggests divergent paths. According to OECD data, Sweden, Luxembourg, and Israel decreased the effort of redistribution. In contrast, countries such as Russia, Portugal, Greece, or Turkey have made stronger efforts to redistribute income since 2004.[3]

[3] Other countries that decreased the effort of redistribution include Bulgaria, Australia, Denmark, Hungary, United States, Lithuania, New Zealand, Slovak Republic, United Kingdom, Germany, Slovenia, Estonia, Latvia, and the Czech Republic. Other countries that increased the effort of redistribution are Ireland, Korea, Switzerland, Japan, Spain, Belgium, Norway, Brazil, Costa Rica, Iceland, Netherlands, Chile, Finland, Canada, Romania, Austria, and France.

## 4 In This Part: Earnings and Inequality

The first part in this volume, "Earnings and Inequality", frames these issues and concepts, by compiling relevant surveys on the evolution of inequality of income, and changes in wages and earnings at the global level over the last three decades.

Since the end of the Cold War, economic growth has been driven by the globalisation of production, promoting economic convergence among developed and key developing economies. However, various major socio-economic and environmental forces have affected inequality of opportunities worldwide, defining a structural shift in the pattern of global income inequalities. But although growing income inequality within countries is "one of the critical issues facing the world today" (Stiglitz, 2014; p. 379), conceptualisations of inequality, and policies for dealing with it, are still disputed. To frame these issues, Chap. 31, by Stewart (2022), studies the changes that have occurred in consideration of equality over the past 50 years, and the related implications for politics and policy. The chapter addresses the theoretical concepts of inequality, distinguishing between vertical and horizontal inequality (e.g., inequality among individuals or households, and social groups, respectively). The author also reviews the main findings about the negative impacts of inequality on various development objectives and sustainable growth, and analyses the interlinkages between inequality and globalisation and development, discussing policy implications. Stewart (2022) finds that different progresses have been achieved in dealing with vertical inequality. Yet the author suggests there are still complex challenges ahead, intrinsic in the current global capitalist system, and with both inequality's measurements and policy analysis. Persistence of structural lack of equality brings to what Stewart (2022) defines the current "inequality paradox": despite strong awareness and reasons for supporting a more equal society are widely consolidating, inequality within countries is persisting, and embedded in the global policymaking. As such, the chapter highlights some political economy implications, and the importance of international and national political actions over global rhetoric for reducing inequality.

The main drivers of global inequality are also discussed in Chap. 32, by van der Hoeven (2022). The author contributes to this issue by overviewing the main characteristics of income inequality and discussing potential policy solutions. In the chapter, van der Hoeven discusses the differences between inequality of factors of production, for example, labour and

capital, and household income distributions, highlighting the renovated importance to focus on factor income inequality. He also distinguishes between international and national drivers for explaining the current rising income inequality. In terms of drivers, as international factors the author identifies specific forces embedded in globalisation, such as markets liberalisation and integration, skill-biased technological changes and financialisation of economies. National drivers would be related to policy initiatives at the national level, such as monetary, labour market, and fiscal policies. Van der Hoeven (2022) suggests these international factors related to the globalisation of production have been fundamental drivers of increasing income inequality, while exclusive and pro-market policy interventions have exacerbated the already existing inequality of income distribution. The current COVID-19 pandemic crisis is also likely to deteriorate this complex situation in case effective policy solutions will not be identified.

In terms of agency, over the last three decades, the global trade union density rate has almost halved from an estimated 36% in 1990 to 18% in 2016 (Visser, 2019), in parallel with a reduction in the labour share of income. This has been related to different drivers of change in the world of work, such as automation, robotisation, and technological change. The decrease of unionisation in both developed and developing countries has made it more complex for trade unions to protect working conditions and equality among earnings; this is likely to increase income inequality (see Herzer, 2014).

The impact of unions on the structure of wage, and distribution of wages, is analysed in the Chapter "Unions and Wage Inequality" by Card, Lemieux, and Riddell. The authors survey this issue by measuring the effect of unions on wage inequality for Canada, the United Kingdom, and the United States, testing whether a part of the growth in earnings inequality in these countries can be attributed to the fall in union coverage. Starting from Freeman and Medoff (1984), Card, Lemieux, and Riddell contribute by presenting an innovative framework for measuring the effect of unions on wage inequality. They report new evidence on the relationship between unions and wage inequality for both men and women, accounting for skill levels. The authors find that, during the period studied, unionisation rates fell similarly in the three countries and that this decline contributes to explain a significant part of rising male wage inequality. However, this effect is smaller when the skill composition of the workforce is controlled for. Card, Lemieux, and Riddell's findings also show that declining unions do not seem to reduce wage inequality among

women. The authors suggest this is likely to be linked with various characteristics of the sub-sample, such as the position of unionised women in the wage distribution ("more concentrated in the upper end of the wage distribution than their male counterparts"), the larger union wage gap, and its differences among different skill groups. The authors highlight that the union coverage trends and the impact of unions on wage structure observed have similar characteristics across the countries studied. Yet Canada shows a peculiar lack of growth in wage inequality, and differences in the levels of unionisation and wage inequality are also detected in this analysis. While the "cross-country differences in wage inequality are consistent with the pattern of wage compression", Card, Lemieux, and Riddell highlight that results on the experience of Canada suggest also other factors may compensate for changes in wage inequality related to deunionisation.

Inequality is also often intrinsically related to gender. Structural gaps between men and women's empowerment and economic participation, as well as gaps in access to health and education, and thus in earnings, are largely persistent. To better understand the interaction between socio-economic transformations and gender equality, Chap. 34, by Gustafsson and Li (2022), studies the gender wage gap and its development in ten provinces in urban China. By doing so, the authors discuss the recent changes that occurred in the region of interest, such as the structural transformation from planned economies to market economies during the 1980s, and its related impacts on urban male and female workers in terms of (crude) gender earnings gap. Despite China having experienced structural changes in the period studied, Gustafsson and Li (2022) find that the average gender pay gap appears to be relatively small in 1988, while an increase in the overall earnings inequality and gender pay gap is reported in 1995. The authors suggest the increasing trend in total earnings inequality seems to explain a substantial part of the increasing gender earnings gap in urban China, and that earnings size depends on different factors, such as the ownership of the enterprise, education, age of work experience, and geographical locations. Decomposing the average gender pay gap, Gustafsson and Li (2022) find that differences in various variables across gender explain about a half of the earnings gap between men and women, while earnings inequality seem to have grown faster where markets' forces have a stronger influence on labour. Yet, the authors also stress that an important part of the increased gender pay gap not explained by "differences in variables between women and men" is observed.

Globalisation and financialisation are contributing to the convergence of developed and developing economies, but they may also play an important role in perpetuating the persistence of inequality of outcomes and opportunities between global regions. Chapter 35, by Dorling and Pritchard (2022), surveys the geography of poverty, inequality, and wealth over three different time historical periods (e.g., 1845–1891; 1895–1965; and 1968–2008). In the chapter, the authors detail the case of the UK, contextualising their findings in a broader perspective, at the global level. Dorling and Pritchard (2022) highlight changes in reporting and counting the distribution of wealth in the UK, reviewing the origin of statistics and cartography of poverty, and poverty studies. Their findings suggest inequalities and relative poverty persist over time in the UK, especially in their spatial dimension, and that "areas inherit disadvantage and advantage more than do people". Dorling and Pritchard (2022) innovate by providing new evidence on the unsustainability of the current geographical scale of poverty and by outlining the persistence and deep interrelation between the distribution and spatial dimension of wealth and poverty.

As poverty, labour market inequality has various dimensions which are interlinked and reinforce each other. These may be geographical, but also social and cultural. The chapter "Measuring Inequality of Opportunity for the Backward Communities: Regional Evidence from the Indian Labour Market", by Sharma and Paramati, contributes to this part by studying inequality of opportunities for the backward communities in the Indian regional labour market. In the chapter, the authors estimate the determinants of inequality in the labour market and survey inequality of opportunity related to caste and religion. They innovate by proposing a state-level analysis, and also by decomposing the inequality of wage in terms of caste and religion, accounting for educational attainment and geographical location. Sharma and Paramati (2022) find socio-economic conditions of these communities significantly vary across the regions and states, and that high-income states have higher levels of inequality. The authors stress that, while education is a crucial determinant of workers' wages, backward castes have relatively lower wages across states. Furthermore, in the Indian context, it seems the wage differentials of the Muslim community are largely explained by community characteristics, which "does not enjoy the reservation in employment and education like other backward communities". Sharma and Paramati (2022) show that "backward castes" have lower income and fewer opportunities, and that these characteristics vary significantly across the various Indian states. The results suggest a national

level policy is unlikely to be the most suitable solution for facing this multidimensional and complex issue, whilst state or regional approaches are likely to be more functioning.

These different macro and micro dimensions of inequality are likely to worsen in relation to global shocks, such as the unfolding COVID-19 pandemic. This is because crises usually hit heavier the most disadvantaged sections of the population and poorer countries through loss of income, consequentially rising poverty, and existing disparities. Yet in the literature it is also argued that, in the past, disruptive events such as pandemics, revolutions, and wars might have facilitated the redistribution of wealth within societies (see for instance Sayed & Peng, 2021). Chapter 37, by Murshed (2022), concludes this part by discussing to what extent COVID-19 pandemic may impact economic inequality in terms of distributional effects and democracy stability. The author overviews the historical dynamics related to redistribution during pandemics, contextualising and discussing the current COVID-19 crisis. Contrary to the past, Murshed (2022) suggests the unfolding pandemic is likely to worsen current inequality, as the disruptive effects of COVID-19 on labour are largely impacting low-income and precarious types of jobs, while high-skilled workers are going to be advantaged in coping with changes in work-tasks, job relocation, automation, and robotisation. In terms of stability of democratic systems, according to the author, this novel potential increasing trend of income inequality risks to shake regimes stability by pushing people towards more autocratic and nationalistic parties.

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# Changing Perspectives on Inequality and Development

*Frances Stewart*

*Whichever way we look at it, we always return to the same conclusion: namely that the social pact establishes equality among the citizens in that they all pledge themselves under the same conditions and all enjoy the same rights.*
—Rousseau, 1968 (first edition 1762, p. 76)

*It is precisely because the force of circumstances tends continually to destroy equality that the force of legislation should always tend to its maintenance.*
—Rousseau (1968, pp. 97: 204)

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## 1 Introduction

The extent of inequality is of critical importance to development and development studies: above all, this is because high inequality is not compatible with a fair or just society as Rousseau powerfully recognized in the quotation that starts this chapter (Rousseau, 1968 (first edition 1762)). From this perspective, preventing a high degree of inequality is an important objective in its own right. In addition, inequality is often viewed instrumentally as influencing other desirable goals, including poverty reduction, economic growth, health and education outcomes, and social and political stability. Here there is a contrast between predominant views today and those 50 years ago. Fifty years ago, inequality was viewed by development economists only from an instrumental perspective—almost exclusively in terms of the relation between inequality and the growth rate—and then accepted as the predominant development objective. Moreover, rising inequality was argued to be a (possibly unavoidable) outcome of development (Kuznets, 1955) which left policymakers as bystanders in an inexorable process—but one that would be reversed, according to Kuznets as development proceeded. Since then consideration of the instrumental aspects of inequality has widened well beyond economic growth; at the same time high inequality is increasingly regarded as undesirable in itself, and consequently, reducing inequality has become an important objective of development, as shown in Goal 10 of the SDGs: to 'Reduce inequality within and among countries'.

Along with its changing position in the array of development objectives, the contours of inequality have also widened with respect to two critical questions: inequality of what; and inequality among whom. Nonetheless, the old questions remain as, or more, relevant than before in this wider context: in particular, first, in terms of the instrumental effects of inequality on other objectives, now including 'new' objectives such as 'happiness' and sustainability; and secondly, exploring how inequality is likely to evolve with development: was Kuznets right that inequality would rise with more development? And has globalization affected its evolution?

Moreover, while inequality has gained more prominence as an objective, in many countries, both rich and poor, inequality has risen significantly bringing the question of policies to counter this to the fore. As Rousseau points out in the second quotation above, it is 'because the force of circumstances tends continually to destroy equality' that legislation is needed to maintain it. Central to debates about equality, then, is that of

identifying appropriate equalizing policies, and beyond that of understanding policy formation, including both global influences on policymaking in this area and domestic political forces. The 'force of circumstances' that tends to destroy equality arises not only from the economic system but also in many cases from the global and domestic political system which can prevent the required legislation that is needed to bring about a just distribution.

The aim of this chapter is to review the changes that have occurred in consideration of equality over the past 50 years, with a particular focus on the areas to which Rousseau draws attention: why more equality is needed; whether the 'force of circumstances' has generated rising inequality; and the implications for policy and politics.

I start with the questions of inequality of what and among whom. Clear answers to these questions are essential preliminaries for any discussion of inequality. I then consider why the extent of inequality has increasingly come to be regarded as an intrinsic objective, a matter of justice. This is followed by consideration of the 'instrumental' question, reviewing findings on some of the instrumental effects of inequality not only for growth but also for the many 'new' development objectives. I then consider some of the connections between development, globalization and inequality, ending with a discussion of policies and politics.

## 2 Conceptual Issues

*Inequality among whom.* In the nineteenth century, the focus was on factor shares, not personal distribution. According to Ricardo, 'To determine the laws which regulate this distribution [between wages, profits and rent] is the principal problem in political economy' (Ricardo, 1821) (p. 5). But this has not been the approach adopted by Development Studies. For much of the last 50 years, the prime interest has been inequality among individuals or households within a country, typically depicted in a Lorenz curve and summarized by the Gini coefficient. This is the type of inequality which concerned (Kuznets, 1955; Galenson & Leibenstein, 1955). And it remains the dominant concern among economists and policymakers. For example, only individual/household distribution is reported on in the widely used World Development Indicators produced by the World Bank. I shall term this *vertical inequality (VI)* to differentiate it from inequality among groups, which I define as *horizontal inequality (HI)*. Interest in horizontal inequality, or distribution among *groups* rather than

individuals, is more recent, although concern with one type of HI—gender inequality—dates back to the 1970s, reflecting the focus on gender that was stimulated by the feminist movements of the 1960s. Concern with horizontal inequalities more generally, with groups categorized along ethnic, racial, religious, or regional lines, initially arose out of work on violent civil conflict—which often follows group lines—but has since become of more general interest (Gurr, 1993; Stewart, 2000, 2002). Appropriate group categories for measuring horizontal inequalities differ across societies as the relevant categories depend on the salience of the categories as well as the question being asked. There are a variety of ways of measuring HIs: a population weighted coefficient of variance is one (Mancini et al., 2008).

At the same time, as well as VI and HI, governments of developing countries have consistently been concerned with the gap between rich countries and the third world, or *inter-country distribution*. Catching-up is a major objective of many developing country policymakers. With globalization, and as data have improved, people are also beginning to measure global vertical (or personal) distribution (i.e. distribution among all persons or households in the world) (Milanovic, 2005; Lakner & Milanovic, 2013).

Thus, there has been a widening of answers to the 'among whom' question, from concern with distribution among individuals within a particular country to group distributions and global personal distribution. But the Ricardo question—the division of national income between profits, rent and wages—which must underly and in part determine distribution among both individuals and groups—has been oddly neglected. While Piketty's work is devoted to the issue of shares of capital and wages, to date it has focused on developed countries.

*Inequality of what, or in what space*. This is an issue which has been subject to a great deal of debate and is critically important for questions of equity and policy. In the 1960s, the concern was with *income* inequality, this then being accepted as the best shorthand for welfare. However, adopting an income or resources metric involves a narrow view of wellbeing which was widely criticized (Seers, 1972; Morris, 1977; Hicks & Streeten, 1979; Sen, 1977). Consequently, in a famous paper entitled 'Equality of What?' Sen (1980) advocated a much broader measure encompassing people's *capabilities* or *freedoms,* that is, all the things that people can be or do. In focussing on a range of capabilities, Sen abandoned the money metric of incomes and moved to a plural assessment of

wellbeing and inequality; and by focussing on capabilities (i.e. what people *could* do or be, not what they *actually* do), he also advocated opportunities rather than outcomes as the space for assessing inequality. In practice, however, measurement problems are such that those who adopt Sen's plural approach typically measure inequalities in a range of *outcomes* (or *functionings*) rather than capabilities. Taking a different approach, Roemer (1998) also argued that the objective should not be defined in terms of outcomes, but as equality of *opportunities*, defined as a situation in which 'morally irrelevant pre-determined circumstances, such as race, gender, place of birth, and family background', do not affect outcomes (Paes de Barros et al., 2009). Both these approaches lead to a multidimensional approach to identifying inequality—indeed the issue becomes one of *inequalities*, not a unique measure of income inequality. Again, the salient dimension is likely to vary across societies. In many countries, health, education, access to basic services, and assets (including land) are clearly relevant and important inequalities. Inequalities in a dimension which lead to inequalities in other dimensions are particularly critical (Stewart, 2009). For example, inequality in access to education can be the source of inequalities in health and in income, and there are also reverse links.

There are also important dimensions beyond the socio-economic, which are of especial relevance to HIs. In particular, inequalities in *cultural recognition* and *respect* are important for the wellbeing and of cultural and religious minorities, as well as in determining the ability of people from such minorities to function effectively. Further, *political inequalities* can be the source of many other inequalities. Lack of citizenship, for example, often debars people from many other entitlements. Lack of adequate representation in political bodies can lead to policy biases and discrimination as well as to lack of self-respect. These are important aspects in any society, but were recognized as such as a result of work on conflict since high inequalities in these dimensions are often a cause of conflict (Langer & Brown, 2008; Stewart, 2011).

Thus, the big change over the decades is from a unidimensional measure—income—to a multidimensional approach. Nonetheless, in practice income inequality remains the dominant measure.

## 3 Inequality and Justice

Utilitarianism, which provides the foundations of welfare economics, can be interpreted to be strongly egalitarian (Pigou, 1932), on the basis of the principle of diminishing marginal utility as incomes increase, but this view was countered by (Robbins, 1938, 1945) argument that one could not compare utility across individuals: 'in our hearts we do not regard different men's satisfactions from similar means as equally valuable' (Robbins, 1945, pp. 156–157). Robbins interpretation was reinforced by those economists, such as Hayek, with libertarian views about the undesirability of restraints on individual actions.

Following Robbins, only efficiency considerations counted for economists and the desirable extent of inequality became that which maximized output or was associated with a Pareto optimum—that is only instrumental reasons related to income were relevant. However, while this was generally accepted by economists, it was questioned by philosophers—notably by Rawls (1971), like Rousseau adopting a social contract approach, who argued that a just distribution was one that maximized the position of the poorest within a nation. This pointed to a much more egalitarian objective than the Robbins view, with inequality only justified if it could be shown to improve the position of the poorest. In a development context, issues of justice were also behind the Declaration of Human Rights, and a rights' based approach to development, as well as the Human Development approach. A rights-based approach to development requires universal rights in a number of dimensions that are particularly important for human wellbeing, including education, health, shelter, etc. The implications of this for inequality depend on the (undefined) level of achievement needed to secure these rights. The higher the level, the more equality is required. But even relatively minimal rights imply more equality than is currently observed in many countries. The Human Development approach, initiated by the UNDP in 1990, argued that 'the basic objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives' (UNDP, 1990, p. 9). While this does not define a particular level of inequality, it rules out high inequality in poor countries, which is not compatible with the objective. Reducing inequality as a major objective and means to Human Development, then, has been a recurrent theme of the Human Development Reports. The 'equality of opportunities' approach also pushes in an egalitarian direction. As noted, according to this, only inequality that is due to factors within a person's

control is justified. In practice, a very large proportion of observed inequality is due to inherited privilege, of wealth, and human and social capital, all outside the individual's control.

Most attempts to define a just distribution are particularly egalitarian with regard to horizontal or group distribution, and less so with regard to vertical distribution. This is because group membership—for example, gender, race, ethnicity, class—is typically outside the control of the individual, so that equality of opportunities would rule out most horizontal inequality, albeit some vertical inequality would be justified as due to variations in individual effort. Equally, incentives which may be needed to achieve a Rawlsian maximin are more relevant at an individual level, and possibly not at all at a group level.[1]

Rawls' explicitly confined his principle to *within* nations or countries, since the implicit social contract on which the principle is based applies only to a society with a single government. In contrast, the Human Rights and Human Development approaches are global and require reduced inter-country as well as intra-country inequality, and the Right to Development, in particular, points to reduced inter-country inequality.

This view of what a just distribution might look like, together with rising inequalities observed in recent decades, led to criticisms of the Millennium Development Goals (MDGs) for including only absolute targets without reference to inequality. In practice this meant, for example, that the target of halving infant mortality rates (or poverty rates) could be achieved at a country level while the rates for the lowest income category changed little, or could even increase. Hence, the aim of reducing inequalities between people, groups and countries has been adopted explicitly in the SDGs.

## 4 The Instrumental Effects of Inequality

The instrumental effects of inequality on economic growth have been a consistent concern of economists, while effects on other dimensions were initially of little concern. And as the objectives of development have widened, so has the concern with the instrumental consequences for the broader set of objectives.

*Economic growth.* The early focus on *incomes* as the objective of development was paralleled by an exploration of how income inequality affected

[1] See Stewart (2013) for elaboration of other philosophers' views.

GDP growth. There are reasons both for expecting a positive impact of inequality on growth and for expecting a negative impact. On the one hand, incentives and savings may be expected to be higher with more inequality; on the other, human capital may be less. In the 1950s it was assumed that more unequal income distribution would lead to higher growth, via higher savings and incentive effects (e.g. Galenson & Leibenstein, 1955; Okun, 1975). This was challenged by Adelman and Morris (1973), who argued, with country evidence, that a more equal initial income distribution was associated with higher growth. Much of the later empirical literature has supported Adelman and Morris, for example (Alesina & Rodrik, 1994; Alesina & Perotti, 1994; Persson & Tabellini, 1994; Bénabou, 1996).[2] But other evidence is more ambiguous (Fishlow, 1995; Barro, 2008; Li & Zou, 1998; Forbes, 2000; Banerjee & Duflo, 2003). The relationship between inequality and growth may vary according to the level of inequality. For 1960–1998, Cornia (2004) found a concave relationship with growth rising as inequality increases from very low levels, and then declining with a further increase in inequality.

Besides the effect on the average growth rate, there is growing evidence that inequality is associated with greater *instability* in growth. Two IMF economists found that 'when growth is looked at over the long term, the trade-off between efficiency and equality may not exist. In fact equality appears to be important *in promoting and sustaining growth*' (Berg & Ostry, 2011: 13 my italics). An example of how inequality may contribute to instability is that of the financial crisis of 2007–2008. Rising inequality in developed countries has been argued to be responsible for the crisis. Given the low wage share, the only way growth could be sustained prior to the crisis was through consumer credit (especially for houses in the US), which eventually became non-viable leading the crash (Stiglitz, 2012, 2013; Lansley, 2012). This is one explanation for the non-sustainability of growth in very unequal economies.

*Inequality and poverty.* From the 1990s, the reduction, and—with the SDGs—elimination, of extreme poverty became a central development objective. Undoubtedly, inequality has an important effect on the achievement of this objective. For any given level of average per capita income, the higher the inequality, the higher the poverty rates. In other words, the elasticity of poverty with respect to growth will be higher, the lower the inequality (Bourgignon, 2003; Adams, 2004; Fosu, 2009). When growth

[2] See also Birdsall et al. (1995), Bourguignon (1995), and Deininger and Squire (1998).

is accompanied by rising inequality, the reduction in poverty may be very small or even negative, while conversely slow growth can be associated with large reductions in poverty if accompanied by substantial reductions in inequality (Cornia, 2004). The importance of the level (and change) in income distribution for mediating the impact of growth on poverty has been illustrated by Dhatt and Ravallion (1998) for Indian states, by Fosu (2009) for African economies and by Kalwij and Verschoor (2007) for 58 developing countries in the 1980s.

*Education, health and nutrition.* The Human Development approach to development, based on Sen's capabilities approach, made improvements in the basic capabilities an intrinsic objective, and consequently the impact of inequality on these capabilities an important instrumental consideration. Extensive evidence shows that inequality in incomes tends to be reflected in inequality in education, including achievements at basic levels (such as literacy, completion of primary and secondary school), and unequal access to tertiary education (Filmer & Pritchett, 1999; Bachmann & Hannum, 2001; Birdsall & Sabot, 1994). This arises because inequality affects both household decisions and public spending (Gutiérrez & Tanaka, 2009; Figueroa, 2006) and has explored inequalities across groups in Peru, showing systematic differences not only in access to education but also returns, partly due to discrimination in the quality of education and in employment between members of rich and poor groups, notably between the poor indigenous groups and the more privileged non-indigenous.

An inverse relationship between *average* health outcomes and income inequality has been claimed, but is not firmly established (Subramanian & Kawachi, 2004). Wilkinson and Pickett (2006) reviewed 168 analyses—of these, 52% found evidence of a link between higher inequality and worse *average* health outcomes, 26% were partially supportive and 22% provided no support. But Deaton (2003) questioned the data and methodology of some of this work and does not find a relationship between vertical inequality and health.[3] The fact that some studies find a negative impact of inequality on average health outcomes, none a positive, suggests that decreasing inequality may improve, and will not worsen, a society's

[3] Multiple regression for 115 countries (including developed) shows a relationship between IMR and income per capita, but no relationship with inequality: $IMR = 40.69 - 0.00132y\,(-6.969) + 0.118g(0.474)$, ($adjusted\ r - square = 0.313$)$where\ y = income\ per\ head(PPP)$, $g = Gini\ coefficient\ and\ bracketed\ figures\ are\ T - values.$

*average* health. Moreover, given that most studies find a relationship between individual income levels and individual health outcomes, reducing income inequality is almost certain to contribute to improving the health of the poor. In addition, inequality has been shown to have a deleterious effect on nutrition of low-income groups, due to a combination of lack of income and poor maternal education (Murcott, 2002; Moradi, 2006). This in turn adversely affects health.

*Inequality and human security.* Human security has come to be recognized as an important aspect of wellbeing and human development, for example in the 1994 *Human Development Report* (and again the 2014 Report), the World Bank's *Voices of the Poor* (Narayan, 2000) and the 2003 Ogata/Sen Commission Report on Human Security. It is a clearly expressed priority for poor people themselves (Narayan, 2000). Though human security goes well beyond physical security, criminality and civil war are critically important aspects of insecurity.

*Criminality.* Most research shows that greater vertical inequality is associated with higher levels of criminality as measured by intentional homicides and robbery. As Fajnzylber et al. (2002a, p. 1) state after investigating the determinants of crime both across and within countries: 'Crime rates and inequality are positively correlated within countries and, particularly, between countries, and this correlation reflects causation from inequality to crime rates, even after controlling for other crime determinants.' (See also Krahn et al., 1986; Fajnzylber et al., 2002b; and many references cited in these articles.) However, interpretation of why there is this link between inequality and crime varies: economists suggest it is due to economics of crime with more poor people having incentives to rob the rich in unequal societies; but sociologists see sociology of crime with social control over conflict being weaker in unequal societies. Which of these mechanisms is dominant will determine appropriate policy responses. However, in either case, lower inequality should be associated with less crime.

*Inequality and conflict.* There is strong and accumulating evidence that higher horizontal inequalities are associated with greater likelihood of the outbreak of civil war (Gurr, 1993; Stewart, 2000; Mancini et al., 2008; Cederman et al., 2013). However, perhaps surprisingly, on balance the evidence does not support a connection between VI and civil war (Collier & Hoeffler, 2004; Fearon & Laitin, 2003) (although Auvinen and Nafziger [1999] found a weak connection). The relationship between HIs and conflict arises because people mobilize behind a common identity

(often ethnicity or religion), and such mobilization can be stimulated by sharp HIs. There is less potential for mobilization with high VI because of the absence of a unifying shared identity, although in some cases peasants' or caste movements unify and mobilize the deprived. Research indicates that HIs are particularly likely to provoke conflict where there are *simultaneously both economic and political inequalities* in the same direction (Stewart, 2009; Cederman et al., 2011; Østby, 2008), since in those circumstances leaders have an incentive to mobilize, because of political exclusion while social and economic exclusion motivates their supporters. Inequalities in cultural recognition can also provoke conflict motivating both leaders and followers (Langer & Brown, 2008). There is also evidence that horizontal inequalities are associated with forms of group violence other than civil war, including milder types of violence such as riots (Blau & Blau, 1982) and horrendous forms like genocide (Fein, 1993, Harff, 2003; Stewart, 2011). Some work too links gender inequality to domestic violence (Bailey & Peterson, 1995, Yodanis, 2004). The relationship between HIs and conflict provides a strong motive for action to correct such inequalities, even among people who are not concerned with equity. Yet action has to be introduced cautiously because the correction itself can be provocative.

*Inequality and sustainability.* The broadening development agenda now gives environmental sustainability a central role, essential if any current development is to be shared by future generations. More inequality is likely to make it more difficult to achieve sustainability goals. This is for two related reasons: the issue of 'catch-up' and that of fairness. Despite technological advances in carbon-saving, higher-economic growth remains tied to greater carbon emissions, and a slow-down in global economic growth is likely to be an essential component of achieving sustainability. Yet both within and across societies, a major motive for growth is to catch-up those people/countries with higher incomes. So long as inter- and intra-country inequality remains constant or increases, catch-up cannot be achieved whatever the growth rate, and people and countries at lower levels in the income hierarchy will constantly press for growth to try and approach the (ever higher) living standards of those above them. Greater equality within and between countries will not only itself bring about some catch-up, but will also make a lower rate of growth more acceptable. Moreover, it will do so without reducing 'happiness' according to empirical research showing that at high-income levels increased incomes do not raise happiness (Easterlin, 1974; Graham & Felton, 2006). The issue of

fairness is related to this. Given an absolute limit on safe carbon emissions at a global level, the scarce emissions need to be distributed fairly, from the perspectives of both justice and acceptability. Prima facie, a fair distribution of a scarce global resource would be one of equal per capita distribution. This might need to be qualified, to encourage efficiency of use, but we can safely conclude that a fair distribution would be far more equal than the present one. A fairer distribution would also be more likely to make limitation of carbon-use acceptable to poorer people and countries, and hence more likely to be implemented. In short, reduced inequality in incomes and carbon-use is an important part of achieving sustainability (Neumayer, 2011; Stewart, 2014)

In sum, while considerations of justice call for much more equality between and within countries, even without any such ethical stance, there are strong instrumental reasons for having more equality—since it would be likely to contribute to the achievement of agreed objectives—leading to more and more sustained economic growth, more educated and healthier populations, less criminality and, with greater horizontal inequality, less civil war. In addition, greater equality would make it easier to achieve environmental sustainability. Thus, most arguments favour more equality, both vertical and horizontal. We may not know the ideal distribution, but we do know the desirable direction of change. Yet Kuznets held that development would be associated with *more inequality*, while many point to the way globalization seems to be increasing inequality. Is the world economy, unavoidably, moving in the 'wrong' direction? This is discussed in the next section.

## 5 Is Rising Inequality Inevitable?

In a seminal paper, derived from cross-country data and evidence on the historical evolution of a few developed countries, Kuznets (1955) suggested that as incomes rose inequality would first rise, and then fall along the famous inverted U-shaped curve. Apart from being an empirical generalization, Kuznets' underlying explanation was that development consisted in a switch of employment from a low productivity traditional sector to a high productivity modern sector, which would generate first rising then falling inequality as the relative size of the two sectors changed. However, increasingly sophisticated tests of the hypothesis have shown that its validity depends on the model specification, the sample and the time period adopted. Tests using trends within countries have given it

little support (Anand & Kabur, 1993; Fields, 2001; Bruno et al., 1998). The failure to find consistent evidence of a Kuznets curve relationship has been attributed to policy differences across countries (Kanbur, 2011). Moreover, recent trends in developed countries show an upturn in inequality—indicating a sideways S-curve rather than an inverted-U—while Piketty has argued that the sharply reduced inequality in the first half of the twentieth century was due to special factors, including the aftermath of two world wars, and could not therefore be expected to be replicated.

In the 1980s and 1990s, the majority of countries (developed and developing) showed a rise in inequality. Indeed, Cornia and Sampsa (2001) found that the Gini coefficient rose between 1980 and 2000 in two-thirds of the 73 developing countries for which they had data. It has been suggested that globalization, which accelerated during these decades, was and would continue to be responsible for rising inequality. 'Globalization has dramatically increased inequality between and within nations' (Mazur, 2000). 'In sum, neoliberalism and financialization are accompanied, in most countries, by self-reinforcing tendencies towards higher levels of economy inequality' (Gallas et al., 2014, p. 146). Of the many aspects of globalization that may affect distribution, two important ones are greater trade openness and freeing of capital movements. Following Heckscher-Ohlin, it was expected that freer trade would improve the distribution in labour-rich countries (i.e. poor countries) and worsen it in capital-rich ones (i.e. high-income countries). Yet this was not observed. Barro (2000), among others, 'finds that the relationship between openness and inequality is positive for low-income countries and negative for high income countries' (quoted in Kremer & Maskin, undated). Szekely and Mendoza (2016) find that 'more trade openness leads to a worsening in the income distribution' among Latin American countries and cite a number of others coming to the same conclusion for Latin America. For the late twentieth century, the balance of the evidence suggests that more trade openness is associated with worsening inequality. Kremer and Maskin develop a model based on labour complementarities which explains why inequality may rise in both rich and poor countries with greater openness. Harrison et al. (2010) survey other theories pointing in the same direction.

There is also general agreement that capital account openness and the financialization that accompanies it is likely to increase inequality (IMF, 2007; Gallas et al., 2014). A further factor associated with globalization that is inequality-inducing is the weakening of workers' movements and

rights, especially in developed countries. To increase competitiveness, labour market reforms have been introduced, including worsening the contractual conditions of labour and depressing unskilled wages, while subsidies to investment are frequently granted in order to secure (internationally mobile) capital. Global competition for the highly skilled has tended to bid up their rewards, thus increasing inequality within the wage sector. Most countries saw rising inequality in the 1980s and 1990s, and some also experienced a rise in inequality in the 2000s, including sharply rising inequality in China, India, the US and the UK as well as a number of other countries. Nonetheless, despite the universal pressures from globalization, in the 2000s, most countries in Latin America and the majority in sub-Saharan Africa saw a *fall* in inequality (Cornia, 2014; Lopez-Calva & Lustig, 2012; Cornia & Martorano, 2012). For the world as a whole, moreover, global personal income distribution has not risen and may have fallen from 1988 to 2008, as declining inter-country inequality—especially due to the rise in Chinese incomes—offsets the worsening intra-country inequality (Lakner & Milanovic, 2013).[4]

The different trajectories among countries suggest that rising inequality is not inevitable even in the context of increasing globalization and competitive pressures. The egalitarian changes in Latin America in the 2000s have been attributed largely to policy differences (Cornia & Martorano, 2012; Cornia, 2014) and Kanbur makes a similar point with respect to countries that avoid the rising inequality predicted by Kuznets (Kanbur, 2011). This suggests that while there are strong tendencies making for rising inequality in a globalizing capitalist world, governments can counter this with well-designed policies. Changing perspectives on policies—and on the politics underlying these policies—are therefore discussed in the next section of this chapter.

## 6 Policy Perspectives

Reducing inequality did not form part of the policy agenda of the donor community—led by the World Bank—for most of the past 50 years. In the 1960s and 1970s, the major emphasis, shared by developing country governments, was on economic growth; the 1980s were the Washington

[4] Lakner and Milanovic (2013) adjust household survey data for underreporting of high incomes by using national accounts, yet this may still understate very high incomes, and possibly very low ones as well.

Consensus years, with stabilization and adjustment as the overriding objectives, and liberalization of various sorts as the means. The devastating impact the policies had on poverty was gradually recognized (Cornia et al., 1986), and from 1990 onwards poverty reduction became a central goal, culminating in 2000 in the MDGs, in which, as noted above, inequality played no part. Reducing inequality has crept up the agenda at an international level in the 2000s. For example, the World Development Report 2006 was on *Equity and Development*; and reducing inequalities within and among countries is one of the SDGs. Yet this has not been paralleled by any global efforts to define and advocate policies to reduce inequality. Indeed, many of the policies which continue to be advocated by global institutions—and even insisted upon in conditional loans—are likely to be inequality increasing, such as reducing public expenditure, switching from direct to indirect taxation, and reducing high marginal rates of income tax. Labour market reforms and privatization also tend to be unequalizing. Similar policies are demanded by European institutions and governments. There are no signs of the policy set advocated by these global institutions being revised, despite apparent acceptance of the need to reduce inequality.

At a country level, there has been a much more varied approach. In the early decades, nationalizing assets and land reforms pushed in an egalitarian direction, but these were reversed, with privatization, or transformed (to market-based land reforms) to become inegalitarian. Nonetheless, particular countries have adopted and maintained egalitarian policies over the years. For example, South Korea and Taiwan introduced radical land reforms in the late 1940s and early 1950s, and many other countries adopted less comprehensive land reforms (El Ghonemy, 1990). Early on Costa Rica introduced an array of pensions and transfers which have been sustained. Affirmative action programmes have reduced HIs (and VI), most comprehensively in Malaysia but also in part in many other countries (e.g. India, Nepal and Brazil; Brown et al., 2012). Cuba sustained a highly egalitarian distribution through nationalization of assets, limits on wage inequalities and strong comprehensive social policies. In the 2000s, Latin American countries have introduced/raised minimum wages, adopted universal social protection programmes and extended education, all contributing to reducing the inequality in disposable incomes (Cornia, 2014). Many countries have reduced education inequalities as they move towards universal primary and secondary education; and some countries have targeted health policies to improve health equality, notably Thailand.

Policies that reduce inequality can be categorized as affecting pre-distribution or redistribution; and as universal or targeted. Pre-distribution policies are those that affect the primary distribution of income, before taxes or transfers. For example, changes in the quantity or returns to education affect the distribution of wage income; the distribution of income from assets is affected by policies towards the distribution of asset ownership and those affecting the returns to assets, such as through interest rate or competition policies. Taxes and transfers affect the redistribution of income and can be designed to reduce inequality substantially.[5] Universal policies are policies that apply to everyone in the country, for example, universal pensions or child support, or universal health and education services. Targeted policies are directed towards particular segments of the population. For VI, these are targeted towards people below a particular income; and for HI towards particular groups, for example, education quotas for disadvantaged individuals or groups.

Country evidence shows that these policies can be effective in reducing inequality. Given the strong evidence, summarized above, that more equality would be desirable from an instrumental perspective as well as advancing justice, the question arises as to why such redistributionary policies have not been adopted more widely. To answer this we have to turn to political economy, which is becoming a central issue for those currently investigating inequality.

Several strands of thought are relevant here: the median voter issue, attitudes towards cross-group redistribution, the apparently increasing role of money in politics and the role of social movements. Although these appear to be separate considerations, analysis suggests they are quite strongly interconnected.

## 7 Political Economy

Although political economy was probably at the forefront of Rousseau's thought—as exemplified by the second quotation at the head of this chapter—political economy considerations were not common 50 years ago (with the exception of Marxist thinkers), partly because redistribution was

[5] Among OECD countries, reductions in the Gini measure of inequality due to taxes and transfers vary from 0.15 in the US to 0.25 in Ireland. Reductions among developing countries are generally much less—0.06 in South Korea, for example. However, public expenditure on basic services is redistributive in developing (and developed) countries (Cornia, 2004).

not a prime objective, and partly because authoritarian regimes were dominant. With the widespread advance of democracy, however, a central paradox emerged: if the majority of people have below-average incomes, why doesn't democracy lead to redistributionary policies? As Roberts points out (this issue), the puzzle is that democratic institutions 'have done little to bring about "significant changes in power relations, property rights, policy entitlements, economic equality, and social status' (Roberts, 2016, quoting Schmitter, 2014). This contradicts the 'median' voter hypothesis, which hypothesises that in a democracy, the greater the inequality the more approval for redistribution (Meltzer & Richard, 1981). However, empirical evidence for the hypothesis is weak and inconclusive, although Schmidt-Catran (2014) finds supporting evidence for long-term within country preferences but not cross-country. A possible reason for the lack of support for the hypothesis is resistance to across group redistribution in multi-ethnic societies, which is explained by psychologists as due to the way people limit their 'domain of justice' to their own group (Schmidt-Catran, 2014; Clayton & Opotow, 2003; Quadagno, 1994). In democracies where a majority group dominates, the government is unlikely to support redistribution to poorer minority groups (Rodrik, 2016). Nonetheless, survey evidence for some African countries shows extensive support for redistribution towards poorer groups among the population, though this may not be translated into government action (Langer et al., 2015).

Robert Wade argues that the median voter hypothesis involves a misconception of how people identify themselves: the median voter, he hypothesizes, may believe that if redistribution occurs it will not be from the rich to the median (or middle class) but more likely from the middle class to the poor. Consequently, the median voter would actually lose by redistribution and therefore resists it. Wade supports the validity of this view by reference to the apparent constancy of the share of the middle 40% of the distribution observed by Palma (Wade, 2014; Palma, 2011; Haggard et al., 2013) questioning the median voter hypothesis find that preferences for redistribution vary according to occupation and place of residence, and not simply according to a person's location in the income hierarchy.

Another explanation, also shared by Wade, is the power of money in politics. As Crouch puts it, increasingly there is not 'free market democracy' but 'corporate authoritarianism', as companies dominate political finance and control the media and many think tanks (Crouch, 2014, p. 4). Moreover, the financial sector exerts power through fear, by threatening

to withdraw if radical redistribution occurs. As Gallas et al. (2014) state: 'In situations of extreme wealth disparity, those at the top find it relatively easy to influence political decisions, while those at the bottom struggle to make themselves heard' (pp. 144–145).

Poor people individually are unable to resist these powerful forces. In principle, political parties may empower them, by enabling them to unite behind a progressive agenda. However, political parties have been shown to be weak in many of the new democracies, and patrimonial rather than class-based (Roberts, 2016). In many African countries, political ties are forged through shared ethnic rather than class identities (Posner, 2005).

Yet this account of the underlying political economy of policies towards redistribution over-determines resistance to redistribution. In practice, a number of developing countries have seen decreases in inequality (shown for Latin America in Fig. 1). Investigations of cases of effective redistribution invariably find that social and political movements have played an important role in bringing about progressive change. For example, this explains the historic emergence of the welfare state in Europe (Haggard & Kaufman, 2008). In Korea too, a powerful worker's movement emerged which gave rise to welfare state provisions (Koo, 2001). In Brazil and

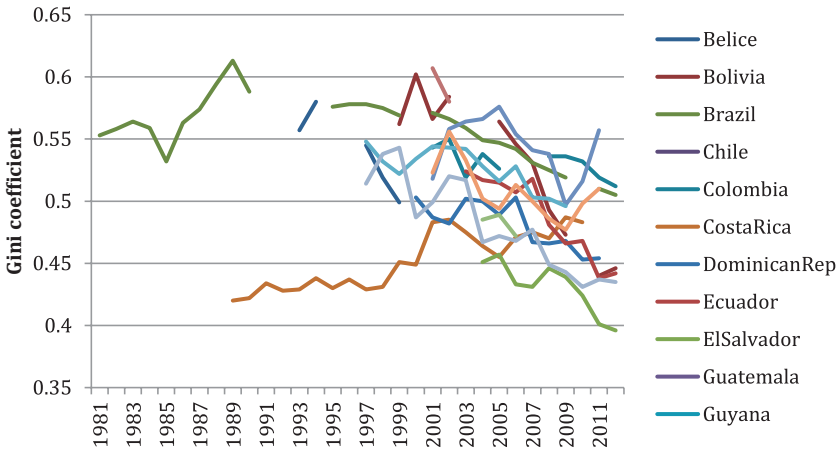


**Fig. 1** Changing income distribution in Latin America. (Source: Max Roser (2015)—'Income Inequality'. *Published online at* OurWorldInData.org. Retrieved from: http://ourworldindata.org/data/growth-and-distribution-of-prosperity/income-inequality/ [Online Resource])

Bolivia, workers and peasant movements formed political parties that eventually gained power (Hunter, 2006; Crabtree & Whitehead, 2001). In some cases, single-issue movements had an influence: for example promoting India's National Employment Guarantee Scheme and the Right to Food (Dreze & Reetika, 2011).

When it comes to correcting HIs, the motive is rather different: it seems that fear of violence is often a powerful motivation. Identity groups by their nature have a natural basis for political mobilization, which may be peaceful but is sometimes violent. The riots of the late 1960s provided the backdrop to the Malaysian policies, while Northern Ireland's policies were introduced in the hope of ending the conflict. In Nigeria, constitutional provisions limited political inequalities with the intention of keeping the country together after the Biafran War. In the US affirmative action was introduced after city riots by blacks. In Brazil, however, workers' movement played a role supported by a discourse of fairness and justice. In South Africa, the deprived group also formed the majority, providing a political basis for redistribution, but policies have been unequalizing within groups.

A full account of the determinants of redistributionary politics and policies is thus complex: put rather simplistically, it is a matter of the power of money balanced against the resistance generated by people's movements, and how well each organizes, in the context of increasing global pressures. In rhetoric, these global pressures are more and more on the side of equality and redistribution, as articulated in the SDGs; but in practice, the influence of competitive pressures, global finance and corporate power weighs the balance against any radical redistribution.

## 8 Conclusions

Fifty years ago the question of equality was predominantly viewed as an intellectual project: what is the extent of inequality? What is the optimum inequality? What policies might bring it about? We have made considerable progress in answering these questions in relation to vertical inequality of incomes, mainly measured by the Gini coefficient; but much less progress on how to achieve something nearer the optimum, given the political forces and the unfavourable global environment.

There is increasing acceptance that the Gini coefficient itself is not well adapted to current inequalities because it focuses too much on the middle and other measures more sensitive to the top and bottom of the

distribution (such as the Palma set of measures[6]) are beginning to be used and measures of global personal distribution are beginning to be produced. It is also widely accepted that we should broaden the dimensions in which we measure inequality, and should focus on horizontal as well as vertical inequality. But in practice much less attention has been given to the broader aspects in either measurement or policy analysis.

Moreover, there is silence towards analysis of the Ricardo question: what the shares of output going to profits (domestic and foreign), rents and wages are, and what determines them. This is an outstanding question that urgently needs to be explored as it underlies distribution among people and groups and across countries. A major determinant of personal income distribution is the distribution of output between wages, profits and rents. In a twenty-first-century context, rents are not mainly a matter of returns to land, but include returns to technology (protected as intellectual property) and to (often temporary but recurring) monopolies (Kaplinsky, 2005). Whereas Ricardo analysed the question in a national context, globalization means that it needs to be analysed both globally and nationally. The global capitalist system allows free movement of capital, which is able to move from one location to another to maximize profits and minimize taxation. Yet the same system limits worker mobility and encourages governments to keep wages and taxes low and minimize worker protection so as to attract the mobile capital. Inter-country distribution is affected, as returns to capital largely accrue to people in the countries where the headquarters of the multinational corporations are located and not in the countries where the profits are earned. Labour migration has led to a similar situation in that earnings in one country affect distribution in another. Remittances from migrants' wages alter the distribution in the countries from where the migrants come, often in an equalizing direction. In Nepal, for example, remittances account for as much as one-quarter of national income and are estimated to have accounted for one-third to one-half of the poverty reduction between 1996 and 2004 according to one study (WorldBank, 2006). A full understanding of the distribution of income within and between countries, and globally, requires the measurement and analysis of factor shares.

[6]The Palma ratio is the ratio of the income share of the top 10% to the bottom 40%; a Palma v2 has been suggested as the ratio of the top 5% to the bottom 40%; and Palma v.3 is the ratio of the top 1% to the bottom 40% (WIDER Research Brief 7/15).

This chapter has drawn attention to what might be termed the inequality paradox: there are strong reasons for supporting more equality for justice and for instrumental factors. Yet within countries, the forces making for more inequality are rarely countered, partly because of weak political capacity and appetite for such a move, which is encouraged by the broadly unequalizing policies supported by the most powerful global institutions. The contradiction between what is, and is accepted to be desirable, and actual policymaking is the central inequality paradox. It is clear from experience that inequality-reducing policies need to be supported and claimed by strong political action, based on associations of the deprived and their allies. They are not likely just to happen because global rhetoric favours more equality.

A critical question is whether concern with equality and inequality should focus on national domains or the global arena. The natural reaction to this question is to argue that it must be global justice and distribution that matters. Yet contractarian theories of justice relate to the national level—including those of Rousseau and Rawls. And many of the instrumental reasons for concern with inequality also relate to the national sphere. Indeed, this chapter has been largely concerned with national distributional issues. A further reason for concern with the national is that policymaking occurs mostly at the national level. Nonetheless, shared humanity suggests that the global level is the right one from a normative perspective, which is recognized by the international human rights approach. In addition, the fact that environmental sustainability can only be achieved at a global level requires concern with global distribution. That between country inequality is estimated to account for around three-quarters of global personal inequality and intra-country only one-quarter reinforces the importance of a global perspective. Even if we completely eliminated intra-country inequality, we would be left with very high levels of global interpersonal inequality (Lakner & Milanovic, 2013).

Clearly, we need to be concerned with both intra- (vertical and horizontal) and inter-country inequality. The main effective arenas of politics and policy are national, and it is here that people live their daily lives. For most people, it is the national level which generates a sense of living in a just or unjust society. National cohesion therefore requires attention to national distribution. But global distribution increasingly pervades people's consciousness. It affects political and economic stability and environmental sustainability. A just, peaceful and flourishing world requires a substantial reduction in inequality at both levels. And as globalization

advances, with further increases in global capital, labour and technology flows, it becomes more difficult to tackle inequality at either level without also tackling the other.

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# Income Inequality and Labour

*Rolph van der Hoeven*

Income inequality received little attention in development economics after the Second World War. In the late 1960s, and early 1970s, however concern about growing inequality and the need for redistribution with growth (Chenery et al., 1974) were raised. Adelman (1979) emphasized 'Redistribution Before Growth'. Redistributing factors of production (land, secondary and higher education, investment capital) before these factors would become scarce in a stronger growth phase (and thus commanding higher factor rewards such as higher wages and profits) would be a superior way to achieve a more equal income distribution during the course of development.

At the end of the 1990s, UNU-WIDER started a large research programme on inequality, growth, poverty and globalisation. One of the findings was that too high-income inequality hampers a kick-off of growth, but also too little inequality, as happened in the former communist countries in Eastern Europe. The project found that the 'old explanatory factors of inequality' (land inequality, poor education, poor infrastructure,

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urban bias) could not explain well the rise in inequality but rather explained the level of inequality. The main causes of the rise in national income inequality were the 'new explanatory factors' such as liberalisation of trade and especially of capital markets, associated with globalisation, the significantly increased financialisation of national economies and of international relations, technological change and the growing limitations of labour market institutions that led to greater inequality between unskilled and skilled workers (Cornia, 2004; Shorrocks & van der Hoeven, 2004).

After the 2007–2008 financial crisis, even the more traditional financial and economic circles sounded the alarm bell, fearing that large and rising income inequalities could affect the foundations of the free-market system. Globalisation, at least the unrestricted globalisation that we see now, and income equality are clearly at odds with each other (Gunther & van der Hoeven, 2004; van der Hoeven, 2011; Bourguignon, 2015).

## 1 What Are the Drivers of Income Inequality?

To answer that question, we must define income inequality more precisely. The classical economists paid attention mainly to the distribution of income between labour and capital, the main factors of production: the factor income or functional inequality. In the post-Second World War period, however, less attention was given to this type of inequality, as neoclassical production functions often assumed a constant capital share under the assumption that wage increases follow productivity increases. Attention shifted to personal income or household income distribution. One can interpret household income distribution in three ways (van der Hoeven, 2011):

- Primary income distribution: the distribution of household incomes, consisting of the (sometimes cumulated) different factor incomes in each household, before taxes and subsidies as determined by markets and market institutions.
- Secondary income distribution: the distribution of household incomes after deduction of taxes and inclusion of transfer payments (i.e., as determined by fiscal policies).
- Tertiary income distribution: the distribution of household incomes when imputed benefits from public expenditure are added to household income after taxes and subsidies.

Most policy discussions on inequality though focus on secondary household income distribution (take-home pay, rents, interest earnings and profits after taxes), over the last ten years, however, attention is shifting back to factor income distribution. Daudey and Garcia-Penalosa (2007) showed that factor distribution of income is a statistically significant determinant of the personal distribution of income.

The focus on factor income inequality points to the importance of better understanding the changing position of labour in the production process in order to correctly interpret inequality trends, as labour has been losing ground relative to capital over the past 20 years (ILO, 2011). Furthermore, experience has shown that it is not possible to reduce primary household income inequality without addressing how incomes are generated in the production process and how this affects factor income inequality (van der Hoeven, 2011). Atkinson (2009) gives three reasons to pay again greater attention to factor income distribution:

- To make a link between incomes at the macroeconomic level (national accounts) and incomes at the level of the household.
- To help understand inequality in the personal distribution of income; and
- To address the social justice concerns with the fairness of different returns to different sources of income.

It is therefore important to be more explicit about the drivers of factor income distribution, as well as the drivers of primary, secondary and tertiary household income distributions and the relation between these different types of inequality. There are many drivers that affect the different types of income distribution. One can distinguish between drivers that are largely exogenous (outside the purview of domestic policy) and endogenous drivers (i.e., drivers that are mainly determined by domestic policy). However, a clear line is difficult to draw because even drivers that may, at first sight, appear to be exogenous or autonomous are often the outcome of policy decisions in the past or the outcome of a domestic political decision to create international institutions (e.g., the creation of World Trade Organization (WTO) to establish trade liberalisation or the decision to invest in technical progress). With increased globalisation, exogenous drivers gain in importance. As a consequence, more is expected from national policy drivers to counteract the effect of the more exogenous drivers.

Changes in labour market policies have been an important driver of inequality (van der Hoeven & Taylor, 2000). In particular, the labour market policies undertaken in the wake of structural adjustment policies as part of the Washington Consensus have increased income inequality in all countries where these policies have been applied (Cornia, 2004; van der Hoeven & Saget, 2004). Especially relevant for income inequality are the labour market policies concerned with the distribution of wages, the gender gap therein and minimum wages. Not only has the share of wages in national income but also the distribution of wages themselves has become more unequal (ILO, 2008).

Gropello and Sakellariou (2010), in reviewing levels and trends in education and skill premiums, and skilled labour force, across eight East Asian countries, observe that while there are increasing proportions of skilled/educated workers over the long run across the region, this is combined with stable or increasing education/skill wage premiums. The importance of skills premia as driver of inequality becomes even stronger in countries where access to post-secondary education is more skewly distributed than incomes (Sharma et al., 2011). Conventional economic theory would predict that education and schooling would reduce skill premiums in the medium term as the supply of skilled labour increases in response to the higher-wage premia. However, this did not seem to happen in many developing countries. Behar (2011) reviews the reason why schooling has not countered the pervasive rises in wage inequality, driven by skill-biased technical change (SBTC). He concludes that technological change is skill-biased in the South simply because it is in the North, thus creating a 'labour elite' that manage to obtain skill-intensive jobs causing permanently rising wage inequality in the South. Other authors however caution against seeing SBTC as the major driver of wage inequality. Singh and Dhumale (2004) suggest other key factors, such as changes in remuneration norms, labour institutions and financial markets.

## 2 COVID-19 and Income Inequality

Hill and Narayan (2020) studying five pandemics between 2003 and 2016 find that on average, income inequality in affected countries increased steadily over the five years following each event, with the effect being higher when the crisis led to contraction in economic activity, as is the case with COVID-19. The historical estimates probably understate the potential long-term effects of COVID-19, given the much larger income impacts

of this pandemic. Within countries, early data indicate that labour market impacts of the pandemic are strikingly unequal, varying with characteristics of jobs, workers and firms. ILO (2021) shows that in most countries, college-educated workers are less likely to stop working than those with less education. The rate of job losses was highest in industry and urban services, which tend to have jobs that are least amenable to working from home.

## 3 Conclusion

Globalisation and especially financialisation and also, to a certain extent, skills-based technical change have been important exogenous drivers of inequality. These drivers have in various cases strengthened existing patterns of inequality through a stubbornly high wealth inequality and through intergenerational transfers of inequality due to skewed access to higher-level education. These adverse effects of financial and trade globalisation on income inequality during the past three decades have been exacerbated by national policies that had a negative impact on income distribution. Monetary policies that emphasized price stability over growth, labour market policies that weakened bargaining position of labour vis-à-vis employers and fiscal policies that prioritized fiscal consolidation at the expense of benefits and progressive taxation, all contributed to increasing income inequality. Early indications of the effect of the COVID-19 pandemic show that aforementioned trends are rather magnified than contained, unless forceful national and especially international action kicks in.

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# Unions and Wage Inequality

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## 1 Introduction

How unions affect the distribution of income is a subject that has long intrigued social scientists. The publication of *What Do Unions Do?* and the related papers by Freeman (1980, 1982, 1984) represented a watershed in the evolution of economists' views on this question. Until the 1970s the dominant view was that unions tended to increase wage inequality (Johnson, 1975). Using micro data on individual workers in the union and nonunion sectors, Freeman (1980) presented results that challenged this view. He showed that the inequality-reducing effects of unions were quantitatively larger than the inequality-increasing effects. The equalizing effect of unions became a key chapter in *What Do Unions Do?* and an important component of the authors' overall assessment of the social and economic consequences of unions.

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Recently the relationship between unions and inequality has attracted renewed interest as analysts have struggled to explain increases in wage inequality in many industrialized countries. The fact that two of the countries with the largest declines in unionization—the United States and the United Kingdom—also experienced the biggest increases in wage inequality raises the question of whether these two phenomena are linked. If so, how much of the growth in earnings inequality can be attributed to the fall in union coverage?

We make several contributions to this issue. We begin by presenting a simple framework for measuring the effect of unions on wage inequality, based on the potential outcomes framework that is now widely used in program evaluation. Our framework emphasizes three key aspects of collective bargaining: How does the probability of union coverage vary for workers who would earn more or less in the nonunion sector? How much do unions raise average wages for workers in different skill groups? How do unions affect the dispersion of wages within narrow skill groups? Next, we trace the evolution of economists' views on the impacts of unions on the wage distribution. This section places the contributions of Freeman (1980, 1982, 1984) and Freeman and Medoff (1984) in historical context. Third, we present new evidence on the relationship between unions and wage inequality for three countries—Canada, the United Kingdom, and the United States—during the past three decades. Finally, we assess whether the position put forward in *What Do Unions Do?* regarding unions and wage inequality has held up to the scrutiny of subsequent research, including the new evidence reported herein.

Our analysis of unions and wage inequality in the United States, the United Kingdom, and Canada is motivated by several factors. One is to better understand trends in income inequality. Several previous studies have concluded that falling unionization contributed to the steep increase in wage inequality in the United States and the United Kingdom during the 1980s. Wage inequality did not rise as quickly in these countries in the 1990s. This raises the question of whether the evolution of union coverage and union wage impacts can account for some of the changing trend in wage inequality. More generally, differences across these countries in the timing of changes in unionization and in wage inequality provide an opportunity for further assessing the contribution of institutional change to trends in income inequality.

Our empirical analysis is also motivated by the fact that in these three countries the institutional arrangements governing unionization and

collective bargaining provide an environment that is suitable for estimating how unions affect wage inequality. As with other aspects of the economy, collective bargaining institutions in these countries are broadly similar. In particular, negotiations are conducted at the enterprise level, and there is no general mechanism to extend union wage floors beyond the organized sector. The fraction of workers covered by collective agreements in the three countries is also relatively modest—currently under one-third of wage and salary workers. Thus it is possible to compare the structure of wages for workers whose wages are set by union contracts, and those whose wages are not, and potentially infer the effect of unions on overall wage inequality. A similar task is far more difficult in other countries (including the major European countries and Australia) because there is no clear distinction between the union and nonunion sectors. Collective bargaining in these countries is conducted at the industry or sectoral level, and the provisions are formally or informally extended to most of the labor force. Moreover, in many countries, unions exert considerable influence on political decisions (such as minimum wages) that directly affect labor market outcomes.

We also seek to assess whether there are common patterns in the impact of unions on the wage structure in countries with economies and industrial relations systems that are broadly similar. Of particular interest are patterns in union coverage and union wage impacts by gender and skill. To do so, we use micro data samples to compare the incidence and average wage effect of unions by skill level on male and female workers in the three countries, and measure recent trends in union coverage by skill level. Despite some differences in the institutional systems that govern the determination of union status in the three countries, we find remarkable similarity in the overall patterns of union coverage and in the degree to which unions affect wages of different skill groups. Within narrowly defined skill groups, wage inequality is always lower for union workers than nonunion workers. For male workers, union coverage tends to be concentrated at the middle of the skill distribution, and union wages tend to be "flattened" relative to nonunion wages. As a result, unions have an equalizing effect on the dispersion of male wages across skill groups in the three countries, complementing the effect on within-group inequality. For female workers, however, union coverage is concentrated near the top of the skill distribution, and there is no tendency for unions to flatten skill differentials across groups. Thus, unions tend to *raise* inequality between

more and less skilled women in the three countries, offsetting their effect on within-group inequality.

As a final step, we use data from the past 25 years to compute the changing effect of unionization on wage inequality. During the 1980s and 1990s, unionization rates fell in all three countries, with the most rapid decline in the United Kingdom and the slowest fall in Canada. These trends contributed to rising male wage inequality, particularly in Britain. Indeed, we estimate that the precipitous fall in UK unionization can explain up to two thirds of the difference in the trend in male wage inequality between Britain and the United States.

## 2 Unions and Wage Inequality

*Conceptual Framework.* A useful framework for studying the effect of unions on wage inequality is the potential outcomes model now widely used in program evaluation (Angrist & Krueger, 1999). Assume that each worker faces two potential wages: a log wage in the union sector, $W_i^U$ , and a log wage in the nonunion sector $W_i^N$ . Ignoring dual job holders, a given individual is either in one sector or the other at any point in time, so one of these outcomes is observed and the other is not. Letting $U_i$ denote an indicator for union status, the observed wage of individual $i$ is

$$W_i = U_i \; W_i^U + \left(1 - U_i\right) W_i^N .$$

Let $W^U$ and $W^N$ represent the means of the potential wage outcomes in the two sectors, and let $V^U$ and $V^N$ represent the corresponding variances. Finally, let $W$ and $V$ represent the mean and variance of observed wages in the economy as a whole. In this setting, a natural measure of the effect of unions on wage inequality is $V - V^N$: the difference between the observed variance of wages and the variance that would prevail if everyone was paid his or her nonunion potential wage.

There are two problems with this measure. The first is purely practical: How do we estimate $V^N$? The second is conceptual. Arguably, any given individual in the union sector has a well-defined potential wage in the nonunion sector. But if the union sector disappeared, the equilibrium set of wage offers in the nonunion sector could change.[1] Thus $V^N$ is a function

[1] This possibility was emphasized by Lewis (1963). The presence of unionized employers may lead to higher wages in the nonunion sector (if nonunion employers raise wages to deter

of the size of the union sector, $V^N(u)$, where $0 \leq u \leq 1$ indexes the fraction of workers in the union sector. In the absence of any unionization, the variance of observed wages would be $V^N(0)$. Thus, the effect of unionization on wage inequality, taking account of the general equilibrium impact of the presence of the union sector, is $V - V^N(0)$.

Despite its theoretical appeal, it is difficult to imagine developing a credible estimate of $V^N(0)$. Under strong assumptions, however, it may be possible to estimate $V^N(U)$, where $U$ is the current fraction of unionized workers. The advantage of this measure is that potential nonunion wage outcomes *under the current level of unionism* are at least partially observed (for all current nonunion workers). Since

$$V - V^N(U) = V - V^N(0) + \left\{V^N(0) - V^N(U)\right\},$$

the difference $V - V^N(U)$ overstates or understates the "true" effect of unions by a term reflecting how much the variance of nonunion wage outcomes would change if the union sector was eliminated. While acknowledging this potential bias, in the rest of this analysis we focus on comparisons between $V$, the observed variance of wages, and $V^N(U)$, the variance that would prevail if everyone were paid according to the *current* nonunion wage structure.

*Estimating the Variance of Potential Nonunion Wages.* In order to estimate $V^N$ we have to make an assumption about how current union workers would be paid if they worked in the nonunion sector. One starting point is the assumption that union status is "as good as randomly assigned," conditional on observed skill characteristics. In this case, the counterfactual variance $V^N$ can be estimated as the variance of wages for a suitably reweighted sample of nonunion workers. In this section we show how the resulting calculations are related to three key factors: the variation in the union coverage rate by wage level in the absence of unions, the size of the union wage effect for different skill groups, and the union-nonunion difference in the variance of wages within skill categories. We then show how the assumption that union status is independent of unobserved productivity factors can be relaxed.

unionization efforts) or to lower wages (if unionization reduces employment in the union sector, increasing labor supply in the nonunion sector).

Let $W_i^N(c)$ represent the log wage that individual $i$ in skill group $c$ would earn in the nonunion sector, and let $W_i^U(c)$ denote the log wage for the same individual if employed in a union job. Assume that

$$W_i^N(c) = W^N(c) + e_i^N \text{ and}$$
$$W_i^U(c) = W^U(c) + e_i^U,$$

where $W^N(c)$ and $W^U(c)$ are the mean nonunion and union log wages for individuals in skill group $c$, respectively, and the random terms $e_i^N$ and $e_i^U$ are *independent* of actual union status (conditional on the observed skill level c). Let $V^U(c)$ and $V^N(c)$ denote the variances of potential wage outcomes for individuals in skill group $c$ in the union and nonunion sectors, respectively. The union-nonunion gap in average wages for workers in skill group $c$ is

$$\Delta_w(c) = W^U(c) - W^N(c),$$

while the corresponding variance gap is

$$\Delta v(c) = V^U(c) - V^N(c).$$

Under the independence assumption, $W^N(c)$ and $V^N(c)$ provide unbiased estimates of the mean and variance of nonunion wage outcomes for all workers in skill group $c$, not just those who are actually working in the nonunion sector. The variance of wages in the nonunion sector will not necessarily equal $V^N$, however, if the distribution of nonunion workers across skill groups differs from the distribution of the overall work force. A simple way to estimate $V^N$ is to reweight individual observations from the nonunion work force to account for this difference. Letting $U(c)$ denote the fraction of workers in skill group $c$ in union jobs, the appropriate weight for nonunion workers in group $c$ is $1/(1 - U(c))$.

While reweighting provides a convenient way to calculate $V^N$, it is nevertheless instructive to develop an analytical expression for $V - V^N$ under the conditional independence assumption. Analogous expressions were first derived by Freeman (1980) and used extensively in Freeman and Medoff (1984). To begin, note that if a homogeneous group of workers

in some skill group c is split into a union and a nonunion sector, and if unions alter the mean and variance of wages by $\Delta_w(c)$ and $\Delta_v(c)$, respectively, then the overall mean and variance of wage outcomes for workers in skill group $c$ will be

$$W(c) = W^{N}(c) + U(c)\Delta_{w}(c), \tag{1}$$

$$V(c) = V^{N}(c) + U(c)\Delta_{v}(c) + U(c)\left(1 - U(c)\right)\Delta_{w}(c)^{2}. \tag{2}$$

The first of these equations says that the average wage of workers in skill group $c$ will be raised relative to the counterfactual nonunion average wage by the product of the unionization rate $U(c)$ and the union wage gap $\Delta_w(c)$. The second expression shows that the presence of unions exerts two potentially offsetting effects on the dispersion of wages, relative to the counterfactual $V^N(c)$. First is a "within-sector" effect that arises if wages are more or less disperse under collective bargaining than in its absence. This is just the product of the extent of unionization and the union effect on the variance of wages. Second is a positive "between-sector" effect, reflecting the wedge between the average wage of otherwise identical union and nonunion workers.

If there are many skill groups in the economy, the variance of log wages across all workers is the sum of the variance of mean wages across groups and the average variance within groups:

$$V = \mathrm{Var}\left[W(c)\right] + \mathrm{E}\left[V(c)\right],$$

where expectations (denoted by E[ ]) and variances (denoted by Var[ ]) are taken across the skill categories. Using Eqs. (1) and (2), this expression be rewritten as:

$$\begin{aligned} V &= \mathrm{Var}\left[W^{N}(c) + U(c)\Delta_{w}(c)\right] + \mathrm{E}\left[V^{N}(c) + U(c)\Delta_{v}(c) + U(c)\left(1 - U(c)\right)\Delta_{w}(c)^{2}\right. \\ &= \mathrm{Var}\left[W^{N}(c)\right] + \mathrm{Var}\left[U(c)\Delta_{w}(c)\right] + 2\,\mathrm{cov}\left[W^{N}(c),\, U(c)\Delta_{w}(c)\right] \\ &\quad + \mathrm{E}\left[V^{N}(c)\right] + \mathrm{E}\left[U(c)\Delta_{v}(c)\right] + \mathrm{E}\left[U(c)\left(1 - U(c)\right)\Delta_{w}(c)^{2}\right], \end{aligned} \tag{3}$$

where Cov[,] denotes the covariance across skill groups. In contrast to Eq. (3), if all workers were paid according to the wage structure in the nonunion sector, the variance of wage outcomes would be

$$V^N = \mathrm{Var}\left[W^N(c)\right] + \mathrm{E}\left[V^N(c)\right].$$

The effect of unions on the variance of wage outcomes, relative to what would be observed if all workers were paid according to the current wage structure in the nonunion sector, is therefore

$$\begin{aligned} V - V^N = {} & \mathrm{Var}\left[U(c)\Delta_w(c)\right] + 2\,\mathrm{cov}\left[W^N(c),\ U(c)\Delta_w(c)\right] \\ & + \mathrm{E}\left[U(c)\Delta_v(c)\right] + \mathrm{E}\left[U(c)\left(1-U(c)\right)\Delta_w(c)^2\right]. \end{aligned} \tag{4}$$

Substituting observed values for $W^N(c)$, $U(c)$, $\Delta_w(c)$, and $\Delta_w(c)$ into Eq. (4) leads to an expression that is numerically equal to the difference between the observed variance of wages $V$ and the "reweighting" estimate of $V^N$, derived by reweighting each nonunion worker by $1/(1 - U(c))$.

To understand the implications of Eq. (4) it is helpful to begin by considering a case where the union coverage rate, the union wage effect $\Delta_w(c)$, and the union variance gap are all constant across skill groups. In this case the first two terms in Eq. (4) are 0, and the effect of unions reduces to the simple "two-sector" equation introduced by Freeman (1980):

$$V - V^N = U\Delta_v + U\left(1-U\right)\Delta_w{}^2, \tag{4'}$$

where $U$ represents the overall unionization rate, $\Delta_v$ represents the difference in the variance of log wages between union and nonunion workers, and $\Delta_w$ represents the difference in mean wages between union and nonunion workers.

When union coverage rates or union effects on the level or dispersion of wages vary by skill group, the effect of unions also depends on how the union wage gain $U(c)\Delta_w(c)$ varies with the level of wages in the absence of unions (the covariance term in Eq. (4)), and on by how much unions raise the variation in mean wages across different groups (the Var$[U(c)\Delta_w(c)]$ term in Eq. (4)). In particular, if union coverage is higher for less skilled workers, or if the union wage impact is higher for such workers, then the

covariance term will be negative, enhancing the equalizing effect of unions on wage dispersion.

*Allowing for Unobserved Heterogeneity.* The assumption that union status is "as good as random" conditional on observed skills is convenient but arguably too strong. In this section we show how the presence of unobserved productivity differences between union and nonunion workers biases the calculation that ignores these differences. As before, assume that workers are classified into skill categories on the basis of observed characteristics, and suppose that potential nonunion and union wages are given by:

$$W_i^N(c) = W^N(c) + a_i + e_i^N, \tag{5a}$$

$$W_i^U(c) = W^U(c) + a_i + e_i^U, \tag{5b}$$

where $a_i$ represents an unobserved skill component that is equally rewarded in the union and nonunion sectors. Continue to assume that $e_i^N$ and $e_i^U$ are independent of union status, and let

$$\theta(c) = \mathrm{E}\left[a_i \,|\, U_i = 1,\ c\right] - \mathrm{E}\left[a_i \,|\, U_i = 0,\ c\right]$$

represent the difference in the mean of the unobserved skill component between union and nonunion workers in group $c$. If union workers in group $c$ have higher unobserved skills than their nonunion counterparts, for example, then $\theta(c) > 0$.

The *observed* wage gap between union and nonunion workers in group c includes the true union wage premium and the difference attributable to unobserved skills:

$$D_w(c) = \Delta_w(c) + \theta(c).$$

Similarly, assuming that $e_i^N$ and $e_i^U$ are independent of $a_i$, the *observed* difference in the variance of wages between union and nonunion workers in group $c$ is:

$$D_v(c) = \Delta_v(c) + \mathrm{Var}\left[a_i \,|\, U_i = 1,\ c\right] - \mathrm{Var}\left[a_i \,|\, U_i = 0,\ c\right],$$

which is a combination of the true union effect on within-group inequality and any difference in the variance of the unobserved productivity effects between union and nonunion workers. If union workers tend to have a narrower distribution of unobserved skills, for example, the observed variance gap $D_v(c)$ will be biased downward relative to the "true" union effect $\Delta_v(c)$.

Assuming that potential wage outcomes are generated by Eqs. (5a) and (5b), it can be shown that the difference in the variance of wages in the presence of unions and in the counterfactual situation in which all workers are paid according to the nonunion wage structure is

$$V - V^{N} = \mathrm{Var}\left[U(c)\Delta_w(c)\right] + 2\,\mathrm{cov}\left[W^{N}(c),\, U(c)\Delta_w(c)\right]$$
$$+\mathrm{E}\left[U(c)\Delta_v(c)\right] + \mathrm{E}\left[U(c)\left(1-U(c)\right)\left\{\left(\begin{matrix}\theta(c)\\ +\Delta_w(c)\end{matrix}\right)^{2} - \theta(c)^{2}\right\}\right]. \qquad (6)$$

Only the last term of this equation differs from Eq. (4), the expression that applies when $\theta(c) = 0$ for all groups.[2] In the presence of unobserved heterogeneity, however, $\Delta_w(c)$ and $\Delta_v(c)$ can no longer be estimated consistently from the observed differences in the means and variances of union and nonunion workers in skill group $c$. By the same token, it is no longer possible to use a reweighting procedure based on the fraction of union members in different observed skill groups to estimate $V^N$.

It is instructive to compare the estimated effect of unions under the "as good as random" assumption to the true effect, when potential wages are generated by Eqs. (5a) and (5b). The estimated effect is given by Eq. (4), using the observed within-skill group union differences $D_w(c)$ and $D_v(c)$ as estimates of $\Delta_w(c)$ and $\Delta_v(c)$. The true effect is given by Eq. (6). The difference is

[2] Equation (6) is only correct if unobserved skills are rewarded equally in the union and nonunion sectors, although it may provide a good first approximation if the rewards for unobserved ability in the union sector are not too much lower than in the nonunion sector. Lemieux (1998) presented a model in which unobserved attributes are rewarded differently in the union and nonunion sectors.

$$\begin{aligned}\text{Bias} = &\text{Var}\left[U(c)D_w(c)\right] - \text{Var}\left[U(c)\Delta_w(c)\right] \\ &+ 2\,\text{cov}\left[W^N(c), U(c)\left(D_w(c) - \Delta_w(c)\right)\right] \\ &+ \text{E}\left[U(c)\left(D_v(c) - \Delta_v(c)\right)\right] + \text{E}\left[U(c)\left(1 - U(c)\right)\begin{Bmatrix} D_w(c)^2 - \Delta_w(c)^2 \\ -2\theta(c)\Delta_w(c) \end{Bmatrix}\right].\end{aligned}$$

There are various competing factors here. For example, if $D^W(c)$ varies more across skill groups than $\Delta_w(c)$, the sum of the first two terms is likely to be positive. On the other hand, if $D_w(c)$ is more strongly negatively correlated with nonunion wages across skill groups than $\Delta_w(c)$ (as argued in Card, 1996), then the third (covariance) term will be negative, leading to an overstatement of the equalizing effect of unions. We return to this issue below.

## 3 A Review of the Literature on Unions and Inequality

Until recently, most economists believed that unions tended to raise inequality. For example, Friedman (1956)—appealing to Marshall's laws of derived demand—argued that craft unions will be more successful in raising the wages of their members than industrial unions. Following this logic, Friedman (1962, p. 124) concluded:

> If unions raise wage rates in a particular occupation or industry, they necessarily make the amount of employment available in the occupation or industry less than it otherwise would be—just as any higher price cuts down the amount purchased. The effect is an increased number of persons seeking other jobs, which forces down wages in other occupations. Since unions have generally been strongest among groups that would have been high-paid anyway, their effect has been to make high-paid workers higher paid at the expense of lower paid workers. Unions have therefore not only harmed the public at large and workers as a whole by distorting the use of labor; they have also made the incomes of the working class more unequal by reducing the opportunities available to the most disadvantaged workers.

As this quote makes clear, Friedman posited two channels for the disequalizing effect of unions. One is the "between-sector" effect—the gap in wages between otherwise similar workers in the union and nonunion

sectors. The other is a hypothesized positive correlation between the union wage gain and the level of wages in the absence of unions—that is, an assumption that the covariance term in Eq. (4) is positive. Even economists more sympathetic to unions than Friedman shared this view. For example, Rees (1962) suggested that "theory and evidence" both predict unions will have a bigger effect on high-skilled workers. Noting that union membership (in 1950) was concentrated among workers in the upper half of the earnings distribution, Rees concluded that the overall effect of unions was probably to increase inequality.

Not all scholars accepted this position. Following their detailed analysis of the evolution of the wage structure in several industries, Reynolds and Taft (1956, p. 194) concluded that: "Summing up these diverse consequences of collective bargaining, one can make a strong case that unionism has at any rate not worsened the wage structure. We are inclined to be even more venturesome than this, and to say that its net effect has been beneficial." Much of the reasoning behind this position was based on evidence of unions negotiating "standard rates" that resulted in greater uniformity of wages within and across establishments.

Evidence on these issues was scanty and inconclusive until the widespread availability of micro data in the 1970s. Stieber (1959) examined the effect of unions in the steel industry and concluded that during the 1947–1960 period collective bargaining did not flatten the wage distribution. In an interesting contribution, Ozanne (1962) tabulated data for McDormick Deering (a farm machine company) over the period 1858 to 1958. During this period many different unions unionized the same plant. He found no tendency for unions per se to reduce or increase intra-firm wage inequality. Skill differentials narrowed during some regimes and they widened during other periods. However, there was a general tendency for industrial unions to lower skill differentials and for craft unions to raise them. In his classic study of union relative wage effects, Lewis (1963) examined the correlation between estimates of the union wage differential and wage levels. He concluded that unionism increased the inequality of average wages across industries by 2 to 3 percentage points.

Some contrary evidence appeared in the late 1960s and early 1970s. Stafford (1968), Rosen (1970), and Johnson and Youmans (1971) found that unions compress the wage structure by raising wages of less skilled workers relative to their more skilled counterparts, while Ashenfelter (1972) found that unions contributed to the narrowing of the black-white wage gap. Nonetheless, in a survey written in the mid-1970s, Johnson

(1975, p. 26) concluded that "union members generally possess characteristics which would place them in the middle of the income distribution …, so that unionism probably has a slight disequalizing effect on the distribution of income."

The direction of subsequent research was fundamentally altered by the methods and findings in Freeman's (1980) important study, which first laid out the two-sector framework described in Section II.[3] Freeman (1980) also used establishment-level data to measure the effect of unions on the wage gap between blue-collar and white-collar workers. Since few white-collar workers are unionized, this exercise extended the simple two-sector model to incorporate a "between group–within sector" effect analogous to the "between" and "within" effects in the basic two-sector model. The key finding in Freeman's study—and a result that was largely unanticipated by earlier analysts—is that the "within-sector" effect of unions on wage inequality is large and negative, especially in manufacturing. Freeman attributed the compression of wages in the union sector to explicit union policies that seek to standardize wages within and across firms and establishments. Coupled with the tendency for unions to reduce the wage gap between blue-collar and more highly paid white-collar employees, the equalizing effects of unions more than offset the "between-sector" disequalizing effect between union and nonunion workers. In nonmanufacturing industries, Freeman concluded that the net impact of unions was smaller, reflecting both a smaller "within-sector" effect and larger "between-sector" effect. Subsequent research has confirmed that wage differences between different demographic and skill groups are lower, and often much lower, in the union sector than in the

[3] A couple of studies in the late 1970s and early 1980s also pointed to the conclusion that unions lowered wage inequality. Hyclak (1979) analyzed the determinants of inequality in wage and salary income in urban labor markets and found that higher union coverage was associated with lower earnings inequality. Hyclak (1980) found a negative relationship between the state mean of union density and the percentage of families with low earnings. Hirsch (1982) performed a cross-sectional study at the industry level using a simultaneous equations model of earnings, earnings dispersion, and union coverage. He concluded that the equalizing effects of unions on earnings inequality are larger when allowance is made for the joint determination of union coverage and wage dispersion. Metcalf (1982) also looked at the dispersion of wages across industries in the United Kingdom (without controlling for the joint determination of earnings and union coverage) but concluded that union coverage widened the pay structure across industries. Metcalf also showed, however, that the variation of weekly earnings was lower in the union sector and that unions narrowed the pay structure by occupation and race.

nonunion sector.[4] The residual variance of wages within demographic and skill groups is also generally lower in the union sector.

Analysis of longitudinal data by Freeman (1984) confirmed the finding of lower wage inequality in the union sector, even controlling for individual worker effects. In particular, Freeman documented that wage dispersion tends to fall when workers leave nonunion for union jobs and to rise when they move in the opposite direction. The effect of unions on wage dispersion estimated from longitudinal data is, however, smaller than comparable estimates using cross-sectional data. This lower estimate appears to be at least partly due to measurement error in union status.

Freeman (1993), using more recent longitudinal data from the 1987–1988 CPS, confirmed that unionization reduces wage inequality. On the basis of his longitudinal estimates, he concluded that declining unionization accounted for about 20 percent of the increase in the standard deviation of male wages in the United States between 1978 and 1988. Using a more sophisticated econometric approach (see the discussion of Card, 1996, below), Card (1992) also concluded that the drop in unionization explained around 20 percent of the increase in wage inequality during the 1980s. Gosling and Machin (1995) reached a similar conclusion that the fall in unionization accounts for around 15 percent of the increase in male wage inequality among semi-skilled workers in Britain between 1980 and 1990.

*Second-Generation Studies.* Beginning with Freeman (1980), the first generation of micro-based studies significantly altered views regarding the relationship between unionization and wage inequality. But these studies tell an incomplete story On the one hand, they focus on male, private sector workers. On the other hand, they tended to ignore variation in the union coverage rate and the union wage effect across different types of workers.

A second generation of studies used variants of the framework underlying Eq. (4) to develop a more complete picture of the effect of unions. DiNardo and Lemieux (1997) implemented a reweighting technique to construct estimates of the sum of the terms in Eq. (4) for men in the United States and Canada in 1981 and 1988. They estimated that in 1981 the presence of unions reduced the variance of male wages by 6 percent in the United States and 10 percent in Canada. The corresponding estimates

[4] See Lewis (1986) for a review of U.S. studies and Meng (1990) and Lemieux (1993) for Canadian evidence.

in 1988 are 3 percent in the United States and 13 percent in Canada. Thus, they estimated that changing unionization contributed to the rise in United States' wage inequality in the 1980s, but worked in the opposite direction in Canada. Their decompositions also showed that in both countries unions lower the variation in wages within and between groups, with a larger net effect within skill groups.

A related study by DiNardo et al. (1996) examined both men and women in the United States in 1979 and 1988. DiNardo et al. (hereinafter, DFL) use the reweighting technique applied by DiNardo and Lemieux. DFL focus on explaining the rise in wage inequality over the 1979–1988 period. For men, their methods suggested that shifts in unionization accounted for 10–15 percent of the overall rise in wage dispersion in the 1980s, with most of the effect concentrated in the middle and upper half of the wage distribution. For women, on the other hand, the estimated contribution of changing unionization was very small. DFL also estimated that falling unionization explains about one-half of the rise in the wage premium between men with a high school diploma and dropouts, and about a quarter of the rise in the college-high school wage gap for men.

The study by Bell and Pitt (1998) used DFL's method to analyze the impact of declining unionization on the growth in wage inequality in Britain. Depending on the data source used, they found that between 10 and 25 percent of the increase in male wage inequality can be explained by the fall in unionization. Machin (1997) reached similar conclusions.

Card (2001) examined the contribution of unions to wage inequality among U.S. men and women in 1973–1974 and in 1993. Card reported estimates based on the simple two-sector formula (Eq. (4′)), and on a variant of Eq. (4) obtained by dividing workers into ten equally sized skill groups, based on predicted wages in the nonunion sector. Two key findings emerged from this analysis. First, the presence of unions was estimated to have reduced the variance of men's wages by about 12 percent in 1973–1974 and 5 percent in 1993. Overall, shifts in unionization can explain about 15–20 percent of the rise in male wage inequality in the 1973–1993 period. Second, although the within-group variance of wages is lower for women in the union sector than the nonunion sector (i.e., $\Delta_v(c)$ is on average negative), this equalizing effect is counteracted by a positive between-group effect, so overall unions had little net effect on wage inequality among U.S. women in 1973–1974 or 1993.

Card (2001) also conducted separate analyses of the effects of unions on men and women in the public and private sectors in 1973–1974 and

1993. The trends in unionization were quite different in the two sectors, with *rises* in union membership in the public sector for both men and women, and declines in the private sector. Nevertheless, comparisons of the patterns of union wage gaps by skill group suggest that unions affect the wage structure very similarly in the two sectors, with a strong tendency to "flatten" wage differences across skill groups for men, and less tendency for flattening among women. Overall, Card's estimates implied that unions reduced the variance of men's wages in the public sector by 12 percent in 1973–1974 and 16 percent in 1993. In the private sector, where union densities declined, the union effect fell from 9 percent in 1973–1974 to 3 percent in 1993. An interesting implication of these estimates is that differential trends in unionization among men in the public and private sectors can potentially explain a large share (up to 80 percent) of the greater rise in wage inequality in the private sector. The estimated effects of unions on women's wage inequality are all close to zero, except in the public sector in 1993, when the effect is about -5 percent.

Gosling and Lemieux (2001) examined the effects of unions on the rise in wage inequality in the United States and the United Kingdom between 1983 and 1998, using the DFL reweighting method. Their estimates suggested that in both the United States and the United Kingdom, unions have a much smaller equalizing effect on female wage inequality than male inequality. They estimated that shifts in union coverage among men in the United Kingdom can explain up to one-third of the rise in wage inequality there between 1983 and 1998, while in the United States the decline in unions can explain up to 40 percent of the rise in inequality. Consistent with findings in DFL and Card (2001) they concluded that changes in unionization had little net effect on female wage inequality in either country.

*Studies That Correct for Unobserved Skill Differences.* A potential problem with estimates of the equalizing effect of unions based on Eqs. (4′) or (4) is that union workers may be more or less productive than otherwise similar nonunion workers. In this case, comparisons of the mean and variance of wages for union and nonunion workers with the same observed skills confound the true "union effect" and unobserved differences in productivity. Traditionally, economists have argued that union workers are likely to have higher unobserved skills than their nonunion counterparts (Lewis, 1986). This prediction arises from the presumption that in a competitive environment, unionized employers will try to counteract the effect of above-market wage scales by hiring the most productive workers. If

total productivity of worker $i$ consists of an observed component $p_i$ and another component $a_i$ that is observed by labor market participants but unobserved by outside data analysts, and if an employer who if forced to pay a union wage $W^U$ hires only those workers with $p_i + a_i > W^U$, then $p_i$ and $a_i$ will be *negatively* correlated among those who are hired. Workers with the lowest observed skills will only be hired if they have relatively high unobserved skills, whereas even those with below-average unobserved skills will be hired if their observed skills are high enough. This line of reasoning suggests that the "flattening" of the wage structure in the union sector arises from selectivity bias, rather than from the wage policy of unions per se.

If unions really flatten the wage structure, however, then there is another side to the story, since highly skilled workers gain less from a union job. A worker with observed productivity skills $p_i$ and unobserved skills $a_i$ can expect to earn $p_i + a_i$ in a competitive labor market. Such a worker will only take a union job paying $W^U$ if $p_i + a_i < W^U$. In this case union members are negatively selected: Workers with the highest observed skills will only accept a union job if their unobserved skills are low. This view also implies that the wage structure in the union sector will appear "flatter" than the nonunion wage structure. Combining the two sides of the market, one might expect union workers with low unobserved skills to be positively selected, since for these workers the demand side is the binding constraint, whereas unionized job holders with high unobserved skills are negatively selected, since for these workers the supply side constraint is the more serious constraint.

Some evidence of this "two-sided" view of the determination of union status was developed by Abowd and Farber (1982), who used information on workers who reported that they would prefer a union job, as well as on those who held union jobs, to separate the roles of employer and employee choice. They found that workers with higher experience were less likely to want a union job (consistent with the idea that wages for highly experienced workers were relatively low in the union sector), but were more likely to be hired for a union job, conditional on wanting one (consistent with the idea that employers try to choose the most productive workers).

Several recent studies attempt to assess the effect of unions on the wage structure, while recognizing that union workers may be more or less productive than otherwise similar nonunion workers. Lemieux (1993) and Card (1996) measure the wage outcomes of job changers who move between the union and nonunion sectors, distinguishing between workers in groups defined by observed productivity characteristics. A limitation of

these studies is that they implicitly assume that the rewards for unobserved ability are similar in the union and nonunion sectors. Lemieux (1998) adopted a more general approach that allows the union sector to flatten the returns to unobserved ability relative to the nonunion sector.

Lemieux (1993) studied men and women in Canada in the late 1980s, and reported separate estimates of the effect of unions for three skill categories in the public and private sectors separately, and in the overall economy. For men, his results showed that unionized workers from the lowest skill group are positively selected (i.e., they have higher unobserved skills than do nonunion workers in the same group), whereas those in the upper skill groups are negatively selected. This result—which is consistent with a simple two-sided selection model—echoes a similar finding in Card (1996) for U.S. men in the late 1980s. An implication of this pattern is that the between-group "flattening effect" of unions apparent in the raw data is somewhat exaggerated, although there is still evidence that unions raise wages of low-skilled men more than those of high-skilled men. Lemieux also examined the changes in the variance of wages, and concluded that some of the apparent reduction in variance in the union sector may be due to selectivity, rather than to a within-sector flattening effect. Unfortunately, this inference is confounded by the potential selectivity of the group of union status changers, and the fact that the variability of wages may be temporarily high just before and just after a job change. Overall, Lemieux concluded that the presence of unions lowers the variance of male wages in Canada in the late 1980s by about 15 percent. A similar calculation for U.S. men, based on Card (1996), shows a 7 percent effect. These effects are somewhat smaller than corresponding estimates that fail to correct for unobserved heterogeneity.

Lemieux's findings for women in Canada were much different from those for men. In particular, neither the cross-sectional nor longitudinal estimates of the union wage gaps showed a systematic flattening effect of unions. Coupled with the fact that union coverage is lower for less skilled women, these results implied that unions raise the between-group variance of wages for women. This effect is larger than the modest negative effect on the within-group variance, so Lemieux's results imply that on net unions raised wage dispersion among Canadian women.

Lemieux (1998) presented an estimation method that accounts for the potential "flattening" effect of unions on the returns to individual skill characteristics that are constant over time but unobserved in conventional data sets. Using data on men who were forced to change jobs involuntarily, he concluded that unions tend to "flatten" the pay associated with

observed and unobserved skills. Moreover, the variance of wages around the expected level of pay is lower in the union sector. As a result of these tendencies, Lemieux's results implied that unionization reduced the variance of wages among Canadian men by about 17 percent—not far off the estimate in his 1993 study.

## 4 Estimating the Effect of Unions on Wage Inequality

*Data Sources.* We use a variety of micro data files to compare the effects of unions on wages in the United States, the United Kingdom, and Canada over the past 30 years. Our U.S. samples are the most straightforward, since the Current Population Survey (CPS) has been collecting data on wages and union status annually since 1973. We use the pooled May 1973 and May 1974 CPS samples as our first U.S. observation. For later years, we use the monthly earnings supplement files (the so-called outgoing rotation group) for 1984, 1993, and 2001. The earnings and union status information all pertain to an individual's main job as of the survey week.

In 1993 the United Kingdom's Labour Force Survey (UKLFS) began asking questions on union status and earnings that are comparable to the CPS questions. Strictly comparable data are unavailable for earlier years. The 1983 General Household Survey (GHS) is the only large-scale micro data set that contains information on union status and wages in the United Kingdom prior to the 1990s. While this data source has several limitations, we elected to combine the 1983 GHS with the 1993 and 2001 UKLFS samples for our UK analysis.

The Canadian Labour Force Survey (CLFS) added questions on earnings and union status in 1997. To supplement these data, we combine two smaller surveys—the 1991 and 1995 Surveys on Work Arrangements—as a source of information for the early 1990s, and the 1984 Survey of Union Membership as a source of information for the early 1980s. All three of these surveys were conducted as supplements to the regular CLFS.

In addition to the usual problems that arise in comparing survey responses over time and across countries, a significant issue for our analysis is the measurement of union status. The 1984 and later CPS files include questions on both union membership and union coverage. The 1973 and 1974 May CPS files, however, only ask about union membership. For comparability reasons, we therefore focus on union membership as our measure of union status in the United States. Our UK data sets include

data on union membership as well as responses to a question about whether there is a "union presence" at the individual's place of employment. As noted in Bland (1999, Table 6), however, the latter question significantly overstates coverage under collective bargaining agreements. As in our U.S. analysis, we therefore use union membership as our measure of unionization in the United Kingdom. With respect to Canada, consistent information on union membership cannot be recovered from the 1991 and 1995 SWAs, so we use union coverage as our measure of unionization in Canada. We believe that this choice has little effect on the results, since only about 2 percent of Canadian employees are covered by collective agreements but are not union members.[5]

In the data appendix we explain in detail how we process the various data sets to arrive at our final estimation samples. Generally speaking, our samples include only wage and salary workers age 16 to 64 (15 to 64 in Canada) with non-allocated wages and earnings (except in 1984 and 2001 in Canada). We use hourly wages for workers who are paid by the hour and compute average hourly earnings for the other workers by dividing weekly earnings by weekly hours (or earnings for a longer time period divided by the corresponding measure of hours). We also exclude workers with very low or very high hourly wage values. Sample weights are used throughout except in the 1983 GHS for which sample weights are not available.

To implement the methods developed in Section II, we divide workers in each sample into skill groups, based on age and educational attainment. The number of skill groups used varies by country, reflecting differences in the sample sizes and the age and education codes reported in the raw data files. In the earlier Canadian data sets, age is only reported in 10-year categories (a total of five categories for workers aged 15 to 64), and education can only be consistently coded into five categories. Thus we only use 25 skill groups for Canada. Given the small sample sizes available in the 1983 GHS and the 1993 UKLFS, we use the same number of skill groups for the United Kingdom (five age and five education groups). In our U.S. samples, we are able to use a much larger number of skill categories because of the larger sample sizes and detailed age and education

[5] In the 2001 CLFS, 2.4 percent of male workers and 1.9 percent of female workers were covered by collective bargaining but not members of a union. The two different measures of unionization lead to nearly identical estimates of the union wage premium in a conventional linear regression of wages on union status, education, and experience.

information in the CPS. We have re-analyzed the U.S. data using about the same number of skill groups as in Canada and the United Kingdom, however, and found that this has little impact on our results.

*Patterns of Union Coverage and Union Wage Effects.* To set the stage for our analysis it is helpful to begin by looking at how union coverage and the size of the union wage gap vary by skill level. Figures 1, 2, and 3 show

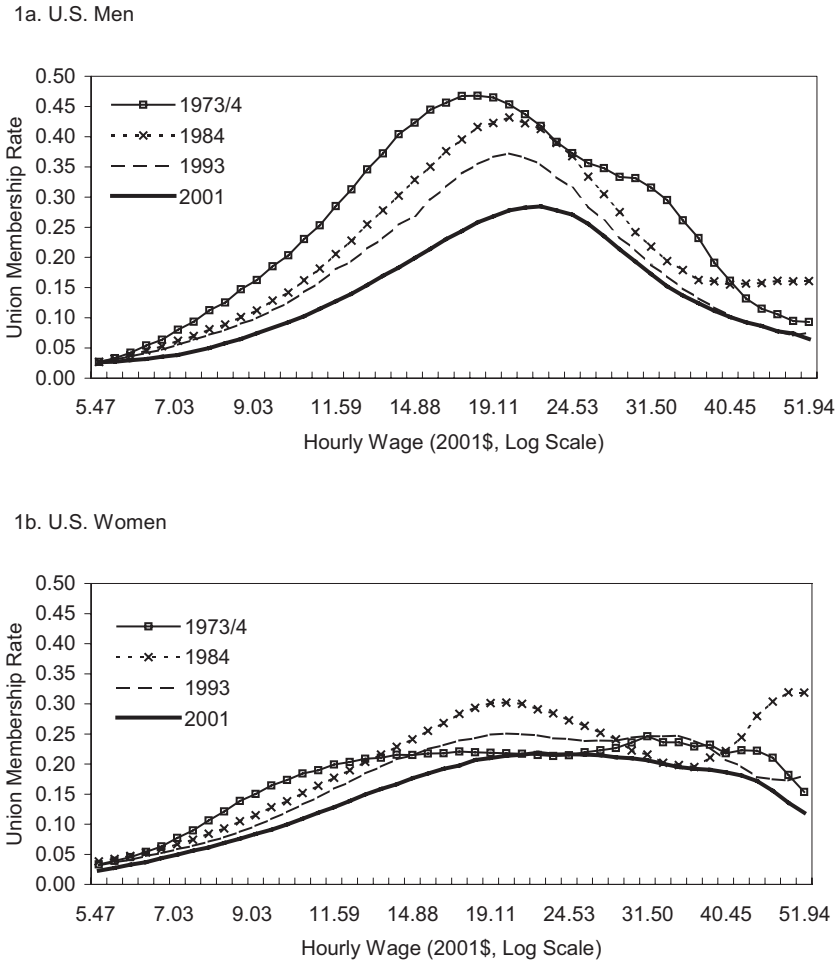
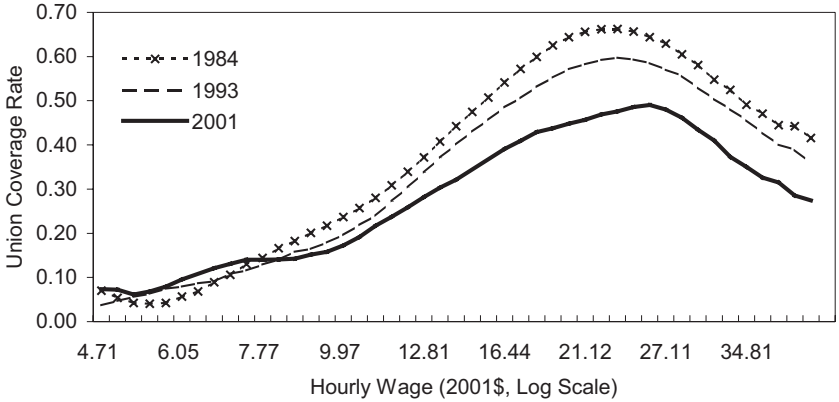



**Fig. 1** Unionization rate by wage level, United States

2a. Canadian Men




2b. Canadian Women

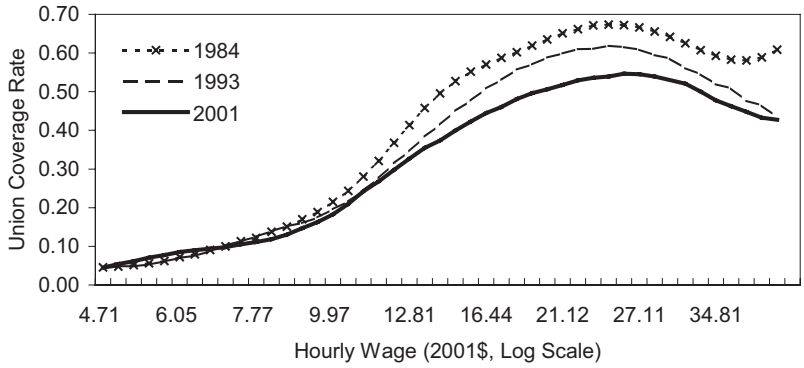
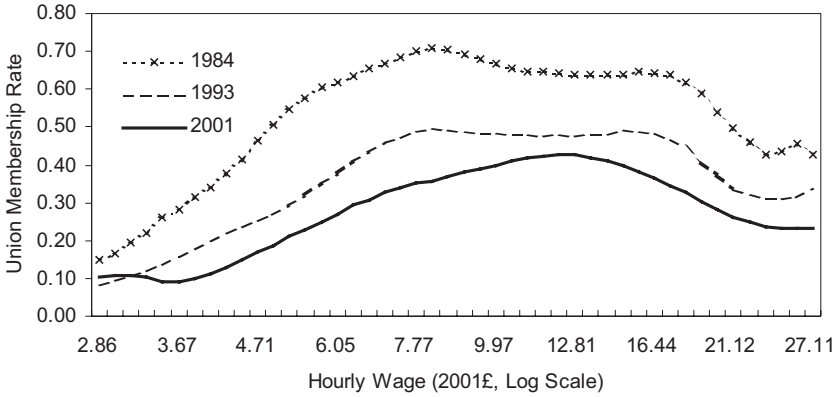



**Fig. 2** Unionization rate by wage level, Canada

3a. U.K. Men




3b. U.K. Women

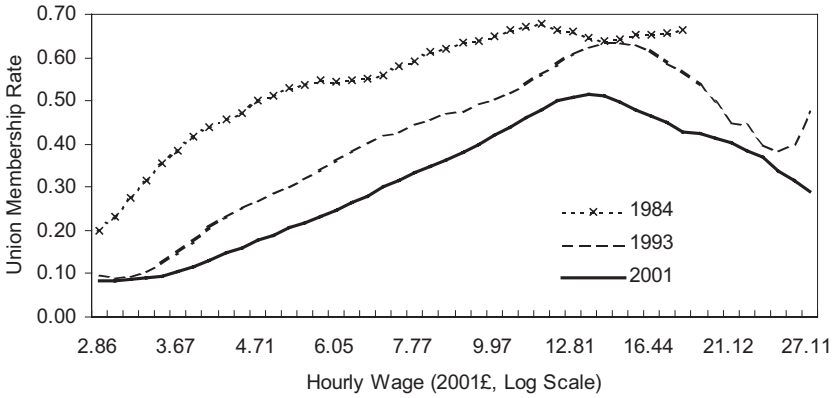



**Fig. 3** Unionization rate by wage level, United Kingdom

the unionization rates of men and women in the United States, the United Kingdom, and Canada, by the level of real hourly wages. These graphs are constructed by calculating union membership/coverage rates for workers

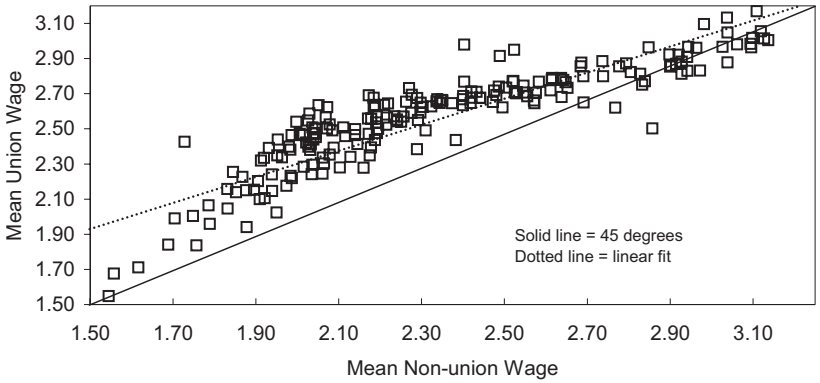
in narrow wage bins, and smoothing across bins.[6] In all three countries, unionization rates of men tend to follow a hump-shaped pattern, peaking for workers near the middle or upper middle of the wage distribution. By comparison, unionization rates of women in the United States and Canada are about the same for highly paid workers as for those in the middle. This pattern is driven in part by relatively high rates of unionization for teachers, nurses, and other public sector workers, who are near the top of the female wage distribution. In the United Kingdom there is more of a fall-off in union membership among the highest paid women, especially in the more recent data. Comparisons of the unionization rates in different years reveal the rapid decline in union membership among U.S. and UK men. Declines are also evident for Canadian men and for women in all three countries.

The framework developed in Section II suggests that the effect of unions on wage inequality depends in part on how the union wage gap varies by skill. Figures 4, 5, and 6 provide some simple evidence on this variation, using data from the early 1990s for the three countries. These figures plot mean wages for unionized workers in a given age-education group (i.e., $W^U(c)$ in the notation of Section II) against the corresponding mean for nonunion workers with the same skill level (i.e., $W^N(c)$) for 25 age-education groups in Canada and the United Kingdom, and about 150 groups in the United States. In interpreting these figures, note that if union and nonunion workers in a given skill group have the same average wages, the points in these graphs will lie on the 45-degree line. On the other hand, if the union wage gap $\Delta_w(c)$ is positive, the points will lie above the 45-degree line. Moreover, if $\Delta_w(c)$ is larger for lower wage workers, the points will tend to be further above the 45-degree line for low-wage skill groups (on the left side of the graph) than for high-wage groups (on the right). This is in fact the case for U.S. men. The best-fitting line relating $W^U(c)$ to $W^N(c)$ is also shown in the figure, and lies above the 45-degree line but with a slope of less than 1.

Interestingly, the same pattern is true for men in Canada and the United Kingdom, as shown in Figs. 5a and 6a. For skill groups with low average wages (e.g., less educated and relatively young men) the mean union wage tends to be substantially higher than the mean nonunion wage, while for groups with high average wages (e.g., middle-age college or university

[6] In the United States, for example, we use bins for the log hourly wage of width 0.05. We use smaller bins for our UK and Canadian samples.

4a. U.S. Men, 1993




4b. U.S. Women, 1993

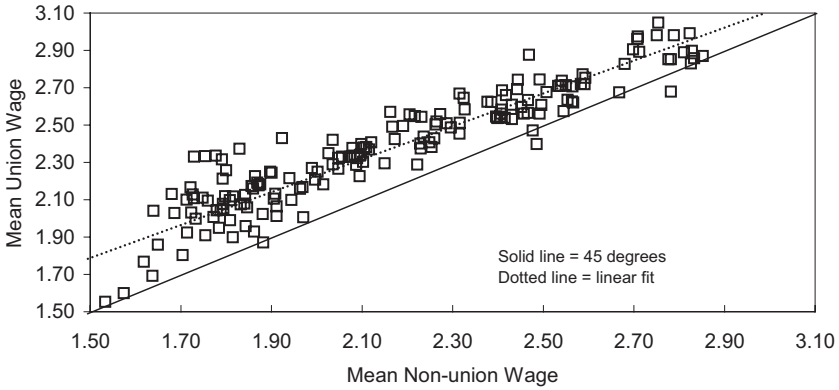
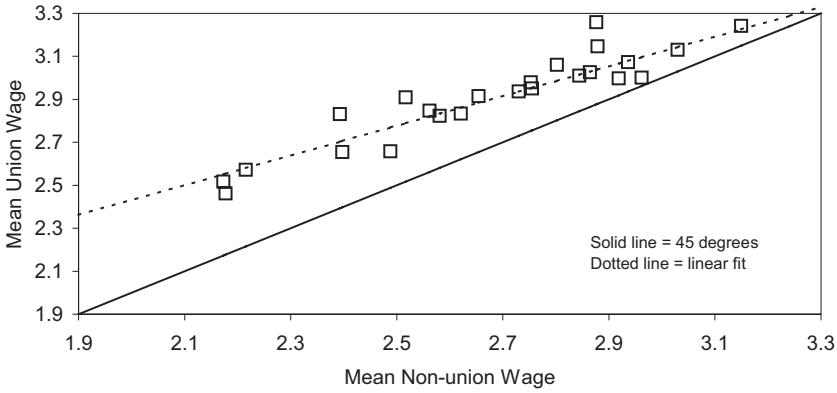



**Fig. 4** Union relative wage structure in the United States, 1993

graduates) the mean union wage is not too much above the mean non-union wage. Thus, in all three countries $\Delta_w(c)$ is larger for low-wage men than high-wage men, implying that unions tend to "flatten" wage differentials across skill groups. As previously discussed, one caveat to this conclusion is that there may be unobserved skill differences between union and nonunion workers in different age-education groups that tend to

5a. U.K. Men, 1993




5b. Canadian Women, 1991-1995

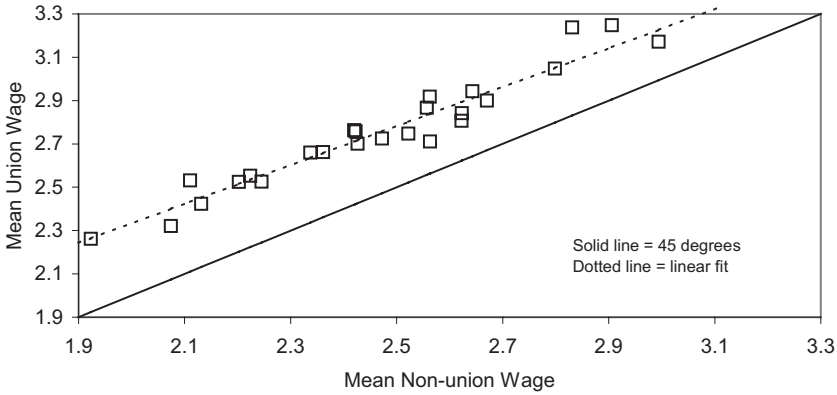
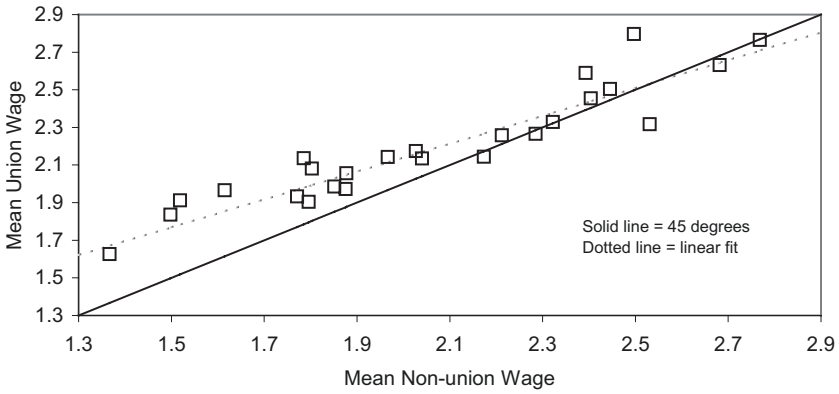



**Fig. 5** Union relative wage structure in Canada, 1991–1995

exaggerate the apparent negative correlation between wages in the nonunion sector and the union wage gap. We address this issue further in the next section.

For women, the patterns of union wages relative to nonunion wages are also remarkably similar in the three countries. Unlike the patterns for men,

6a. U.K. Men, 1993




6b. U.K. Women, 1993

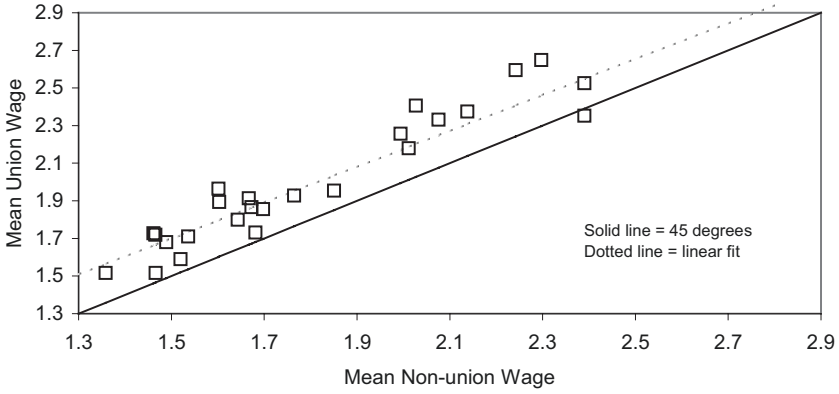



**Fig. 6** Union relative wage structure in the United Kingdon, 1993

however, the union wage gaps for women are roughly constant. Coupled with the tendency for unionization rates of women to rise across the wage distribution, the absence of a "flattening" effect of unions on female wages implies that covariance between the nonunion wage $W^N(c)$ and the union

wage gain $U(c)\Delta_w(c)$ is either zero or positive, limiting the potential equalizing effect of unions on female inequality.

Although the data in Figs. 4, 5, and 6 pertain to the early 1990s, similar plots from other years show that the basic patterns have been very stable in all three countries over the past 20–30 years. In all our sample years, the union-nonunion wage gap for men tends to be highest for the least skilled workers, and to be relatively small (or even negative) for highly skilled men. The union gap for women, on the other hand, tends to be stable or only slightly declining with skill level. The consistency of these patterns over time and across the three countries is remarkable.

*The Effect of Unions on Wage Inequality.* With this background, we turn to our analysis of the effect of unions on wage inequality in the three countries. Tables 1, 2, and 3 summarize a variety of facts about unionization and the structure of wages for the United States, Canada, and the United Kingdom, respectively. Reading across the columns of Table 1, a comparison of the entries in the first row confirms the steep decline in U.S. unionization rates documented in many studies. As illustrated in Figs. 1a and 1b, however, these aggregate figures hide a sharp difference between men and women. Between 1973 and 2001, the unionization rate of women declined only about 2 percentage points, from 14 to 12 percent, while for men it fell by 50 percent, from 31 to 15 percent. This sharp male-female difference has much to do with the gradual shift of unionization from the private to the public sector. For instance, Card (2001) showed that for both men and women, unionization rates declined by about 50 percent in the private sector between 1973 and 1993. During the same period, however, unionization rates increased sharply in the public sector. Women in general, and unionized women in particular, are much more concentrated in the public sector than their male counterparts. As a result, the rise in public sector unionism has largely offset the decline in private sector unionization among women.

The trends in unionization in Canada between 1984 and 2001 (Table 2) are similar to those in the United States. The male unionization rate declined by 14 percentage points, even more than the 9 percentage point decline in the United States over the same period. As in the United States, the decline for women was more modest (4 percentage points). The drop in unionization in our Canadian samples is much steeper than the decline registered in membership tallies obtained from union reports, but is

**Table 1** Effect of unions on wage structure of U.S. workers, 1973–2001

| | *1973/1974* | | *1984* | | *1993* | | *2001* | |
|---|---|---|---|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* |
| Fraction union members | 0.307 | 0.141 | 0.236 | 0.141 | 0.185 | 0.132 | 0.149 | 0.121 |
| *Mean log wages (2001$):* | | | | | | | | |
| Nonunion workers | 2.646 | 2.270 | 2.573 | 2.276 | 2.535 | 2.337 | 2.667 | 2.457 |
| Union workers | 2.841 | 2.499 | 2.866 | 2.605 | 2.838 | 2.686 | 2.899 | 2.761 |
| Union gap (unadjusted) | 0.196 | 0.230 | 0.293 | 0.329 | 0.304 | 0.349 | 0.233 | 0.305 |
| Union gap (adjusted) | 0.185 | 0.220 | 0.208 | 0.228 | 0.210 | 0.210 | 0.156 | 0.149 |
| *Standard deviation log wages:* | | | | | | | | |
| Nonunion workers | 0.553 | 0.442 | 0.563 | 0.467 | 0.594 | 0.515 | 0.601 | 0.538 |
| Union workers | 0.354 | 0.383 | 0.363 | 0.408 | 0.399 | 0.444 | 0.417 | 0.460 |
| Union gap | –0.198 | –0.059 | –0.199 | –0.058 | –0.194 | –0.071 | –0.184 | –0.077 |
| *Variance decomposition:* | | | | | | | | |
| Overall variance | 0.258 | 0.195 | 0.289 | 0.223 | 0.331 | 0.270 | 0.340 | 0.289 |
| *Two-sector model* | | | | | | | | |
| Within-sector effect | –0.055 | –0.007 | –0.044 | –0.007 | –0.036 | –0.009 | –0.028 | –0.009 |
| Between-sector effect | 0.008 | 0.006 | 0.015 | 0.013 | 0.014 | 0.014 | 0.007 | 0.010 |
| Total effect | –0.047 | 0.000 | –0.028 | 0.006 | –0.022 | 0.005 | –0.021 | 0.001 |
| *Model with skill groups* | | | | | | | | |
| Within-sector effect | –0.022 | –0.006 | –0.020 | –0.007 | –0.018 | –0.009 | –0.013 | –0.009 |
| Between-sector effect | 0.007 | 0.004 | 0.010 | 0.008 | 0.012 | 0.011 | 0.004 | 0.008 |
| Dispersion across groups | –0.011 | 0.001 | –0.007 | 0.000 | –0.008 | –0.003 | –0.006 | –0.005 |
| Total effect | –0.026 | 0.000 | –0.017 | 0.001 | –0.014 | –0.001 | –0.015 | –0.007 |
| Sample size | 43,189 | 30,500 | 77,910 | 69,635 | 71,719 | 69,723 | 55,813 | 55,167 |
| Number of skill groups | 180 | 180 | 343 | 343 | 244 | 246 | 245 | 246 |

Note: Samples include wage and salary workers age 16–64 with non-allocated hourly or weekly pay, and hourly wages between $2.00 and $90.00 per hour in 1989 dollars

**Table 2** Effects of unions on wage structure of Canadian Workers, 1984–2001

| | *1984* | | *1991–1995* | | *2001* | |
|---|---|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* |
| Fraction union workers | 0.467 | 0.369 | 0.408 | 0.353 | 0.330 | 0.317 |
| *Mean log wages (2001$)* | | | | | | |
| Nonunion workers | 2.658 | 2.365 | 2.661 | 2.452 | 2.728 | 2.495 |
| Union workers | 2.987 | 2.793 | 2.972 | 2.851 | 2.964 | 2.853 |
| Union gap (unadjusted) | 0.330 | 0.428 | 0.311 | 0.398 | 0.236 | 0.358 |
| Union gap (adjusted) | 0.251 | 0.321 | 0.204 | 0.275 | 0.153 | 0.226 |
| *Standard deviation log wages:* | | | | | | |
| Nonunion workers | 0.528 | 0.446 | 0.514 | 0.465 | 0.501 | 0.463 |
| Union workers | 0.343 | 0.368 | 0.362 | 0.380 | 0.386 | 0.395 |
| Union gap | –0.185 | –0.078 | –0.152 | –0.084 | –0.115 | –0.068 |
| *Variance decomposition:* | | | | | | |
| Overall variance | 0.231 | 0.218 | 0.233 | 0.227 | 0.229 | 0.224 |
| *Two-sector model* | | | | | | |
| Within-sector effect | –0.075 | –0.023 | –0.054 | –0.025 | –0.034 | –0.019 |
| Between-sector effect | 0.027 | 0.043 | 0.023 | 0.036 | 0.012 | 0.028 |
| Total effect | –0.048 | 0.019 | –0.031 | 0.011 | –0.021 | 0.009 |
| *Model with skill groups* | | | | | | |
| Within-sector effect | –0.041 | –0.027 | –0.033 | –0.028 | –0.025 | –0.022 |
| Between-sector effect | 0.017 | 0.022 | 0.010 | 0.017 | 0.006 | 0.012 |
| Dispersion across groups | –0.014 | 0.014 | –0.002 | 0.014 | 0.001 | 0.013 |
| Total effect | –0.037 | 0.009 | –0.025 | 0.002 | –0.017 | 0.003 |
| Sample size | 17,737 | 15,356 | 17,981 | 18,323 | 24,003 | 23,703 |
| Number of skill groups | 25 | 25 | 25 | 25 | 25 | 25 |

Note: Samples include wage and salary workers age 15–64 with allocated hourly or weekly pay (except in 1991–95), and hourly wages between $2.50 and $44.00 per hour in 2001 dollars

consistent with the trends reported by Riddell and Riddell (2001) based on similar micro-data sources.

Table 3 shows that unionization rates have also fallen sharply in the United Kingdom in the past two decades: by 27 percentage points for men and by 14 percentage points for women. As in the United States and Canada, the faster decline in male unionization is linked to the relative shift of unionization from the private to the public sector (Gosling & Lemieux, 2001). In the United Kingdom, this shift was compounded by privatization of many nationalized industries, which transferred sizeable numbers of mainly male workers from the unionized public sector to the

**Table 3** Effects of unions on wage structure of UK workers, 1983–2001

| | *1983* | | *1993* | | *2001* | |
|---|---|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* | *Male* | *Female* |
| Fraction union workers | 0.570 | 0.426 | 0.392 | 0.337 | 0.307 | 0.285 |
| *Mean log wages (2001£):* | | | | | | |
| Nonunion workers | 1.843 | 1.416 | 2.036 | 1.705 | 2.170 | 1.873 |
| Union workers | 2.053 | 1.685 | 2.224 | 2.047 | 2.306 | 2.167 |
| Union gap (unadjusted) | 0.210 | 0.269 | 0.188 | 0.342 | 0.135 | 0.294 |
| Union gap (adjusted) | 0.162 | 0.195 | 0.131 | 0.184 | 0.045 | 0.137 |
| *Standard deviation of log wages:* | | | | | | |
| Nonunion workers | 0.532 | 0.412 | 0.586 | 0.499 | 0.588 | 0.510 |
| Union workers | 0.382 | 0.399 | 0.438 | 0.475 | 0.442 | 0.468 |
| Union gap | –0.150 | –0.013 | –0.148 | –0.024 | –0.146 | –0.043 |
| *Variance decomposition:* | | | | | | |
| Overall variance | 0.216 | 0.183 | 0.293 | 0.268 | 0.303 | 0.266 |
| *Two-sector model* | | | | | | |
| Within-sector effect | –0.078 | –0.004 | –0.059 | –0.008 | –0.046 | –0.012 |
| Between-sector effect | 0.011 | 0.018 | 0.008 | 0.026 | 0.004 | 0.018 |
| Total effect | –0.067 | 0.013 | –0.051 | 0.018 | –0.042 | 0.006 |
| *Model with skill groups* | | | | | | |
| Within-sector effect | –0.034 | –0.023 | –0.031 | –0.028 | –0.032 | –0.025 |
| Between-sector effect | 0.009 | 0.011 | 0.006 | 0.008 | 0.002 | 0.005 |
| Dispersion across groups | –0.026 | 0.009 | –0.016 | 0.012 | –0.013 | 0.010 |
| Total effect | –0.050 | –0.003 | –0.041 | –0.008 | –0.042 | –0.010 |
| Sample size | 4435 | 3512 | 4009 | 4139 | 7548 | 8113 |
| Number of skill groups | 25 | 25 | 25 | 25 | 25 | 25 |

Note: Samples include wage and salary workers age 15–64 with non-missing hourly or weekly pay, and hourly wages between £1.50 and £50.00 per hour in 2001 pounds

much less organized private sector (Gosling & Lemieux, 2001). Interestingly, the relatively faster decline of male unionization in the three countries meant that by 2001, male and female unionization rates were not too different in the United States, Canada, or the United Kingdom. This near equality marks a sharp departure from the historical pattern of greater unionization among men.

The next set of rows in Tables 1, 2, and 3 show the evolution of mean wages of nonunion and union workers and the trend in the union wage gap. We also report an adjusted wage gap, calculated from a regression that includes dummies for each skill category. As in the case for the unionization rates, the estimated wage gaps show a remarkably similar pattern

across the three countries. The unadjusted wage gaps tend to be larger for women than for men. The adjusted wage gaps are uniformly smaller than the unadjusted gaps, and in all three countries the divergence has increased over time, implying that union membership rates have fallen more for relatively unskilled workers (as is apparent in Figs. 1, 2, and 3).

Like the unadjusted union wage gap, the adjusted wage gap is typically larger for women than for men. Nevertheless, gender differences in the adjusted gaps are less pronounced than the corresponding differences in the unadjusted gaps, especially in more recent years. For example, the unadjusted wage gaps in the United States in 2001 were 0.233 for men and 0.305 for women, versus adjusted wage gaps of 0.156 and 0.149. This pattern is consistent with Figs. 1, 2, and 3, which show that unionized women are more highly concentrated in the upper end of the skill distribution than unionized men. As a result, controlling for the skill composition of the work force reduces the union wage gap far more for women than for men.

Another trend that is shared by all three countries is a gradual decline in the adjusted union wage gap, by 5 to 10 percentage points (depending on gender and country) between the early 1980s and 2001. Since the rate of unionization also declined sharply during this period, the implied effect of unions on average wages—the union wage gain $E[U(c)\Delta_w(c)]$—has declined dramatically over the last two decades. For example, the adjusted impact of unions on male wages in the United Kingdom went from 9.2 percentage points in 1983 (unionization rate of 0.57 times an adjusted gap of 0.162) to 1.7 percentage points in 2001 (0.307 times 0.045). In the United States, the effect on average wages of men fell from 5.7 percentage points (unionization rate of 0.307 times an adjusted gap of 0.185) to 2.3 percent in 2001 (0.149 times 0.156).

The next rows in Tables 1, 2, and 3 report measures of wage dispersion within the union and nonunion sectors. Once again, the results are remarkably consistent across countries. As first documented in Freeman (1980), the standard deviation of wages is always smaller in the union than in the nonunion sector. Moreover, the gap between the standard deviation in the union and nonunion sector is always larger for men than for women. These observations are confirmed by Figs. 7, 8, 9, 10, 11, and 12, which show kernel density estimates of the densities of log hourly wages in the union and nonunion sectors, and for the two sectors pooled together, by

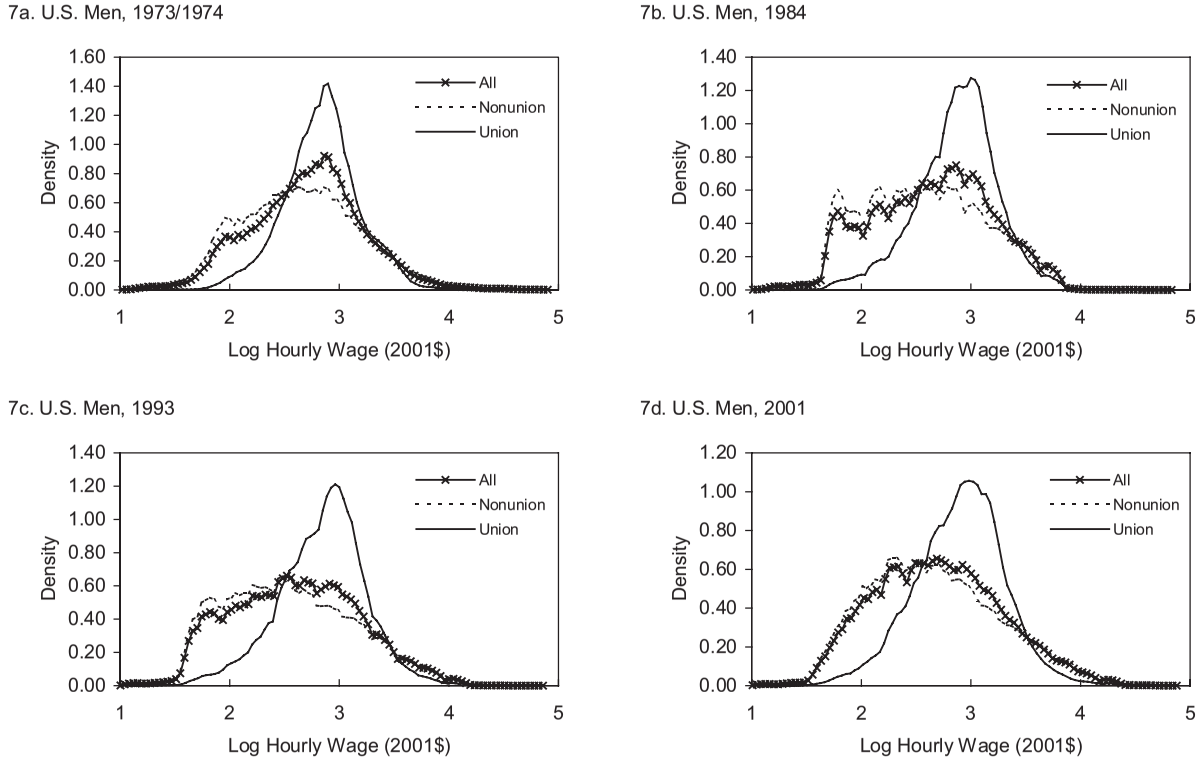



**Fig. 7** Density of wages, U.S. males

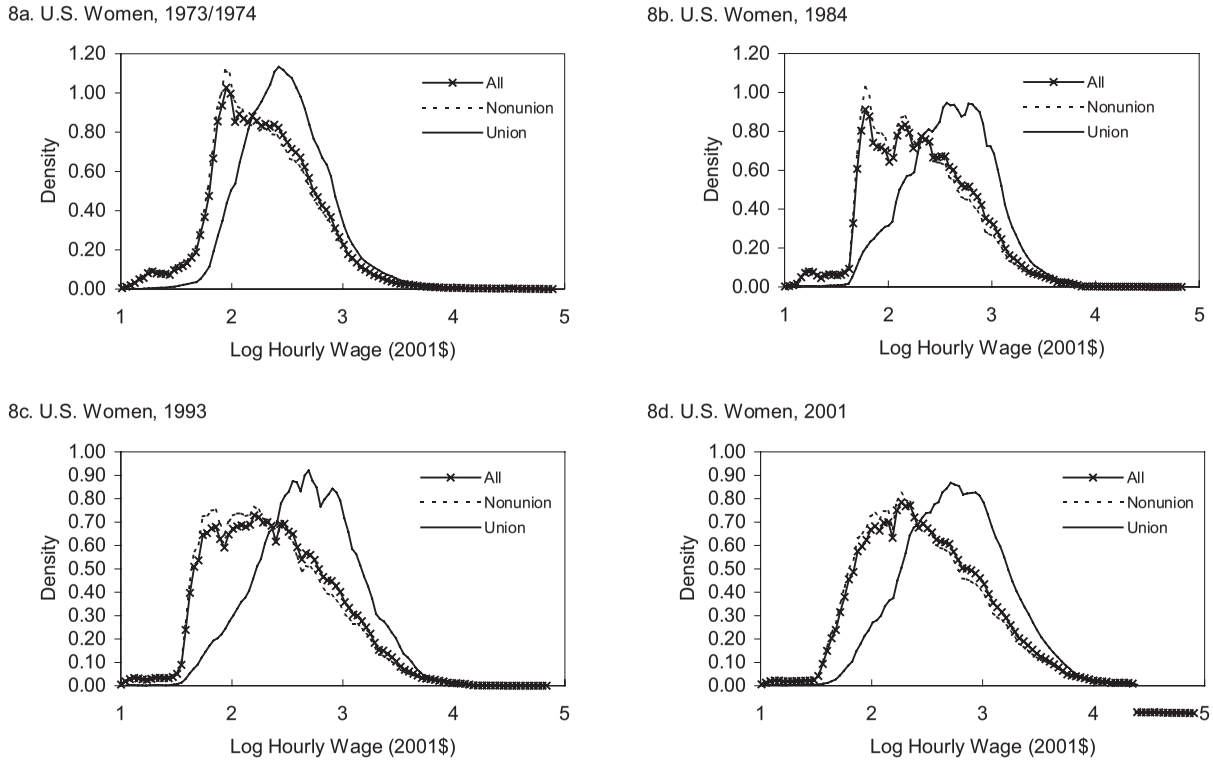
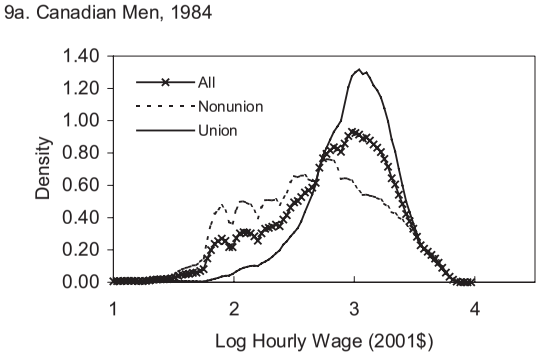
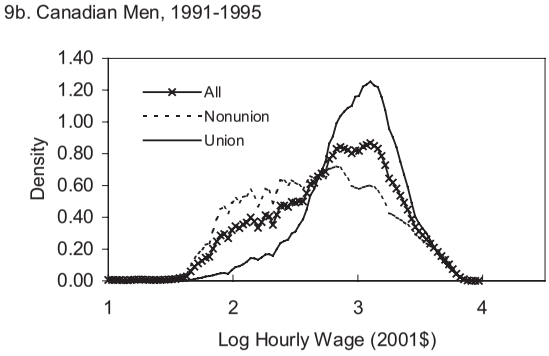



**Fig. 8** Density of wages, U.S. females



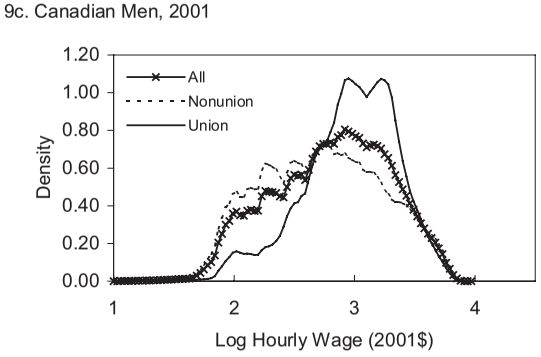




**Fig. 9** Density of wages, Canadian males

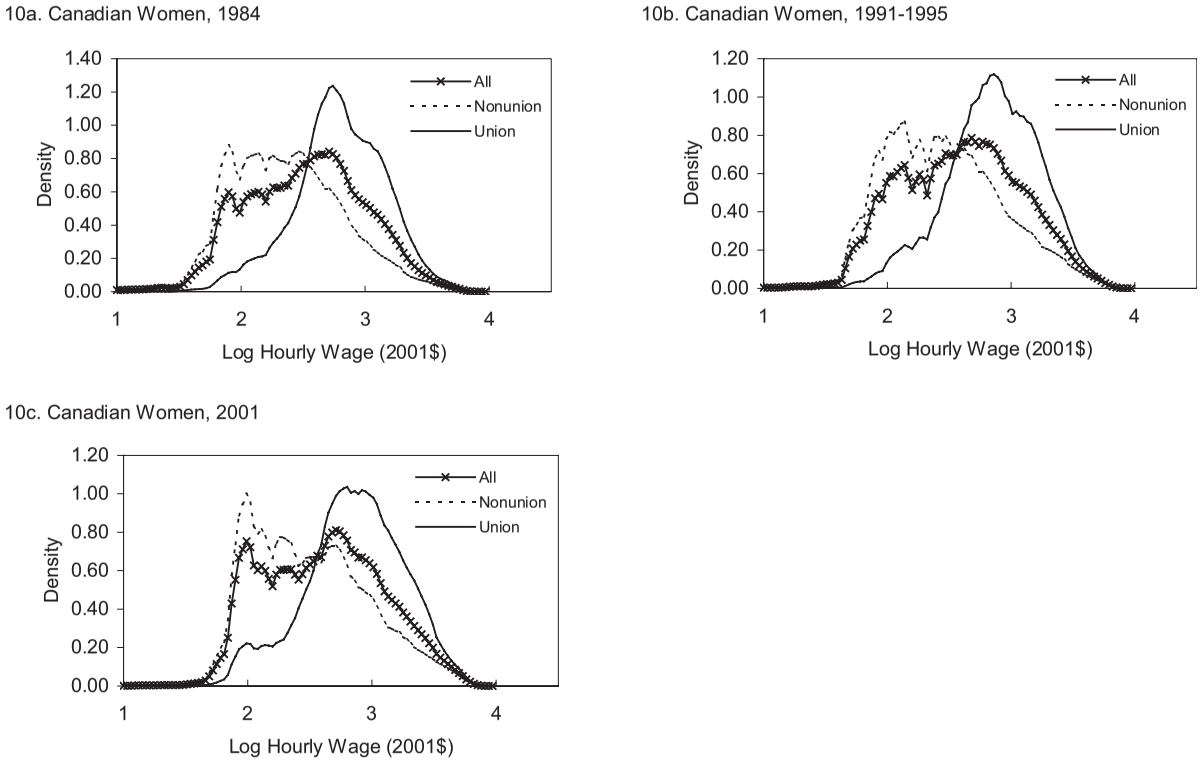
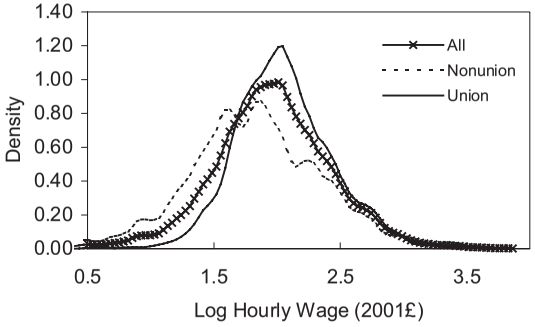
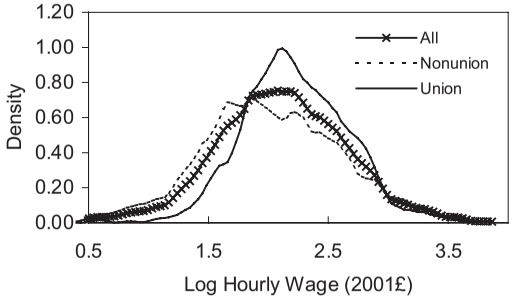



**Fig. 10** Density of wages, Canadian females

11a. U.K. Men, 1984




11b. U.K. Men, 1993




11c. U.K. Men, 2001

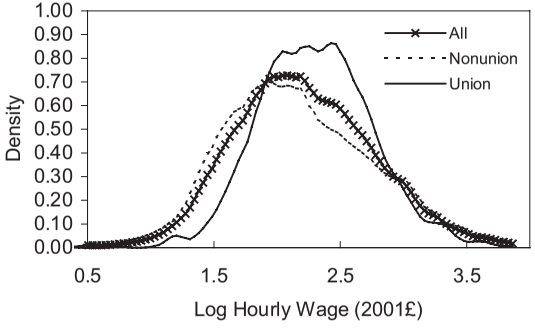



**Fig. 11** Density of wages, UK males

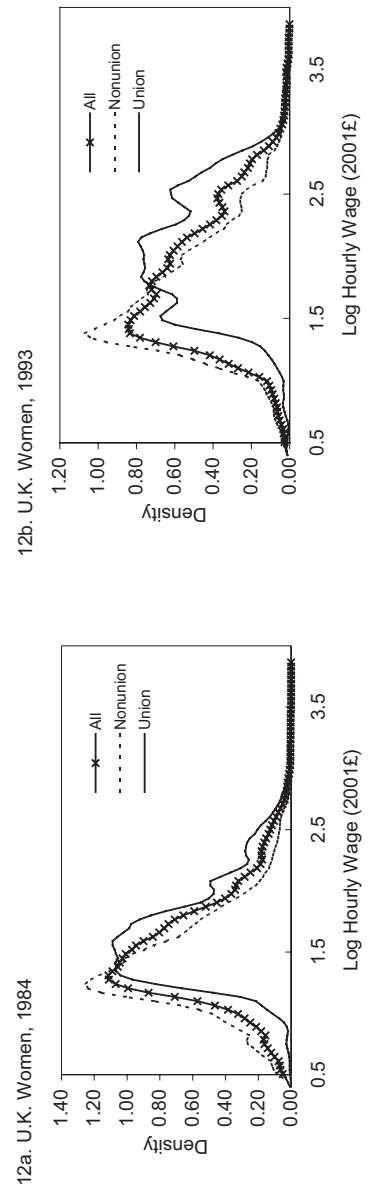



**Fig. 12** Density of wages, UK females

gender and time period.[7] For example, Fig. 7 displays the wage distribution for U.S. males. In all four time periods, wages are more tightly distributed in the union than the nonunion sector. In particular, while the upper tails of the union and nonunion densities look qualitatively similar, the lower tail goes much further to the left in the nonunion sector. By contrast, the inter-sectoral differences in wage dispersion are much less striking for U.S. women (Fig. 8). In 1984, for example, the union and nonunion distributions show different skewness, and average wages are higher in the union sector. However, whether wages are more narrowly distributed in the union or nonunion sector is unclear.

Inspection of Figs. 7 and 8 (and the corresponding figures for Canada and the United Kingdom) suggests that the minimum wage is an important factor in explaining overall trends in wage inequality, particularly for nonunion female workers.[8] An interesting conjecture is that unions appear to have a more limited effect on the dispersion of female wages in part because minimum wages limit the amount of dispersion in the lower tail of the female wage distribution.

The wage densities for Canadian men (Fig. 9) and women (Fig. 10) are qualitatively similar to those in the United States. In particular, it is clear that male wages are more narrowly distributed in the union sector than the nonunion sector. Things are not as clear for women, in part because of the minimum wage, which has a surprisingly large visual impact in the nonunion sector, especially in 2001. Relative to the United States or Canada it is more difficult to see union wage compression effects for UK males (Fig. 11) or females (Fig. 12). Comparing the reported standard deviations of wages in the two sectors in Table 3, however, the union-nonunion gaps are nonetheless quite similar to those in Canada or the United States.

The bottom rows of Tables 1, 2, and 3 show the various components of our analysis of the effect of unions on wage inequality. For reference purposes, we first present a simplified analysis based on the two-sector model that ignores any differences across skill groups (Eq. (4′)). Comparing the results across countries and over time, the results from this simplified analysis are remarkably consistent. For men, the within-sector effect is

[7] The densities are estimated using a bandwidth of 0.05. See DiNardo et al. (1996) for more detail.

[8] This is similar to DiNardo et al. (1996) who showed that the minimum wage has a much larger impact on women than on men.

substantially larger (in absolute value) than the between-sector effect, implying that unions reduce wage dispersion. Relative to the overall variance, the compression effect ranges from 31 percent in the United Kingdom in 1984, when the unionization rate was 57 percent, to 6 percent in the United States in 2001 (unionization rate of 15 percent). More generally, the compression effect of unions is highly correlated with the overall level of unionization.[9]

In contrast to the situation for men, the simplified analysis of Eq. (4′) implies that unions have either no effect on female wage inequality, or a slightly disequalizing effect. This contrast is attributable to three complementary factors. First, the female unionization rate is lower, reducing the size of the within-sector effect. Second, the gap in overall wage dispersion between union and nonunion workers is much smaller for women than men. Third, the union wage gap is systematically larger for women than men, yielding a larger (more positive) between-sector effect $U(1-U)\Delta_w^2$. Indeed, in the later years of our analysis, the between-sector effect dominates in all three countries. Consistent with findings reported in Card (2001) and Lemieux (1993), unions thus tend to increase the variance of wages among women.

The final rows in Tables 1, 2, and 3 show the effect of unions on the variance of wages when we distinguish among skill groups. Recall from Eq. (4) that this analysis includes three components: an average within-sector effect, $\mathrm{E}[U(c)\Delta_v(c)]$, an average between-sector effect, $\mathrm{E}[U(c)(1 - U(c))\Delta_w(c)^2]$, and the sum of two "between-skill-group" terms, $\mathrm{Var}[U(c)\Delta_w(c)] + 2\,\mathrm{Cov}[W^N(c), U(c)\Delta_w(c)]$, that reflect the rise in inequality between groups if the union wage gain varies by skill group and any tendency of unions to raise wages more or less for higher wage workers.

Starting with men, the introduction of controls for observable skill systematically reduces the magnitudes of both the within- and between-sector effects. It is easy to see why this happens in the case of the between-sector effect. As noted earlier, adjusting for characteristics reduces the union wage gap, and thus decreases the size of the between-group effect. In other words, part of the measured between-sector effect in the simple two-sector calculation is a spurious consequence of that fact that union workers are more skilled, on average, than nonunion workers. A similar reasoning can be used to understand why the within-group effect

[9] The derivative of the right hand side of Eq. (4′) with respect to the unionization rate is $\Delta_v + (1-2U)\Delta_w^2$. This is negative as long as $\Delta_v$ is large relative to $\Delta_w^2$.

also declines when differences in observed skills are taken into account. Recall from Figs. 1a, 2a, and 3a that unionized men are more concentrated in the middle of the wage distribution than nonunion men. Part of the lower dispersion of wages in the union sector is thus a spurious consequence of the fact that union workers are more homogenous.

Interestingly, adjusting for observed skill characteristics also reduces the magnitude of the between-sector effect for women but increases (or leaves unchanged in the United States) the magnitude of the within-group effect. The latter finding means that union women are no more homogenous (in terms of their observable skills) than their nonunion counterparts, which is consistent with the evidence reported in Figs. 1b, 2b, and 3b. Once worker characteristics are taken into account, the within-sector effect tends to dominate the between-sector effect for both men and women. Thus, the results from a simplified analysis which ignores measured skill differences tend to overstate male-female differences in the effect of unions on wage inequality.

The final components of the union effect are the two terms which reflect the effect of unions on the distribution of wages across skill groups. As highlighted in our discussion of Figs. 4, 5, and 6, the union wage effect $\Delta_w(c)$ is systematically lower for high-wage men, inducing a negative covariance between $W^N(c)$ and $U(c)\Delta_w(c)$. By contrast, the wage gap for women is not much lower for high-wage groups, and the higher unionization rate for those groups induces a positive covariance between $W^N(c)$ *and* $U(c)\Delta_w(c)$.

The results in Tables 1, 2, and 3 are broadly consistent with this prediction. As expected, unions tend to reduce wage dispersion across skill groups for men (except in recent years in Canada where the effect is essentially zero). Also as expected, unions tend to increase wage dispersion across skill groups for women in Canada and the United Kingdom. In the United States, however, unions have little effect on female wage dispersion across skill groups from 1973 and 1993 and actually reduce wage dispersion in 2001. A natural explanation for the difference between the United States on one hand, and Canada and the United Kingdom, on the other, is that the union wage gap for U.S. women tends to decline slightly with higher nonunion wages (see Fig. 4b). This lowers the covariance between $W^N(c)$ and $U(c)\Delta_w(c)$ for U.S. women relative to the other two countries.

Once all three factors are taken into consideration, our calculations show that unions systematically reduce the variance of wages for men. By

contrast, the effects for women tend to be small and slightly positive (i.e., unions raise inequality). This pattern of result is quite similar to what we found with the simpler model, though the magnitude of the effects tends to be smaller when we control for worker's characteristics.

*Biases from Unobserved Heterogeneity.* As noted earlier, a potential problem with estimates of the equalizing effect of unions based on Eq. (4) or (4′) is that union workers may be more or less productive than otherwise similar nonunion workers. In this case, comparisons of the mean and variance of wages for union and nonunion workers with the same observed skills confound the true union effect and unobserved differences in productivity. Studies by Lemieux (1993), Card (1996), and Lemieux (1998) have attempted to use data on job changers to measure the extent to which union and nonunion workers in different skill groups have different unobserved productivity characteristics.[10] The two Lemieux studies analyzed data for men and women in Canada, while Card examined data for men in the United States. All three studies found that among North American men, unions tend to raise wages more for less skilled workers, but that simple comparisons which ignore unobserved skill components tend to *overstate* the flattening effect. Lemieux's results for Canadian women, on the other hand, show little evidence of flattening, either in simple cross-sectional comparisons or in more sophisticated longitudinal estimators. Lemieux (1998) also used longitudinal data to examine the apparent effect of unions on the dispersion of wages controlling for observed and unobserved skill components. This analysis suggested that some of the apparent reduction in variance in the union sector may be due to selectivity, rather than to a within-sector effect. Unfortunately, this inference is confounded by the potential selectivity of the group of union-status changers, and the fact that the variability of wages may be temporarily high just before and just after a job change. Overall, Lemieux (1998) concluded incorporating unobserved heterogeneity effects leads to a small reduction in the apparent effect of unions on male wage inequality. A similar conclusion was reached in Card (1996).

Based on these findings, we conclude that the estimates of the equalizing effect of unions on male workers in the United States, Canada, and the United Kingdom in Tables 1, 2, and 3 are likely to slightly *overstate* the true equalizing effects. For women, the estimated effects in Tables 1,

[10] Taking a more direct approach, Hirsch and Schumacher (1998) examined test-score data and found that union members with high measured skills had relatively low test scores.

2, and 3 are very small anyway, and the existing longitudinal research suggests there is no important bias.

*Unions and Differences in the Trends in Wage Inequality.* To what extent can changes in the strength of unions explain the evolution of wage inequality over time and the differences in inequality across countries? In light of the results of Tables 1, 2, and 3, we look at this question for men only since unions appear to have little effect on wage inequality for women.[11] Starting with the United States, Table 1 shows that the variance of male wages increased from 0.258 to 0.340 (a rise of 0.082) between 1973/1974 and 2001. During the same period, the effect of unions on the variance of wages computed using the simplified model declined from -0.047 to -0.021 (a rise of 0.026). If this effect had remained constant over time, overall wage inequality would have grown by 31 percent less (0.026/0.082) than it actually did. The contribution of unions to the growth of inequality remains important though only about one-half as big (14 percent) when we use the more sophisticated estimates of the union effect that control for observable skills.

The results for the United Kingdom are qualitatively similar. Between 9 and 29 percent of the 0.087 growth in the variance of log wages between 1983 and 2001 can be accounted for by the decline in union compression effects. Furthermore, in both the United States and UK union wage compression effects remained relatively constant between 1993 and 2001. In particular, the effects from the analysis that controls for workers' characteristics are essentially unchanged in the period from 1993 to 2001. This is consistent with the slowdown in the growth of inequality in both countries in the 1990s, relative to the 1980s.

As in the United States and United Kingdom, the union wage compression effect has been steadily declining for Canadian men since 1984. Unlike the United States and the United Kingdom, however, overall inequality has remained very stable in Canada over time, so overall inequality would have actually declined if union wage impacts had remained at their 1984 levels. Several developments may have offset the pressures toward increased inequality associated with the decline in union strength. The real minimum wage in Canada rose from the mid-1980s to the late-1990s, in contrast to the situation in the United States where the real

[11] DiNardo et al. (1996), Card (2001), and Gosling and Lemieux (2001) all concluded that de-unionization explains very little of the increase in wage inequality among women in the United States or United Kingdom.

minimum wage was approximately constant over this period (Kuhn, 2000). In addition, there is some evidence that the much more rapid growth in educational attainment in Canada compared to the United States during the 1980s and 1990s reduced the tendency for widening earnings differentials between less educated and more educated workers (Murphy et al., 1998).

Turning to cross-country differences in wage inequality, first note that in 1983/1984 the variance of wages was lowest in the United Kingdom (0.216) followed by Canada (0.231) and the United States (0.289). By contrast, union wage compression effects (from the model that controls for skill differences) were highest in the United Kingdom (–0.050), followed by Canada (–0.037) and the United States (–0.017). The pattern of cross-country differences in wage inequality is thus consistent with the pattern of union wage compression effects. For instance, differences in union wage compression effects account for 45 percent of the UK–U.S. difference in the variance of wages in the early 1980s. By 2001, the U.S.–UK difference in the variance of wages had fallen to 0.037, while the U.S.–UK difference in the union compression effect had fallen to 0.027. This indicates that over 70 percent of the difference in wage inequality can now be explained by union wage compression effects. In 2001, however, union wage compression effects cannot account for the much lower variance of wages in Canada.

In summary, union wage compression effects help explain a reasonable fraction of the secular growth in male wage inequality and of cross-country differences in male wage inequality. One exception is the surprising lack of growth in male wage inequality in Canada relative to the other two countries. An assessment of the relative importance of the various influences on wage inequality among Canadian men is a worthwhile subject for future research.

## 5 Summary and Conclusions

The impact of unions on the structure of wages has recently attracted renewed interest as analysts have struggled to explain the rise in earnings inequality in several industrialized countries. Canada, the United Kingdom, and the United States provide a potentially valuable set of countries for examining this question. All three countries now collect comparable data on wages and union status in their regular labor force surveys. Several features of the collective bargaining institutions of these countries make them

suitable for studying the relationship between unions and wage inequality. Bargaining is highly decentralized; there are no general mechanisms for extending collective bargaining provisions beyond the "organized" sector; and the fraction of the work force covered by collective bargaining is relatively modest. Thus it is possible to compare the structure of wages for workers covered by union contracts to those who are not covered, and potentially infer the effect of unions on overall wage inequality.

A number of previous studies, including Freeman (1980, 1982, 1984, 1993), Lemieux (1993), Card (1996, 2001), DiNardo et al. (1996), DiNardo and Lemieux (1997), Machin (1997), and Gosling and Lemieux (2001), have examined the relationship between unionization and wage inequality in these countries individually or in country pairs. Most of the previous work has focused on men and on the 1970s and 1980s. One contribution of this study is to provide a comprehensive analysis of the evolution of unionization and wage inequality for both men and women in all three countries over the past two to three decades. Following the approach developed in Lemieux (1993) and Card (1996), we also take into account variation in collective bargaining coverage and union wage impacts across workers with different levels of observable skills.

In his landmark paper, Freeman (1980) concluded that, overall, unions tend to reduce wage inequality among men because the inequality-increasing "between-sector" effect is smaller than the dispersion-reducing "within-sector" effect. Our analysis indicates that this finding is very robust across countries (United States, United Kingdom, and Canada) and time periods (from the early 1970s to 2001). Controlling for worker characteristics alters the magnitudes of the "within-sector" and "between-sector" effects, and introduces additional terms that reflect differences in union coverage and union wage effects across skill groups. For men in all three countries both the "within-" and "between-"sector effects decline when we control for the skill composition of the work force. Because union workers are more skilled, on average, than nonunion workers, adjusting for characteristics reduces the magnitude of the "between-sector" effect. The decline in the within-group effect reflects the fact that unionized men are more homogeneous than their nonunion counterparts.

We find remarkably similar patterns in union representation and union wage impacts across skill groups for men in all three countries. Union coverage tends to be concentrated in the middle of the skill distribution, and union wages tend to be compressed relative to nonunion wages. As a consequence, unions have an equalizing effect on the dispersion of wages

across skill groups in the three countries, complementing the effect on "within-group" inequality.

Once all these factors are taken into consideration, our calculations imply that unions systematically reduce the variance of wages for men in all three countries, though the magnitudes of the effects are smaller when we control for the skill composition of the work force.

Interestingly, an equally robust finding that emerges from this paper is that unions do not reduce wage inequality among women. In all three countries, this important male-female difference in the impact of unionism is due to a combination of three factors. First, unionized women are more concentrated in the upper end of the wage distribution than their male counterparts. Second, the union wage gap is larger for women than for men, resulting in a larger "between-sector" effect. Third, the union wage gap is larger for lesser than higher skilled men, while this is not the case for women.

Another important conclusion is that the impacts of unions on the wage structure in the United States, Canada, and the United Kingdom have followed remarkably similar trends over the last two decades. In all three countries, the unionization rate and the union wage differential have declined substantially since the early 1980s. For men, this has resulted in a steady erosion of the equalizing effect of unions that explains a significant fraction of the growth in wage inequality in the United States and United Kingdom. The decline of female unionization has been much smaller than that of men. As a consequence, unionization rates of men and women are nearly equal now in all three countries, marking a sharp departure from the historical pattern. However, the modest decline in union coverage among women had little impact on female wage inequality.

Interestingly, in both the United States and the United Kingdom our estimates of the effects of unions on wage inequality were virtually unchanged between 1993 and 2001. This is consistent with the slowdown in the growth of inequality in both countries during the 1990s, relative to the 1980s. However, in Canada there was little change in wage inequality during the 1980s and 1990s, despite a moderate drop in union coverage among men. The Canadian experience suggests that other factors offset the pressures toward widening inequality associated with the decline in unionization.

Although trends in union coverage and union wage effects are very similar in the three countries, there are substantial differences in the levels of unionization and wage inequality. The pattern of cross-country

differences in wage inequality is consistent with the pattern of wage compression effects. Our calculations indicate that differences in union wage compression effects can account for almost one-half of the UK-U.S. differential in the variance of wages in the early 1990s, and over two-thirds of the differential in 2001.

In *What Do Unions Do?*, the impact of unions on the distribution of income is a leading example of how the "voice" aspect of unionism (reduced inequality among union workers—the "within-sector" effect) dominates its "monopoly" face (inequality between union and nonunion workers—the "between-sector" effect). Twenty years later, our study confirms that this key finding remains robust to the choice of country and time period. An important qualification, however, is the case of women where we show that these two aspects of the impact of unions on wage inequality more or less offset each other.

*What Do Unions Do?* recognizes that there is no consensus on the social benefits of the equalizing effects of unions on the distribution of income. It states that "For readers to whom greater inequality is a plus, what unions do here is definitely good, For readers to whom greater equalization of income is undesirable, what unions do is definitely bad" (p. 247). On balance, however, *What Do Unions Do?* clearly sides with those who think that unless the equalizing effects of unions result in large costs due to allocative inefficiencies, what unions do here is socially good. Although we do not assess the impacts of unions on resource allocation and economic performance, we share the view that the consequences of unions for wage inequality are beneficial from a social point of view.

The last paragraph of *What Do Unions Do?* starts with a dire warning: "All told, if our research findings are correct, the ongoing decline in private sector unionism—a development unique to the United States among developed countries—deserves serious public attention as being socially undesirable" (p. 251). By linking the decline in unionism to the dramatic increase in wage inequality in the United States since the 1970s, our research strongly confirms that the ongoing decline in private sector unionism indeed had socially undesirable consequences. In retrospect, this sentence of *What Do Unions Do?* only erred by stating that the decline in private sector unionism was a development *unique* to the United States. In the 20 years following the publication of the book, unionism sharply declined in the United Kingdom and fell moderately in Canada. In the case of the United Kingdom, the decline in unionism has resulted in a steep growth in wage inequality among men. These recent developments

show that the social consequences of the decline in unionism deserve even broader attention (north of the border and across the Atlantic) than at the time *What Do Unions Do?* was first published.

## 6 Data Appendix

*US Data:* Since 1979, the US Census Bureau has been collecting data on weekly hours, weekly earnings, and hourly earnings (for workers paid by the hour) for all wage and salaried workers in the "outgoing rotation group" (ORG) of the Current Population Survey (CPS). Beginning in 1983, the ORG supplement of the CPS also asks about the union status of workers (and union coverage). Similar variables are also available in the May supplement of the CPS between 1973 and 1978, though only union membership (and not coverage) is available for this period.

In both the May and ORG supplements of the CPS, workers paid by the hour are asked their hourly rate of pay. We use this variable, which is collected in a consistent fashion over time, as our measure of the hourly wage rate for these workers. The May and ORG supplements also provide information on usual weekly earnings for all workers. For workers not paid by the hour, we use average hourly earnings (weekly earnings divided by weekly hours) as our measure of the wage rate.

Note, however, that weekly earnings are not measured consistently over time. From 1973 to 1993, this variable was collected by asking individuals directly about their earnings on a weekly basis. From 1994 to 2001, individuals had the option of reporting their usual earnings on the base period of their choice (weekly, bi-weekly, monthly, or annually). Weekly earnings are then obtained by normalizing the earnings reported by workers on a weekly basis. The available evidence does not suggest, however, that this change in the way earnings are collected had a significant impact on the distribution of wages (see Card and DiNardo (2002) and Gosling and Lemieux (2001) for more detail).

Another potential problem is that weekly earnings are top-coded at different values for different years throughout the sample period. Before 1988, weekly earnings were top-coded at $999. The top-code was later increased to $1923 in 1988 and $2884 in 1998. For an individual working 40 hours a week, the weekly earnings top-code corresponds to an hourly wage ranging from of $42.6 in 1984 ($2001) to $99.6 in 1973 ($2001). To keep the wage samples relatively comparable over time, we trim observations with wages above $63 ($2001). We also trim

observations with wages below $2.5 ($2001), which typically corresponds to about half of the minimum wage. The wage deflator used is the Consumer Price Index (CPI-U). All the US wage statistics reported herein are also weighted using the CPS earnings weights.

Questions about educational achievement were changed substantially in the early 1990s. Until 1991, the CPS asked about the highest grade (or years of schooling) completed. Starting in 1992, the CPS moved to questions about the highest degree. We have recoded the post-1992 data in terms of completed years of schooling to have a measure of schooling that is consistent over time. We then use years of schooling to compute the standard measure of years of potential experience (age-schooling-6). Only observations with potential experience larger or equal than zero are kept in the analysis samples.

Finally, in the 1979–2001 ORG supplements of the CPS, wages or earnings of workers who refuse to answer the wage/earnings questions were allocated using a "hot deck" procedure. We exclude observations with allocated wages and earnings for two reasons. First, wages and earnings were not allocated in the May 1973–1978 CPS. We thus need to exclude allocated observations from the 1984, 1993, and 2001 ORG supplement data to maintain a consistent sample over time. Second, union status is not one of the characteristics used to match observations with missing earnings to observations with non-missing earnings in the imputation procedure (hot deck) used by the US Census Bureau. As a result, estimates of union wage effects obtained from a sample with allocation observations included can be severely biased downward (see Hirsch and Schumacher, 2004 for more details).

*UK Data:* As mentioned in the text, for the UK we use data from the 1983 GHS and the 1993 and 2001 UKLFS. For the sake of consistency, we exclude observations from Northern Ireland since this region was sampled in the UKLFS but not in the GHS. Real wages are obtained by deflating nominal wages with the Consumer Price Index (Retail Price Index). To limit the effect of outliers, we only keep observations with an hourly wage rate between 1.5 and 50 pounds (in 2001 pounds).

In general, we process the UK samples to make them as comparable as possible to the US samples. In both the UKLFS and the GHS, we use observations for wage and salaried workers with non-missing wages and earnings. We also use the sample weights whenever available (there are no sample weights in the GHS). Since education is not consistently measured over time, we recode education into five broad categories that are

consistent over time: university graduates, higher level vocational training and A-level qualifications, middle-level vocational training or O-level qualifications, lower level vocational training, and no qualifications or diploma.

*Canadian Data:* As mentioned in the text, for Canada we use the 2001 Labour Force Survey (CLFS), the 1991 and 1995 Surveys on Work Arrangements (SWA), and the 1984 Survey of Union Membership (SUM). These data sets are all relatively comparable since both the SUM and the SWA were conducted as supplements to the Labour Force Survey. Relative to the US and UK data however, there are some important limitations in the Canadian data. First, as mentioned in the text, it is not possible to distinguish union membership from union coverage in the SWA. For the sake of consistency over time, we thus use union coverage as our measure of unionization in Canada.

A second limitation is that in the 1984 SUM and the 2001 CLFS missing wages and earnings were allocated but no allocation flags are provided. We thus have to include observations with allocated wages and earnings in the analysis which generates an inconsistency relative to the SWA (where missing wages and earnings are not allocated) and the US and UK data. This likely understates the effect of unions on wages in 1984 and 2001, though it is not possible to quantify the extent of the bias. Another limitation is that age is only provided in broad categories, unlike in the US and UK data where age is reported in years. In particular, it is not possible to separate workers aged 15 from those aged 16. This explains why we use all wage and salaried workers aged 15 to 64 in Canada, compared to workers aged 16 to 64 in the two other countries.

A further limitation is that hourly wages are top-coded at a relatively low level in the Canadian data. The top codes are $45 in the 1984 SUM, $50 in the 1991 SWA, $40 in the 1995 SWA, and $100 in the 2001 CLFS. For the sake of consistency, we trim observations with hourly wages above $44 (in $2001). Wages are deflated using the Canadian CPI for all items. We also trim observations with wages below $2.5 in $2001, which represents about half of the minimum wage.

One final limitation is that only five education categories are consistently available over time. These categories are: 0 to 8 years of school, high school (some or completed), some post-secondary education, post-education degree or diploma (less than university), and university degree. As in the CPS and the UKLFS, all statistics for Canada are computed using sample weights.

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# Economic Transformation and the Gender Earnings Gap in Urban China

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## 1 Introduction

How are women faring in the transformation from planned economies to market economies beginning during the 80s? Specifically is the gender wage gap increasing or decreasing? A picture is now emerging and it shows great diversity in findings from various countries. While available signs point to the gender wage gap in Russia and Ukraine to be increasing, they point in the direction of decreases for Central and Eastern European countries moving towards a market economy (Brainerd, 1996a, 1996b).

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This paper is an attempt to add another example, as we focus on the size and development of the gender earnings gap in urban China from the second part of the 80s to the middle of the 90s. Although we only study the urban population of China, this is a labour force larger than that found in any other single country moving away from central planning.

While economic transformation in Central and Eastern Europe as well as in the former Soviet Union was accompanied by large decreases in output the opposite has been the case in the People's Republic of China. Unlike many other countries in transition, economic reform in China up to now has not meant large-scale privatisation of state-owned enterprises. Instead reform has meant giving existing enterprises more freedom to manoeuvre which includes autonomy of how to remunerate workers and whom to hire. Economic reform has also meant removing obstacles to growth for the non-state sector in China. Much of the spectacular economic growth in China is due to the growth of this sector composed predominantly of collective enterprises, but also of private firms, joint-ventures and of the self-employed.

The first task of this paper is to describe the crude gender earnings gap and its changes. A second task is to analyse reasons for the crude earnings gap and its changes. For this purpose we run earnings-functions for females and males to attribute the crude gender wage gap to differences in variables and differences in coefficients. While the latter is an (imperfect) measure of unequal treatment of women in the earnings determining process, the former covers unequal treatment in education and hiring as well as other reasons before the earnings determining process. Using the Oaxaca-decomposition is nowadays a standard technique for analysing differences in earnings between women and men. Its use is limited, however as it compares the mean incomes of women and men. A fuller representation is provided when utilising the new approach of Jenkins (1994).

Obviously we are not the first to study gender aspects of earnings in China, though, the existing literature is rather limited. One reason for the lack of study on this topic in China may be due to a general feeling among researchers that the gender earnings difference in China has never been a serious problem since the Chinese constitution guarantees women's right to labour market earnings equal to those of men for the same kind of work. In addition there seem to have been serious efforts to implement this policy of equal pay for equal work. Another reason for the few studies on gender aspects of earnings in China stems from problems with data availability.

Some studies using data for the 80s report that keeping characteristics constant, women earn less than men in urban China (Qian, 1996). However, these studies do not focus on gender wage differences. One study focusing on just gender wage differences is Meng and Miller (1995) who studied township village and privately owned enterprises in four counties in *rural* China. The only study focusing on gender earnings differences in *urban* China known to us is Qian (1996). While her investigation is based on the data of two provinces (Guandong and Beijing) in 1993 our study covers ten provinces which are surveyed for two periods. This is made possible by using two unique cross-section surveys performed by similar design and instruments. The first survey refers to 1988 which is at an early phase of the reform process, while the second measures circumstances seven years later, that is in 1995.[1] There seems to be no previous study of changes in gender wage differential for urban China.

The paper is laid out as follows: In the next section we discuss recent changes in urban China and how they might have affected female and male workers. Methodological considerations are discussed in Sect. 3. Section 4 describes our data and research strategy. Using the two surveys we describe the changed labour market in Sect. 5. In Sect. 6 we report the results and discuss estimated earnings-functions which are then used for decomposition analysis in the following sections: The Oaxaca-decomposition results are reported in Sect. 7 and findings from the distribution approach in Sect. 8. A concluding section ends the paper.

## 2 Changes in China Affecting Urban Workers

China patterned itself after the Soviet economic system for its urban areas during the 50s. State-owned enterprises (SOEs) came to be the dominating form of production units. Workers were assigned to jobs by administrative measures and wages were centrally regulated in wage-scales. After leaving school almost all women entered the labour force and their number of working hours have been remarkably similar to men.

An important reason why women generally earn less than men is interruption of their working career for child birth. However, such interruptions have generally been rather short among mothers in urban parts of the Peoples Republic of China. In addition mothers in urban China typically do not have more than one child nowadays; thus only one

[1] Knight and Song (1993) use the same data for 1988.

interruption, a circumstance which sets them apart from mothers in many other countries.

While women in China are quite similar to men in performing market work they are also the main provider of housework. For example a time use study for 1990 shows urban males on weekdays spending half an hour longer on paid work than females. This is contrasted by women spending 2 h longer on housework.[2] Having on average larger household responsibilities than men one would expect the average Chinese women to devote less efforts on a career, which should show up in their earnings.

Looking at possibilities to be offered a well-paid job it seems that many Chinese people believe women to be disadvantaged in this respect.[3] Furthermore, such disadvantages can have increased during the process of transformation due to changes in work legislation. China has turned to "productive" legislation which focuses on the biological differences between women and men. These laws make an effort to accommodate women's reproductive needs in the workplace (Woo, 1994). At the same time this different treatment of women has made women less attractive as workers.

The Chinese transition strategy has been a gradual one. It has relied on the creation of market competition through the entry of new domestic producers while few state-owned establishments were privatised up to 1995. During the 1980s, the crucial role in the creation of competition was played by Township and Village Enterprises (TVEs) which are collectively owned and located in rural China. However, in the 1990s, foreign invested enterprises began to take the lead in domestic competition.[4]

Table 1 shows the breakdown of ownership composition of industrial output in 1988 and for each year from 1991 to 1995. As can be seen the proportion coming from SOEs has decreased drastically being only one

[2] SSB (1995a) reports the following point estimates referring to persons of the urban population 15–64 years of age: Urban women (men) spend on paid work 7 h and 7 min (7 h and 30 min) and on housework 4 h and 23 min (2 h and 10 min). Rural women (men) are reported to spend on out of household work 5 h and 46 min (7 h and 13 min) and on housework 5 h and 11 min (2 h and 14 min).

[3] White et al. (1996, p. 72) reports results from an investigation on opinions made in two cities point in this direction. Furthermore a general perception was found that the government was not active in addressing this issue.

[4] Recent useful introductions in English to the topic "China economic transformation" include articles in the December issue of China Quarterly (1995), Naughton (1996), World Bank (1996, 1997). See also Sachs and Woo (1997) for the discussion on the causes of Chinese economic growth.

**Table 1** Gross output value of industry by ownership in China (in billion yuan)

| | *1988* | *1991* | *1992* | *1993* | *1994* | *1995* |
|---|---|---|---|---|---|---|
| Gross value (%) | 1822.5 (100) | 2662.5 (100) | 3459.9 (100) | 4840.2 (100) | 7017.6 (100) | 9189.4 (100) |
| State-owned enterprises | 1035.1 (56.8) | 1495.5 (56.2) | 1782.4 (51.5) | 2272.5 (47.0) | 2620.1 (37.3) | 3122.0 (34.0) |
| Collective enterprises in which: | 658.8 (36.2) | 878.3 (33.0) | 1213.5 (35.1) | 1646.4 (34.0) | 2747.2 (37.7) | 3362.3 (36.6) |
| Township-owned | 184.7 (10.1) | 240.1 (9.0) | 353.4 (10.2) | 537.4 (11.1) | 810.2 (11.6) | 1193.2 (13.0) |
| Village-owned | 170.4 (9.4) | 234.7 (8.8) | 363.2 (10.5) | 516.3 (10.7) | 965.8 (13.8) | 1184.7 (12.9) |
| Joint-venture | 43.9 (2.4) | 56.9 (2.1) | 87.0 (2.5) | 132.2 (2.7) | 261.1 (3.7) | 213.4 (2.3) |
| Individual-owned enterprises | 79.1 (4.3) | 128.7 (4.8) | 200.6 (5.8) | 386.1 (8.0) | 708.2 (10.1) | 1182.1 (12.9) |
| Other ownership in which: | 49.5 (2.7) | 163.1 (6.1) | 268.8 (7.8) | 517.4 (10.7) | 901.8 (12.9) | 1523.1 (16.6) |
| Shareholding | | | | 146.1 (3.0) | 318.3 (3.5) | |
| Foreign-owned | | | | 185.3 (3.8) | 540.8 (5.9) | |
| Overseas Chinese from HK, Macao, Taiwan | | | | 176.1 (3.6) | 556.4 (6.1) | |

Source: SSB, China Statistical Yearbook 1994 and 1996, pp. 401 and pp. 406–407

Notes: (1) Gross output values are in current prices; (2) shares of components are calculated by the authors

third of the total at the end of the period. Although at the end of the period the collective sector is of the same size, it is concentrated to rural China. Another expanding sector is that of individually owned enterprises. Foreign-owned enterprises and enterprises owned by overseas Chinese are also of importance. As of 1995 both stand for somewhat more than 6% of the gross output value.

The Chinese reform process has had a clear regional dimension as changes first took place in the south-eastern regions which were first opened to foreign investments. Economic growth has been much faster there, while the interior regions have lagged behind. The development of the province of Guangdong has been particularly rapid and today its average household income is very high by Chinese standards. In the middle of the 90s more than one fourth of the foreign investments in China had

Guangdong as their destination while the province had less than 6% of China's population.

Of course changes in ownership and geographical location can be supposed to have affected earnings of different workers differently. It is a general belief that earnings-inequality in China has increased during the period of transformation. Expanding sectors attract new workers by paying more. Thus there are visible signs of workers in SOEs and in other public employment lagging behind workers in foreign investment enterprises. A visitor to China quickly sees examples illustrating this such as secretaries in FIEs being much better paid than university professors and teachers being much better off if they set up small-scale businesses.

In addition to earnings differences caused by sector changes there are also processes of widening earnings within each sector. One would expect differences in earnings by skill levels to have widened as productivity considerations have become more important in the wage-setting process. Across SOEs there is also a new cause for earnings variation as they have been given more and more freedom in making decisions. At the same time several indicators point to the poor performance of industrial state enterprises relative to non-state enterprises. The number of loss-making enterprises has grown steadily to be as high as 44% in 1995 (Naughton, 1996, p 289). Loss-making enterprises should have more difficulties in paying high earnings than profit-making enterprises.

Although not at zero, rates of return to education in the People's Republic of China have been low (Byron & Manaloto, 1990; Li & Travers, 1993). One would expect great pressure for longer educated labour (in the case where education stands for a demanded skill) from the demand-side during the process of transformation. Countering this have been large increases in the supply of those with longer educations. What about rates of return to experience? After running earnings equations for Russian samples collected at different points in time during the 90s, Brainerd (1996a) found a dramatic change indicating that human capital of older workers became obsolete during transformation while younger workers gained much ground. However, it is far from clear if this has happened in China as the Chinese process of transformation has been much more gradual.

What have all the changes discussed above meant for the development of the gender wage gap during transformation? In the old system earnings were much linked to characteristics of the person without an explicit link

to her or his productivity. A hypothesis is that during transformation productivity has become more important for the individual's earnings. In the case of women being on average less productive than men, the gender wage gap would increase, an increase which would not necessarily stand for increased wage discrimination.[5]

## 3 Methodological Considerations

In this paper we analyse the gender earnings gap using the current standard decomposition attributed to Oaxaca (1973). It helps to sign out unequal treatment of women before the earnings-determining process (differences in variables) from unequal treatment in the earnings-determining process (differences in coefficients). In the literature the latter is most often referred to as "earnings-discrimination" to distinguish from a wider concept of gender discrimination including different treatment in education and occupational attainment. To the extent that women are over-represented among those of limited education, young adults (with short work experience), enterprises in low paying sectors, enterprises having low paying ownership, provinces with low earnings and so on, this will show up as differences in variables.

It should be noted that when applying this framework one faces a "fractal problem." For a given sample one is likely to find that the more narrowly occupation categories are defined, the smaller the part of the earnings gap which can be attributed to "earnings discrimination." Taken to its extreme one can vindicate that there never exist two identical occupations and as a consequence all of the crude gender earnings gap must be attributed to differences in variables. What this means is that it is not possible to measure earnings discrimination at one point in time without referring to how broadly occupations are defined. When making comparisons over time occupations (as well as other variables) should be defined in the same way each year under observation.

Another well-known limitation when applying this decomposition approach is the possibility of omitted variables bias. In the case of variables omitted from the wage-function being correlated with gender it is not

[5] It seems as though the Chinese have differing opinions on the existence of earnings discrimination. White et al. (1996, pp. 71–72) reports result from a survey of opinions made in two cities where the proportion of respondents agreeing that women receive lower pay than men was as large as the proportion who felt that there was no such discrimination.

appropriate to interpret differences in coefficients as an unbiased measure of discrimination. Take the example of increases in human capital by investment in on-the-job training, which typically is not observed by the analyst but indicated by a variable experience or a variable potential experience. One year of potential experience for the average female might indicate less on-the-job training and therefore less human capital than one year of potential experience for an average male. Therefore when estimating a regression model a lower coefficient for the variable experience among females must not necessarily mean (real) discrimination. Unfortunately in this study (as in most other studies of the gender wage gap) we are not able to measure human capital acquisition by on-the-job training but have to rely on a variable indicating potential experience.

## 4 Data and Research Strategy

The data comes from the Urban Household Income Surveys conducted in 1989 and 1996 by the Institute of Economics, Chinese Academy of Social Sciences, for the reference periods of 1988 and 1995. The data sets were derived from larger samples drawn by the State Statistics Bureau (SSB). Households were selected using the "symmetrical equidistant selection method" as further described for the survey 1989 by Eichen and Zhang (1993). Studies using the same study are found in Griffin and Zhao (1993). Another application is Gustafsson and Li (1997). Once a member of such a sample, a household is visited monthly by an enumerator for a period of 5 years after which the household is dropped from the sample. The method of SSB to select urban households is undocumented. Rural households living in an urban area without a *houko* (thus not officially registered) are most likely not in the sample. For natural reasons it is not possible to have a well-based estimate of this uncovered ("floating") population. With this exception all households should have the same probability of entering the sample.

The Urban Household Income Survey covers ten provinces. Respondents were chosen from the SSB sample in order to give information on conditions in various regions of China and of cities and towns of various sizes. The following ten provinces were surveyed: Anhui, Beijing, Gansu, Guangdong, Henan, Hubei, Jiangsu, Liaoning, Shanxi and Yunnan. (In the second survey also the province of Sichuan was added. However, for comparability reasons we have chosen to use not those observations in this study.) There was very little non-response.

The two surveys used very similar, although not identical instruments. Rather understandably the second survey includes some questions not asked earlier which permits a somewhat more detailed analysis for the most recent year. The two samples are large as there are 9354 male and 8533 female workers in the first sample and 5603 male workers and 5011 female workers in the second sample.

Information on earnings is collected by questions and refers to the period of one normal month which is then converted to annual amounts by multiplying by the number 12. Earnings are defined as the individual income of active workers obtained from their work units or own private business. Earnings consist of four major components, that is, basic wage (or net revenue), bonus, subsidies and other income.

Our analysis proceeds along the following four steps: First we present descriptive statistics allowing for comparisons over time. These include gender earning gaps according to several breakdowns such as age, education, ownership, occupation and sector. This kind of information has to our knowledge not been published for China by the State Statistics Bureau. We also report on how earnings inequality has changed over time. Inspired by Blau and Kahn (1996) who analysed cross-country differences in the gender wage gap, we investigate if the rank order of women in the distribution of males has changed or not.

The second step is to run earnings equations using logarithmic earnings as left hand side variable. A rather large number of explanatory variables are included and estimation is made for males and females separately each year under observation.

The third step is to use the estimates from the regression models together with means for females and males to analyse the average earnings gap for the 2 years and its changes. The average unadjusted logarithmic differential in gender earnings, defined as $G$, may be decomposed respectively into an "explained" part and a part may be misleadingly called the "unexplained part" which stands for the same characteristics being rewarded differently.

$$\overline{\ln w^m} - \overline{\ln w^f} = \left(\overline{X^m} - \overline{X^f}\right) B^m + \left(B^m - B^f\right) \overline{X^f} \quad \text{or}$$

$$\overline{\ln w^m} - \overline{\ln w^f} = \left(\overline{X^m} - \overline{X^f}\right) B^f + \left(B^m - B^f\right) \overline{X^m},$$

where $m$ = male and $f$ = female worker, the bar indicates mean values, $X$ the vectors of characteristics and the Bs are the vectors of estimated coefficients.

Oxacaca's "discrimination" index, $D^b$, is the unexplained log gap expressed as an earnings differential. Depending on the weights used, it is given by:

$$D^f = \left[\exp\left(\bar{X}^f\left(B^m - B^f\right)\right)\right] - 1$$
$$D^m = \left[\exp\left(\bar{X}^m\left(B^m - B^f\right)\right)\right] - 1.$$

The fourth step is to make a fuller representation of earnings "discrimination" using the method of Jenkins (1994). This analysis also starts from estimated earnings functions. However, instead of analysing "earnings discrimination" for a representative person we look at the entire distribution of women and men. Thus it allows us to investigate if "discrimination" experience is homogenous in the sample studied. This analysis starts with the earnings gap defined as the absolute value of the differences between the predicted earnings of an individual when paid according to the men's and women's earnings schedules respectively.

In a given sample Jenkins' indices can be written as

$$J_\alpha = \sum_{i \in F} \omega_i \left(1 - d_i^{-\alpha}\right) = 1 - \sum_{i \in F} \omega_i d_i^{-\alpha}, \quad \alpha > 0$$

where

$$d_i = 1 + \left|\hat{r}_i - \hat{y}_i\right| / \bar{r}^f,$$
$$\omega_i = \left(\hat{y}_i / n_f \bar{y}^f\right),$$

$\hat{y}_i$ is predicted income of individual female workers with the rates of return to female attributes in the female wage equation, that is, $\hat{y}_i = \exp\left(X_i \hat{\beta}^f\right)$

$\hat{r}_i$ is predicted income of individual female workers with the rates of return to male attributes in the male wage equation, that is, $\hat{r}_i = \exp\left(X_i \hat{\beta}^m\right)$. $\bar{y}_i$ and $\bar{r}_i$ are mean values of $\hat{y}_i$ and $\hat{r}_i$ respectively. $\omega_i$ is wage share of a

woman $i$. The index $J_\alpha = 0$, when there is no discrimination against female workers, that is $\hat{r}_i = \hat{y}_i$.

The parameter $\alpha$ reflects different assumptions about how earnings gaps should be aggregated. It can be interpreted as the degree of "discrimination" aversion, with higher value for $\alpha$ corresponding to greater aversion (Jenkins, 1994).

Jenkins' index is suitable for decomposition analysis, when the sample is partitioned into $G$ mutually exclusive subgroups. Total earnings "discrimination" is the sum of the group's specific "discrimination" weighted by the size of the group. Decomposition along various breakdowns of the population allows us to paint a full picture of how differently women and men are remunerated. The decomposition formula is written as

$$J = \sum_{g=1}^{G} \theta_g J_g,$$

where

$$\sum_{g=1}^{G} \theta_g = 1, \theta_g > 0 \text{for each} g = 1, \ldots \ldots, G.$$

## 5 A Statistical Picture of the Changed Urban Labour Force

Urban China underwent a number of important demographic changes between our two points of measurement. The size of the population increased rapidly mainly because of migration, although this has not been fully reflected in the official statistics. The average household size diminished and the population aged.

In Table 2 we use the two surveys to portray the urban labour force in 1988 and 1995 by gender and here we comment on differences across gender and over time. Starting with the participation rates we see slight decreases over time for both genders. This change is fairly general for all age and gender groups. The only exception is in the low rate for women over their general retirement age of 55. The higher participation rates among males are largely attributed to their higher age at retirement as it is at 60 years of age. On the other hand participation rates among the youngest adults are somewhat higher among females, which are consistent with females on average having a shorter education.

**Table 2** Descriptive statistics of main variables by gender (%)

| | *1988* | | *1995* | |
|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* |
| *Participation rate* | | | | |
| Total | 81.1 | 72.7 | 78.8 | 69.5 |
| Aged 16–25 | 51.5 | 55.2 | 46.5 | 49.0 |
| Aged 26–35 | 99.0 | 97.2 | 97.3 | 93.9 |
| Aged 36–45 | 99.5 | 96.0 | 98.5 | 95.1 |
| Aged 46–55 | 94.6 | 62.1 | 92.1 | 58.7 |
| Aged 56–65 | 47.9 | 8.1 | 38.2 | 10.9 |
| *Composition of workers* | | | | |
| Age group | | | | |
| Aged 16–25 | 15.3 | 17.8 | 10.4 | 12.2 |
| Aged 26–35 | 25.8 | 32.6 | 23.3 | 27.9 |
| Aged 36–45 | 28.9 | 32.5 | 36.4 | 42.4 |
| Aged 46–55 | 23.4 | 16.2 | 22.6 | 15.5 |
| Aged 56–65 | 6.6 | 1.0 | 7.3 | 2.0 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Minority* | | | | |
| National minority | 3.8 | 3.7 | 4.2 | 4.3 |
| Non-national minority | 96.2 | 96.3 | 95.8 | 95.7 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Party membership* | | | | |
| Party member | 34.2 | 11.7 | 33.3 | 15.0 |
| Non-party member | 65.8 | 88.3 | 66.7 | 85.0 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Education* | | | | |
| 4-year college | 8.7 | 3.2 | 10.3 | 5.2 |
| 2-year college | 8.2 | 4.9 | 18.1 | 12.6 |
| Professional school | 10.8 | 11.2 | 16.2 | 17.2 |
| Upper middle school | 24.1 | 25.4 | 22.7 | 26.1 |
| Lower middle school | 37.1 | 40.0 | 28.1 | 32.3 |
| Primary school | 9.0 | 11.8 | 4.3 | 6.0 |
| Less than primary school | 2.0 | 3.4 | 0.3 | 0.7 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Ownership* | | | | |
| State-owned sector | 43.4 | 33.8 | 30.1 | 22.5 |
| Other public sector | 40.3 | 36.9 | 53.7 | 52.0 |
| Collective sector | 14.3 | 26.6 | 11.1 | 19.3 |
| Private or self-employed | 1.1 | 1.4 | 1.7 | 1.9 |
| Joint-venture or foreign firm | 0.03 | 0.07 | 1.2 | 1.1 |
| Other ownership | 0.8 | 1.3 | 2.3 | 3.4 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

(*continued*)

**Table 2** (continued)

| | *1988* | | *1995* | |
|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* |
| *Occupation* | | | | |
| Owner of private firm | 1.3 | 1.3 | 1.7 | 1.6 |
| Professional or technician | 15.6 | 15.8 | 21.2 | 22.2 |
| Responsible officer or manager | 7.5 | 1.5 | 5.5 | 1.5 |
| Ordinary officer or manager | 3.0 | 0.5 | 10.9 | 4.1 |
| Office worker | 25.5 | 20.9 | 18.7 | 21.7 |
| Manual worker | 46.6 | 59.3 | 42.0 | 49.1 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Sector* | | | | |
| Agriculture | 1.1 | 0.8 | 1.9 | 1.2 |
| Manufacturing | 40.9 | 44.4 | 40.8 | 38.5 |
| Mining | 5.0 | 3.0 | 1.2 | 0.9 |
| Construction | 4.0 | 2.8 | 3.2 | 2.4 |
| Transportation and communication | 8.3 | 5.0 | 5.7 | 3.9 |
| Commerce and trade | 11.5 | 17.7 | 12.1 | 16.7 |
| Public utilities | 2.2 | 2.8 | 3.3 | 4.4 |
| Health and social welfare | 3.4 | 5.8 | 3.4 | 5.4 |
| Education and culture | 6.7 | 7.8 | 6.2 | 8.2 |
| Scientific research and technology | 2.5 | 1.6 | 2.5 | 2.0 |
| Finance and insurance | 1.5 | 1.5 | 1.8 | 2.1 |
| Government and social organisations | 11.5 | 5.0 | 13.3 | 9.4 |
| Others | 1.5 | 1.9 | 4.7 | 4.8 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Status of job* | | | | |
| Permanent worker | 98.6 | 98.0 | 94.0 | 91.3 |
| Temporary or short-term contract worker | 0.9 | 1.1 | 1.9 | 3.4 |
| Others | 0.5 | 0.9 | 4.1 | 5.0 |
| | 100.0 | 100.0 | 100.0 | 100.0 |
| *Province* | | | | |
| Beijing | 5.1 | 4.5 | 8.3 | 8.0 |
| Shanxi | 11.2 | 10.4 | 10.9 | 10.6 |
| Liaoning | 10.0 | 10.7 | 12.0 | 11.8 |
| Jiangsu | 12.9 | 12.5 | 12.6 | 12.7 |
| Anhui | 9.9 | 9.9 | 7.7 | 8.2 |
| Henan | 11.7 | 11.9 | 9.6 | 9.3 |
| Hubei | 10.7 | 11.0 | 12.2 | 12.1 |
| Guangdong | 11.9 | 12.0 | 9.7 | 9.6 |
| Yunnan | 9.8 | 10.6 | 10.6 | 11.3 |
| Gansu | 6.9 | 6.6 | 6.4 | 6.4 |
| | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Urban household income surveys 1989 and 1996

The aging of the labour force is clearly seen in Table 2. While slightly more than two out of five males in the labour force were below 35 years of age in 1988 this was the case for one out of three in 1995. Instead the proportion of persons aged 36–45 increased, as among females from 33% to 42%. Because of earlier school-leaving age and earlier retirement the female labour force is younger than the male labour force.

In the People's Republic of China ethnic minorities are concentrated to rural areas. Only about 4% of the labour force in urban China belongs to a minority. While one out of three male workers is a member of the Communist party the proportion is much smaller among females. Turning to education large increases between the two years studied are visible. While in 1988, 17% of the male labour force had an education of at least 2 years of college in 1995 the proportion had increased to 28%. At the later point in time 18% of the female labour force had an education of at least 2 years of college illustrating a clear gender difference which is also reflected in the occupation distribution. Females are less frequent in the categories "professionals or manager" and "responsible officers or manager" but more frequent in the category "manual workers."

Males are over-represented in the state-owned sector, and females in the collective sector. There are some gender differences in the sector composition of the labour force which can be commented on. Females are over-represented in the sector "Commerce and trade, restaurants etc." and under-represented in "Government and party organisations and social organisations."

Table 3 shows that between 1988 and 1995 average male annual earnings increased by as much as 47% (in real terms) and inequality measured by the Gini-coefficient increased from 23.3% to 28.9%. Turning to components of total earnings we see that the average for two increased faster than total earnings: the basic wage and subsides. The latter which actually more than doubled includes housing subsidies, one-child allowance, price subsidies, regional subsidies, medical subsidies, and some other subsidies. In the early 1990s reforms meant that more of the compensation to workers were given as subsidies and less as services and goods provided in kind. At the other end bonuses actually decreased. Further it can be seen that at each point in time the basic wage is the main component of total earnings and it is more equally distributed than total earnings. The other extreme is bonuses with a high concentration coefficient.

Finally turning to changes in earnings inequality over time, Table 3 shows that the increase can be traced to two sources: the basic wage and

**Table 3** Descriptive statistics of mean earnings and inequality by gender

| | *1988* | | *1995* | |
|---|---|---|---|---|
| | *Male* | *Female* | *Male* | *Female* |
| *Mean (yuan)* | | | | |
| Total earnings | 2064 (1129) | 1727 (995) | 3030 (1783) | 2507 (1536) |
| Basic wages | 1088 (710) | 904 (472) | 1775 (1117) | 1440 (880) |
| Bonus | 445 (640) | 371 (626) | 444 (832) | 374 (684) |
| Subsidies | 315 (218) | 277 (295) | 687 (751) | 607 (703) |
| Other | 216 (380) | 175 (242) | 124 (470) | 86 (278) |
| *Gini coefficient or concentration coefficient* (%) | | | | |
| Total earnings | 23.3 | 23.7 | 28.9 | 31.1 |
| Basic wages | 15.8 | 15.5 | 21.9 | 22.5 |
| Bonus | 39.9 | 42.0 | 51.0 | 54.4 |
| Subsidies | 19.0 | 21.7 | 32.7 | 39.0 |
| Other | 33.2 | 30.8 | 28.8 | 16.3 |
| *Share of earning components* (%) | | | | |
| Total earnings | 100 | 100 | 100 | 100 |
| Basic wages | 52.7 | 52.4 | 58.6 | 57.4 |
| Bonus | 21.6 | 21.5 | 14.7 | 14.9 |
| Subsidies | 15.3 | 16.0 | 22.6 | 24.3 |
| Other | 10.4 | 10.1 | 4.1 | 3.4 |
| *Contribution to total inequality* (%) | | | | |
| Total earnings | 100 | 100 | 100 | 100 |
| Basic wages | 35.7 | 34.2 | 44.4 | 41.6 |
| Bonus | 37.0 | 38.1 | 25.9 | 26.1 |
| Subsidies | 12.5 | 14.7 | 25.6 | 30.5 |
| Other | 14.8 | 13.2 | 4.1 | 1.8 |

Source: Urban household income surveys 1989 and 1996

Notes: (1) 1995 earnings and earning components are in 1988 prices. (2) Standard errors in parentheses

subsidies. The increase in the concentration coefficient is particularly large for subsidies. Thus during transformation, benefits from various subsidies have turned out to be much more concentrated to high-earners.

Table 4 reports mean earnings for men in 1988 and 1995 and the average gender earnings gap for different breakdowns of the population. We report a modest increase in the gender earnings gap as female earnings as a per cent of the male earnings changed from 84.4 to 82.5%. Although those numbers indicate a deteriorating relative position of urban Chinese women, by international standards the gender wage gap appears to be rather small. One point of reference is Sweden where the female earnings ratio is known to be higher than in most other industrialised countries.

**Table 4** Mean of earnings of men and women by population group (yuan)

| | | *1988* | | *1995* | |
|---|---|---|---|---|---|
| *Name of variables* | *Notations* | *Male* | *Female as percentage of male* | *Male* | *Female as percentage of male* |
| Total | | 2064 (1129) | 84.4 (995) | 3030 (1783) | 82.5 (1536) |
| *Age group* | | | | | |
| Aged 16–25 | AG1 | 1282 (1084) | 93 (635) | 2231 (1703) | 91 (1553) |
| Aged 26–35 | AG2 | 1918 (1041) | 90 (1119) | 3002 (1812) | 88 (1605) |
| Aged 36–45 | AG3 | 2221 (1075) | 85 (991) | 3582 (2053) | 86 (1775) |
| Aged 46–55 | AG4 | 2439 (1065) | 80 (834) | 3920 (2019) | 79 (1772) |
| Aged 56–65 | AG5 | 2439 (985) | 72 (1046) | 3902 (2022) | 42 (1672) |
| *Minority* | | | | | |
| National minority | MIN1 | 2062 (1068) | 81 (668) | 3134 (1715) | 82 (1293) |
| Non-national minority | MIN2 | 2065 (1131) | 84 (1005) | 3422 (2033) | 82 (1762) |
| *Party membership* | | | | | |
| Party member | PA1 | 2348 (1179) | 93 (1520) | 3902 (2041) | 91 (2110) |
| Non-party member | PA2 | 1916 (1072) | 87 (886) | 3160 (1965) | 85 (1637) |
| *Education* | | | | | |
| 4-year college | ED1 | 2510 (1236) | 86 (822) | 4156 (2053) | 89 (1939) |
| 2-year college | ED2 | 2112 (933) | 91 (759) | 3668 (2166) | 93 (1957) |
| Professional school | ED3 | 2134 (994) | 91 (1170) | 3439 (2109) | 92 (1826) |
| Upper middle school | ED4 | 1911 (1160) | 87 (1053) | 3192 (1947) | 84 (1577) |
| Lower middle school | ED5 | 1990 (1129) | 85 (966) | 3188 (1879) | 78 (1600) |
| Primary school | ED6 | 2230 (1149) | 76 (887) | 3054 (1714) | 72 (1497) |
| Less than primary school | ED7 | 1978 (940) | 74 (797) | 2359 (1621) | 79 (1526) |
| *Ownership* | | | | | |
| State-owned sector | OW1 | 2161 (1054) | 87 (1285) | 3709 (1879) | 88 (1740) |
| Other public sector | OW2 | 2028 (969) | 87 (738) | 3349 (2034) | 85 (1655) |
| Collective sector | OW3 | 1813 (1065) | 83 (734) | 2793 (1824) | 80 (1610) |
| Private or self-employed | OW4 | 3091 (3466) | 60 (1928) | 3350 (2775) | 75 (2560) |
| Joint-venture or foreign firm | OW5 | 2355 (980) | 80 (1421) | 4087 (2888) | 90 (2321) |
| Other ownership | OW6 | 1806 (3596) | 65 (950) | 3578 (2477) | 77 (2224) |

(*continued*)

**Table 4** (continued)

| | | *1988* | | *1995* | |
|---|---|---|---|---|---|
| *Name of variables* | *Notations* | *Male* | *Female as percentage of male* | *Male* | *Female as percentage of male* |
| *Occupation* | | | | | |
| Owner of private firm | OC1 | 2829 (3995) | 66 (1841) | 3582 (2762) | 73 (2328) |
| Professional or technician | OC2 | 2306 (981) | 86 (760) | 3763 (1998) | 90 (1692) |
| Responsible offices or manager | OC3 | 2366 (854) | 88 (567) | 4132 (2455) | 97 (3384) |
| Ordinary offices or manager | OC4 | 2710 (1408) | 81 (1077) | 3991 (2042) | 94 (1943) |
| Office worker | OC5 | 2118 (1084) | 88 (1059) | 3334 (2104) | 88 (1876) |
| Manual worker | OC6 | 1851 (976) | 87 (987) | 2976 (1790) | 81 (1401) |
| Other | OC7 | 1324 (959) | 94 (889) | 2975 (1754) | 80 (1578) |
| *Sector* | | | | | |
| Agriculture | SE1 | 2069 (1059) | 81 (535) | 3633 (2285) | 77 (1614) |
| Manufacturing | SE2 | 1968 (997) | 85 (904) | 3184 (1822) | 82 (1504) |
| Mining | SE3 | 2026 (743) | 72 (693) | 3456 (1499) | 83 (1102) |
| Construction | SE4 | 2021 (877) | 87 (821) | 3579 (2730) | 75 (1613) |
| Transportation and communication | SE5 | 2264 (1198) | 79 (829) | 3786 (2570) | 77 (2009) |
| Commerce and trade | SE6 | 2262 (1584) | 78 (1251) | 3184 (2034) | 79 (1511) |
| Public utilities | SE7 | 2006 (1035) | 77 (846) | 3752 (2276) | 73 (2492) |
| Health and social welfare | SE8 | 2170 (1042) | 87 (704) | 3750 (1940) | 91 (1835) |
| Education and culture | SE9 | 2193 (889) | 88 (824) | 3828 (1709) | 85 (1593) |
| Scientific research and technology | SE10 | 2294 (1086) | 86 (806) | 3948 (1738) | 83 (1340) |
| Finance and insurance | SE11 | 1999 (705) | 83 (676) | 3879 (2667) | 92 (2045) |
| Government and social organisations | SE12 | 2079 (1083) | 91 (1624) | 3528 (1979) | 92 (2247) |
| Others | SE13 | 1913 (2590) | 67 (906) | 3429 (2228) | 80 (1899) |
| *Status of job* | | | | | |
| Permanent worker | JO1 | 2059 (1037) | 84 (978) | 3429 (1996) | 84 (1711) |

(*continued*)

**Table 4** (continued)

| | | *1988* | | *1995* | |
|---|---|---|---|---|---|
| *Name of variables* | *Notations* | *Male* | *Female as percentage of male* | *Male* | *Female as percentage of male* |
| Temporary worker | JO2 | 3121 (4880) | 56 (1989) | 2807 (2125) | 71 (1544) |
| Others | JO3 | 1418 (972) | 81 (1005) | 3229 (2488) | 75 (2307) |
| *Province* | | | | | |
| Beijing | P11 | 2156 (763) | 87 (702) | 4066 (1930) | 86 (1514) |
| Shanxi | P14 | 1764 (726) | 84 (1584) | 2797 (1348) | 74 (1070) |
| Liaoning | P21 | 1954 (672) | 88 (552) | 3145 (1496) | 80 (1278) |
| Jiangsu | P32 | 2047 (1050) | 85 (558) | 3601 (1713) | 83 (1529) |
| Anhui | P34 | 1921 (1087) | 79 (986) | 2776 (1290) | 77 (1064) |
| Henan | P41 | 1674 (765) | 83 (594) | 2889 (1366) | 79 (1235) |
| Hubei | P42 | 1845 (814) | 90 (619) | 3095 (1426) | 88 (1226) |
| Guangdong | P44 | 2957 (1687) | 84 (1517) | 6175 (3714) | 85 (3235) |
| Yunnan | P53 | 2182 (936) | 82 (654) | 3119 (1238) | 87 (1247) |
| Gansu | P62 | 2184 (1650) | 73 (804) | 2637 (1101) | 79 (998) |

Notes: (1) Earnings in 1995 were deflated with 1988 provincial prices. (2) Standard errors of male earnings and female earnings in parentheses

Source: Urban household income surveys 1989 and 1996

For example Gustafsson and Johansson (1998) report for full time, full year workers an average earnings ratio of females to males of 81.4% for 1983, but declining to 77.8 in 1991.[6]

Next we look at earnings and the gender earnings gap for various breakdowns of the population starting with age. While the gender earnings gap in urban China according to Table 4 is small among the youngest adults it very clearly increases with age in both cross-sections. For example in 1988

[6] We have found a considerably higher gender wage gap for urban China than Qian (1996) who reported it to be 9%. Thus we do not share her conclusion that China has by far the smallest gender wage gap observed in the world (p. 114). One explanation for the differences between the studies is that the gender earnings gap is smaller in the two provinces in her study (which also are included in our study). We report in Table 4 for 1995 a gender earnings gap of 14% in Beijing and 15% in Guangdong to be compared to 18% for urban China as a whole. In addition there are differences in definitions between the studies. For example our study is on earning and we include the self-employed while her study is on wages excluding self-employed.

women 16–25 earned only 4% less than men of the same age, but the gap was 20% among those aged 46–54. The small fraction of women working after their general retirement age of 55 have earnings remarkably low in comparison to men of the same age.

There is also an interesting pattern in the education breakdown. The overall relation between level of education and earnings is weak for 1988 but clearer for 1995. The change is probably at least partly due to the urban workers being rewarded more according to their productivity, one of its determinants being human capital, and partly because the rapid growth of high-tech industries has resulted in great demand for well-educated workers. The gender earnings gap is smallest among those with a longer education and there is even a very small decrease in the gap between the 2 years of observation. On the other hand the gender earnings gap is larger for those with short educations. In addition with the exception of the very lowest level of education the gender earnings gap has increased among those with shorter education.

Table 4 also contains information on male earnings as well as female earnings as proportion of male earnings for breakdowns according to ownership, occupation, sector, status of job and province. We choose to comment on only a few of these findings. It is interesting to see that there is no example of female earnings being higher or equal to male earnings. Differences in earning levels across provinces are rather large compared to differences in earnings along other dimensions.

What have changes in earnings inequality in urban China meant for the average gender earnings gap? Our calculations show that in 1988 the female median is located at the 38.3 percentile of the male earnings distribution. Seven years later the location is actually slightly higher, at the 39.7 percentile (in a now more unequal distribution). This indicates that the increase in the gender earnings gap in urban China is driven by increased earnings inequality, not by a deteriorating relative position of women in the earnings distribution.

## 6 Earnings Functions

Estimated earnings functions for males and females are reported in Table 5 for 1988 and in Table 6 for 1995. There are many results worth commenting on.

**Table 5** Coefficients of earnings functions of male and female workers, 1988

| | *Male workers* | | *Female workers* | |
|---|---|---|---|---|
| | *Coefficient* | *Standard error* | *Coefficient* | *Standard error* |
| *Intercept* | 7.466 | 0.054 | 7.252 | 0.025 |
| *Age group* | | | | |
| Aged 16–25 | -0.408 | 0.012 | -0.351 | 0.012 |
| Aged 26–35 | – | – | – | – |
| Aged 36–45 | 0.140 | 0.010 | 0.103 | 0.010 |
| Aged 46–55 | 0.213 | 0.011 | 0.150 | 0.013 |
| Aged 56–65 | 0.217 | 0.016 | 0.106 | 0.043 |
| *Minority* | | | | |
| National minority | 0.018 | 0.018 | 0.004 | 0.022 |
| Non-national minority | – | – | – | – |
| *Party membership* | | | | |
| Party member | 0.056 | 0.009 | 0.102 | 0.014 |
| Non-party member | – | – | – | – |
| *Education* | | | | |
| 4-year college | 0.089 | 0.016 | 0.102 | 0.026 |
| 2-year college | 0.027 | 0.015 | 0.043 | 0.021 |
| Professional school | 0.016 | 0.013 | 0.030 | 0.016 |
| Upper middle school | – | – | – | – |
| Lower middle school | 0.014 | 0.009 | -0.016 | 0.011 |
| Primary school | -0.012 | 0.015 | -0.090 | 0.016 |
| Less than primary school | -0.082 | 0.031 | -0.194 | 0.027 |
| *Ownership* | | | | |
| State-owned sector | 0.154 | 0.012 | 0.188 | 0.011 |
| Other public sector | 0.073 | 0.011 | 0.119 | 0.011 |
| Collective sector | – | – | – | – |
| Private or self-employed | 0.246 | 0.084 | -0.112 | 0.077 |
| Joint venture or foreign firm | 0.386 | 0.066 | 0.310 | 0.070 |
| Other ownership | -0.228 | 0.066 | 0.019 | 0.056 |
| *Occupation* | | | | |
| Owner of private firm | 0.163 | 0.038 | 0.092 | 0.049 |
| Professional or technician | 0.078 | 0.014 | 0.061 | 0.016 |
| Responsible officer or manager | 0.079 | 0.017 | 0.091 | 0.036 |
| Ordinary officer or manager | 0.151 | 0.022 | 0.076 | 0.060 |
| Office worker | 0.037 | 0.010 | 0.045 | 0.012 |
| Manual worker | – | – | – | – |
| Others | -0.311 | 0.054 | -0.397 | 0.048 |
| *Sector* | | | | |
| Agriculture | -0.055 | 0.036 | 0.074 | 0.050 |

(*continued*)

**Table 5** (continued)

| | *Male workers* | | *Female workers* | |
|---|---|---|---|---|
| | *Coefficient* | *Standard error* | *Coefficient* | *Standard error* |
| Manufacturing | – | – | – | – |
| Mining | -0.053 | 0.016 | 0.100 | 0.021 |
| Construction | -0.031 | 0.023 | 0.131 | 0.031 |
| Transportation and communication | -0.024 | 0.019 | 0.104 | 0.027 |
| Commerce and trade | -0.069 | 0.018 | 0.092 | 0.022 |
| Public utilities | -0.107 | 0.032 | 0.025 | 0.040 |
| Health and social welfare | -0.039 | 0.044 | -0.015 | 0.039 |
| Education and culture | -0.088 | 0.025 | 0.078 | 0.027 |
| Scientific research and technology | -0.090 | 0.021 | 0.080 | 0.026 |
| Finance and insurance | -0.066 | 0.027 | 0.098 | 0.038 |
| Government and social organisations | -0.088 | 0.032 | 0.046 | 0.039 |
| Others | -0.124 | 0.019 | 0.029 | 0.028 |
| *Status of job* | | | | |
| Permanent worker | – | – | – | – |
| Temporary worker | -0.239 | 0.037 | -0.476 | 0.028 |
| Others | -0.256 | 0.076 | -0.174 | 0.065 |
| *Province* | | | | |
| Beijing | -0.017 | 0.019 | -0.047 | 0.022 |
| Shanxi | -0.243 | 0.015 | -0.291 | 0.018 |
| Liaoning | -0.084 | 0.015 | -0.064 | 0.017 |
| Jiangsu | – | – | – | – |
| Anhui | -0.128 | 0.015 | -0.164 | 0.017 |
| Henan | -0.262 | 0.015 | -0.308 | 0.017 |
| Hubei | -0.171 | 0.015 | -0.136 | 0.017 |
| Guangdong | 0.265 | 0.015 | 0.246 | 0.017 |
| Yunnan | -0.024 | 0.015 | -0.041 | 0.017 |
| Gansu | -0.082 | 0.017 | -0.194 | 0.020 |
| Adjusted $R^2$ | 0.436 | | 0.386 | |
| *F*-value | 158.1 | | 117.4 | |
| Mean value of dependent variable | 7.533 | | 7.349 | |
| Number of observations | 9354 | | 8533 | |

Source: Urban household income surveys 1989 and 1996

**Table 6** Coefficients of earnings functions of male and female workers, 1995

| | *Male workers* | | *Female workers* | |
|---|---|---|---|---|
| *Variable* | *Coefficient* | *Standard error* | *Coefficient* | *Standard error* |
| *Intercept* | 7.763 | 0.044 | 7.717 | 0.042 |
| *Age group* | | | | |
| Aged 16–25 | -0.348 | 0.028 | -0.386 | 0.029 |
| Aged 26–35 | – | – | – | – |
| Aged 36–45 | 0.190 | 0.020 | 0.162 | 0.021 |
| Aged 46–55 | 0.230 | 0.023 | 0.025 | 0.029 |
| Aged 56–65 | 0.095 | 0.032 | -0.771 | 0.063 |
| *Minority* | | | | |
| National minority | -0.039 | 0.036 | -0.068 | 0.041 |
| Non-national minority | – | – | – | – |
| *Party membership* | | | | |
| Party member | 0.077 | 0.018 | 0.101 | 0.026 |
| Non-party member | – | – | – | – |
| *Education* | | | | |
| 4-year college | 0.155 | 0.030 | 0.208 | 0.043 |
| 2-year college | 0.068 | 0.024 | 0.122 | 0.031 |
| Professional school | 0.033 | 0.024 | 0.063 | 0.028 |
| Upper middle school | – | – | – | – |
| Lower middle school | -0.038 | 0.021 | -0.062 | 0.023 |
| Primary school | -0.161 | 0.041 | -0.294 | 0.041 |
| Less than primary school | -0.302 | 0.136 | -0.184 | 0.101 |
| *Ownership* | | | | |
| State-owned sector | 0.259 | 0.026 | 0.300 | 0.027 |
| Other public sector | 0.113 | 0.023 | 0.121 | 0.023 |
| Collective sector | – | – | – | – |
| Private or self-employed | 0.008 | 0.097 | 0.109 | 0.093 |
| Joint venture or foreign firm | 0.353 | 0.071 | 0.460 | 0.084 |
| Other ownership | 0.264 | 0.108 | 0.262 | 0.091 |
| *Occupation* | | | | |
| Owner of private firm | 0.039 | 0.067 | 0.097 | 0.085 |
| Professional or technician | 0.067 | 0.031 | 0.203 | 0.036 |
| Responsible officer or manager | 0.113 | 0.039 | 0.145 | 0.074 |
| Ordinary officer or manager | 0.104 | 0.030 | 0.119 | 0.051 |
| Office worker | 0.008 | 0.028 | 0.100 | 0.033 |
| Manual worker | – | – | – | – |
| Others | -0.006 | 0.034 | 0.034 | 0.031 |
| *Sector* | | | | |
| Agriculture | 0.002 | 0.052 | -0.074 | 0.076 |

(*continued*)

**Table 6** (continued)

| | *Male workers* | | *Female workers* | |
|---|---|---|---|---|
| *Variable* | *Coefficient* | *Standard error* | *Coefficient* | *Standard error* |
| Manufacturing | – | – | – | – |
| Mining | -0.027 | 0.074 | -0.059 | 0.105 |
| Construction | 0.063 | 0.043 | 0.005 | 0.059 |
| Transportation and communication | 0.097 | 0.032 | 0.076 | 0.044 |
| Commerce and trade | -0.007 | 0.024 | -0.019 | 0.025 |
| Public utilities | 0.041 | 0.041 | -0.063 | 0.042 |
| Health and social welfare | 0.054 | 0.041 | 0.076 | 0.039 |
| Education and culture | 0.077 | 0.032 | 0.083 | 0.034 |
| Scientific research and technology | 0.060 | 0.047 | 0.014 | 0.062 |
| Finance and insurance | 0.216 | 0.055 | 0.258 | 0.060 |
| Government and social organisations | 0.036 | 0.025 | 0.049 | 0.032 |
| Others | -0.215 | 0.077 | -0.410 | 0.089 |
| *Status of job* | | | | |
| Permanent worker | – | – | – | – |
| Temporary worker | -0.135 | 0.059 | -0.226 | 0.048 |
| Others | -0.074 | 0.079 | -0.189 | 0.073 |
| *Province* | | | | |
| Beijing | 0.034 | 0.032 | -0.040 | 0.038 |
| Shanxi | -0.296 | 0.030 | -0.487 | 0.035 |
| Liaoning | -0.155 | 0.029 | -0.279 | 0.034 |
| Jiangsu | – | – | – | – |
| Anhui | -0.294 | 0.033 | -0.343 | 0.037 |
| Henan | -0.238 | 0.031 | -0.342 | 0.036 |
| Hubei | -0.220 | 0.029 | -0.221 | 0.034 |
| Guangdong | 0.476 | 0.031 | 0.480 | 0.036 |
| Yunnan | -0.197 | 0.031 | -0.194 | 0.035 |
| Gansu | -0.342 | 0.036 | -0.438 | 0.041 |
| Adj $R^2$ | 0.276 | | 0.337 | |
| *F*-value | 47.50 | | 56.41 | |
| Mean of dependent variable | 7.983 | | 7.751 | |
| *N* | 5603 | | 5011 | |

Source: Urban household income surveys 1989 and 1996

Earnings in urban China are very clearly related to age. In 1988 age effects increased in the male equation up to the age class 46–55 after which it levelled out. However, in 1995 the age effect for those over 55

was much smaller which might reflect productivity considerations being more important than previously when determining earnings for older workers. Pay also attention to the large negative effect of being over 55 among female workers in 1995. Females working after the general retirement age are very low paid.

All estimated effects of minority status are small and have a low degree of statistical significance. On the other hand being a party member has a positive effect estimated with a high t-value. However, this effect which might stand for a party member having more social capital than a non-party member and is not particularly large as the point estimates range from 5 to 10%.

Effects of education in our specification which also includes variables measuring occupation were small in 1988. However over time they have increased dramatically. Thus while the earnings differential among men with 4 years of college implied earnings 9% higher than for men with upper middle school the difference had increased to 15% in 1995. Effects of education are somewhat larger for female workers than for male workers.

Tables 5 and 6 clearly show that ownership of the work unit affects earnings in urban China. It comes as no surprise that the highest paying ownerships are joint venture or foreign-owned enterprises followed by state-owned enterprises and thereafter other public, but not collectively owned enterprises. Other effects of ownership are not as straightforward to interpret. Most effects of the economic sector are small. The main exception is finance and insurance which show considerably higher earnings in 1995 while the corresponding size of the effect could not be established for 1988. This result is in line with what has been reported in the official statistics (SSB, 1995b, pp. 114–115). Finally we note large effects of province which are not generally smaller for the last year under study. (The issue of earnings convergence across provinces in urban China is investigated using the same samples by Knight et al. (1997).)

Overall the results illustrate that what matters for how much a person earns in urban China is where he or she works as indicated by location and by the ownership of the enterprise. Whether or not one has long work experience as indicated by age is also of importance to earnings, as well as the person's education for 1995.

## 7 Decomposition of Average Gender Gaps

Using the estimated earnings functions reported in Tables 5 and 6 the average gender earnings gap in 1988 and 1995 is decomposed in Table 7. About half of the crude difference in average log earnings can be explained by differences in average values for variables cross gender. Evaluating the difference by parameters estimated for males we find that the single most important variable for partly explaining the crude gap in 1988 is age to which 19% of the gap can be attributed. For the same year the second variable in importance is ownership to which 10% of the observed earnings gap can be attributed. Other contributions come from party membership

**Table 7** Results of decomposition of gender difference of earnings in urban China

| | $\beta_m X_m - \beta_m X_f$ | *Percent of total* | $\beta_m X_f - \beta_f X_f$ | *Percent of total* |
|---|---|---|---|---|
| 1988 | | | | |
| Intercept | 0 | 0 | 0.3628 | 203.12 |
| Age group | 0.0340 | 19.02 | 0.0110 | 6.14 |
| Minority status | 0.00005 | 0.03 | 0.0011 | 0.59 |
| Party membership | 0.0124 | 6.92 | -0.0057 | -3.19 |
| Education | 0.0056 | 3.14 | 0.0059 | 3.33 |
| Ownership | 0.0184 | 10.32 | -0.0354 | -19.83 |
| Occupation | 0.0122 | 6.85 | -0.1476 | -82.64 |
| Economic sector | -0.0003 | -0.16 | -0.1240 | -69.41 |
| Type of job | 0.0039 | 2.17 | 0.0067 | 3.76 |
| Province | -0.0014 | -0.78 | 0.0190 | 10.62 |
| Total | 0.0849 | 47.51 | 0.0937 | 52.49 |
| 1995 | | | | |
| Intercept | 0 | 0 | 0.0462 | 19.87 |
| Age group | 0.0169 | 7.28 | 0.0645 | 27.74 |
| Minority status | 0.0001 | 0.02 | 0.0014 | 0.59 |
| Party membership | 0.0142 | 6.12 | -0.0037 | -1.60 |
| Education | 0.0172 | 7.40 | 0.0001 | 0.02 |
| Ownership | 0.0208 | 8.96 | -0.0163 | -7.03 |
| Occupation | 0.0114 | 4.92 | -0.0199 | -8.58 |
| Economic sector | 0.0003 | 0.14 | 0.0087 | 3.76 |
| Type of job | 0.0026 | 1.12 | 0.0060 | 2.59 |
| Province | 0.0020 | 0.84 | 0.0601 | 25.86 |
| Total | 0.0855 | 36.80 | 0.1469 | 63.20 |

Source: Urban household income surveys 1989 and 1996

**Table 7a** Difference of decomposition results between 1995 and 1988

| | $(\beta_m X_m - \beta_m X_f)95 - (-\beta_m X_m - \beta_m X_f)88$ | $(\beta_m X_f - \beta_f X_f)95 - (\beta_m X_f - \beta_f X_f)88$ |
|---|---|---|
| Intercept | 0 | -0.3166 |
| Age group | -0.0171 | 0.0535 |
| Minority status | 0.00005 | 0.0003 |
| Party membership | 0.0018 | 0.0020 |
| Education | 0.0116 | -0.0058 |
| Ownership | 0.0024 | 0.0191 |
| Occupation | -0.0008 | 0.1277 |
| Economic sector | 0.0006 | 0.1327 |
| Type of job | -0.0013 | -0.0007 |
| Province | 0.0034 | 0.0411 |
| Total | 0.0006 | 0.0532 |

Source: Urban household income surveys 1989 and 1996

and occupation both closing 7% of the crude earnings gap while differences in education close an even smaller proportion.

We now turn to changes between 1988 and 1995 as reported in Table 7. While the raw gender earnings gap is larger in 1995 than in 1988 almost no part of the increase can be attributed to differences in variables cross gender.[7] The bottom part of Table 7a shows that using the estimates of males the explained proportion amounts to as little as about one tenth of the increase in the earnings gap. The explained part can in turn be decomposed into two terms: a. "The variable-effect" measuring how the difference in variables between men and women has hanged (evaluated by coefficients of 1995); b. "The coefficient effects" showing how given characteristics are differently rewarded in 1995 compared to 1988 (evaluated by the difference in variables in 1988). Looking further in Table 7a one sees that the single most important source of the increase in the explained part is education. In the estimated equation for 1995 earnings effects of education are much larger than in the equation estimated for 1988 and on average men have longer educations than women. However, working in the opposite direction is age. The lower average age of the

[7] In a sensitivity analysis we dropped variables indicating occupation and economic sector from the earnings functions but received similar results. The gender earnings gap due to differences in mean values accounts to 43.8% in 1988 while it dropped to 36.4% in 1995.

female worker had a lesser impact on the gender earnings gap in 1995 than in 1988. In 1995 the most important differences in variables cross gender for closing the crude earnings gap were ownership (9% of the gap), education and age (both 7% of the crude gap) followed by party membership.

## 8 Decomposition Using the Distribution Approach

A number of interesting points stand out in Table 8 where we report numerical values for Jenkins' "discrimination" index. (When constructing Table 8 we have aggregated some cells into broader categories.) Earnings "discrimination" has increased for most but not for all subgroups. Exceptions are persons aged 36–45, the small group of persons in private or other ownership, the heterogeneous occupation category "other" and in the provinces of Yunnan and Gansu. There largest increases in group-specific "discrimination" are reported for the youngest and those with primary education, which is consistent with the development of the crude gender gap as shown above.[8] The indices for state-owned enterprises increased more than for collective enterprises. We report very high numbers for both years for women aged 56 to 65. However, as women in those ages are over the general retirement-age (while this is not the case for many men) the results might also be labelled different treatment of retired (Table 8).

Finally we complement the description by looking at how total discrimination is made up in 1988 and 1995 weighting the category-specific indices by number of persons. Table 9 constructed by setting $\alpha$ equal to 1 shows contribution defined as the product of the within group index and the predicted earnings share. All numbers are expressed as a percentage of the aggregated "discrimination" index for the particular year. Several comments can be made.

[8] We do not have evidence as to why the increases are largest for those categories so explanations have to be speculative. First looking at young workers one can notice that they have been hired recently. It is therefore most likely that any increased preference among employer to hire male workers is strongest for this category. Therefore in order to get a job young female workers have (probably) been increasingly willing to accept lower wages (than males). Turning to the category of people with a short education one can notice that much work done by such people is physically demanding. Women might be less productive performing many such tasks, and this might be an important reason why the "discrimination index" has increased for this category.

**Table 8** Jenkins' indices of discrimination in 1988 and 1995 in urban China

| | | $\alpha = 0.5$ | | $\alpha = 1$ | | $\alpha = 2$ | |
|---|---|---|---|---|---|---|---|
| | | *1988* | *1995* | *1988* | *1995* | *1988* | *1995* |
| Age | Age 16–25 | 0.0269 | 0.0567 | 0.0525 | 0.1087 | 0.1001 | 0.2001 |
| | 26–35 | 0.0336 | 0.0423 | 0.0654 | 0.0820 | 0.1246 | 0.1544 |
| | 36–45 | 0.0451 | 0.0435 | 0.0874 | 0.0844 | 0.1645 | 0.1586 |
| | 46–55 | 0.0604 | 0.0797 | 0.1162 | 0.1520 | 0.2158 | 0.2775 |
| | 56–65 | 0.1264 | 0.2231 | 0.2358 | 0.3933 | 0.4129 | 0.6245 |
| Education | High level | 0.0294 | 0.0424 | 0.0572 | 0.0817 | 0.1088 | 0.1523 |
| | Middle level | 0.0408 | 0.0472 | 0.0790 | 0.0909 | 0.1486 | 0.1695 |
| | Primary level | 0.0785 | 0.1798 | 0.1497 | 0.3382 | 0.2738 | 0.6013 |
| Ownership | State-owned | 0.0400 | 0.0505 | 0.0775 | 0.0971 | 0.1456 | 0.1801 |
| | Collective | 0.0599 | 0.0606 | 0.1148 | 0.1160 | 0.2120 | 0.2131 |
| | Private | 0.1016 | 0.0696 | 0.1885 | 0.1321 | 0.3278 | 0.2388 |
| | Other | 0.1240 | 0.0536 | 0.2291 | 0.1030 | 0.3947 | 0.1912 |
| Occupation | Owner | 0.0925 | 0.0530 | 0.1755 | 0.1014 | 0.3169 | 0.1864 |
| | Professional | 0.0344 | 0.0406 | 0.0669 | 0.0785 | 0.1269 | 0.1470 |
| | Manager | 0.0403 | 0.0500 | 0.0775 | 0.0960 | 0.1438 | 0.1775 |
| | Office worker | 0.0385 | 0.0414 | 0.0745 | 0.0798 | 0.1400 | 0.1490 |
| | Manual worker | 0.0510 | 0.0710 | 0.0983 | 0.1361 | 0.1827 | 0.2508 |
| | Other | 0.1455 | 0.0689 | 0.2668 | 0.1313 | 0.4535 | 0.2399 |
| Province | Beijing | 0.0401 | 0.0522 | 0.0777 | 0.1001 | 0.1463 | 0.1854 |
| | Shanxi | 0.0530 | 0.0791 | 0.1021 | 0.1507 | 0.1898 | 0.2748 |
| | Liaoning | 0.0288 | 0.0676 | 0.0563 | 0.1293 | 0.1078 | 0.2375 |
| | Jiangsu | 0.0373 | 0.0441 | 0.0725 | 0.0851 | 0.1373 | 0.1594 |
| | Anhui | 0.0567 | 0.0485 | 0.1072 | 0.0935 | 0.1991 | 0.1748 |
| | Henan | 0.0527 | 0.0573 | 0.1015 | 0.1099 | 0.1889 | 0.2026 |
| | Hubei | 0.0251 | 0.0368 | 0.0490 | 0.0714 | 0.0938 | 0.1346 |
| | Guangdong | 0.0457 | 0.0479 | 0.0883 | 0.0925 | 0.1655 | 0.1719 |
| | Yunnan | 0.0446 | 0.0384 | 0.0864 | 0.0746 | 0.1623 | 0.1409 |
| | Gansu | 0.0823 | 0.0573 | 0.1564 | 0.1101 | 0.2833 | 0.2040 |
| Total | | 0.0452 | 0.0530 | 0.0872 | 0.1017 | 0.1629 | 0.1880 |

Source: Urban household income surveys 1989 and 1996

Although the highest category specific "discrimination" indexes are reported in ages when persons enter and exit working life, "discrimination" at such ages contributes relatively little to total "discrimination" due to the relatively small proportion of the sample belonging to those categories. Most of earnings "discrimination" in urban China can be attributed to persons in the middle of working life as they make up the dominating part of Chinese workers. Thus in both years about 40% of total earnings

**Table 9** Contributions of group discrimination to total discrimination ($\alpha = 1$)

| | | *1988* | | *1995* | |
|---|---|---|---|---|---|
| Group variable | | Weight | Percentage | Weight | Percentage |
| Age | Age 16–25 | 0.120 | 7.6 | 0.077 | 8.8 |
| | 26–35 | 0.325 | 25.4 | 0.266 | 21.9 |
| | 36–45 | 0.362 | 38.5 | 0.483 | 40.5 |
| | 46–55 | 0.185 | 25.9 | 0.166 | 25.4 |
| | 56–65 | 0.008 | 2.6 | 0.008 | 3.4 |
| Education | High level | 0.096 | 6.3 | 0.224 | 18.0 |
| | Middle level | 0.764 | 69.7 | 0.724 | 64.8 |
| | Primary level | 0.137 | 24.0 | 0.052 | 17.2 |
| Ownership | State-owned | 0.757 | 67.1 | 0.796 | 76.0 |
| | Collective | 0.230 | 30.1 | 0.154 | 18.0 |
| | Private | 0.009 | 1.8 | 0.035 | 4.5 |
| | Other | 0.004 | 1.1 | 0.015 | 1.5 |
| Occupation | Owner | 0.004 | 0.8 | 0.067 | 6.7 |
| | Professional | 0.188 | 14.2 | 0.280 | 21.6 |
| | Manager | 0.025 | 2.1 | 0.077 | 7.3 |
| | Office worker | 0.228 | 19.5 | 0.228 | 17.9 |
| | Manual worker | 0.550 | 62.0 | 0.328 | 43.9 |
| | Other | 0.005 | 1.4 | 0.021 | 2.6 |
| Province | Beijing | 0.050 | 4.4 | 0.087 | 9.9 |
| | Shanxi | 0.086 | 10.2 | 0.068 | 11.9 |
| | Liaoning | 0.111 | 7.4 | 0.092 | 13.7 |
| | Jiangsu | 0.130 | 10.8 | 0.120 | 11.8 |
| | Anhui | 0.085 | 10.5 | 0.057 | 6.5 |
| | Henan | 0.095 | 11.2 | 0.065 | 8.5 |
| | Hubei | 0.109 | 6.3 | 0.100 | 8.5 |
| | Guangdong | 0.164 | 16.7 | 0.152 | 15.5 |
| | Yunnan | 0.111 | 11.2 | 0.098 | 8.3 |
| | Gansu | 0.057 | 10.3 | 0.041 | 5.4 |
| Total | | 1.00 | 100 | 1.00 | 100 |

Source: Urban household income surveys 1989 and 1996

"discrimination" in urban China can be attributed to the relatively narrow age group of persons aged 36–45.

Looking at results for the education breakdown substantial changes between the years are evident. In 1995 18% of total "discrimination" is attributed to those with a high education, while the corresponding percentage was 6 in 1988. Mirroring this the proportion of total "discrimination" attributed to the occupations professional and manager has increased

from 16% to 29%. At the other end of the spectrum, the contribution to total "discrimination" from those with only primary education decreased, although group-specific "discrimination" increased greatly. The dominating part of total earnings "discrimination" in urban China can be attributed to those with a middle level of education.

Finally pay attention when looking at ownership; one sees that the proportion of total earnings "discrimination" attributed to state-owned and other collective enterprises actually has increased from two thirds in 1988 to three fourths in 1995.

## 9 Conclusion

Using large samples we have investigated the gender earnings gap in urban China. We have taken advantage of samples covering many provinces and made comparisons between the years 1988 and 1995. During this period China experienced rapid industrialisation, urbanisation and transformation towards a market economy. A main result is that compared to the situation in many other countries the average gender earnings gap in urban China appears to be small. In 1988 average female earnings were 15.6% lower than for average males. The gender earnings gap is even smaller among the youngest wage earners and those with longer educations.

Another important result is that the gender earnings gap in urban China has increased since in 1995 females earned on average 17.5% less than males. Parallel to this, earnings inequality has increased rapidly. Analyses of earnings components show that the increase in the total earnings distribution was driven by the development of the basic wage and of subsidies. The increased inequality in earnings is a sufficient explanation for the increase in earnings gap for urban China.

Results from estimating earnings functions indicate that the size of earning in urban China is highly dependent on geographic location and ownership of the enterprise. Best paid work is found in foreign owned enterprises and in joint ventures, followed by the state sector. In addition earnings are positively affected by age standing for work experience and also (especially in the 90s) by education. The educational composition of the Chinese urban labour force has changed much from the end of the 80s to the middle of the 90s due to the greater education of those persons entering the labour force than those leaving due to retirement. This makes the increased returns to education observed during the period even more remarkable.

Decomposing the average crude earnings gap in urban China between women and men shows that about half in 1988 can be attributed to differences in average values for variables cross gender. The decomposition analyses show that different forces have affected the explained part of the average gender wage gap towards different directions. The shorter average education of Chinese women has tended to increase the average gender earnings gap but the fact that women workers on average are younger than male workers has worked in the other direction. Nevertheless the results show that a substantial and increasing part of the average earnings gap cannot be explained by differences in variables between women and men. Actually the overwhelming part of the increase in the gender earnings gap is due to differences in coefficients between females and males. However, it is not self-evident if this stands for increased earnings discrimination of women or for productivity considerations being more important and women on average being less productive than men.

In segments of urban China where market forces have gained in influence earnings differences between women and men have increased more rapidly than in other parts. Major examples of the former are young adults and persons with shorter educations. Analyses indicate that in such segments earning differences between women and men having the same characteristics have increased particularly rapidly.

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# The Geography of Poverty, Inequality and Wealth in the UK and Abroad: Because Enough Is Never Enough

*Danny Dorling and John Pritchard*

## 1 The Origins of the Statistics and Cartography of Poverty in England and Wales (1845–1901)

At the very centres of the twin hearts of the world economy, in London and New York, great wealth and miserable poverty are located only a stone's throw apart. We now know how unequal we are in great detail. But how did we get to know this detail so well? There are many stories that give an answer. This particular story goes back a century and more to the 400th odd page of the 186th volume of *Philosophical Transactions of*

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*London*. London is the most unequal part of the United Kingdom (UK), a city of even greater social contrasts now than it was then.

At the foot of page 404 of volume 186 of the *Philosophical Transactions of the Royal Society of London*, Series A (Mathematical), is a reference to an obscure diagram labelled "Plate 14, Figure 17: Statistics of Pauperism in England and Wales, distribution of 632 Unions, 1891". The diagram shows several curves and is reproduced as Fig. 1 here. The curves describe the probability distribution for paupers by Poor Law Union (area), ranging from 1% up to almost 8.5% of the population of some areas of England and Wales, but with a mean about 3.5% and "the observations are at once seen to give a markedly skew distribution" (Pearson, 1895, pp. 404–405). This is the first description of the national geography of poverty on these islands, but that is not what this graph is remembered for. It is remembered as the first example of a graph of chance, and of the suggestion that poverty is somehow inherited.

Squeezed between pages on the latent heat of evaporation of fluids and the specific heat of water, Series *A of the Transactions* appears now to be an

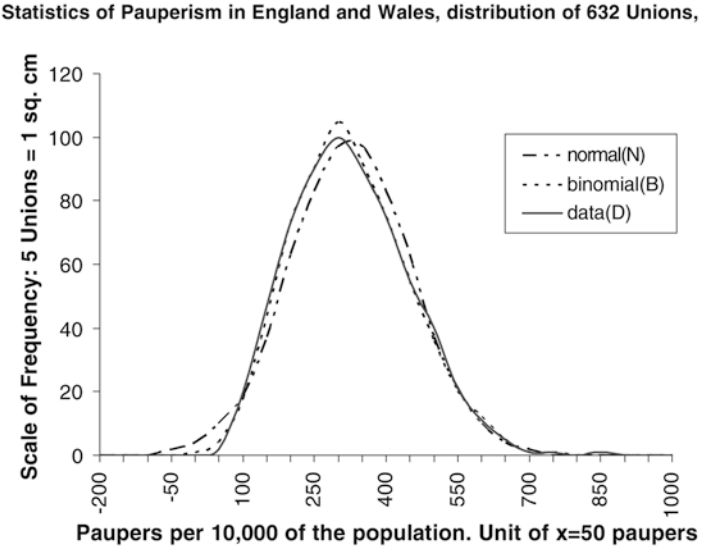


**Fig. 1** The first estimate of the geographical distribution of poverty in England and Wales. (Source: Karl Pearson, Volume 186 of the Philosophical Transactions of the Royal Society of London, Series A (Mathematical))

odd home for one of the first scientific papers to describe the geographical distribution of poverty in England and Wales. The paper was written by Karl Pearson (MacKenzie, 1999) who later founded the first university Statistics department in the world. His paper is mainly referred to today as containing one of the first examples of the curve of a probability distribution. However, amongst social scientists Pearson's work is now remembered as one of the early attempts to apply Charles Darwin's theory of evolution to people and to suggest that the poor have children often destined to be poor by dint of some biological mechanism (Dorling, 2010, Sections 4.2 and 4.3).

The curve Pearson drew shows how many Poor Law Union Areas contained just a few paupers and how many areas were home to far more poor people. Paupers were folk who were forced to rely on relief from the poor law and included those who lived in the workhouse in late nineteenth-century England and Wales (Scotland was not included in this work). Paupers were the poorest of the poor of those times. To try to understand why there might be more poor folk in some areas than others Pearson fitted various models to the basic curve that described the data. He concluded that the point-binomial distribution fitted particularly well and that "the suggestiveness of such results for social problems needs no emphasising" (ibid., p. 405). Pearson went on to speculate that "if the statistical curve of pauperism for 1881 be compared with that of 1891 [the] curve is sliding across from right to left" (ibid., p. 406). In other words, poverty breeds poverty, and the result of that breeding is ever-growing concentrations of the poor.

For Pearson and most other progressive learned folk of his time, poverty breeding poverty was a literal belief. This was the key influence of Darwin's work on those who study people. The *Origin of Species* (or *The Preservation of Favoured Races in the Struggle for Life,* to give it its poorly remembered alternative title; Darwin, 1859) had been published shortly after Pearson was born, and *Hereditary Genius* just a decade later (by Galton, 1869). Galton was Darwin's half-cousin and Pearson's mentor. Karl Pearson drew the curve to help establish part of his Mathematical Theory of Evolution (in "homogeneous material"). He saw pauperism as a biological outcome (the opposite of the "inherited genius") and the rise and geographic concentration of paupers as a great social problem clearly requiring eugenic solutions (although even in 1895 the language was coded as "social problems"). Pearson used the pauperism statistics to add supposed-weight to his discussion on heredity that began, if you look up

the 1895 paper, on the frequency of the emergence of blossom in white clover and ended with discussions of skull shape, school-girl height and school-boy short-slightness.

Karl Pearson's data came from Appendix I of Charles Booths' "Aged Poor" study (Booth, 1894). Booth was a contemporary of Pearson and drew the first detailed maps of poverty and wealth in London around this time; an example is shown in Fig. 2. Thus, the very first poverty statistics in England and Wales, and the first poverty maps (of London) were closely related. A few short years later, in 1901, (Benjamin) Seebohm Rowntree, partly influenced also by Booth, drew his map of poverty and wealth in York (shown here as Fig. 3). A just a couple of years after that a young man called William Beveridge wrote that there was a class that were unemployable, and that "they include those habituated to the workhouse and to the casual ward, and the many regular inmates of shelters who are paupers in all but name. For these, long periods of regular work and discipline in


**Fig. 2** A fragment of Booth's descriptive map of London poverty. (Source: Dorling et al., 2000, *Figure 1*. Detail of one of Booth's maps. Key: Yellow: Upper-middle and Upper classes. Wealthy, Red: Well-to-do. Middle-class, Pink: Fairly comfortable. Good ordinary earning, Purple: Mixed. Some comfortable, others poor, Pale Blue: Poor. 18s. to 21s. a week for moderate family, Dark blue: Very poor, casual. Chronic want, Black: Lowest class. Vicious, semi-criminal)


**Fig. 3** Plan of the city of York—slum areas to servant keeping classes. (Source: B. Seebohm Rowntree, 2000 (1901), Poverty: a study of town life, Bristol: The Policy Press)

compulsory labour colonies are essential" (Beveridge & Maynard, 1904, quoted in Welshman, 2006, p. 591). Welshman argues eloquently that our current debates over the poor and their claiming of incapacity benefit for worklessness are now as "shaped as much by ideological and political factors as by broader economic trends" (ibid., p. 604) as they were at the times of Rowntree, Beveridge and Booth. And that is just one of the reasons why this history needs to be told in contemporary analysis.

To bring this short story of the origins of the statistics and cartography of poverty in Britain to a close, Seebohm's father, Joseph Rowntree, had written a pamphlet on the very same subject as mentioned in Pearson's paper: "Pauperism in England and Wales", but 30 years earlier: in 1865. Joseph went on to give his name to the Foundation, Charitable Trust and Reform Trusts that have been so influential in British poverty politics during the last century and decade. However, not that much has changed in the intervening 150 years as to how we construct and then view the statistics and cartography of poverty (today). We still draw maps that label streets in particular ways—even if now through the geodemographics industry—and we still have a tendency to consider geographical distribution of poverty as if they are about people not like us—objects to be studied—paupers in all but name. To understand why it may be a good time to change some of the fundamental ways in which we look at poverty today—and in particular why it makes sense to simultaneously consider wealth—it is worth looking back at why most of these men who first studied poverty did not look in that direction.

All of these folk were connected—not just by similar social background but much more. Pearson was brought up by a Quaker, his father was brought up by Quakers in York (as was Joseph Rowntree), and his mother's family were involved in shipping from Hull. Charles Booth was similarly born into a Liverpool ship-owning family. The Galtons were Quaker gun manufacturers (presumably, they did not use their own weapons given Quaker beliefs in non-violence). The Galtons were also bankers, from the city of Birmingham (those bankers had a lot to answer for even then!). Wealth, provincialism and puritanism came together in the early study and mapping of poverty. This mix may also have obscured the views a little (or a lot) of those from these backgrounds. These men were not operating in a knowledge vacuum, but they had collectively decided to ignore much previously published work. Most obviously they ignored the writing of an

immigrant (albeit a wealthy immigrant), who 20 years prior to Joseph Rowntree's pamphlet publication, and exactly 50 years before Pearson's graphs were drawn, had these words on poverty published:

> Society, composed wholly of atoms, does not trouble itself about them; leaves them to care for themselves and their families, yet supplies them no means of doing this in an efficient and permanent manner. Every working man, even the best, is therefore constantly exposed to loss of work and food, that is to death by starvation, and many perish in this way. The dwellings of the workers are everywhere badly planned, badly built, and kept in the worst condition, badly ventilated, damp, and unwholesome. The inhabitants are confined to the smallest possible space, and at least one family usually sleeps in each room. The interior arrangement of the dwellings is poverty-stricken in various degrees, down to the utter absence of even the most necessary furniture. The clothing of the workers, too, is generally scanty, and that of great multitudes is in rags. The food is, in general, had; often almost unfit for use, and in many cases, at least at times, insufficient in quantity, so that, in extreme cases, death by starvation results. Thus the working class of the great cities offers a graduated scale of conditions in life, in the best cases a temporarily endurable existence for hard work and good wages, good and endurable, that is, from the worker's standpoint; in the worst cases, bitter want, reaching even homelessness and death by starvation. The average is much nearer the worst case than the best. And this series does not fall into fixed classes, so that one might say, this fraction of the working class is well off, has always been so, and remains so. (Engels, 1845, p. 109)

Thus, the first maps and statistics of poverty in Britain were drawn by folk who were rediscovering what had been written about in detail years earlier. But they were also ignoring one of the key discoveries of 1845, that the poor do not fall into fixed classes, but that each individual, families and community circulates between various degrees of destitution and coping over time. Poverty was rediscovered just over a century ago as still existing and affecting a huge proportion of the population (around a third according to both Rowntree and Booth), and this despite the absolute dominance and unimaginable wealth of the British Empire. Poverty in the midst of plenty and the constant rediscovering of endemic poverty are themes that arise again and again in the study of poverty in Britain.

## 2 From the First National Counts to the First National Surveys (1895–1965)

The story of poverty into the twentieth century was a continuation of the story of a hobby. Poverty studies were something that well-meaning capitalists conducted in their spare time. And these were studies mostly for the otherwise idle but not without-conscience rich. Poverty was rife a long time before Friedrich Engels wrote on Manchester (King, 2000; Tomkins & King, 2003; Tomkins, 2006) and is rife in our times (see below). It also continues to be a concern for the paternalistic rich today. Worldwide the best example of this concern of the unbelievably rich for the plight of the extremely poor is given by the actions of Bill and Melinda Gates. They are not shy about their actions and their Foundation, so it is not to find out about just how charitable they have been. Back in Britain it does not take many jumps of historical figures to go from the interest in poverty amongst those who helped create the Labour party in Britain back then, to those who helped turn it into something "new" in 1997, as the next two paragraphs show. The year 2009 marked the centenary in Britain of the key Royal Commission on the Poor Laws, which continued the story of the interest of the rich and famous into the early years of the last century, although now for the first significant time there are women involved too.

These women were Helen Bosanquet and Beatrice Webb—key figures in the majority and minority reports respectively of the 1909 Royal Commission on the Poor Laws. Helen was the daughter of a Manchester businessman and had clashed publicly with Seebohm Rowntree in 1902. Beatrice was the daughter of a Wigan railway entrepreneur. Neither Beatrice nor Helen needed to work due to the wealth of their husband and father, respectively. Beatrice was influential in the early work of the Fabian Society, and fledging Labour party, and had worked for Charles Booth, helped establish the London School of Economics, and the weekly publication *New Statesmen*. In contrast, Helen Bosanquet, arguing on the less progressive side the debate, has left little impact. But both were establishment figures and neither was responsible for there being a Royal Commission in the first place.

The Royal Commission came about due to the interest of another immigrant (to England at least): David Lloyd George (initially not wealthy) who in turn influenced greatly William Beveridge (born wealthy), who was appointed director of Labour exchanges in 1909—the geographical heirs of Poor Law Union Areas. Following the implementation of

much of what Beveridge and his colleagues suggested in a later report (now best known by his name), an ageing Seebohm Rowntree, with George Russell Lavers, suggested that poverty had mostly disappeared in Britain by 1951 (Rowntree & Lavers, 1951). What happened next has been neatly summarised by Howard Glennerster, in an extract from his essay on "One hundred years of poverty and policy" selected, in theory, to help Tony Blair think better about poverty in 2000. Glennerster wrote this:

> Abel-Smith and Townsend (1965) used the national sample provided by the Family Expenditure Survey and updated Rowntree's poverty line in line with prices as a check on their own findings for 1953/54 (see below). They found 5.4 per cent of households in poverty. When Atkinson et al. (1981) reanalysed Rowntree's data using the then National Assistance Board scales as the poverty line they found that 14.4 per cent of working class households would have been judged poor. More recently Hatton and Bailey (2000) have reanalysed the same material to test Rowntree and Lavers' claim that poverty had fallen so dramatically because of the impact of post-war social policy. They found it did fall, but by nothing like as much as the earlier study claimed. Rowntree and Lavers claimed that the fall in poverty had been 20 percentage points. Hatton and Bailey suggest it was about 10 percentage points and much of that was the result of food subsidies: 'It is unfortunate that, in the absence of other comparable studies for the 1950s, this produced a somewhat distorted picture of poverty in the early post war period, an impression which took two decades to counteract' (2000, p. 537).
>
> Peter Townsend, as a new young researcher at the Institute for Community Studies, was asked to review Rowntree and Lavers and was not convinced. It led him to a lifetime of work that has changed the way we think about poverty in most developed economies, with the exception of the United States (Glennerster, 2002).
>
> His central point was that we cannot determine a level of adequacy simply by virtue of some expert calculation of dietary or health needs. Social custom requires that we share cups of tea with neighbours or buy presents for our children at Christmas, even have the occasional pint. (See also Glennerster et al., 2004, pp. 86–87)

Peter Townsend, who died in 2009, and those who worked with him changed fundamentally the way that poverty was thought of and mapped in Britain, in Europe and now in much of the world outside of the US. His ideas of poverty have been further developed by David Gordon and colleagues as illustrated in Fig. 4 (Gordon & Townsend, 2000; Gordon et al., 2000). And, ironically, just as Townsend, Atkins and Hatton and their

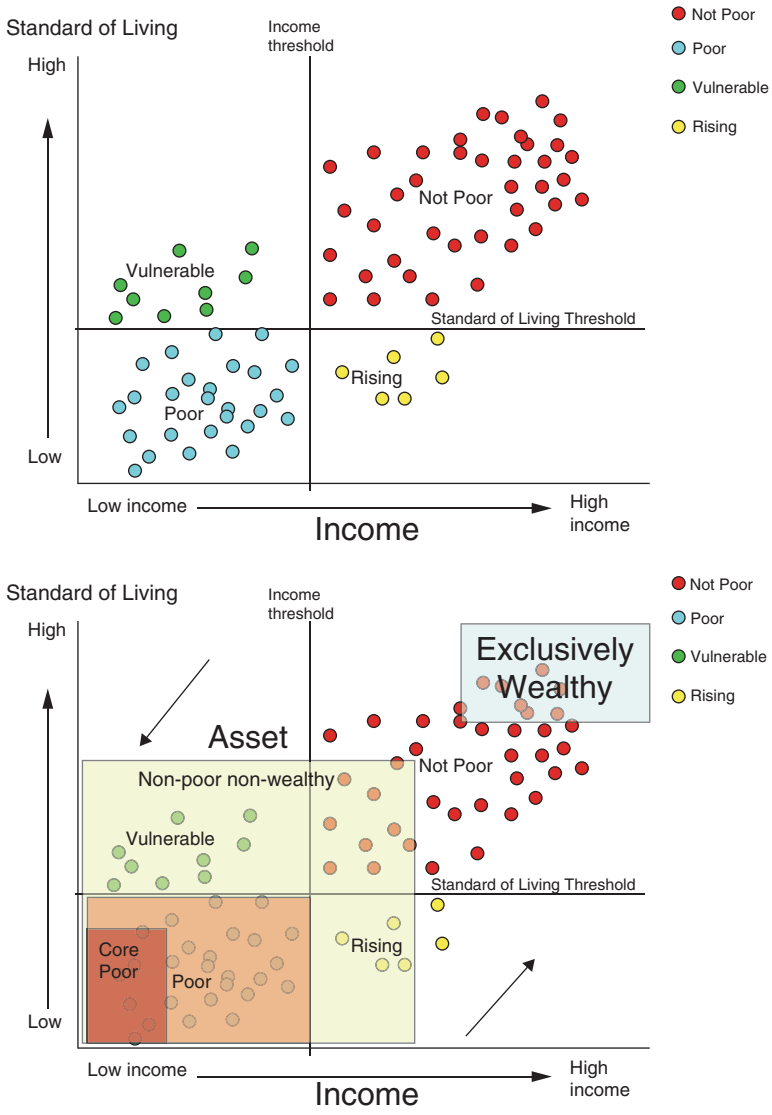


**Fig. 4** A model of the dynamics of poverty and five categories of household. (Source: Adapted from David Gordon's original (personal communication))

colleagues all referred to above found more poverty in York than Rowntree & Lavers', 1951 publication had suggested at the time, so too has contemporary re-analysis of Townsend's work of the 1960s found levels of poverty to have been higher than previously thought to have been the case (Dorling et al., 2007).

In Fig. 4 a dynamic model of poverty is drawn to illustrate Friedrich Engels' assertion referenced above: "The average is much nearer the worst case than the best. And this series does not fall into fixed classes, so that one might say, this fraction of the working class is well off, has always been so, and remains so". Each circle in the figure represents a hypothetical household. Poverty is defined using a relative poverty line—defined theoretically by Townsend (1979) as the resource level which is so low that people living below it are excluded from participating in the norms of society. This resource level can be determined using the Breadline Britain Index which is detailed in Gordon and Pantazis (1997). In practice those people living in households with a standard of living measured by the index to be below the crucial level, and with an income below that needed to raise this standard of living above that level are the "breadline poor", and are labelled as poor in the lower left-hand box in the graph at the top of Fig. 4. If and when their household incomes rise they move rightwards, and later increase their spending and are no longer poor (now being in the top right-hand corner of the top diagram). For those in that corner whose income falls substantially, they move leftwards, but tend to attempt to maintain their standards of living despite falling incomes. They are thus "vulnerable". It is then only when they can no longer maintain living standards, often nowadays when debts are too high, that their standard of living falls too, the circles representing them fall downwards on the graph, and they are (in many cases *again*) poor.

The version of the model at the bottom of Fig. 4 is the same as that at the top of Fig. 4, other than now new subsets of the population have been defined from the poorest of the poor to the rich, and exclusively rich in the more elaborate version of this illustrative figure. These are not fixed classes. Households do move between them and lie on the borders of them, but they are a useful way to think what people fall into a climb over the backs of others to get out of. These new categories have been defined as follows.

- Core poor: people who are income poor, materially deprived and subjectively poor
- Breadline poor: people living below a relative poverty line, and as such excluded from participating in the norms of society
- Non-poor, non-wealthy: the remainder of the population classified as neither poor nor wealthy
- Asset wealthy: estimated using the relationship between housing wealth and the contemporary inheritance tax threshold
- Exclusive wealthy: people with sufficient wealth to exclude themselves from the norms of society

Note that the core poor and exclusive wealthy households are subsets of the Breadline Poor and Asset Wealthy, respectively. Re-analysis of Townsend's 1968 poverty survey finds that just under a quarter of households were breadline poor around then, around 1 in 7 were core poor and only 1 in 14 were exclusively rich (see Dorling et al., 2007 for more details, the text that follows, and Fig. 7 for the 2001 distribution).

Thus, in moving from 1895 to a re-analysis of work first started in 1951, we no longer have folk simply labelled as "paupers"; but those who are extremely poor; functionally poor; neither poor nor wealthy; asset wealthy; and a subset of them so wealthy that they can exclude themselves from the norms of society through their access to wealth. In this way the statistical categories begin to resemble the colour keys to the early maps of poverty (Figs. 2 and 3)—where the rich had to be included because there is nowhere to hide on a map. It has taken over a century for the statistics of poverty to catch up with its cartography.

## 3 Current Era and the Persistence of Poverty over Time (1968–2008)

The reassessment of Rowntree's work of the late 1940s and Townsend's in the late 1960s (and their colleagues) suggests that the general level of poverty in Britain has had a persistence that is stronger than we thought during much of the middle of the last century. If a longer perspective is taken then, as Fig. 5 illustrates, the map of poverty in London and elsewhere in Britain (Dorling et al., 2000; Dorling, 2003, 2004, 2006; Gregory et al., 2001) has not changed greatly. In fact the map of 1890 is slightly more closely linked to mortality outcomes in the 1990s than the poverty map of 1991! The persistence is so strong that two of the towns

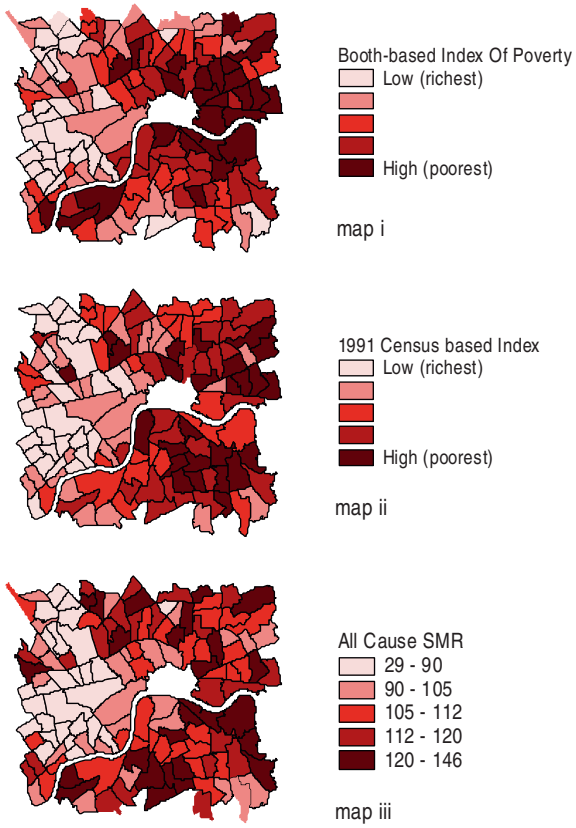


**Fig. 5** Poverty in London, 1896 and 1991, and mortality (1990s). (Source: Dorling et al., 2000, *Figure 3.* London poverty (1896 and 1991) and mortality (1990s))

(Salford and Oldham) that Engels identified as having the highest mortality rates in England in 1845 were the two with the highest standardised rates by 1995. And conveniently for those who do not believe that either poverty (or much else that affects life expectancy) is inherited—population turnover in these towns over those 150 years has been such that the great grandparents of many dying there today grew up in what is now Pakistan; areas inherit disadvantage and advantage more than do people.

Poverty and Wealth are fractal in their geographies. Similar to the pattern in London and in Britain more widely, there is still gross poverty within the city of York (see Fig. 6), that area which was studied and became

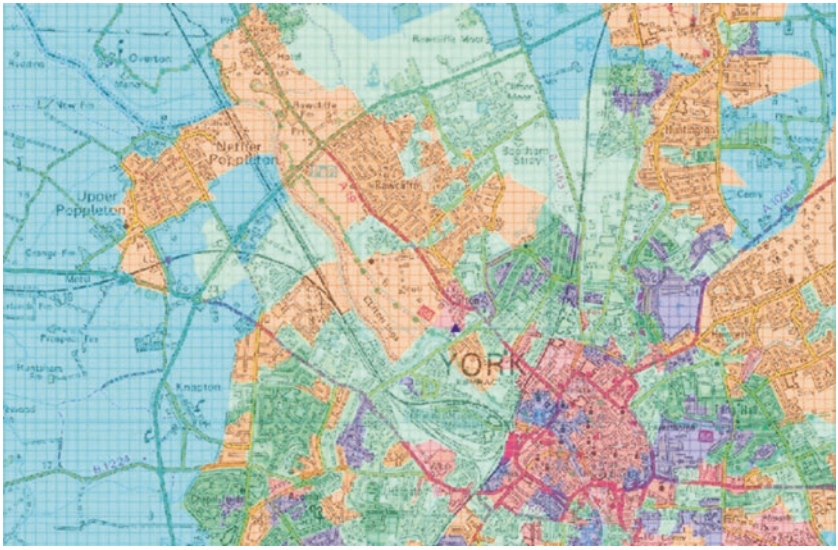


**Fig. 6** Vickers's map: York 2001. (Key: Blue: "Idyllic Countryside"; Orange: "Comfortable Estates"; Light Green: "Typical Traits"; Brown: Inner City Multi Cultural (not found in York); Dark Green: "Blue Collar"; Red: "Melting Pot"; Purple: "Constrained by Circumstances". Source: Map supplied by Dan Vickers, when PhD student, University of Leeds. Based on analysis of the 2001 census jointly with the Office for National Statistics, unpublished at that time)

a catalyst of social change at the start of the last century and which is now often seen as a rich town (and which Helen Bosanquet labelled as rich also when Seebohm wrote on it!). In fact, there is no town or city within the UK where neither poverty nor affluence is found. The forces which operate to both maintain and transform places are in operation across the country, varying little (see Dorling, 2010, chapter 6). The forces are also extremely resistant to intervention. Over time when a town or city fares well its poorer areas contract compared to the spreading seen elsewhere, and affluent suburbs expand in area. Thus, in comparison to most towns and cities in the North of England, there are fewer poor enclaves in York than elsewhere, but nevertheless poor enclaves remain and have spread since 1901 (Fig. 7).

The persistence of poverty is of course not just an issue for research in Britain, it is the subject of much current debate in America too. There, the

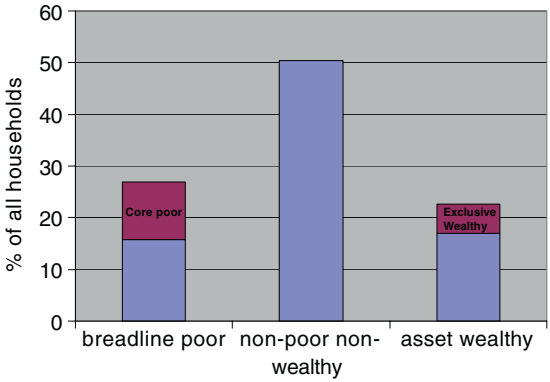


**Fig. 7** Distribution of households by poverty and wealth in Britain in 2000. (Source: Dorling et al., 2007)

Brookings Institute (Jargowsky, 2003) suggests that despite the numbers of (extremely) poor people in the US rising from 31.7 million to 33.9 million between 1990 and 2000, the number of high-poverty neighbourhoods where over 40% of the population were poor declined by a quarter. This, if true would be a reversal of the rises in concentrated poverty seen in the US between 1970 and 1990. The US poverty line is set notoriously low, raised only by inflation, and thus the proportion of the population who fell beneath it reduced from 13.1% to 12.4% over the 1990s (the absolute numbers only rose because the population in total rose). Nevertheless, this change in the spatial concentration of the poor is dramatic if it turns out to have happened. In the poorest parts of the US, disproportionate numbers of residents saw their incomes increase by just enough to raise them over the poverty line in the 1990s, more than for the poor elsewhere. The effect on cities such as Detroit is, at first glance, stunning (see Fig. 8):

There are themes that re-emerge and repeat, across times and places. From the 1840s Manchester that Engels described in the first long quotation above to twenty-first-century America—extreme rates of poverty were and are tolerated—there are no immune groups, and the spectra of hunger (or malnutrition) is ever present. That hunger and desperation may be hidden away from the main streets, whereas the rich parade their wealth around the squares (see Fig. 2), but it was and is there nevertheless, and has been for some time. There is a tendency to assume progress in reducing poverty and then to be shocked when it does not materialise. Charles Booth's maps of 1880s and 1890s London were drawn as its

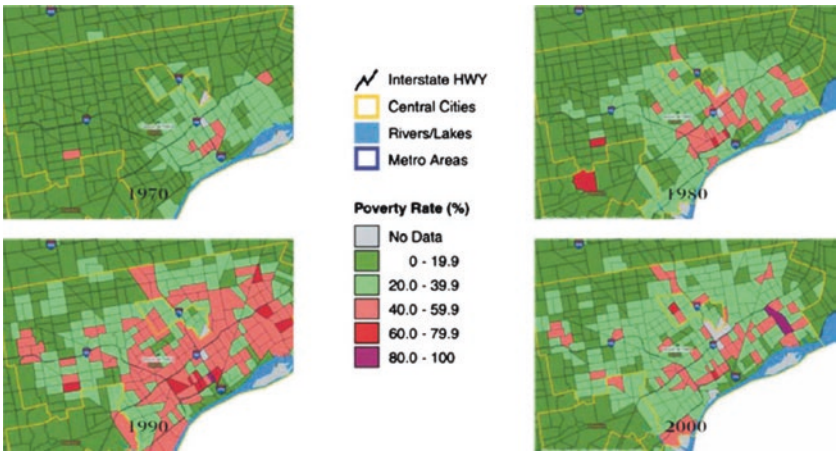


**Fig. 8** Highest poverty neighbourhoods in Detroit, 1970–2000. (Source: Jargowsky, 2003, Figure 5)

author tried to disprove that poverty was still rife in the capital of that country half a century after Friedrich Engels had documented the excess in newly industrialised Manchester, and following decades of supposed reform between 1845 and 1895. In Fig. 9 we show changing poverty rates in and around Manchester in the decades over a century later; decades which again were supposed to include huge social reforms, including the demolishing and rebuilding of entire estates within Manchester.

The labels we give areas and people change (contrast the keys to Figs. 2 and 6 for instance), but the inequalities persist, as does their importance. It is hard to resist the conclusion that because so much else of our means of production, distribution, reward and threat is similar now to what was common in the 1840s, that we should not be surprised to find rates of relative poverty that are similar over time. Thus, an unimaginable change in absolute levels of material well-being can coincide with so little change in the relative ranking of people and areas. Levels of income inequality and even murder rates with Britain have now returned to their Victorian highs despite increases in overall material wealth. When poverty in London measured by house to house visits in the 1880s and 1890s is compared to that estimated from a survey and a census in 1991, it is evident that the map changes ever so slowly. Compare maps i and ii of Fig. 5. There are differences—but many areas that changed—went downhill for instance since

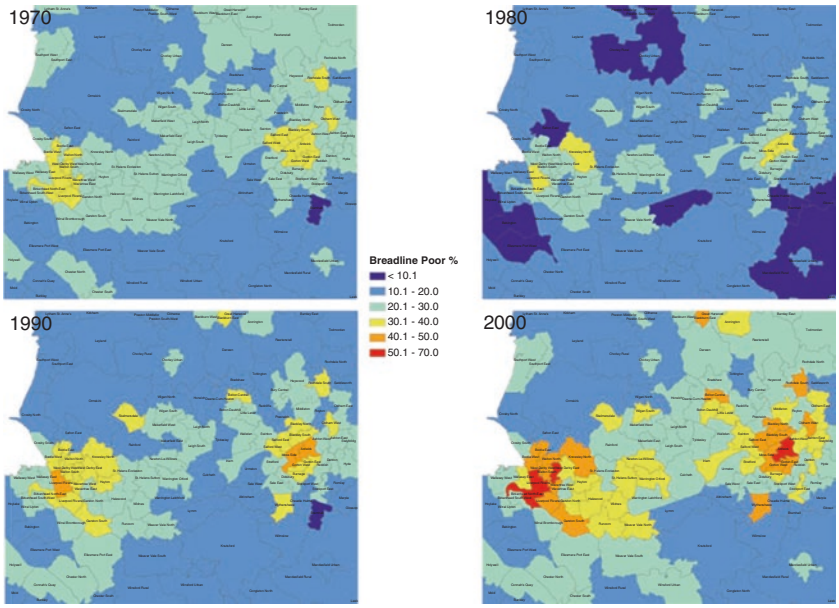


**Fig. 9** Breadline poor households across the Liverpool/Manchester area, 1970–2000. (Source: Figure 2, Dorling et al., 2007)

Victorian Times—have since reverted back to their former socio-geographical positions: the Notting Hills of London (as opposed to its "Notting Dales"—the first-ever "special area"). When change has happened in as packed an area as London, it has not been as a result of new transportation systems being introduced (the train, tram and car), or cataclysmic events such as war and the blitz. Instead, it was the arrival of a few darker-skinned people from the West Indies and where they could find to call home that is most closely associated with visible differences between these maps that separate a century.

Figures 10–13 show how there is change over time, decade by decade, that is often to an extent that matters. Currently, the pendulum is swinging away from slight equality and so for the first time in at least 60 years, by the year 2000 in many parts of inner London over half the population were poor. In similar parts of the capital in 1980 just a third of households were deemed to be poor. In contrast, Fig. 11 shows how, outside of London, in the better-off parts of the Home Counties over half the

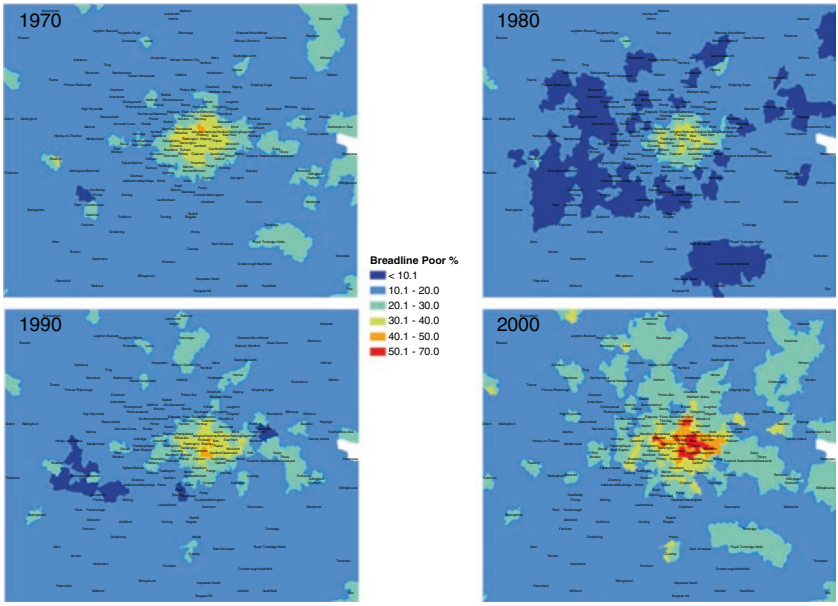


**Fig. 10** Breadline poor households across the home counties (including London), 1970–2000

population of many neighbourhoods were asset wealthy by the year 2000 and that in only three places over the same broad sweep of southern England was the same true in the 1980s. Thus, in one sense as the numbers of asset wealthy rise, so do those living nearby (but elsewhere) that have the least (Dorling et al., 2007).

Figure 12 first shows the spatial concentration of the poor in 2001 using local authority rather than neighbourhood geography and upon a cartogram rather than on a conventional map. Glasgow and Northern Ireland are included here and the averaging effect of using slightly larger areas, especially boroughs in London, results in no area having half its population poor. The map uses a slightly earlier definition of poverty. The second map in Fig. 12 is of the change in the proportion of households living in poverty 1991–2000 by these areas and shows how across almost all of Britain rates rose, even in generally wealthy areas—and how very different things were occurring in London (not commented on elsewhere here).

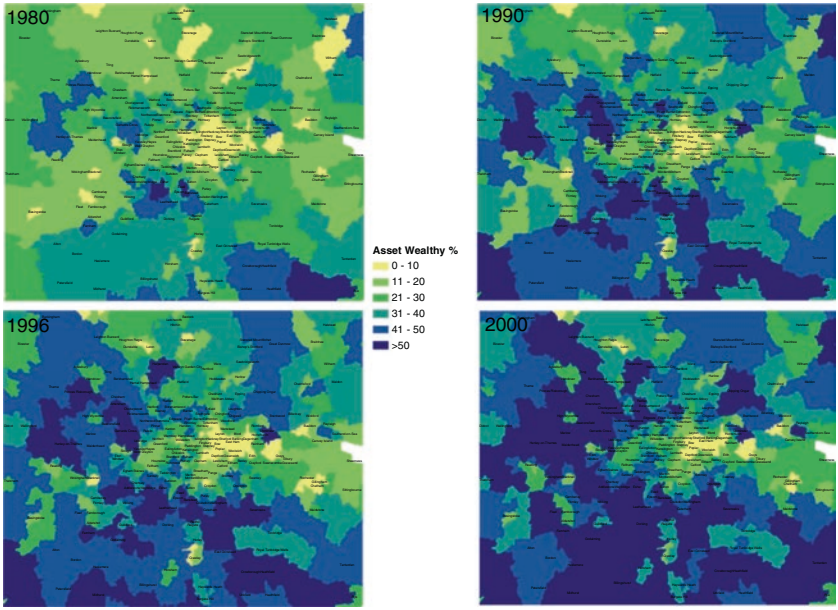


**Fig. 11** Asset wealthy households across the home counties (including London), 1980–2000

Figure 13 highlights how the exclusive wealthy are concentrated in a far narrower group of areas, and returns to the large neighbourhood scale for mapping their proportions in contrast with the homes of the poorest of the poor—who never exceed more than about one in six of the households of any large neighbourhood. These geographies of where the extremely rich and poor live, in contrast to the rest, should be borne in mind when considering the terrible position the UK has when compared internationally, as in the graphs in Figs. 14 and 15 demonstrate.

## 4 Poverty, Inequality and Wealth and Why Enough Is Never Enough

Income inequality is just a part of the picture of poverty and wealth, both worldwide and closer to home. Neither the very poor nor the very rich have conventional incomes: salaries, wages or some other relatively

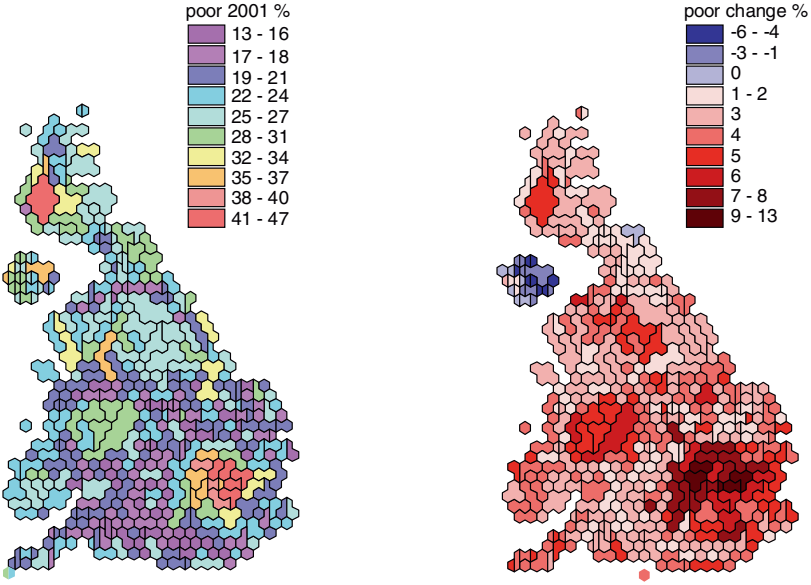


**Fig. 12** Distributions of the breadline poor in 2001 and the change in their numbers 1991–2001 by constituency. (Source: Dorling and Thomas (2003))

steady inflow of monies (Scott, 1994; Clark, 2002). The very poor beg and die in poor countries and live only on welfare in rich countries. The very rich could not imagine what it is to work, let alone be poor. Nevertheless, for most people their steady income matters and it matters also for the most, on the face of it, intangible of things. Take for instance the subjective well-being of children in some of the richest nations on earth, mainly found in Europe (but also North America, and although not shown here, Japan). Figure 14 shows the propensity of children in these nations to report subjective indicators of well-being with the average for the countries set to 100.

Why should the Netherlands lead the table of subjective well-being amongst young folk of the rich nations and the UK be at its tail? Elsewhere in the *Innocenti* Report (Adamson, 2007), from which this figure was drawn, the US was shown to closely mirror the UK, with the UK only pepping the US at the post for being the worst performing rich nation in terms of the well-being of its children because children in the UK are a

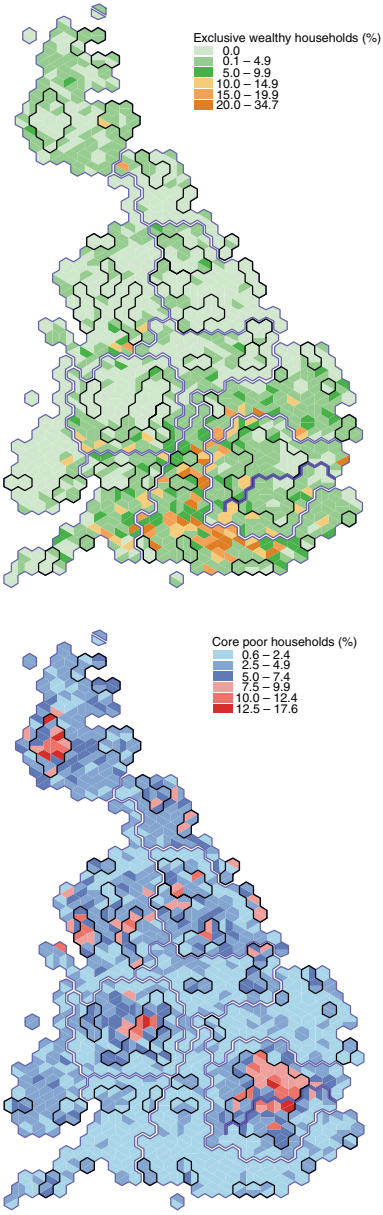


**Fig. 13** Distributions of the 6% exclusive wealthy and the 11% core poor around the year 2000. (Source: Thomas and Dorling (2007))

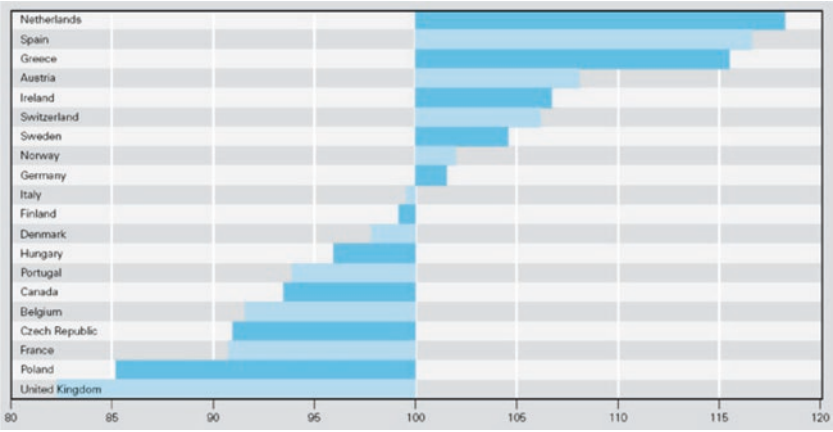


**Fig. 14** The rich nation league table of child well-being 2007. (Source: Fig. 6.0 Subjective well-being of young people, an OECD overview, Innocenti Report (Adamson, 2007), page 34)

little more sanguine when asked whether they are happy in comparison with their US counterparts. Children in the US are perhaps a little more socialised, taught and brought up to sound "up-beat" even if their circumstances do not warrant it.

As with any statistics that matter, those concerning poverty and wealth are much contested. This is especially true when considering worldwide estimates. Nevertheless, there are some basic truths to the extents of poverty, inequality and wealth that is born out almost everywhere, repeatedly and which has been true for some considerable time (although hardly forever): Large numbers of people are poor; a few are rich; fewer still are truly wealthy; and, for the truly wealthy—enough is never enough. For the poor it makes no sense to talk of assets, only income, spent almost as soon as it is received. For the truly wealthy it makes no sense to work for an income, nor to talk of one, their assets are self-replicating—in fact it is very hard to dispose of them, as until recently they have grown faster than they could be spent. This was part of the problem for the super-rich as Bill and Melinda had discovered. The economic crash of 2008, by reducing the wealth of people like Bill and Melinda so greatly, relieved a little of their problems of what to do with their money, but it may well not as yet have reduced overall global inequalities. At exactly the same time that the Gates were losing billions of dollars, billions of the poorest people on

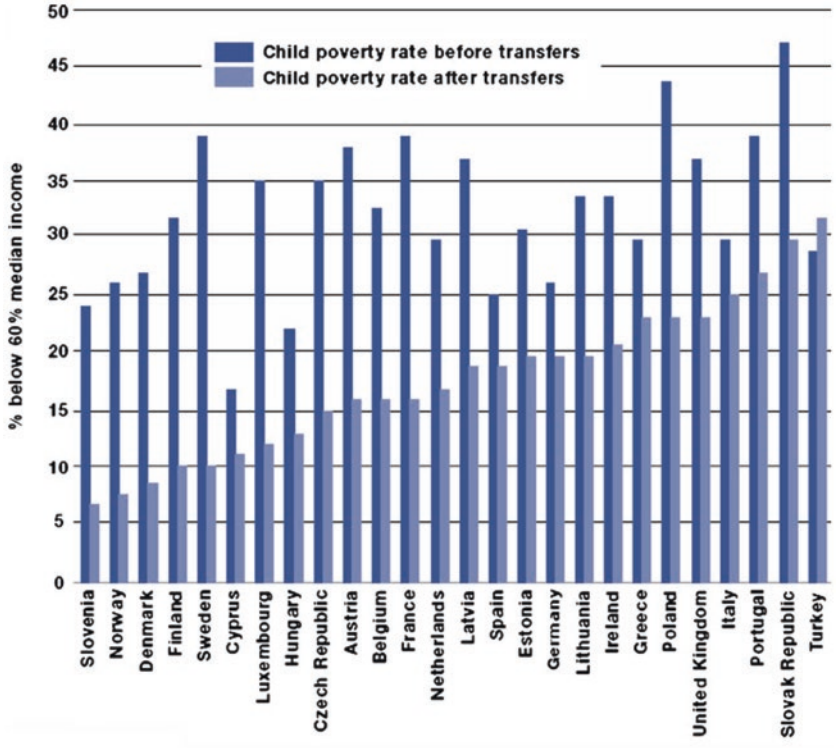


**Fig. 15** The European Union League Table of Child Poverty 2005. (Source: http://www.hirsch.demon.co.uk/endchildpoverty.pdf. Donald Hirsh—what will it take to end child poverty? York: Joseph Rowntree Foundation 2006: Figure 5: Child Poverty rate before and after cash benefits)

earth saw their meagre relative incomes also fall as the price of food rose. Almost everyone became poorer, it is just that for the very rich that meant they suffered by being able to give a little less to charity than before, and that too hurt the very poorest, but perhaps not for the long term. The poor in countries like Britain used to have to rely on charity hospitals and charity for clothes and food and for schools for their children. There are better ways to live than rely on charity. In Britain the rich were helped to part with their money through taxes rather than as gifts to pay for things like hospitals for all. The British now live longer than people in the US. In the US they are still arguing in 2009 about the merits of state-funded health care!

Around the year 2002, over a billion people were living on an income of less than one dollar a day. The world when shaped by their bodies is shown at the top of Fig. 16. By definition their collective annual income is less than US$365 billion. It is in fact much less, not just because many are surviving on less than the wretched dollar a day, but because these are not real US dollars that their income is being counted in, but local currency

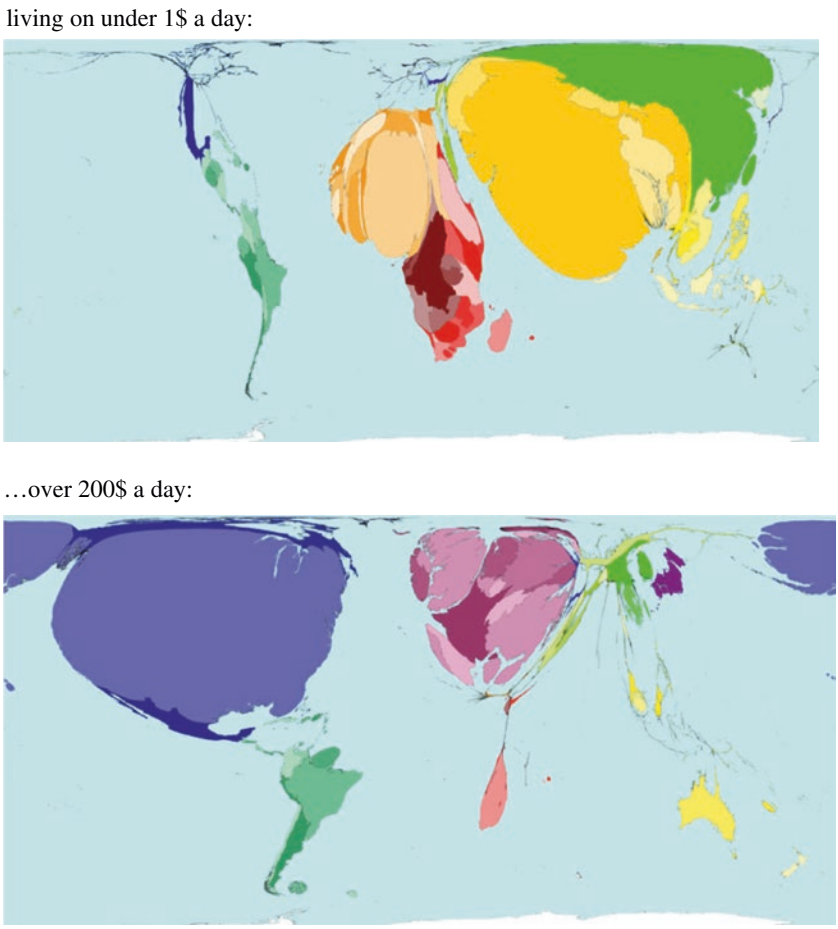


**Fig. 16** Worldmapper maps of the lowest and highest incomes living on under $1 a day: over $200 a day. (Source: www.worldmapper.org)

converted into dollars on the basis of local prices. A real US dollar would buy far more rice in all of the places drawn large at the top of Fig. 16 than would that fictional "PPP" dollar used to calibrate the incomes of the poor. A further one and a half billion survive on between one and two of these adjusted dollars a day, and another billion on more than two but less than ten.

The wealth of the richest people on earth is similarly hard to nail down precisely. Estimates of the wealth of Mr Gates vary. Even in early 2009 after the big write-downs of the crash, according to Forbes his value was estimated at $40 billion (Kroll et al., 2009). But again these are not the same kinds of dollars as the incomes of the poor are measured in, or even American dollars. This money is mostly held in the form of investments, stock options, trusts or charities—it grows by itself, it avoids taxation, and if even a fraction of it had been enough he'd have stopped amassing it by now. Wealth falls at times, precariously in 1929 and 2008, but in most years it is wealth (and inequality in wealth) that grows quickly. The wealth of this one man would save the labours of the poorest billion for a year, if converted into the same kind of money and goods the poorest billion receive. But it is not the same kind of money—it is not convertible, because it is never enough.

Money is not liquid; it is not like water. The money in your pocket is not the same kind of stuff as the money in your bank account. You almost certainly have both kinds if you are reading this. It is not the same as a salary you can expect to continue to receive, or the less certain wages of others who work where you work. It is not the same kind of money as the assets of your extended family, as the reserves or debts held by the company or university you might work for. It is not the same kind of money that is awarded in research grants; matched by development grants; doubled by some other scheme; reported in university and then national accounts; sent spinning around the world by wire; or represented by a few copper coins in the pocket of a child working in a mine excavating copper worth less itself than were those coins to be melted down. This is not the same kind of money as £175 billion that the government in Britain had "borrowed" to bail out banks by Autumn 2009, the billions more it was "quantitatively easing" out of the Bank of England as recovery stalled, or the trillions of dollars the US had "made" appear when needed. Money is not money is not money. This makes calculations of inequalities difficult.

Money might be slippery, but location is more solid. What is obvious is that the highest earners worldwide no longer live anywhere near the

poorest, other than in the hearts of our financial capitals (London and New York). The map in the bottom half of Fig. 16 is of the world shaped to show with equal importance the homes of the best rewarded 1% of people. International estimates are only made for the very poor, not for the rich and so this map is based on an income model described in the note to Table 1. This map is the antithesis of the map above it.

Most studies of global income inequalities argue over the precise magnitude of those inequalities, the extent to which they are manifest between nation states and within them and what the trends in all those aspects of these inequalities are. Recently estimates have also been made of global wealth inequalities (Davies et al., 2006). More important than all of this, though, is the staggering extent of those inequalities. There is no easy way to even draw a graph of the 221 numbers in Table 1 (192 of which are not totals). All these numbers show are estimates of how many million people in each household fall into each of 16 income bands and into each of the 12 regions used as the primary shades in Fig. 16. Each income band is twice as wide as that above it in the table and half as wide as that beneath it.

Figure 17 shows two visualisations of Table 1. The income distribution of the world is divided into 12 regions, and the world total is shown as a black line. The variation in income means that it is necessary to use log scales on both axes of Fig. 17a. Figure 17b shows the numbers of people in each of the 16 annual income bands and how many within each band live in each of the 12 regions. Again, it is necessary to use log scales in order to be able to see the whole picture. The distribution within Africa can be seen but it is far from simple to compare them with other regions. In short, while many different facets of inequality can be visualised, the whole is never visible, even when summarised in less than a couple of hundred well-ordered numbers.

Figure 15 shows children affected by poverty in Europe. Wider international comparisons often have the US missing, as they do not collect the information needed, do not feel the information needs to be collected, or—most fundamentally—cannot collect the information because the population have been conditioned to answer surveys in particular ways. Americans tend to report that they are happy almost instinctively when asked in a nation brought up to “have a good day”.

If the US were included, it would be to the extreme right of the chart. Note again how far over the UK is in that direction. Almost a quarter of children in the UK live below the family income poverty level now set across Europe at 60% of median national household income. This is a

**Table 1** World income distribution

| *GDP/capita* | *Central Africa* | *Southeastern Africa* | *Northern Africa* | *Southern Asia* | *Asia Pacific* | *Middle East* | *Eastern Asia* | *South America* | *Eastern Europe* | *North America* | *Western Europe* | *Japan* | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 64 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 128 | 4 | 6 | 10 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 22 |
| 256 | 13 | 23 | 27 | 1 | 4 | 2 | 4 | 6 | 0 | 0 | 0 | 0 | 80 |
| 512 | 23 | 59 | 54 | 23 | 19 | 9 | 27 | 18 | 1 | 2 | 0 | 0 | 235 |
| 1024 | 27 | 80 | 81 | 174 | 62 | 29 | 113 | 43 | 3 | 6 | 0 | 0 | 618 |
| 2048 | 19 | 52 | 98 | 496 | 139 | 62 | 275 | 74 | 17 | 14 | 0 | 0 | 1246 |
| 4096 | 8 | 25 | 92 | 503 | 168 | 86 | 386 | 94 | 58 | 26 | 3 | 0 | 1449 |
| 8192 | 3 | 15 | 53 | 172 | 102 | 90 | 317 | 88 | 87 | 47 | 25 | 0 | 1001 |
| 16,384 | 1 | 10 | 17 | 19 | 43 | 62 | 164 | 59 | 62 | 87 | 99 | 19 | 641 |
| 32,768 | 0 | 6 | 3 | 1 | 19 | 27 | 55 | 29 | 21 | 115 | 161 | 77 | 514 |
| 65,536 | 0 | 2 | 0 | 0 | 8 | 7 | 11 | 11 | 2 | 86 | 86 | 31 | 244 |
| 131,072 | 0 | 1 | 0 | 0 | 2 | 1 | 1 | 3 | 0 | 34 | 15 | 1 | 58 |
| 262,144 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 7 | 1 | 0 | 9 |
| 524,288 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 1,048,576 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 99 | 280 | 439 | 1389 | 566 | 374 | 1352 | 428 | 251 | 425 | 391 | 128 | 6123 |

Source: http://www.worldmapper.org/data.html, data file 3, table 14

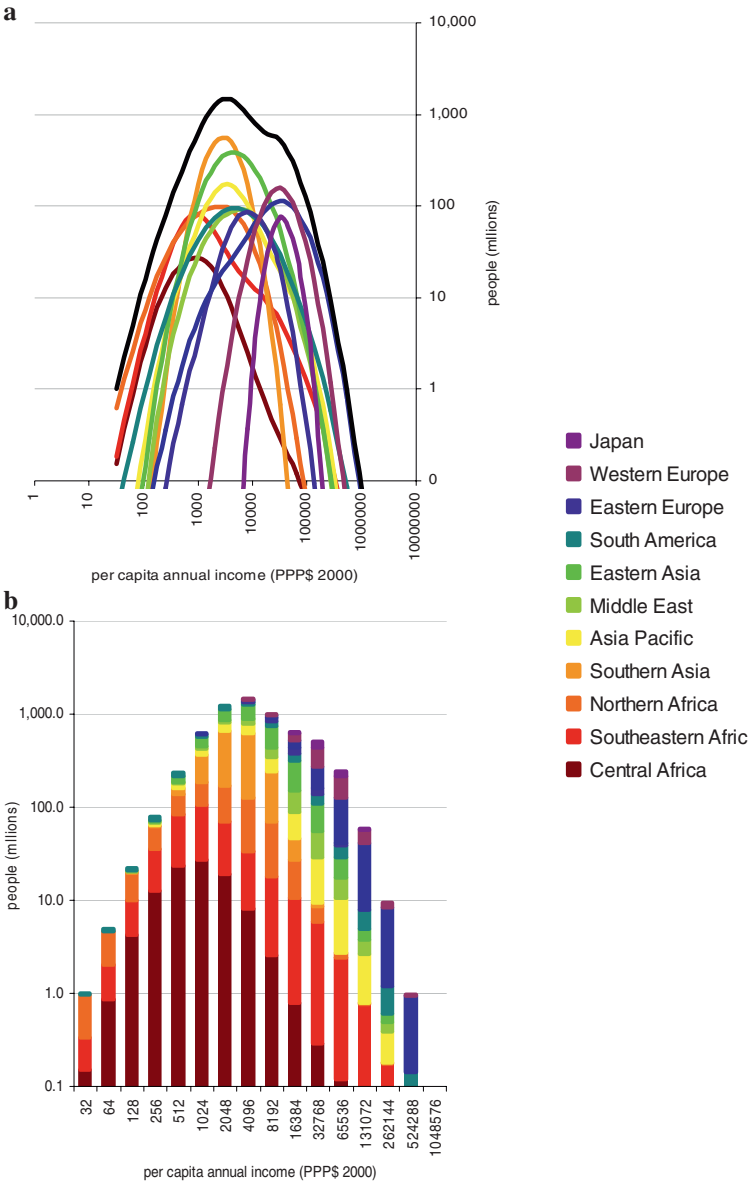


**Fig. 17** Visualisations of world income. (a) Source: Table 1, (b) Source: Table 1

**Table 2** Areas of Britain where the highest income earners most commonly live in recent years

| *Constituency* | *Proportion (%)* | *Number* |
|---|---|---|
| Kensington and Chelsea | 8 | 4884 |
| Cities of London and Westminster | 6 | 4048 |
| Hampstead and Highgate | 5 | 3543 |
| Richmond Park | 5 | 3677 |
| Esher and Walton | 5 | 3697 |
| Beaconsfield | 5 | 3190 |
| South West Surrey | 4 | 3086 |
| Maidenhead | 4 | 2756 |
| Mole Valley | 4 | 2869 |
| Hammersmith and Fulham | 4 | 2934 |
| Finchley and Golders Green | 4 | 2729 |
| Tonbridge and Malling | 4 | 2435 |
| Sevenoaks | 4 | 2380 |

Source: Some of the wealthiest areas in the world are in the UK

Adults with an income over £100,000 per annum in 2004 (source Barclays Bank): most concentrated 10% in all parliamentary constituencies of England and Wales

relative limit unlike the absolute measures used in the US and hardly altered since their 1960s inceptions. Poverty and inequality are inexorably intertwined—one and the same thing. And it is where there is income inequality, and hence high poverty, even in the richest of nations that many more children grow up feeling worthless—that they cannot trust their friends—those that are not poor as well as those that are rich. Thus, even children growing up in the highest-income areas of Britain are not really healthy in many ways we would consider important. Table 2 shows precisely where the homes of the highest-income earners in Britain tend now to be located.

## 5 Conclusion

One reaction to our current state of affairs, a state of affairs that has changed far less in 1850 years than we might think, is that we continue to blame the poor for the state we collectively find ourselves in. The continued re-labelling of the poor as ill, lazy, illegal and stupid and in a multitude of other ways potentially undeserving is all around us. The paupers are still here. However, given how hugely expensive it is to maintain an exclusively rich elite, even one that only about 5% of people can be in, it is necessary

that large numbers of people live in poverty in a country like Britain. The same is far less the case in many other European nations and in Japan. It is thus vital to understand the distribution of wealth to better understand that of poverty. The huge cost of maintaining the lives of a tiny proportion of people in luxury has to be borne by the rest. A few of the rest can be asset wealthy—hold some noticeable wealth even if not enough to exclude themselves. More can be normal—neither rich nor poor—but they are now only half of all households in Britain. Nationally, a quarter of households in Britain are now poor and today in large parts of the country over half of all households are breadline poor, and up to a sixth are extremely poor in the supposedly united UK.

Money does not come out of the ether. As the exclusive rich become richer and richer, their rights to others' time, labour and subservience grow. Even if their wealth falls, if the incomes of others also fall, then they will even more desperately work for the rich, labour in factories in China, grow cash crops in Bangladesh and work in service in the new grand houses in London. This truism holds at a wide range of geographical scales, from within cities in England, to globally. If you are rich, enough is never enough, and for the rich social position is relative too. Losing even a small proportion of your wealth could be very hard to take. No matter how much you have to begin with.

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# Measuring Inequality of Opportunity for the Backward Communities: Regional Evidence from the Indian Labour Market

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## 1 Introduction

Inequality is a common phenomenon in multi-cultural and multi-religious countries like India. Due to severe social discrimination, inequality could be a reflection of difference in the dimensions of individuals from different social and religious groups to grab available opportunities. A country with varied opportunities is often to be characterized by a relatively lesser shift in social and economic status of individuals and their success or failure heavily depends on their social or family background such as caste and religion. The slower shift in status and opportunity often leads to inter-generational perseverance in poverty, which has serious implications for

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growth and development of a country. For example, some social groups which have been experiencing discrimination on basis of race, colour, religion, creed or family background from centuries do not get a fair opportunity in job markets and, thus, their economic and social status is quite predictable and unchanged for a long period of time.

Inequality in society in general and labour market in particular is a widely discussed issue in the standard literature as a function to acquired attributes such as education, and profession; inherited and personal attributes such as ethnicity, race, caste, gender (Cowell & Jenkins, 1995; Blinder, 1973) and religion (Bourguignon et al., 2007; Bhaumik & Chakrabarty, 2010; Singh, 2010). The pursuit of greater equity through better equality of opportunities could be crucial for achieving higher economic efficiency. Equality of opportunity implies with equal rewards for individual effort irrespective of prior and historical statuses such as ethnicity, race, caste and gender (Cowell & Jenkins, 1995; Blinder, 1973). The equality of opportunity is important for effective use of resources, increase social unity and subsidize sustainable development (Roemer, 1998).

The idea of inequality of opportunity (IOP) has gained much attention in the literature of inequality over the last two decades. Roemer (1998) was first to propose to divide total inequality into two components: first, due to different effort levels as well as luck and second, different opportunities arise due to circumstances beyond the control of individuals. An important and desirable different income or other outcomes could be a result of different effort levels. In contrast, the ethically offensive part of inequality in outcome is the part of inequality that is due to circumstances which are not in control of individuals. Such circumstances include caste, family and religious background, which cannot be changed through efforts and may have a significant impact on their income and other outcomes. Fleurbaey and Peragine (2013) differentiate inequality of opportunity in *ex-ante* and *ex-post*. The former is achieved when circumstances do not decide the outcome, while the latter approach focuses more on effort and implies that equality of opportunity is achieved when all the people make same degree of effort and attain similar outcome, thus the outcome is independent of their circumstances. In this study, we adopt the *ex-ante* approach to test the inequality of opportunity across the major Indian states.

Empirical work on inequality of opportunity, though not very old, is growing rapidly considering its importance for policy implications. This literature is initially focused mainly on the regions of Western Europe and Latin America, but recently it has also been extended to other regions like

Africa and Asia (see e.g. Bourguignon et al., 2007; Lefranc et al., 2008; Cogneau & Mesplé-Somps, 2008; Barros et al., 2008; Checchi & Peragine, 2010; Checchi et al., 2010; Ferreira & Gignoux, 2011). Some recent studies have also covered India and China (e.g. Banerjee & Piketty, 2003; Deaton & Dreze, 2002; Gaiha et al., 2007; Singh, 2012; Gang et al., 2008; Zhang & Eriksson, 2010; Chi et al., 2011).

In this study, we focus on India. There are several factors that motivate us to focus on the Indian case. First, the Indian economy has been one of the fastest growing economies in the world. The role of economic growth, industrialization and market-oriented reforms on wage, inequality and inequality of opportunity in the country is a subject of considerable interest. Second, the caste system has been an integral part of India's social fabric for centuries. Politics in the post-independence was traditionally dominated by the upper castes, which is perceived to be changing dramatically in the last few decades. The adoption of reservations in political representation, education and government jobs for lower castes is expected to have some positive effects on their income and opportunities. Similarly, some state and national governments have taken a number of steps for providing equity in opportunity for the religious minority Muslims. Despite a surge in the related literature with some exceptions (Gang et al., 2002; Bhaumik & Chakrabarty, 2010), the existing literature has overlooked an important aspect of India's social characteristics, that is effects of caste and religion on the wage of workers. Finally, India is a federation of states and these states are diverse in terms of several policies, history and economic development. Most of previous studies on India have considered country-wise analysis, however, state-wise comparison and analysis is relevant and important from a policy standpoint. For instance, it is important to know that do states have the identical level of inequality and inequality of opportunity. We, therefore, aim to understand whether India needs a uniform policy action to tackle the problem or a state-specific policy will be more suitable.

Against this backdrop, we are set to have the following objectives in this study. First, we estimate the determinants of income. To gauge the distribution of income of workers according to their caste and religion, we include these factors along with education attainment and other socio-economic factors in the model. Second, we adopt the *ex-ante* approach to estimate inequality of opportunity due to caste and religion on income at state level. Third, using the Blinder–Oaxaca approach, we aim to decompose the inequality in earning of workers in terms of caste and religion.

Specifically, the wage differential between different caste and religious groups is estimated to know the level of differential exists because of the endowment effects, that is some specific characteristics. Finally, the role of educational attainment on income and inequality of opportunity is also examined in the analyses.

The main contributions of this study are threefold. First, barring a few studies, most of the earlier literature on India (e.g. Singh, 2012) have focused on the country-level analysis; our analysis is more comprehensive in nature as it focuses on state level. Second, in the analysis, deviating from much of previous research, we focus on three important issues: wage determinants, inequality of opportunity and decomposition of inequality in the context of caste and religious background. Furthermore, apart from caste and religious issues, we have also tested the effects of location and education factors on wage, inequality and inequality of opportunity. Finally, our analysis utilizes the recent advancement in techniques in the related area. For instance, to test inequality of opportunity, we employ the approach developed by Ferreira and Gignoux (2011). This framework uses the recent advancements in parametric estimation of IOP in the *ex-ante* terms.

This paper is organized as follows. The next section discusses background of caste and religious issues and related policies in India, and briefly reviews the related empirical literature. Section 3 describes the data used in this study. Section 4 provides some stylized facts and preliminary analysis of inequality. Section 5 lays out our empirical models and provides results of income determinants. Section 6 discusses our approach of estimation and results of IOP and its decomposition. The final section concludes and provides the policy implications and limitations of this study.

## 2 Literature Review

### *Affirmative Action Policies in India*

In this section, we provide history and background of affirmative action policies of governments in India. A number of affirmative actions[1] have been executed in the country to improve the well-being of the historically disadvantaged communities. These policies are not a new phenomenon

[1] See Bertrand et al.'s (2010) paper for elaborative discussion on affirmative action policies in India.

and its roots were materialized as back as in the colonial era. The reservation policy was developed under the British rule, to provide opportunities for the weaker sections of the society in government jobs and political representation (see Kumar, 1992). The first caste-based reservation in parliament was announced by the British administration in 1936. After the independence in 1947, article 46 of the Indian constitution[2] incorporated the promotional and economic interest of weaker sections of the society such as scheduled castes (SCs), scheduled tribes (STs) and others. However, the constitution has not provided any specific affirmative action policies for other backward categories (OBCs) in its commencement. Though, the constitution apparently prohibited discrimination against the OBCs. In the year 1953, the central government had appointed a commission to study the social and economic status of OBCs in the country. The outcome of the commission says that there are about 2399 backward castes, which are also eligible for the reservations and they account roughly 40% of the total population (e.g. De Zwart, 2000). However, the central government did not follow up the recommendation of this commission. Nevertheless, the union government has given power to state governments to provide necessary concessions to the OBCs. Subsequently, several states had initiated the reservation seats for the OBCs in state-owned colleges and universities (see Baley, 1999).[3]

The central government made the amendment in 2006 to make the education as the fundamental right of a person in the country. This has given a chance to the central government to implement OBCs reservations in all central educational institutes and universities. In the same year, the central government also passed the act, stating 'the implementation of reservation in admissions under the central educational institutions in respect to persons belonging to OBC community'. However, the government could not execute the reservations immediately due to various reasons. Finally, the 27% of OBCs reservations were implemented in all central institutes and universities from the academic year 2008–2009.[4]

[2] The Republic of India's Constitution formally effected from January 26th, 1950. The constitution of India enforces the political representation of SCs and STs in lower house of the Parliament (i.e. Lok Sabha) and state legislative assemblies (the directly elected political members).

[3] However, the reservation seats for OBCs were not implemented in national colleges, institutes and universities.

[4] However, the OBC reservations are not applicable in privately funded colleges and institutes.

The reservation for Muslim community in education and public sector jobs has been a debated issue in the country.[5] The central government had approved 4.5% of minority reservations[6] (within the 27% of OBC reservations) in 2011 for all public sector jobs and admissions in all nationally controlled institutes and universities. However, the implementation of the Muslim's reservation could not take place as it is turned down by the Supreme Court of India. Given this background on the affirmative action policies, which are implemented to uplift the socially and economically backward communities, we aim to see to what extent these affirmative action policies have played role in terms of determining the income and equal opportunities for SCs, STs and OBCs. Further, we also look at the similar issue for Muslims across the major states of India as the current debate is to whether reservation for Muslims is warranted or not in the country.[7]

## *Literature Review*

A number of previous studies, using the Indian data, have analysed the gaps in income, wage and consumption. Some of them estimated the factors that are causing the gap between different castes and social groups. For example, Deshpande (2000) using National Sample Survey Organization (NSSO) data for 1993–1994 revealed that, in a relatively egalitarian state Kerala, inter-caste disparity continues to underlie overall disparity. The cross-tabulations, both for rural and for urban areas, on food expenditure, clothing expenditure, land-holding and education levels of heads of household indicated for a substantial inter-caste disparity between the SC/ST population compared to others. Deshpande also

[5] In the history of India, first time the state government of Andhra Pradesh passed a government order to provide 5% reservations for Muslim community in education and public sector jobs. Afterwards, the state government order was challenged in the state High Court. Again, in the year 2007, the state government has reduced the Muslim reservation to 4%. However, the state government decision was again challenged in the state High Court and still the debate is on its way.

[6] The five minority communities have been identified in the country such as Muslims, Sikhs, Christians, Buddhists and Zoroastrians (Parsis). Out of these communities, the Muslim population shares the majority portion of it.

[7] Kohli (2014) provides detailed discussion on the Indian democracy and state-society relations in his edited book. Therefore, we recommend the reader to go through this book for understanding the evolution of Indian democratic set up and the policies for socio-economic development in the country.

calculated the Theil index that suggested for a low to medium level of overall inequality.

Desai and Kulkarni (2008) provided a detailed discussion on the inequalities in education. The authors documented that the educational gap between Hindus and Muslims has been continuously widening in the country. However, they provided evidence in support of the argument that the gap between upper caste Hindus and Dalits (SCs) has significantly declined in 1990s. The authors also noted that the educational gap reduction is more visible in primary education than that in college-level education. While, Misra and Bal (2014) argued that despite of various affirmative policies, there is still an asymmetry between male, female and minorities in terms of their relative access to higher education in India. Using NSSO data, Parul (2014) documented that the SCs' enrolment in higher education has significantly increased over the decades. However, the author reported that there is a persistence of disparity when SCs are compared with non-SCs. Unni (2009) documented that the gender inequality in education is primarily caused by several social factors such as domestic work, child labour, early marriages and so on, while Unni (2016) provided a detailed discussion on the skill gaps and employability in India. Tilak (2015) examined the growth and inequalities in Indian higher education system using the NSSO data. It was reported that there is a considerable inequality in higher education among the rural and urban areas and also across the social groups in India.[8]

Utilizing the advancement in measurement techniques, Borooah (2005) analysed inequality and poverty in India within the context of caste-based discrimination.[9] The results, based on unit record data of households, showed that at least one-third of average income differences between Hindu and SC/ST households were due to the 'unequal treatment' of the latter. Adopting a wage determination and its decomposition

[8] A very recent study by Mishra (2016) proposes a method for evaluating the achievements of Millennium Development Goals (MDGs) in child health across 32 developing economies. The author argues that the proposed method could assist the policy makers to identify the achievements in a more realistic manner and helps to frame comprehensive policies to achieve socio-economic development.

[9] Some studies have examined the effect of economic growth on poverty reduction; for instance Satti et al. (2016) document that economic growth significantly reduces poverty. On the other hand, Raza et al. (2016) report that military expenditure increases income inequality while Alam and Paramati (2016) document that the growth of tourism in developing economies contributes in higher income inequality.

techniques, Bhaumik and Chakrabarty (2006) examined the determinants of the differences in inter-caste and inter-religion earnings in India. Their findings revealed that the earning differences between upper castes and SC/ST have reduced during 1987–1999. Evidence also revealed that the earning differences between Muslims and non-Muslims have largely increased during the same period. On the basis of findings, the authors argued that income earning differences between inter-caste and inter-religion existed mainly due to the differences in educational endowment and returns on age (experience). Finally, the authors documented that the difference in return on education is not much explained by caste and religion factors.[10]

Zacharias and Vakulabharanam (2011) analysed the relationship between wealth inequality and caste divisions in India using a nationally representative survey on household wealth. Their findings suggested that the groups in India that are generally considered disadvantaged have substantially lower wealth than the "forward" caste groups, while the other backward castes and non-Hindus occupy the middle position. Their estimates showed that between-caste inequality is about 13% of overall wealth inequality. The stratification parameters indicated that the forward castes overlap little with the other caste groups, while the latter have significantly higher degrees of overlap with one another and with the overall population.

Azam (2012) examined the differences in per capita expenditure between social groups in rural India. The analysis suggests that the ST households are the most disadvantaged followed by the SCs and the OBC households with respect to general category households, and the disadvantage exists across the entire distribution. Very recently, Borooah et al. (2014) examined the inequality and poverty issues of rural households in India from the perspective of a household's monthly per capita consumption expenditure. Highlighting the important role of caste, the study concluded that households' outcomes with respect to their position on the distributional ladder, or with respect to their chances of being poor, are dependent on their caste. Thus, a household from the SC is more likely to be in the lowest quintile of consumption, and is more likely to be poor, than a high-caste Hindu household.

[10] A recent study by Mishra and Singhania (2014) finds that the lower or higher levels of poverty are not necessarily accompanied with lower or higher levels of poverty burden in India.

The central focus of the study of Deininger et al. (2013) was on the gender issues in the context of wage discrimination in the Indian informal sector. Contrary to most of the Indian studies, results of this study concluded that the wage differential and inequality are not significantly different among castes. Focusing on the Nepalese society that has many similarities with the Indian society, Karki and Bohara (2014) estimated that the majority of the earnings gap between *Dalits*[11] and non-*Dalits* is attributed to the endowment effect. They explained that *Dalits* earn less than non-Dalits because *Dalits* have some characteristics which are unfavourable in the labour market. The study concluded that this endowment effect works against *Dalits* that could be a reflection of the social exclusion and job segregation faced by *Dalits* in the past.

In the recent decades, a relatively new literature has developed in the areas of normative economics and distributional analysis, which is called the equality of opportunity literature (see Fleurbaey & Peragine, 2013). This literature has developed the ideas that individual attainments are partly the outcome of historical background and morally arbitrary circumstances, for instance, castes, religious and social background and so on, and partly the outcome of individual's work and effort. A strong theoretical background and important policy implications of the concept have attracted a large number of empirical researchers to measure the degree of inequality opportunity and linked it to a variety of public policies in different countries and in different spheres of social life, such as discrimination, poverty, education and income distributions (e.g. Roemer et al., 2003; Fleurbaey & Schokkaert, 2009; Ferreira & Gignoux, 2011; Donni et al., 2011; Checchi & Peragine, 2010; Fleurbaey & Peragine, 2013).

Despite a fast growing literature, barring a few, none of the previous studies has attempted to estimate inequality of opportunity in the labour market at a state-level setting. For instance, Asadullah and Yalonetzky (2012) and Singh et al. (2014) have analysed the selected Indian states; however, their focus was on the inequality of educational opportunities than the labour market. Moreover, to the best of our knowledge, no attempt has been made to deal with the issue of inequality of opportunities for different castes and religious groups in Indian states. Some studies (e.g. Singh, 2010, 2012) have addressed the inequality of opportunity among castes or social groups on India, but these studies were at country

[11] Dalits are considered to be part of SC community and the literal meaning of Dalit is oppressed class in the society.

level. As discussed previously, a substantial variance in level of socio-economic condition prevails among the Indian states; therefore, it would be imperative to estimate the issue at the state level.

## 3 The Data

The National Sample Survey Organisation (NSSO) data on 'Employment and Unemployment' contains information on wages, occupation, gender, caste, age and occupation of workers. Specifically, we use 66th round of survey data, which was conducted in 2009–2010. We choose the 'Employment and Unemployment' surveys of NSSO for our analysis, because these are primary sources of data on various indicators of labour force at national and state level in India. The Indian labour market is quite heterogeneous and complicated in many senses. Therefore, a large survey is required to capture the different aspects of the market. The NSS survey is specifically designed for this purpose. It is important to note that this is the largest survey in India and conducted by a department (Central Statistical Organization) of the union government of India. Furthermore, the database provides information regarding labour on both accounts: circumstances (e.g. castes, religions) and efforts (e.g. education), which is useful for our analysis. We specifically use 66th round of data, because this is a comprehensive and the most recent available data set.[12]

The data also contains information regarding the employment sector for the individuals, that is, regular employed, self-employment and casual workers. A large proportion of the self-employed and casual workers do not report any earnings for the week in which data was collected. This poses a problem for empirical analysis using wage data. Therefore, our analysis focuses on regular employed and two others groups, self-employed and casual workers, are excluded from our analysis as our focus is on wage inequality. The analysis in this study covers, except some very small states, most of the states of India. Since our prime focus in this study is on the measurement of inequality on the basis of religion and castes, we consider the information on this account in the research. There can be inequality in opportunity at the level of choice of employment, sector, gender and living in a rural or urban area, therefore, these information are also utilized. The information on wage is provided at weekly level in database, which is

[12] At the time of our analysis, next round of survey was being progressing and only a subsample was released in the public domain.

**Table 1** Description of the variables

| *Indicator* | *Definition* |
|---|---|
| Urban | If reside in urban area 1, otherwise 0 |
| Age | Age of the worker |
| Sex | Female = 1, male = 0 |
| Marital status | Married = 1, otherwise 0 |
| Muslim | If worker is Muslim 1, otherwise 0 |
| ST | If worker belongs to ST community 1, otherwise 0 |
| SC | If worker belongs to SC community 1, otherwise 0 |
| OBC | If worker belongs to backward caste community 1, otherwise 0 |
| Education | Ranked 1–4, 1 is least educated while 4 is highest[a] |

[a]The NSS survey has ranked the education in following way: not literate—01, literate without formal schooling—02, 03 and 04, literate: below primary—05, primary—06, middle—07, secondary—08, higher secondary—10, diploma/certificate course—11, graduate—12, postgraduate and above—13. We have used modified rank in the analysis as: NSS rank, 1–5:1, NSS rank, 6–10:2, NSS rank, 11–12:3 NSS rank 13:4

converted to annual basis for the analysis. We have used terms 'wage', 'earning' and 'income' interchangeably in this study. Details of the variables and their construction are explained in Table 1.

## 4 A Comparison of Income: Some Stylized Facts

One of our goals in this study is to gauge the level of inequality in income among different social groups. We begin our analysis by comparing mean and median of different groups which are considered as backward or disadvantageous in India. We also compare the coefficient of variation of the groups to know variation in income within a group. The comparison is presented in Table 2. Our comparison indicates that backward groups, that is SCs, STs, OBCs and Muslims are having lesser income than others. Comparing income of SCs with others reveals that in Delhi, Madhya Pradesh, Uttar Pradesh and Tamil Nadu, condition of SCs is most miserable vis-à-vis others, which is well reflected by both mean and median comparisons. This group (SCs) is relatively well-off in Chhattisgarh and Himachal Pradesh, yet, their income is lower than that of overall. The mean and median comparison point out that in Maharashtra, West Bengal and Uttar Pradesh, their condition is quite miserable. In fact, the median income of this group is less than half of the overall, and worst in Uttar Pradesh, where it is only one-third of the overall. Nevertheless, in

**Table 2** A comparison of income: some stylized facts *Source*: authors' calculations

| *State* | *Observations* | *Overall* | | | *SC* | | | *ST* | | | *OBC* | | | *Muslim* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | *Mean* | *Median* | *C.V.* | *Mean* | *Median* | *C.V.* | *Mean* | *Median* | *C.V.* | *Mean* | *Median* | *C.V.* | *Mean* | *Median* | *C.V.* |
| Jammu and Kashmir | 1164 | 79 | 67 | 0.72 | 48 | 38 | 0.65 | 71 | 64 | 0.41 | 56 | 46 | 0.79 | 82 | 77 | 0.58 |
| Himachal Pradesh | 884 | 86 | 72 | 0.77 | 69 | 62 | 0.84 | 87 | 77 | 0.64 | 76 | 67 | 0.78 | 42 | 28 | 0.79 |
| Punjab | 1870 | 85 | 51 | 0.92 | 52 | 29 | 1.20 | 39 | 29 | 0.70 | 58 | 36 | 0.90 | 27 | 23 | 0.83 |
| Uttaranchal | 740 | 79 | 69 | 0.78 | 52 | 36 | 0.82 | 75 | 64 | 0.63 | 57 | 44 | 0.72 | 56 | 36 | 0.85 |
| Haryana | 1100 | 70 | 48 | 0.88 | 46 | 31 | 0.83 | 50 | 26 | 0.97 | 49 | 31 | 0.87 | 37 | 37 | 0.24 |
| Delhi | 968 | 110 | 77 | 0.91 | 53 | 39 | 0.74 | 120 | 51 | 1.00 | 75 | 51 | 0.99 | 48 | 39 | 0.64 |
| Rajasthan | 1358 | 80 | 54 | 0.91 | 53 | 36 | 0.84 | 63 | 57 | 0.66 | 55 | 34 | 0.93 | 38 | 23 | 1.00 |
| Uttar Pradesh | 2443 | 81 | 72 | 0.80 | 51 | 29 | 0.88 | 43 | 25 | 1.09 | 57 | 36 | 0.86 | 48 | 26 | 0.96 |
| Bihar | 702 | 92 | 97 | 0.74 | 64 | 49 | 0.87 | 110 | 96 | 0.34 | 67 | 46 | 0.89 | 89 | 77 | 0.87 |
| West Bengal | 2375 | 70 | 50 | 0.99 | 48 | 26 | 0.98 | 38 | 21 | 1.05 | 46 | 23 | 0.97 | 55 | 36 | 0.94 |
| Jharkhand | 842 | 110 | 100 | 0.82 | 66 | 64 | 1.03 | 76 | 62 | 1.26 | 71 | 59 | 0.84 | 60 | 95 | 0.79 |
| Orissa | 1227 | 70 | 62 | 0.78 | 50 | 36 | 0.86 | 51 | 48 | 0.82 | 55 | 41 | 0.80 | 40 | 27 | 0.90 |
| Chhattisgarh | 898 | 63 | 42 | 0.81 | 50 | 36 | 0.86 | 57 | 55 | 0.71 | 45 | 30 | 0.88 | 55 | 29 | 1.11 |
| Madhya Pradesh | 1830 | 73 | 62 | 0.77 | 36 | 22 | 1.06 | 50 | 32 | 1.02 | 39 | 23 | 1.04 | 49 | 32 | 0.92 |
| Gujarat | 1908 | 74 | 49 | 1.05 | 49 | 31 | 0.80 | 53 | 33 | 0.87 | 43 | 31 | 0.83 | 41 | 29 | 1.00 |
| Maharashtra | 4781 | 91 | 59 | 1.97 | 57 | 36 | 1.05 | 49 | 24 | 1.08 | 60 | 37 | 0.90 | 51 | 30 | 1.29 |
| Andhra Pradesh | 2791 | 69 | 40 | 1.03 | 38 | 20 | 1.02 | 53 | 34 | 0.97 | 40 | 23 | 1.11 | 37 | 24 | 1.00 |
| Karnataka | 1823 | 83 | 60 | 0.97 | 48 | 31 | 1.08 | 46 | 33 | 0.76 | 50 | 32 | 0.97 | 45 | 33 | 0.94 |
| Goa | 1823 | 83 | 60 | 0.97 | 48 | 31 | 1.08 | 46 | 33 | 0.76 | 50 | 32 | 0.97 | 45 | 33 | 0.94 |
| Kerala | 1723 | 72 | 58 | 0.85 | 44 | 25 | 1.08 | 52 | 39 | 0.79 | 59 | 43 | 0.86 | 110 | 110 | 0.91 |
| Tamil Nadu | 3784 | 110 | 80 | 0.84 | 39 | 26 | 1.00 | 61 | 57 | 0.86 | 51 | 29 | 1.08 | 50 | 26 | 1.11 |

Values are in thousand Indian rupees, which was an average of Rs. 48.8/1US$ in January 2009

*ST* Scheduled tribes, *SC* scheduled castes, *Muslim* Muslim communities, *OBC* other backward communities

Chhattisgarh, Himachal Pradesh, Rajasthan and Jammu and Kashmir, this group is placed at par or even better than overall. Comparing the income of STs vis-à-vis others reveals that in Himachal Pradesh and Bihar, they are relatively well-off. While in some of relatively high income states, that is Maharashtra and Punjab, their condition seems to be awful, which are well indicated by both the mean and median comparison.

Now focusing on OBCs, which are perceived to be relatively better-off in terms of economic and social status as compared with SCs and STs. The comparison indicates that at least in four states this group's median income is less than half of income of overall. More surprisingly, only in Himachal Pradesh, this group's median or mean income is close to the overall.

Muslims, which have not been given reservation in employment and education, seems to be the most disadvantageous group. In seven states, the median income of this group is less than half of the overall. In Tamil Nadu, a relatively well-off state, Muslims' average income is one-third of the overall. Similar condition is also shown in Uttar Pradesh, which is the largest state of India both in terms of overall population as well as Muslim population. In terms of mean income, in Punjab, Muslims are the most backward group. On the other side, in Kerala and Jammu and Kashmir, where Muslims population ratio is good, they have better median and mean income than overall population. In fact in Kerala, the group's income is almost double of the overall. Muslims are in majority in Jammu and Kashmir and they are considered to be economically and socially dominating, therefore, this result is not very surprising.

Focusing on the inequality in income measured through the coefficient of variation (CV)[13] suggests that high-income and industrialized states, that is Maharashtra, Gujarat and Andhra Pradesh, have higher income variations. In these states, variation in income within the group is also quite high. Among SCs, Punjab, Karnataka, Goa and Kerala have very high inequality. Among STs, inequality is highest in Jharkhand, followed by Uttar Pradesh and Maharashtra, while in Andhra Pradesh it is the highest among OBCs. Again among the Muslims, Maharashtra occupies the

[13] A relatively equal income distribution has smaller standard deviations; as such, the CV will be smaller in more equal groups. It is a simple measure of inequality; however, use of the CV has been fairly limited in the literature. Because it does not have an upper bound, unlike the Gini coefficient (Campano & Salvatore, 2006) making interpretation and comparison somewhat more difficult. Also, the mean and the standard deviation may be exceedingly influenced by anomalously low- or high-income values.

top position. Inequality in overall population as well as within the groups is lowest in economically backward states, such as Bihar and Orissa.

At this stage, we can conclude that barring a few exceptions all four socially disadvantageous groups have lower income than the rest of the society in majority of the Indian states. Furthermore, economically well-off states like Maharashtra, Gujarat and Punjab have higher inequality than poor states like Bihar and Orissa. These results somewhat support the Kuznets' U-shape curve hypothesis as high-income states have high level of inequality and perhaps these states have not reached to the threshold level. These findings also validate the results of Das et al. (2014) that conclude that economic development causes inequality across the Indian states.

## 5 Determinants of Wage: Estimating a Mincerian Equation

In the next step, we estimate determinants of workers' wage. To this end, we estimate a Mincerian wage equation:

$$\ln E_i = \beta_0 + \beta_1 religion_i + \beta_2 caste_i + \sum_k \lambda_k X_i + \varepsilon_i \quad (1)$$

where, *lnE* is the natural logarithm of the income or wage, while, *religion* and *caste* are religion and caste of individual *i,* respectively. In addition, X is a vector of control variables, such as age, education, rural or urban, marital status and sex of the individual. Our model is consistent with the related literature (e.g. Heckman et al., 1996; Münich et al., 2005). Our Mincer equation is estimated using ordinary least squares (OLS) and appropriate measures are taken to ensure that the standard errors are robust. The regression coefficients are reported in Tables 3 and 4. The difference between these two tables is squared terms of education and age. In Table 3, we do not include the squared terms, while in Table 4 we do. Comparing the goodness of fit (adjusted $R^2$) indicates that the model of Table 4 has a better explanatory power. Nevertheless, we present both models for a robustness check purpose.

Results of the empirical analysis of Tables 3 and 4 reveal that our prime focus variables related to religion and castes, that is Muslim, STs, SCs and OBCs, are found to be statistically significant in several occasions indicating that these factors are crucial in the wage determination. More importantly, the sign of these indicators varies across the states. Nevertheless, in

most of the sample states, these groups have negative signs indicating a lower income than other groups. This, in turn, indicates similar to the general perception and the official position of the government, these groups by and large have lower wage than others. These results also validate our conclusion of the previous section that disadvantageous groups have lower income in majority of the states. However, we do have some exceptions, for instance, our results suggest that Muslims in Jammu and Kashmir, STs in Uttarakhand and Himachal Pradesh and OBCs in Uttarakhand have higher wages than other groups (see Table 3).

The results further suggest that in Himachal Pradesh and Punjab, Muslims have around 30% lower wage than other groups. In Maharashtra and Tamil Nadu, STs' wages are on average 25% less than the others. SCs in Bihar and Madhya Pradesh and OBCs in Jammu and Kashmir, Madhya Pradesh and Tamil Nadu have substantially lower wages. It is also noteworthy to mention that, contrary to a general perception, OBCs have lower wages than SCs and STs in several states.

In Table 4 we have included square of age and education to know their impact on the weekly earnings across all the states. Results display that both education and age squared variables have considerable negative impact on the earnings, which makes sense. These results are similar to those of Bhaumik and Chakrabarty (2006), whose study documented that age squared has a negative impact on the earnings in India. Similarly, our results indicate that age, marital status, education and urbanization (at least in 16 states) have significant positive impact on the earnings. On the contrary, being a female and belonging to lower communities and minorities have significant adverse impact on the individual earnings across the Indian states.

At this stage, our analysis reveals that social and religious groups' wages vary substantially across the states. The most important take away is the economic condition of these groups is not similar across the country. Other key results indicate that age, marital status and education are the potential positive determinants of weekly earnings across all the states. From these findings, we can draw some important inferences: first, as the age of individuals grow then their earning capacity also increases. However, the negative sign of square of age suggests that after a threshold level its impact on earning is negative, which makes sense. Second, education is the most significant and dynamic factor in determining the wages. Theoretically and empirically this can be argued that if an individual's educational qualification increases then he or she has a greater possibility of

**Table 3** Determinants of wage

| *State code* | *State* | *Urban* | *Age* | *Sex* | *Marital status* | *Muslim* | *ST* | *SC* | *OBC* | *Education* | *Const.* | *Adj $R^2$* | *Number of obs* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Jammu and Kashmir | 0.145* (0.035) | 0.025* (0.002) | –0.325* (0.053) | 0.196* (0.049) | 0.152* (0.036) | 0.042 (0.249) | –0.233* (0.057) | –0.050 (0.050) | 0.177* (0.016) | 9.438* (0.076) | 0.393 | 1145 |
| 2 | Himachal Pradesh | 0.312* (0.055) | 0.032* (0.003) | –0.433* (0.064) | 0.303* (0.071) | –0.360* (0.171) | 0.226* (0.108) | –0.158* (0.063) | –0.190* (0.083) | 0.286* (0.023) | 8.792* (0.123) | 0.378 | 877 |
| 3 | Punjab | –0.023 (0.033) | 0.022* (0.002) | –0.485* (0.043) | 0.330* (0.041) | –0.275 (0.172) | –0.224 (0.158) | –0.110* (0.038) | –0.143* (0.044) | 0.412* (0.015) | 8.914* (0.065) | 0.486 | 1866 |
| 5 | Uttaranchal | 0.026 (0.052) | 0.034* (0.003) | –0.484* (0.075) | 0.264* (0.072) | –0.036 (0.116) | 0.332** (0.187) | –0.111 (0.069) | 0.057 (0.082) | 0.258* (0.021) | 8.698* (0.119) | 0.421 | 739 |
| 6 | Haryana | –0.043 (0.041) | 0.024* (0.002) | –0.352* (0.061) | 0.247* (0.054) | –0.011 (0.130) | –0.141 (0.251) | –0.185* (0.053) | –0.185* (0.048) | 0.311* (0.019) | 9.056* (0.084) | 0.394 | 1099 |
| 7 | Delhi | –0.001 (0.083) | 0.022* (0.002) | –0.200* (0.054) | 0.152* (0.047) | –0.107 (0.082) | 0.066 (0.161) | –0.090** (0.049) | –0.091 (0.059) | 0.392* (0.018) | 9.236* (0.108) | 0.527 | 952 |
| 8 | Rajasthan | 0.096* (0.039) | 0.033* (0.002) | –0.544* (0.059) | 0.243* (0.051) | –0.321* (0.069) | 0.035 (0.073) | –0.080 (0.054) | –0.074 (0.046) | 0.299* (0.016) | 8.604* (0.085) | 0.478 | 1358 |
| 9 | Uttar Pradesh | 0.157* (0.032) | 0.031* (0.001) | –0.596* (0.050) | 0.282* (0.042) | –0.293* (0.046) | –0.285** (0.164) | –0.145* (0.048) | –0.140* (0.036) | 0.265* (0.014) | 8.660* (0.070) | 0.439 | 2441 |
| 10 | Bihar | –0.061 (0.057) | 0.034* (0.003) | –0.596* (0.093) | 0.304* (0.088) | –0.046 (0.089) | 0.401 (0.265) | –0.061 (0.091) | –0.104 (0.066) | 0.304* (0.024) | 8.586* (0.145) | 0.453 | 702 |
| 19 | West Bengal | 0.051 (0.036) | 0.025* (0.002) | –0.699* (0.041) | 0.404* (0.043) | –0.049 (0.052) | –0.002 (0.071) | –0.125* (0.044) | –0.219* (0.066) | 0.388* (0.016) | 8.476* (0.078) | 0.468 | 2372 |
| 20 | Jharkhand | 0.067 (0.054) | 0.039* (0.002) | –0.487* (0.071) | 0.351* (0.074) | –0.123 (0.085) | –0.066 (0.083) | –0.106 (0.087) | –0.132* (0.062) | 0.306* (0.023) | 8.389* (0.128) | 0.493 | 842 |
| 21 | Orissa | 0.115* (0.042) | 0.029* (0.002) | –0.443* (0.057) | 0.472* (0.059) | 0.093 (0.170) | 0.050 (0.068) | –0.062 (0.064) | –0.133* (0.050) | 0.330* (0.019) | 8.378* (0.102) | 0.440 | 1227 |
| 22 | Chhattisgarh | –0.020 (0.051) | 0.034* (0.002) | –0.509* (0.064) | 0.349* (0.066) | –0.032 (0.132) | 0.008 (0.073) | –0.195* (0.082) | –0.282* (0.063) | 0.271* (0.020) | 8.478* (0.122) | 0.457 | 898 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Madhya Pradesh | 0.354* (0.040) | 0.026* (0.002) | –0.721* (0.047) | 0.377* (0.054) | –0.124** (0.068) | 0.045 (0.067) | –0.343* (0.056) | –0.364* (0.046) | 0.339* (0.016) | 8.331* (0.095) | 0.483 | 1828 |
| 24 | Gujarat | 0.120* (0.033) | 0.017* (0.001) | –0.527* (0.043) | 0.422* (0.040) | –0.207* (0.052) | –0.095** (0.049) | –0.022 (0.050) | –0.193* (0.036) | 0.357* (0.016) | 8.893* (0.072) | 0.430 | 1906 |
| 27 | Maharashtra | 0.245* (0.026) | 0.021* (0.001) | –0.424* (0.027) | 0.286* (0.028) | –0.335* (0.039) | –0.329* (0.055) | –0.253* (0.032) | –0.216* (0.027) | 0.452* (0.011) | 8.648* (0.052) | 0.435 | 4771 |
| 28 | Andhra Pradesh | 0.185* (0.029) | 0.023* (0.001) | –0.524* (0.034) | 0.403* (0.034) | –0.080 (0.049) | 0.140** (0.078) | –0.130* (0.045) | –0.176* (0.035) | 0.388* (0.013) | 8.422* (0.066) | 0.476 | 2788 |
| 29 | Karnataka | 0.206* (0.036) | 0.022* (0.002) | –0.501* (0.040) | 0.192* (0.041) | –0.133* (0.056) | –0.135 (0.089) | –0.188* (0.053) | –0.189* (0.038) | 0.450* (0.018) | 8.688* (0.083) | 0.463 | 1822 |
| 30 | Goa | 0.206* (0.036) | 0.022* (0.002) | –0.501* (0.040) | 0.192* (0.041) | –0.133* (0.056) | –0.135 (0.089) | –0.188* (0.053) | –0.189* (0.038) | 0.450* (0.018) | 8.688* (0.083) | 0.463 | 1822 |
| 32 | Kerala | 0.113* (0.039) | 0.014* (0.002) | –0.437* (0.040) | 0.460* (0.050) | –0.060 (0.058) | 0.106 (0.177) | –0.217* (0.076) | –0.033 (0.044) | 0.384* (0.019) | 8.856* (0.096) | 0.363 | 1715 |
| 33 | Tamil Nadu | 0.123* (0.026) | 0.018* (0.001) | –0.484* (0.027) | 0.401* (0.030) | –0.173* (0.055) | –0.281 (0.192) | –0.392* (0.053) | –0.351* (0.046) | 0.402* (0.011) | 8.891* (0.074) | 0.455 | 3780 |

Standard error in parentheses; * $p < 0.10$; ** $p < 0.05$; models are estimated using NSS data of 66th round for regular workers; dependent variable is log of annual wage/income

**Table 4** Determinants of wage

| *State code* | *State* | *Urban* | *Age* | *Sex* | *Marital status* | *Muslim* | *ST* | *SC* | *OBC* | *Education* | *Education²* | *Age²* | *Const.* | *Adj $R^2$* | *Number of obs* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Jammu and Kashmir | 0.130* (0.035) | 0.082* (0.012) | -0.310* (0.052) | 0.056 (0.055) | 0.145* (0.036) | -0.017 (0.246) | -0.211* (0.056) | -0.041 (0.049) | 0.502* (0.098) | -0.055* (0.016) | -0.001* (0.000) | 8.075* (0.230) | 0.412 | 1145 |
| 2 | Himachal Pradesh | 0.302* (0.055) | 0.118* (0.018) | -0.442* (0.064) | 0.138** (0.078) | -0.302** (0.169) | 0.211* (0.107) | -0.154* (0.062) | -0.191* (0.082) | 0.479* (0.124) | -0.033 (0.020) | -0.001* (0.000) | 7.055* (0.361) | 0.397 | 877 |
| 3 | Punjab | -0.017 (0.033) | 0.079* (0.009) | -0.508* (0.043) | 0.155* (0.049) | -0.222 (0.170) | -0.218 (0.157) | -0.186* (0.038) | -0.131* (0.044) | 0.515* (0.072) | -0.019 (0.012) | -0.001* (0.000) | 7.905* (0.167) | 0.498 | 1866 |
| 5 | Uttaranchal | 0.025 (0.051) | 0.111* (0.017) | -0.520* (0.075) | 0.095 (0.079) | -0.008 (0.115) | 0.372* (0.184) | -0.092 (0.069) | 0.071 (0.081) | 0.518* (0.121) | -0.044* (0.019) | -0.001* (0.000) | 7.088* (0.329) | 0.441 | 739 |
| 6 | Haryana | -0.045 (0.040) | 0.083* (0.010) | -0.394* (0.060) | 0.085 (0.059) | -0.001 (0.128) | -0.201 (0.247) | -0.194* (0.053) | -0.181* (0.047) | 0.251* (0.089) | 0.009 (0.015) | -0.001* (0.000) | 8.215* (0.206) | 0.413 | 1099 |
| 7 | Delhi | -0.014 (0.083) | 0.079* (0.012) | -0.238* (0.055) | 0.045 (0.052) | -0.093 (0.081) | 0.051 (0.159) | -0.076 (0.048) | -0.089 (0.059) | 0.401* (0.097) | -0.003 (0.016) | -0.001* (0.000) | 8.323* (0.239) | 0.537 | 952 |
| 8 | Rajasthan | 0.092* (0.038) | 0.122* (0.010) | -0.589* (0.058) | -0.001 (0.057) | -0.256* (0.068) | 0.029 (0.071) | -0.043 (0.053) | -0.047 (0.045) | 0.307* (0.087) | -0.005 (0.014) | -0.001* (0.000) | 7.270* (0.199) | 0.507 | 1358 |
| 9 | Uttar Pradesh | 0.145* (0.032) | 0.101* (0.008) | -0.590* (0.050) | 0.080** (0.047) | -0.239* (0.046) | -0.273** (0.161) | -0.111* (0.048) | -0.108* (0.035) | 0.506* (0.072) | -0.042* (0.012) | -0.001* (0.000) | 7.258* (0.162) | 0.460 | 2441 |
| 10 | Bihar | -0.061 (0.057) | 0.046* (0.018) | -0.583* (0.095) | 0.274* (0.099) | -0.042 (0.089) | 0.392 (0.265) | -0.056 (0.091) | -0.103 (0.065) | 0.517* (0.136) | -0.036 (0.022) | -0.000 (0.000) | 8.130* (0.346) | 0.454 | 702 |
| 19 | West Bengal | 0.049 (0.035) | 0.106* (0.008) | -0.712* (0.042) | 0.238* (0.045) | -0.006 (0.051) | -0.010 (0.070) | -0.111* (0.043) | -0.230* (0.065) | 0.552* (0.083) | -0.032* (0.014) | -0.001* (0.000) | 6.945* (0.187) | 0.489 | 2372 |
| 20 | Jharkhand | 0.052 (0.054) | 0.090* (0.015) | -0.485* (0.072) | 0.224* (0.081) | -0.104 (0.085) | -0.075 (0.082) | -0.093 (0.087) | -0.122* (0.061) | 0.583* (0.127) | -0.049* (0.021) | -0.001* (0.000) | 7.242* (0.306) | 0.502 | 842 |
| 21 | Orissa | 0.109* (0.041) | 0.093* (0.013) | -0.433* (0.056) | 0.280* (0.065) | 0.155 (0.167) | 0.055 (0.067) | -0.082 (0.062) | -0.139* (0.049) | 0.902* (0.109) | -0.010* (0.018) | -0.001* (0.000) | 6.665* (0.246) | 0.465 | 1227 |
| 22 | Chattisgarh | -0.008 (0.050) | 0.081* (0.014) | -0.461* (0.064) | 0.232* (0.071) | -0.052 (0.129) | 0.020 (0.072) | -0.161* (0.081) | -0.265* (0.062) | 0.840* (0.121) | -0.092* (0.019) | -0.001* (0.000) | 6.935* (0.312) | 0.475 | 898 |
| 23 | Madhya Pradesh | 0.331* (0.038) | 0.101* (0.011) | -0.669* (0.046) | 0.180* (0.058) | -0.081 (0.066) | 0.048 (0.065) | -0.291* (0.055) | -0.331* (0.044) | 1.039* (0.082) | -0.117* (0.013) | -0.001* (0.000) | 6.240* (0.212) | 0.518 | 1828 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24 | Gujarat | 0.125* | 0.060* | -0.507* | 0.313* | -0.193* | -0.096* | -0.013 | -0.189* | 0.732* | -0.065* | -0.001* | 7.752* | 0.443 | 1906 |
| | | (0.032) | (0.009) | (0.043) | (0.044) | (0.051) | (0.049) | (0.049) | (0.036) | (0.079) | (0.013) | (0.000) | (0.184) | | |
| 27 | Maharashtra | 0.249* | 0.109* | -0.435* | 0.088* | -0.298* | -0.260* | -0.241* | -0.210* | 0.907* | -0.079* | -0.001* | 6.623* | 0.465 | 4771 |
| | | (0.025) | (0.006) | (0.026) | (0.031) | (0.038) | (0.054) | (0.031) | (0.026) | (0.058) | (0.010) | (0.000) | (0.134) | | |
| 28 | Andhra Pradesh | 0.176* | 0.087* | -0.492* | 0.229* | -0.050 | 0.147** | -0.118* | -0.160* | 0.667* | -0.053* | -0.001* | 7.118* | 0.495 | 2788 |
| | | (0.029) | (0.007) | (0.034) | (0.038) | (0.048) | (0.077) | (0.045) | (0.035) | (0.061) | (0.011) | (0.000) | (0.141) | | |
| 29 | Karnataka | 0.219* | 0.094* | -0.470* | 0.050 | -0.079 | -0.096 | -0.186* | -0.176* | 1.125* | -0.118* | -0.001* | 6.630* | 0.491 | 1822 |
| | | (0.036) | (0.011) | (0.039) | (0.045) | (0.055) | (0.087) | (0.052) | (0.037) | (0.092) | (0.015) | (0.000) | (0.227) | | |
| 30 | Goa | 0.219* | 0.094* | -0.470* | 0.050 | -0.079 | -0.096 | -0.186* | -0.176* | 1.125* | -0.118* | -0.001* | 6.630* | 0.491 | 1822 |
| | | (0.036) | (0.011) | (0.039) | (0.045) | (0.055) | (0.087) | (0.052) | (0.037) | (0.092) | (0.015) | (0.000) | (0.227) | | |
| 32 | Kerala | 0.114* | 0.087* | -0.445* | 0.306* | -0.002 | 0.098 | -0.230* | -0.044 | 0.570* | -0.032** | -0.001* | 7.366* | 0.379 | 1715 |
| | | (0.038) | (0.011) | (0.040) | (0.055) | (0.058) | (0.175) | (0.076) | (0.044) | (0.121) | (0.019) | (0.000) | (0.266) | | |
| 33 | Tamil Nadu | 0.125* | 0.090* | -0.444* | 0.211* | -0.158* | -0.269 | -0.369* | -0.335* | 0.906* | -0.085* | -0.001* | 7.019* | 0.482 | 3780 |
| | | (0.025) | (0.006) | (0.027) | (0.033) | (0.054) | (0.187) | (0.052) | (0.045) | (0.063) | (0.010) | (0.000) | (0.152) | | |

Standard error in parentheses; * $p < 0.10$; ** $p < 0.05$; models are estimated using NSS data of 66th round for regular workers; dependent variable is log of annual wage/income

earning higher salaries especially in a developing income society. This is empirically confirmed by numerous studies in the literature (e.g. Gamboa & Waltenberg, 2012). Our analysis also suggests that education has the significant and positive impact on the earning across all the states in India. However, the square of education attainment is estimated to be negative and that makes sense as it shows a decreasing return after a threshold level of education attainment. Finally, in several states, urbanization has a considerable positive influence on the earning of the individuals.

## 6 Analysing Inequality of Opportunities

### *Estimation of Inequality of Opportunities*

Now we estimate the inequality of opportunity for different social caste and religious groups. In the related literature, there are several alternative approaches used to assess inequality of opportunity. One of the widely used approaches is the regression-based approach, which comprises a large number of variants. We specifically use the regression-based method developed by Ferreira and Gignoux (2011).

The idea can be understood as: y be the outcome variable of interest and C is a matrix of circumstances, which are beyond the control of the individual such as caste and religion. The core element of this method is to relate the outcome to the vector of circumstances. In a general way, we can describe this by the expected conditional outcome:

$$\hat{y} = E\left[y \mid C\right] \tag{2}$$

The equation is estimated using OLS considering income as dependent variable. To compute the absolute inequality to a common inequality measure $I(.)$ applied to $\hat{y}$. The absolute inequality is measured as $\theta_a = I(\hat{y})$.

All variation in the vector $\hat{y}$ is exclusively due to circumstances; hence, it refers to inequality of opportunity. In addition to absolute inequality measure, we can also obtain the relative measure by dividing the absolute inequality by the same metric applied to the actual outcome to get a relative measure of inequality of opportunity. Specifically, a relative measure of inequality of opportunity is computed as:

$$\theta_r = I\left(\hat{y}\right) / I\left(y\right) \tag{3}$$

Now we turn to results of the computed IOP. Results of the analysis regarding absolute and relative inequality of opportunity are presented in Figs. 1 and 2, respectively. The purpose of estimating absolute and relative IOP is to estimate inequality of opportunity in the labour market across the Indian states. The inequality in opportunity is computed on the basis of different caste and religious groups. The estimated absolute inequality of income opportunity indicates that states like Madhya Pradesh (0.0030), West Bengal (0.0027), Uttar Pradesh (0.0027) and Andhra Pradesh

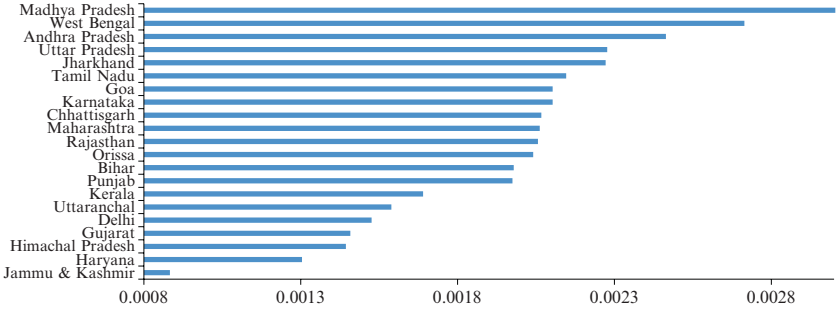


**Fig. 1** Absolute IOP: Ferreira–Gignoux index. (Notes: IOP is estimated using 66th round data of NSS. Castes and religions are used as circumstances of workers. Source: authors' calculation)

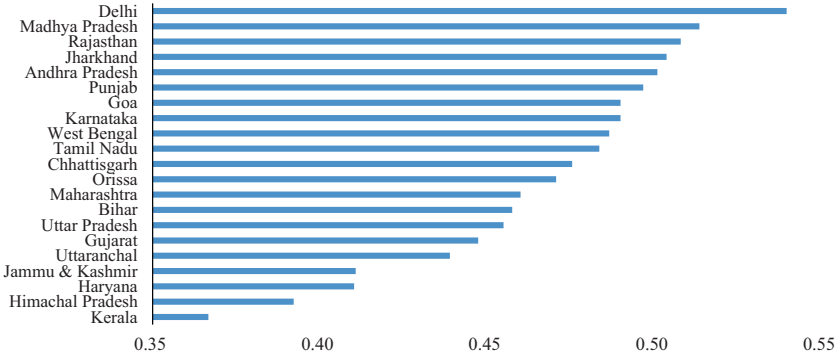


**Fig. 2** Relative IOP: Ferreira–Gignoux index. (Notes: IOP is estimated using 66th round data of NSS. Castes and religions are used as circumstances of workers. Source: authors' calculation)

(0.0024) have higher inequality in opportunities, while Jammu and Kashmir (0.0009), Haryana (0.0013), Himachal Pradesh (0.0014), Delhi (0.0015), Gujarat (0.0015) and Kerala (0.0017) have lower absolute inequality income opportunities in terms of castes and religion.

Now, we present results of the relative inequality, which is a measure of share of heterogeneity or inequality in income data due to observed circumstances. The computed relative inequality of income opportunities suggests that Delhi (0.5396), Madhya Pradesh (0.5135), Rajasthan (0.5079), Jharkhand (0.5037) and Andhra Pradesh (0.5009) have higher relative inequality of income opportunities. Meanwhile, Kerala (0.3667) and Himachal Pradesh (0.3922) have comparative lower inequality of income opportunity when relative measure is used. The results of absolute and relative inequality of income opportunity provide interesting findings. The estimated absolute inequality of income opportunity implies that large states of northern and central India suffer from inequality in opportunity.

### *Decomposition of Inequality*

Our approach has yielded a point measure of inequality of opportunity. However, in order to analyse the dynamics and evolution of inequality of opportunity, it is relevant to decompose the estimated IOP. We specifically use the Oaxaca-type decomposition that allows us to separate which part of the difference is due to different distributions of circumstances and due to difference in the effect of these circumstances on the outcome. In order to have an inequality of opportunity, people must have to differences in circumstances and these circumstances should have an influence on the outcome. These conditions are fully met for our sample; therefore, we choose to use Blinder–Oaxaca decomposition (Blinder, 1973; Oaxaca, 1973). It is noteworthy to say that because of its useful properties, the technique is the most applied IOP decomposition technique in the labour market and the discrimination literature (e.g. Weichselbaumer & Winter-Ebmer, 2005).[14]

The procedure divides the wage differential between two groups. For instance, there are two groups A and B, an outcome variable Y and a set of predictors. For example, consider logged income of SCs and non-SCs as

[14] Subramanian (2011) provides a review of the results of decomposable inequality measures such as absolute, relative, centrist and unit-consistent indices.

the outcome variable, and human capital indicators such as education and work experience as predictors. The question now is how much of the mean outcome differs. It can be shown as:

$$R = E\left(Y_A\right) - E\left(Y_B\right) \tag{4}$$

where E(Y) denotes the expected value of the outcome variable. The mean outcome difference is decomposed into three parts:

$$\mathrm{R} = \mathrm{E} + \mathrm{C} + \mathrm{I} \tag{5}$$

The first component E amounts to the part of the differential that is due to group differences in the predictors called the endowments effect. This represents the portion of the earnings gap attributed to the differences in average characteristics between two groups, that is SCs versus non-SCs. The second component (C) measures the contribution of differences in the coefficients (including differences in the intercept). Specifically, this represents the differences in average reward in the individual's income-generating characteristics, such as skills and hard work.[15] This component represents the differential due to unobservable components as well as to labour-market discrimination. While the third component (I) is an interaction term accounting for the fact that differences in endowments and coefficients exist simultaneously between the two groups.

We decompose the inequality to know the effects of caste and religion, that is Muslim, STs, SCs and OBCs. We calculate endowment, coefficient and interaction effects of the earning inequality and they are reported in Table 5. Focusing on Muslim's results indicates that in Punjab, Haryana and Kerala inequality is mainly explained by the endowment effects. Interestingly, Kerala is in southern part of India and has a sizable number of Muslim population (approximately 27% of total population), while other two states are in northern region of the country and have comparatively less Muslim population. Inequality in wages of Muslims in other

[15] 'C' is a measure of inequalities due to efforts or factors for which people can be held responsible. Efforts include skills, education, social networks, intergenerational inertia and working sincerely. Arrow et al. (2000) and Hertz et al. (2008) have quantified evidence for persistent inequality, which is not attributable to discrimination between individuals, but rather due to effort. On the other side, 'E' measures the inequality in income due to circumstances, such as caste, religion, family culture and investment (e.g. see Dardanoni et al., 2006).

groups in Maharashtra, Himachal Pradesh and Rajasthan is by and large explained by coefficient effect. The interaction effects are found to be substantially higher in Haryana, Himachal Pradesh and Kerala.

Focusing on the results of STs reveals that in Haryana endowment effects are sizable and negative. While in Kerala and West Bengal, endowment effects are large but positive. In Haryana and Kerala the interaction effects are also estimated to be large, while in Uttarakhand and Bihar, the coefficient effects are found to be significant. The results regarding SCs indicate that in Madhya Pradesh both endowment and coefficient effects are sizable but in some other states, that is Jammu and Kashmir, Punjab, Delhi and Kerala, endowment effects are mainly explaining the wage differential. For OBCs, endowment effects are large in Assam, while coefficient effects are sizable in Chhattisgarh and Assam. Not very surprising, the wage differential of OBCs vis-à-vis others is not found to be explained largely by the endowment effect. This makes sense as unlike other weaker communities, OBCs do not face any historical discrimination in the Indian society across the states.

## 7 Conclusion and Implications

Using the employment and unemployment survey data of NSS of 66th round, we analysed the backward communities', such as SCs, STs, OBCs and Muslims, condition in the Indian labour market. Since socio-economic conditions of these communities significantly vary across the regions and states, we therefore aim to analyse at state level instead of national level. It is important to summarize the significant findings of our analyses. At first stage a mean and median comparison among the communities indicated that backward communities, in general, have lower income than the forward communities. However, there are exceptions to this end. For instance, STs in Himachal Pradesh, Muslims in Jammu and Kashmir and Kerala have better mean and median income than overall. The comparison further suggested that within- and between-groups' variation is relatively large in the states which are economically healthier and industrialized such as Gujarat and Maharashtra. These results somewhat supported the Kuznets' U curve hypothesis as high-income states have high level of inequality and these states are perhaps yet to reach the threshold level of income. In some sense, these findings also validate the results of Das et al. (2014), who conclude that economic development causes inequality in the Indian states.

**Table 5** Decomposition of earnings differentials: application of Blinder–Oaxaca decomposition of inequality

| *State code* | *State* | *Muslim* | | | *Schedule tribe (ST)* | | |
|---|---|---|---|---|---|---|---|
| | | *Endowments* | *Coefficients* | *Interaction* | *Endowments* | *Coefficients* | *Interaction* |
| 1 | Jammu and Kashmir | –0.069 | –0.174 | 0.005 | –0.306 | 0.016 | 0.215 |
| 2 | Himachal Pradesh | 0.127 | 0.289 | 0.245 | –0.084 | –0.218 | 0.114 |
| 3 | Punjab | 0.644 | 0.218 | –0.010 | 0.316 | 0.218 | –0.240 |
| 5 | Uttaranchal | 0.119 | –0.009 | 0.029 | 0.026 | –0.373 | 0.164 |
| 6 | Haryana | 0.631 | 0.006 | –0.487 | –1.540 | 0.199 | 1.485 |
| 7 | Delhi | 0.461 | 0.091 | –0.075 | 0.036 | –0.048 | –0.170 |
| 8 | Rajasthan | 0.300 | 0.248 | 0.051 | –0.091 | –0.027 | –0.043 |
| 9 | Uttar Pradesh | 0.466 | 0.230 | –0.067 | 0.370 | 0.275 | –0.357 |
| 10 | Bihar | 0.046 | 0.037 | 0.051 | –0.271 | –0.395 | –0.117 |
| 18 | Assam | 0.164 | –0.109 | –0.208 | –0.107 | –0.047 | –0.104 |
| 19 | West Bengal | –0.091 | 0.003 | 0.128 | 0.520 | 0.018 | –0.195 |
| 20 | Jharkhand | 0.216 | 0.104 | –0.098 | 0.235 | 0.085 | –0.078 |
| 21 | Orissa | 0.220 | –0.162 | 0.203 | 0.356 | –0.053 | –0.110 |
| 22 | Chhattisgarh | 0.218 | 0.053 | –0.132 | –0.008 | –0.049 | –0.095 |
| 23 | Madhya Pradesh | 0.235 | 0.083 | –0.106 | 0.161 | –0.044 | –0.189 |
| 24 | Gujarat | 0.058 | 0.195 | 0.026 | 0.009 | 0.088 | –0.045 |
| 27 | Maharashtra | 0.214 | 0.298 | –0.165 | 0.366 | 0.265 | –0.144 |
| 28 | Andhra Pradesh | 0.134 | 0.045 | –0.076 | 0.170 | –0.142 | –0.185 |
| 29 | Karnataka | 0.251 | 0.075 | –0.006 | 0.163 | 0.093 | –0.077 |
| 30 | Goa | 0.251 | 0.075 | –0.006 | 0.163 | 0.093 | –0.077 |
| 32 | Kerala | 0.552 | 0.013 | –0.368 | 0.936 | –0.097 | –0.802 |
| 33 | Tamil Nadu | 0.142 | 0.158 | –0.059 | –0.306 | 0.268 | –0.088 |

(*continued*)

**Table 5** (continued)

| *State code* | *State* | *Schedule cast (SC)* | | | *Other backward castes (OBCs)* | | |
|---|---|---|---|---|---|---|---|
| | | *Endowments* | *Coefficients* | *Interaction* | *Endowments* | *Coefficients* | *Interaction* |
| 1 | Jammu and Kashmir | 0.319 | 0.211 | –0.054 | –0.077 | 0.039 | 0.085 |
| 2 | Himachal Pradesh | 0.121 | 0.150 | 0.002 | –0.090 | 0.192 | 0.004 |
| 3 | Punjab | 0.349 | 0.199 | –0.095 | 0.078 | 0.129 | –0.056 |
| 5 | Uttaranchal | 0.229 | 0.074 | 0.070 | 0.153 | –0.107 | 0.070 |
| 6 | Haryana | 0.198 | 0.203 | –0.133 | 0.100 | 0.189 | –0.072 |
| 7 | Delhi | 0.377 | 0.054 | 0.068 | 0.071 | 0.084 | 0.020 |
| 8 | Rajasthan | 0.100 | 0.030 | 0.012 | 0.127 | 0.007 | 0.071 |
| 9 | Uttar Pradesh | 0.179 | 0.111 | –0.120 | 0.202 | 0.086 | 0.014 |
| 10 | Bihar | 0.225 | 0.074 | –0.137 | 0.257 | 0.096 | –0.013 |
| 18 | Assam | –0.121 | 0.279 | 0.127 | 0.476 | 0.295 | –0.341 |
| 19 | West Bengal | 0.170 | 0.113 | 0.048 | 0.012 | 0.227 | 0.019 |
| 20 | Jharkhand | 0.235 | 0.085 | –0.0783 | 0.145 | 0.145 | –0.049 |
| 21 | Orissa | 0.140 | 0.081 | –0.072 | –0.014 | 0.127 | 0.012 |
| 22 | Chhattisgarh | 0.088 | 0.172 | –0.155 | 0.069 | 0.288 | –0.068 |
| 23 | Madhya Pradesh | 0.400 | 0.321 | –0.234 | 0.165 | 0.324 | –0.067 |
| 24 | Gujarat | 0.184 | 0.011 | –0.088 | 0.095 | 0.191 | –0.012 |
| 27 | Maharashtra | 0.131 | 0.240 | –0.141 | 0.028 | 0.204 | –0.058 |
| 28 | Andhra Pradesh | 0.167 | 0.122 | –0.105 | 0.143 | 0.159 | –0.025 |
| 29 | Karnataka | 0.139 | 0.188 | –0.109 | 0.181 | 0.174 | –0.042 |
| 30 | Goa | 0.106 | 0.103 | 0.218 | 0.181 | 0.174 | –0.042 |
| 32 | Kerala | 0.374 | 0.238 | –0.124 | 0.091 | 0.174 | –0.170 |
| 33 | Tamil Nadu | 0.185 | 0.356 | –0.269 | –0.005 | 0.342 | –0.275 |

Subsequently, we tested the effects of castes and religion on wage of workers, which revealed that backward castes have relatively lower wages for the workers across states barring a few exceptions. Nevertheless, some backward communities' wage is significantly lower in some states, for instance, Muslims in Maharashtra and Madhya Pradesh and OBCs in Madhya Pradesh have around 35% less wage than others. Attainment of education is found to be another crucial determinant of workers' wage in most of the states. This supports the findings of Duraisamy (2002), which estimated a substantial level of effects of education in the Indian labour market in early 1990s. In next stage, we adopted the *ex-ante* approach to test the IOP and applied a recent method developed by Ferreira and Gignoux (2011). The estimation indicated that Madhya Pradesh and Delhi have highest score in terms of absolute and relative IOP.

Finally, using the Blinder–Oaxaca decomposition method, we decomposed the mean difference of wage based on regression models in a counterfactual manner. We decomposed the inequality in wage to know the effects of caste and religion, that is Muslim, ST, SC and OBC. Findings suggested that mainly the endowment effects dominated in explaining the wage inequality except for OBCs. Importantly, the results indicated that wage differential of Muslims vis-à-vis others is largely explained by the endowment effect, that is community's characteristics. This is a worry sign as the community does not enjoy the reservation in employment and education like other backward communities. Furthermore, for OBCs, the endowment effect is not found quite sizable, indicating that the community is socially well-off despite being an economically backward community. Our results are somewhat different from that of Karki and Bohara (2014) for Nepal, who have found that the endowment effect explains the difference. Perhaps, unlike the Nepalese case, the role of community characteristics is falling in India due to better education attainment and urbanization.

To improve the attainment in education and employment, affirmative action policies have been at the core of public policies for historically disadvantaged communities in India. The country has had perhaps the longest history of affirmative action policies to counter caste and ethnic discrimination (Revankar, 1971). Our results are important for the related policy debates, that is reservation policy for education and employment in India for socially and economically disadvantaged communities. It seems that disadvantaged groups have lower income in the labour market and inequality in opportunity is also a noticeable problem. However, the

evidence also indicates that the level of inequality and inequality in opportunity vary significantly among the Indian states. Therefore, our results perhaps take us to the conclusion that a state-wise or local-level reservation policy may be more appropriate than a national-level policy to achieve a better outcome. Furthermore, our results also indicated the key role of education in wage determination across the states, emphasizing the better education attainment could be useful in reducing the inequality among the castes and religious' groups in the country.[16]

However, in spite of the significance of our study, it has some limitations. The most important one is we have covered only employed persons across all communities and religious groups. The self-employed group, which represents large proportion in the survey data, is not considered in the analysis due to unavailability of their information on income or wage. Future studies may use consumption data to analyse inequality and inequality of opportunity for castes and religious groups. Furthermore, conversion from SCs and STs to Muslim, Christianity and Buddhism is a frequent phenomenon in India. Therefore, we concede that sometime distinguishing and decomposing the castes and religions' effects is very difficult. Moreover, our analysis has not covered the effects of inequality on the economic performance. The empirical setting of Marrero and Rodríguez (2013) for the U.S. economy can be attempted in future studies in the context of India, which may be helpful in designing the macroeconomic policy for a developing country like India. Considering the existence of a significant heterogeneity in rural and urban areas of India, the future studies may also consider to compare IOP in rural and urban areas. This will help in designing labour and social policies for urban and rural areas separately. Also, one may attempt to know in a future study that why there exists a significant IOP difference among the Indian states.

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[16] Contrary, in case of the U.S., Hendel et al. (2005) suggested that education may lead to increased income inequality.

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# The COVID-19 Pandemic, Economic Inequality and Democracy

*Syed Mansoob Murshed*

## 1 Introduction

The COVID-19 pandemic, and the governmental response to this emergency, should act as a reminder of the inseparability between economics and politics. The pandemic which struck the world with such great ferocity at the end of 2019 does have the potential to bring about a great transformation in the sense of Polyani (1944), but such changes can take a long time towards completion. For example, the Black Death (*magna*

This chapter substantially draws upon my previous ideas in Murshed (2020, 2021).

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*pestilencia*) of circa 1348–1350 led to the decline of feudalism in Europe, but it was a process which was to last three centuries to Thirty Years' War of 1618–1648 (Scheidel, 2017). Upon impact, however, the Black Death *temporarily* raised the wage-rental ratio in some countries such as England, moving the distribution of income in favour of workers, due to the substantial decline in the labour force. The current pandemic has already had a major impact on the most national macroeconomies, and there is the potential for deep structural change in the economies in many countries. A lot has, and will continue to, hinge on the policy response, which in turn is related to political economy processes. And, the mechanisms underlying political economy are also affected by economic performance. In what follows, I discuss the possible distributional effects of COVID-19 and its consequences for liberal democracy.

## 2 Inequality

A modicum of economic inequality, in terms of income and wealth, is a feature of any society and is even argued to be a necessary mechanism for incentivising effort, thrift, risk-taking and innovation. What is considered to be undesirable, or unacceptable, is excessive inequality, the extent of which is the subject of much debate. Most individuals would, however, consider deeply embedded and structural inequalities of opportunity, which systematically disadvantage certain groups, ethnicities or socio-economic classes, as totally unacceptable. This is known as the inequality of *opportunity* (e.g. Roemer, 1998), in contrast to inequalities of outcome.

A related question is whether inequality is instrumental in promoting economic growth, as was traditionally believed. Dabla-Norris et al. (2015) and Ostry et al. (2014) demonstrate that the recent growth experiences of a cross-section of developed and developing countries evidence that excessive inequality is harmful to growth prospects. Greater inequality leaves economies more vulnerable to financial crises; results in less human capital accumulation; inequality contains within it the seeds of conflict. All of these hamper growth prospects. In empirical models, redistributive policies, including social sector expenditures, appear to no longer harm growth prospects (Ostry et al., 2014) by crowding out private investment, suggesting that the efficiency-equity trade-off is much weaker at present.

Historically, there have been waves of rising and falling inequality. Scheidel (2017) writes of 'four horsemen' who have always acted as the great levellers throughout history: total war necessitating mass

mobilization, state collapse, political revolutions and, of course, pandemics. All four of these phenomena are inter-related and endogenous to each other. Milanovic (2016) indicates that phases of globalization such as between 1870 and 1914, and our present-day experience of globalization are associated with rising inequality. The view about our current era of globalization, being associated with rising inequality, worldwide is widely accepted. The contrasting epoch (1914–1980) of falling inequality is also the period of declining wealth to GDP ratios (and falling rental to growth ratios) highlighted by Piketty (2014), who believes that the most important aspect of economic inequality is the distribution of wealth (ownership of capital). Wealth ownership is more concentrated compared to the distribution of income, and the wealth-GDP ratio has been rising again for the last half a century.

Returning to the pandemic and its concomitant lockdowns, these will result in negative supply shocks as supply chains are disrupted and labour is withdrawn. Any negative aggregate demand effect can be mitigated by governments introducing income support schemes. For many households there may be a loss of income due to the diminution in labour supply, either because of the reduced demand for labour (involuntary unemployment) or because of the voluntary withdrawal of labour engendered by the fear of infection. The reduction in labour demand is likely to be greatest for the provision of personal services, which is the category most pervasive among precariously employed and low-income workers. By contrast, higher-income knowledge workers are hardly affected because of their ability to work remotely. In addition, there will be an acceleration of the long-term structural changes favouring robotization, and labour-saving technical progress; see Furceri et al. (2020). Also, the functional distribution of income is more likely to move towards the more skilled in the labour force. All in all, therefore, the prospects for further increases in inequality seem imminent.

The PEW Institute (2021) points to a post-pandemic shrinking global middle class, whom they define to be households where each member lives on between $10–20 a day in 2011 purchasing power parity (PPP) dollars, using World Bank data and estimates on changes in income globally. They estimate that the global middle class will shrink by about 54 million individuals, with the bulk of these taking place in India. A dwindling middle class is also indicative of growing inequality and greater polarization.

Turning to global inequality, measured in terms of differences in income per capita between nation states, Deaton (2021) indicates that if we look

at population unweighted global inequality (each country is treated equally regardless of its global population share), then global inequality may have declined in the post-pandemic year 2020 because poor countries suffered less in terms of lives lost and national income compression. But population-weighted global inequality rose, because China, which is now among the rich nations club, fared so well during the pandemic in 2020.

## 3 Democracy

We need, first of all, to make a distinction between liberalism and democracy. The liberal values of tolerance and respect for the rule of law need not coincide with democratic electoral processes. We are witnessing a rising wave of autocracy (VDEM report, 2021), especially in developing countries, accompanied by a rise in 'populism' in the context of democratic electoral processes, chiefly, but not exclusively, in developed countries. Populist leaders such as Donald Trump, Boris Johnson, Jair Bolsonaro and Narendra Modi who are democratically elected, espouse populist nationalistic causes, but ultimately possess a plutocratic agenda aimed at further immiserizing the poor (Pierson, 2017). The economically disadvantaged segments of the population feel so hopeless about their future, that they will sometimes willingly vote for a nationalistic demagogue, who they know will make them poorer, but prefer them to less than credible promises of economic redress from the traditional liberal elite.

There has been a growing tide of inequality in the context of the globalized economic architecture of the last 40 years. If inequality is a consequence of globalization, Rodrik (2018) points out that the rise in populism, and the populist backlash, is associated with rising globalization. This is because the traditional liberal elites do not offer a solution to increasingly plutocratic systems of global economic governance, especially the scant respect for domestic redistributive social contracts.

There is prima facie evidence that states with a populist leader mismanaged the pandemic compared to their democratic or autocratic counterparts in 2020, measured by indicators such as excess mortality (Bayerlein et al., 2021). Clearly, this is related to the populist scepticism about the dangers of COVID-19, and associated preventative measures.

## 4 Conclusions

Economic and political processes are inextricably intertwined. In an age where there has been a steady rise in inequality since the 1970s, the pandemic is likely to further worsen inequality, especially wealth inequality, as the pace of labour-saving technical progress accelerates. This is likely to lead to more populist and nationalist political success. It would be dangerous to speculate, however, as to what really happens in the distant future.

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PART II

# (In)decent Work

# Decent Work for Change

*Gianluca Ferrittu, Pedro Goulart, and Raul Ramos*

## 1 From Work to Decent Work: The Evolution of a Concept

Since Aristotle, the conception of work has evolved over centuries in relation to socioeconomic and cultural changes in societies (Dupré & Gagnier, 1996). By the beginning of the 1990s, numerous social scientists announced the "end of work" (Doherty, 2009). However, since the 2000s, this trend has changed (ILO, 2017a), and the central role that

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work plays for societies and individuals has been re-affirmed (see Meda, 2010; Fidelis & Mendonça, 2021). This repurposed Western idea of working life (ILO, op. cit.), originally based on Weber (1930), conceptualises work as intrinsically important, and characterised by high levels of welfare and social protection linked to employment.

Despite these arguments, conceptualisations of work have remained, at best, ambiguous (see Balliester & Elsheikhi, 2018). By the end of the Cold War, the progressive liberalisation and flexibilisation of labour markets and innovations have meant increasing economic growth, but also vulnerable and informal employment, excessively long hours of paid and unpaid work, gender and geographical disparities, and scant social protection. Especially in emerging economies, work is often not enough for escaping poverty (ILO, 2019), whilst people still die at work, or trying to get one (ILO, 2017a). As a response to these challenges, concepts such as quality employment and, later on, decent work have been growing over the last three decades (see Burchell et al., 2014; Rantanen et al., 2020). Different systematisations of these concepts are thus provided in the literature (see Fields, 2003; Piasna et al., 2020; Green, 2021). The most significant attempt to frame these ideas is the concept of Decent Work launched by the International Labour Organisation, which declared decent work its institutional priority at the end of the 1990s. As reported by Ghai (2003), nowadays, the promotion of decent work for all is still at the centre of the ILO's agenda, which describes decent work as "opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity" (1999, 87th Session). Decent work is thus here outlined as a multidimensional concept, which combines access to full and productive employment, together with various qualitative dimensions of work, such as rights at work, but also social protection and social dialogue promotion (Piasna et al., op. cit.). The adoption of Sustainable Development Goal 8 reflects this new conceptualisation of the working life, by claiming for inclusive and sustainable economic growth, through full and productive employment and decent work for all.

## 2 Working Conditions Since 1991

The main indicators of working conditions generally concern dynamics such as levels of remuneration, working hours and contractual arrangements (Eurofound and ILO, 2019). In terms of earnings, in developing countries the section of the population that can be considered middle class

grew significantly since 1991, reaching up to more than 34 percent of total employment (as reported by UNDP in "Sustainable Development Goals"[1]). According to these last estimates, this number has almost tripled between 1991 and 2015. As countries gain access to better average income, families tend to work less (see Dolton, 2017). Figure 1 depicts income per capita and hours of work in 43 countries for three years: 1991, 2005, and 2019. For over 10,000 euros per capita, the income effect seems to prevail, with societies pursuing more leisure. Individual country trajectories tell a more nuanced view, where the decline in working hours for richer countries is less evident, such as for Sweden or the USA. Will the trendy four-day-week prescription set a difference for the future (see Gomes, 2022)? Nonetheless, it is noteworthy the distinct individual trajectories of countries, with Chile and the USA with the tradition of working longer hours and Bulgaria and Sweden working less, for example. In

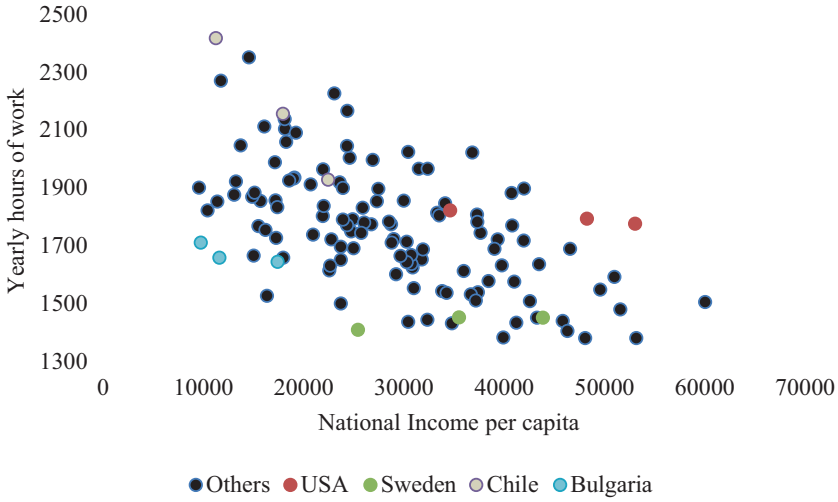


**Fig. 1** Income per capita and working hours (1991, 2005, 2019). (Source: Authors' calculations based on average annual hours actually worked (OECD database))

[1] See UNDP (2021). *Goal 8: Decent Work and Economic Growth.* Available at [https://www1.undp.org/content/oslo-governance-centre/en/home/sustainable-development-goals/goal-8-decent-work-and-economic-growth.html]. Last access: 01/09/2021.

chronological time, OECD data suggests that, on average, there was a stronger reduction in working hours post-Great Recession.

On the other hand, reductions in working hours worldwide observed are also the result of variations in labour utilisation, which may be related to structural changes, but also cyclical recessions, and economic shocks (see Horemans et al., 2016). This issue is a matter of concern because it may be associated with involuntary time-related underemployment and working poverty, which can prevent workers to achieve adequate wages (see Brülle et al., 2019). Figure 2 depicts the evolution of the share of involuntary part-timers as a percentage of part-time employment. In 2019, the share of involuntary part-timers was around 14%, after having decreased steadily over the previous five years. However, the share of involuntary part-time employed was still higher than in 1990, when it was less than 13%. The estimates show that the global involuntary part-time employment shares have unsteadily increased over the last three decades, with a first peak reached up in 1997 (more than 16%), to which it follows a sharp decline until 2001 (around 12%). In line with this, the ILO (2020a) also estimates that, in 2018, 172 million people in the world were

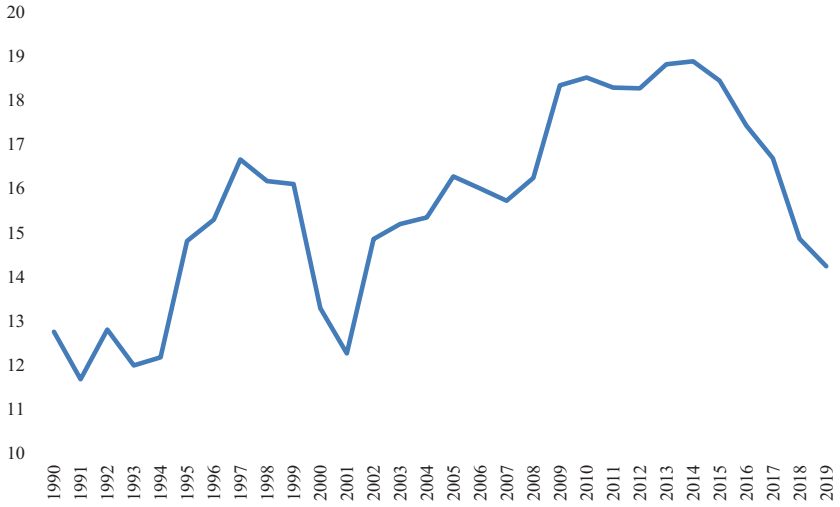


**Fig. 2** Share of involuntary part-timers as % of part-time employment. (Source: Authors' calculations based on OECD data (2021b) and ILOSTAT (2021b))

still without work, representing an unemployment rate of 5%, reaching up 6.4% in 2020, and that 61% of the total workforce at the global level, for example, 2 billion workers, were involved in informal employment. At the same time, in 2020, more than one in five young people aged 15–24 at the global level (e.g., 22.4%) were neither in employment, education, nor training (NEET, see ILO, 2020b).

Since 2001, the estimates show a structural increase in the share of involuntary part-timers, with higher rates after the financial crisis in 2008, reaching the second peak in 2014 (about 19%, the highest share in the last 30 years). Despite the decreasing trend registered since 2014, it thus seems that along many years into the post-2008 recovery period, the global share of involuntary part-timers has remained above 1991 and 2001 levels. This persistence in involuntary part-time work during the post-crisis recovery may be related to structural changes in the industry composition of employment, as opposed to only cyclical economic downtrend factors (Borowczyk-Martins, 2017; Ramos et al., 2022). On the other hand, high part-time employment shares in the period 2009–2014 may also be related to weak economic conditions due to a lack of robust economic growth. The COVID-19 pandemic crisis has also exacerbated this issue by reducing working hours worldwide. According to ILO (2021a), "working-hour losses in 2020 were approximately four times greater than during the global financial crisis in 2009", while global labour income[2] is "estimated to have declined by 8.3 percent, which amounts to 4.4 percent of global GDP" (global GDP in 2019, using 2019 market exchange rates).

Of course, hours of work affect both earnings and working conditions. Involuntary part-time employment may impact the incidence of poverty among workers, increasing the risk of working poverty (see Horemans et al., 2016). On the other hand, according to ILO's and WHO's estimates (see Pega et al., 2021), the number of people working long hours globally has increased over time, to an estimated 479 million workers, around 9% of the global population. Exposure to long working hours (≥55 hours/week) is common and may cause health problems, such as large attributable burdens of ischemic heart disease and stroke. Protecting and promoting workers' occupational safety and health requires interventions to reduce hazardous long working hours.

[2] This is "before taking into account income support measures" (ILO, 2021).

In terms of decent work, one of the main ILO's strategies for consolidating social justice has been the implementation of international labour standards (see also Biffl & Isaac, 2002). In 2019, among the eight fundamental ILO's Conventions and covered by the ILO's Declaration on Fundamental Principles and Rights at Work (1998), 92% of the possible ratifications (1376 ratifications) have been defined, while only 121 were still missing (ILO website, 2021). Over the last three decades, child labour has been one of the key decent work challenges identified in the ILO's policy agenda (van Daalen & Hanson, 2019). Encouragement to adopt labour standards and minimum age of employment laws has thus been the main global child labour policy since the 1990s (Edmonds & Theoharides, 2020). The latest global estimates show an important decline in child labour since 1990, and a reduction of 94 million child labourers since 2000 (ILO, 2017b). Yet there are still about 160 million child labourers in the world, accounting for almost one in ten of all children globally, while children in employment[3] are around 222 million (ILO, 2021b). Table 1 aims to depict the evolution of the economic activity rate of children at the global level over the last three decades, reporting data for four years: 1990, 2000, 2010, and 2020. According to the figures, while the employment of children has decreased worldwide since 1990, it seems that this downtrend has slowed down substantially between 2010 and 2020, making it difficult to achieve the policy goal to eliminate child labour in all its form by 2025. Further, child employment decline has been

**Table 1** Economic activity rate of children (%, 1990–2020)

| *Region* | *1990* | *2000* | *2010* | *2020* |
|---|---|---|---|---|
| World | 14.7 | 11.3 | 8.4 | 7.9 |
| Africa | 27.9 | 24.9 | 22.5 | 18 |
| Asia and the Pacific | 15.2 | 10.9 | 5.6 | 4.8 |
| Latin America and the Caribbean | 11.2 | 8.2 | 5.5 | 4.3 |

Source: Authors' systematisation based on ILO (1997) and ILOSTAT (2021a)

Note: Economic activity rate of children, age group 10–14 is reported for the period 1990–2010. The last column (2020) reports the proportion of children engaged in economic activity for the age group 5–17 (SDG indicator 8.7.1, not including household chores). The percentages reported for the year 2010 are ILO's projections based on the period 1990–2000

[3]We refer to "child employment" as a broader measure comprising both child labour and permitted forms of employment involving children of legal working age (see ILO, 2017).

heterogeneous across regions: Africa shows generally higher rates of child employment compared to the rest of the world, while the Asian bloc has diminished the employment of children more than others in the period 1990–2010, after which follows a period of more moderate decline. According to ILO's estimates, while Latin America and the Caribbean maintains a good pace of decline across all period, it also suffers a significant slowdown in the decreasing trend, in line with the overall global figures.

Despite the important progress reported at the global level, the ILO (2020c) also estimates that the unfolding COVID-19 crisis may hit about 42–66 million children worldwide, who could fall into extreme poverty. To cope with job loss and health shocks related with the pandemic, poor households may decide to send their children to work, exacerbating the current situation (op. cit.). Even in relatively developed countries, the perpetuation of various forms of child work can be detrimental to schooling and human capital accumulation (Goulart & Bedi, 2008). In this sense, whilst the employment of children is still largely persisting, this complex phenomenon seems to require new integrated policy responses.

## 3 Decent Work Agenda on the Rise

Since 1991, the globalisation of labour markets and working life have distressed the characteristics and access to decent work in both developed and developing economies. Innovation's adoption and automation are contributing to structural changes, impacting the number and types of jobs in societies. Whilst this may have disruptive impacts on social agendas by reducing employment and working hours, it also creates the opportunity for more and better jobs (ILO, 2020d). In relation to this transition, inequality is also likely to increase due to declining labour shares of income across the world (see Lin & Tomaskovic-Devey, 2013). Hence, reducing inequality through redistribution policies is one of the guiding strategies for overcoming transition's challenges, while labour institutions and relations, such as minimum wage, social dialogue and labour market regulation, as well as effective social protection, seem still key factors for decent work promotion (see ILO, 2017a; Goulart et al., 2022 "Income Inequality and Effectiveness in Redistribution").

The globalisation of production has also shaped the organisation of global work through transnational value chains (see Gereffi et al., 2005). Offshoring and outsourcing activities create employment opportunities in developing countries, but they also allow firms to move work to often

informal and low-wage economic scenarios. This may increase indecent work in value chains in several ways, also by contributing to the intensification of forced and child labour and labour exploitation, especially in the informal sections of value chains (ILO, OECD, IOM, and UNICEF, 2019). Gender discrimination is also largely observed along global supply chains (see Barrientos, 2019, 2022). Further, developed economies face the negative social consequences of these changes in the international production system, with high informality and underemployment rates, and thus limited tax revenues and resources for social protection (ILO, 2017a). Global crises, including the last COVID-19 pandemic crisis (see for instance Parwez & Ranjan, 2021), have also exacerbated the situation in many countries by destabilising social protection and consumptions. Formalisation of the informal work, together with social protection expansion and structural responsible business standards along value chains are likely to be strategic for promoting decent work, and governing these last changes in the world of work (see ILO, 2017a; Das, 2022; Shigute et al., 2022).

## 4 In This Section: (In)decent Work

Part II, "Indecent Work", contributes to this debate by compiling relevant key publications on last developments in the world of work in terms of changes in decent work conditions and practices, and social policies since 1991.

Employment should be a vector to lift people out of poverty, but without adequate earnings having a job is not always enough for keeping workers and their families out of poverty (ILOSTAT, 2019). How does a change in the minimum wage affect economic well-being? Chapter 11 in this volume, by Fields and Kanbur (2022), addresses this question by analysing the effects of a higher minimum wage in terms of poverty. This is done by "extending the literature standard model effect to allow for income sharing between employed and unemployed, and by dealing with income sharing within families". The authors find a higher minimum wage does not always increase poverty due to the related unemployment it may create. Yet this is not as well necessarily associated with poverty reduction simply because of its direct link with higher income shared with the unemployed (either through family sharing or through social sharing). Fields and Kanbur's model shows the effect of a higher minimum wage on poverty is not univocal, and that the poverty effects of a minimum wage policy

may depend on various parameters, such as the elasticity of labour demand, the extent of income-sharing in place, the sensitivity of the measure of poverty, and the level of the minimum wage in relation to poverty. Fields and Kanbur contribute by highlighting the conditions under which higher minimum wages may raise, lower, or maintain the same level of poverty. Policy implications are thus discussed in the chapter.

Employment and development are multidimensionally interrelated. But the way unemployment is measured is not univocal, and it may depend on different types of classifications adopted. Chapter 12, by Pedersen and Schmidt (2022), contributes to this issue by comparing two unemployment measures on a cross European Union panel study. The first estimation approach tested is based on the ILO's unemployment definition, while the second is calculated in relation to self-reported states of unemployment. Contrasting the two measures, Pedersen and Schmidt outline the overlapping between the two concepts by several demographic variables. It follows an estimation of a multinomial logit model for specifying the transition from unemployment according to the two unemployment measures. The authors find that the ratio between the two unemployment concepts differs considerably among European countries, and across gender and age groups. Pedersen and Schmidt's results also suggest that many more of the background factors identified (e.g., demographic, labour market, education, and attitude variables) are statistically significant by using unemployment as a self-reported state. This seems consistent across European countries. This chapter sheds light on the importance of tracking unemployment measured and evaluated in different ways, and the relevance to include both measures of unemployment as guidelines and indicators for policy-making. This seems to be particularly important for reducing also other forms of labour market slack, such as underemployment and involuntary part-time employment), and atypical and informal forms of work (see OECD, 2021a).

In 2018, more than 61% of the world's employed population made their living in the informal economy (ILO, 2018), which is mainly characterised by the absence of access to social protection, job insecurity, and, generally, lower wages. This dynamic has hampered the capability of developing countries to benefit from globalisation, especially in the Global South. But how can an informal job in formal establishments be defined, and who has an informal job? What are the labour market outcomes? Tijdens, Besamusca, and van Klaveren (2022) address these questions in Chap. 13. They explore the characteristics of informal and formal jobs in

formal enterprises in nine Sub-Saharan countries, developing a novel index for job-based informality. This is structured on employment status, and contribution and entitlement to social security. The result proposed is an 11-point informality index, on a scale from very informal (value 0) to very formal (value 11). The authors find that working in a small enterprise, especially for workers in trade, transport, and hospitality, is linked with lower index scores. At the same time, young and low-educated workers are more likely to score lower in the index and have informal jobs, whilst they do not find women are more likely to have informal jobs than men. Yet the authors suggest this may be related to sampling bias due to formal establishments, where only relatively high-skilled women may enter. In the chapter, Tijdens, Besamusca, and van Klaveren find that poor labour market outcomes are related to lower scores on the informality index: informal work in formal establishments seems generally characterized by lower wages, higher working hours, and higher chances of not being covered by collective agreements.

In Chap. 14, Ñopo (2022) contributes to this debate by surveying the current status and policy implications of labour informality in Peru. The author stresses that labour informality in the country is high, which begs the question of the adequacy of the policy solutions adopted to solve the problem. He further delves into the economic conceptualisations of the phenomenon, at the base of this policy-making. Ñopo highlights that informality in Peru has proved to be "more rigid than expected" and economic explanations of this issue (especially based on social insurance coverage) seem partial. In this chapter, the author expands this conceptualisation by identifying three multidimensional layers in the decision-making process related to informality, which are related to rational expectations of decision-making processes, cognitive constraints and social norms. The inability to capture these complementary aspects of the phenomenon in the policy-making is likely to have contributed to its persistence in the country. Ñopo stresses that the fragmentation and complexity of the current development reality does not allow anymore to apply the traditional paradigm of financing social protection from the labour markets, conceptualising social protection schemes "as a worker's right instead of a citizen's right". The author argues this creates problems at the origin of the economic incentives conceptualised for coping with informality, exacerbating the issue.

Labour informality is often associated with indecent forms of work, especially for youth and women workers, or, generally, along with the

lowest segments of value chains. With regard to the former, Swinkels, Miroro, and Dekker, in Chap. 15 (2022), survey to what extent indecent work strategies reflect the daily work of youth and women in Uganda, and discuss decent work opportunities in the country. Drawing on findings of the project "INCLUDE's African Policy Dialogue (APD)", the authors highlight labour informality is extensively concentrated in the agricultural sector, where youth work (and especially young female workers) is more likely to be associated with lower income, unpaid work, and scant access to productive land, credit, and improved technologies. Miroro, Dekker, and Swinkels discuss the various policy strategies that have been defined to cope with these issues, such as the "formulation and enforcement of labour laws, skills development, youth empowerment programmes and prioritisation of agro-industrial value chains". The authors discuss the daily work of youth and women in Uganda in the cotton and fish value chains, surveying the decency of work in relation to the position in the value chain. Despite labour laws implementation, Miroro, Dekker, and Swinkels suggest that the daily reality of the work of youth and women is still far from being decent. As such, it seems that only prescribing certain labour institutions for decent work is unlikely to be the most functioning approach. Policy alternatives are thus discussed in this chapter, such as interventions for improving working conditions and promoting the rights of those who already work in the most informal sections of value chains.

Over the last years, corporate responsibility has become a popular framework for coping with poor working conditions in global value chains. Chapter 16, by Barrientos (2022), contributes to this section by providing an overview of corporate responsibility with a focus on social compliance. While women are usually involved in the most precarious work of the international production system, the author highlights specific gender risks in informal sections of global value chains and discusses why the social audit industry has failed to deal with gender issues in value chains. Barrientos argues the reasons for this failure seem linked with global buyers' influence. They would pressure suppliers to meet product and social standards at low prices and on a "just in time" basis. This would push suppliers to structure employment on a core permanent workforce, combining it with "flexible" precarious workers, usually female, with lower wages. The author suggests this dynamic also interacts with social and cultural norms about gender inequality in sourcing countries, which are likely to expose women to more numerous and complex risks, especially in the most informal segments of supply chains. Although there are still doubts

about top-down social compliance, Barrientos shows that there are signs of improvement. Yet better conditions for women in GVC seem to be only possible through structural changes in the global business model, and commercial sourcing strategies within global value chains.

Since 1991, the nature of work has changed in several ways due to technological and socioeconomic changes. Whilst the information technology advancement has enabled people to work from different times and locations, it has also blurred the traditional boundaries between work and non-work activities (Las Heras et al., 2017), and thus between family and workspaces. At the same time, increases in women's labour force participation have implied a higher number of dual-earner couples, often resulting in new burdens between paid and unpaid work for women, outlining the necessity for further flexibility to take care of family responsibilities. These interlinked dynamics may result in increasing conflicts between work and family, especially for female workers. Chapter 17 in this book, by Mesmer-Magnus and Viswesvaran (2022), explores this issue by surveying the role of family-friendly work environments in reducing work-family conflicts using a meta-analytic methodology. In this chapter, the authors systematise and analyse a total of 105 correlations from 38 different articles, examining work-family conflicts and facets of family-friendly work environments. The research findings suggest that a family-friendly work culture is likely to be influential in reducing work-family conflicts. Mesmer-Magnus and Viswesvaran also show that spousal support initiatives may not be considered a substitute for a functioning family-friendly organisational environment, and that work-family conflicts are likely to be better addressed through synergies between organisational cultures and family-friendly policies. The authors stress that "these dynamics naturally interact with the potential ways household regulates work and family commitments". How these intra-household decisions are defined is currently an issue of growing concern.

Chapter 18, by Craig (2022), concludes this section by analysing how employed mothers manage to avoid a one-for-one trade-off between market work and childcare. In the chapter, the analysis is defined by comparing the time use of employed fathers, employed mothers, and non-employed mothers in Australia. Craig's findings suggest that employed mothers give a very high value on maintaining both their attachment to the paid workforce and spending time with their children. Hence, in comparison with non-employed women, they try to avoid trading off time between market work and childcare by reducing the time they spend in non-work and

non-childcare activities. Craig finds that non-parental care is likely to be associated with more daily sleep and childfree recreation for fathers, and with more daily personal care and childfree recreation for non-employed mothers. At the same time, employed mothers "got almost no childfree recreation, and the use of non-parental care on a workday did not predict any increase". As such, the chapter shows employed mothers try to allocate time in order to avoid negative effects to their employers or their children at a cost to themselves, while non-employed mothers seem to use non-parental childcare to reschedule daily activities. These results shed light on future research questions on the potential adverse individual implications of this dynamic for employed mothers.

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# Minimum Wages and Poverty with Income-Sharing

*Gary S. Fields and Ravi Kanbur*

## 1 Introduction

How does a change in the minimum wage affect economic well-being? The standard economists' argument is that a higher minimum wage is problematical, because it increases unemployment. Minimum wages are typically evaluated in terms of their effects on unemployment, be it in standard textbook models (Ehrenberg & Smith, 2006), in specialized labor market models (Fields, 1997; Gramlich, 1976; Harris & Todaro, 1970; Mincer, 1976, 1984), or in empirical studies (Card & Krueger, 1995, 2000; Neumark & Wascher, 2000).

Evaluations based on unemployment implicitly use social welfare functions of the form $W = f(\text{UNEM})$, $f' < 0$. In our view, this function is too scanty. A central rationale for minimum wage legislation is that it helps lift the working poor out of poverty by raising their wages. With this argument in mind, in this chapter we use a welfare function of the form

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$W = g(\text{POV}), g' < 0$, and ask: how does an increase in the minimum wage affect poverty?

Empirical studies relating minimum wages to poverty produce conflicting results. For the US, Card and Krueger (1995) find some reductions in poverty as a result of the minimum wage, while Brown (1999) finds that minimum wage increases compress the wage distribution. On the other hand, Neumark and Wascher (2002) and Adams and Neumark (2005) find opposing forces with small net effects. Freeman (1996) presents a broader review of the evidence on distributional consequences and of the conflicting tendencies. For Latin America, Morley (1995) finds that poverty falls as the minimum wage rises. Using cross-country data on developing countries, McLeod and Lustig (1996) also find that a higher minimum wage is associated with lower poverty even though the higher minimum wage reduces employment. Finally, for the case of Brazil, Neumark et al. (2006) find no evidence that minimum wages in that country lift family incomes in the lower part of the income distribution.

Despite this (albeit scattered) empirical evidence that higher minimum wages could reduce poverty, the tradeoff between reduced poverty among the working poor versus increased poverty because of greater unemployment has not been addressed in the theoretical literature in precise terms. The first contribution of this chapter is to develop a framework where this tradeoff can be assessed in rigorous fashion using a specific family of poverty measures.

Throughout this analysis, poverty is measured using a fixed poverty line $z$ and gaged relative to $z$ using the class of indices developed by Foster et al. (1984). The FGT index, denoted $P_\alpha$, takes each poor person's poverty deficit as a percentage of the poverty line, raises it to a power $\alpha$, and averages over the entire population. Letting $y_i$ be the income of the $i$th person, $z$ the poverty line, $q$ the number of poor persons, and $n$ the total number of persons, the $P_\alpha$ poverty measure is

$$P_\alpha = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z - y_i}{z}\right)^\alpha . \tag{1}$$

As is well known, when $\alpha = 0$ this measure collapses to the Headcount Ratio, the fraction of people below the poverty line. Other values for $\alpha$ are greater than or equal to one. Benchmark values in this range are $\alpha = 1$, in which case we have the Income Gap measure of poverty, and $\alpha = 2$, which

is known as the Squared Income Gap measure. The higher is $\alpha$, the greater is the sensitivity of poverty to changes in the incomes of the poorest compared to the incomes of the not so poor. For these reasons, $\alpha$ is known as the "poverty aversion" parameter. To allow for the social loss from poverty to increase at an increasing rate as incomes fall relative to the poverty line, it is common for empirical poverty researchers to choose $\alpha = 2$. Different degrees of poverty aversion will be seen to be important in delineating the consequences of the minimum wage for poverty.

Unemployment is only one of the factors that breaks any simple relationship between the labor earnings of those employed on the one hand and the incomes of all members of society on the other hand. Income-sharing in families and communities, which typically comprise wage-earners and unemployed, can make the distribution of income among individuals very different from that among wage-earners. Empirical estimates of the contribution of a minimum wage to the poverty status of the families of minimum wage workers in the US may be found in Burkhauser et al. (1996) and Neumark and Wascher (2000). Further evidence on income-sharing among employed and unemployed members of a family is available for South Africa, for example, in Klasen and Woolard (2001). The second contribution of this chapter is to examine theoretically how alternative sharing mechanisms in a society condition the impact of minimum wages on poverty.

Our task in this chapter is to use a number of theoretical models to show conditions under which a higher minimum wage raises poverty and when it does not. Throughout the chapter, it is assumed that the minimum wage applies and is equally enforced throughout all sectors of the economy. We begin in Sect. 2 with the textbook model of a competitive labor market. We then proceed to extend the textbook model to allow for two types of income-sharing. In Sect. 3, the sharing is between employed and unemployed persons in society; we term this the "social sharing model." By contrast, Sect. 4 extends the textbook model to two-person families, assuming full income-sharing between those family members who are employed and any family members who may be unemployed; we term this the "family sharing model." Table 1 summarizes the main results of Sects. 2, 3, and 4. Section 5 concludes.

**Table 1** Summary of results

| *Model* | *Effect of a minimum wage increase on poverty* |
|---|---|
| Textbook model with no income-sharing | |
| Case where $0 < z \leq \hat{w}$: | Poverty increases |
| Case where $0 < \hat{w} < z$: | |
| $\alpha = 0$ | Poverty is unchanged |
| $\alpha = 1$ | Poverty increases (decreases)<br>If $\eta$ is greater (less than) one |
| $\alpha > 1$ | Poverty increases (decreases)<br>If $\eta$ is sufficiently high (low)<br>And/or $\alpha$ is sufficiently low (high) |
| The social sharing model | |
| Case where $xb\hat{w} < z < \hat{w}[1 - b(1 - x)]$: | |
| $\alpha = 0$ | Poverty increases |
| $\alpha \geq 1$ | Poverty increases (decreases)<br>If $\eta$ is sufficiently high (low) |
| Case where $xb\hat{w} < \hat{w}[1 - b(1 - x)] < z$: | |
| $\alpha = 0$ | Poverty is unchanged |
| $\alpha = 1$ | Poverty increases (decreases)<br>If $\eta$ is greater (less than) one |
| $\alpha > 1$ | Poverty increases (decreases)<br>If $\eta$ is sufficiently high (low)<br>And/or $\alpha$ is sufficiently low (high) |
| The family sharing model | |
| Case where $0 < z \leq \frac{1}{2}\hat{w}$: | Poverty increases |
| Case where $\frac{1}{2}\hat{w} < z < \hat{w}$: | |
| $\alpha = 0$ | Poverty increases |
| $\alpha \geq 1$ | Poverty increases (decreases)<br>If $\eta$ is sufficiently high (low) |
| Case where $0 < \hat{w} < z$: | |
| $\alpha = 0$ | Poverty is unchanged,<br>Because everyone is always poor |
| $\alpha = 1$ | Poverty increases (decreases)<br>If $\eta$ is greater than (less than) one |
| $\alpha > 1$ | Poverty increases (decreases)<br>If $\eta$ is sufficiently high (low) |

## 2 Minimum Wage and Poverty: Individuals in a Competitive Labor Market

Consider the basic textbook labor market model in which a single homogeneous type of labor is supplied by workers and demanded by firms. Let the demand for labor be $D(w)$, $D'(w) < 0$, where $w$ is the wage per period.

Assume no labor force entry or exit and normalize the working population at size 1. Then, with full market-clearing, the nonintervention wage is given by $w^*$, where $D(w^*) = 1$. Denote the minimum wage by $\hat{w}$ and assume that this minimum wage applies equally to all jobs in the economy. Given the preceding demand for labor function, a minimum wage reduces employment. The resultant amount of employment, denoted $x$, is $x = D(\hat{w})$, and the amount of unemployment is $1 - x$. The employed get wage income $\hat{w}$. There is assumed to be no unemployment insurance, so the unemployed get income zero.

We have several cases depending on where the minimum wage $\hat{w}$ is set relative to the poverty line $z$, and what value is chosen for $\alpha$. Let us start with the case where the minimum wage is set above the poverty line, the object being to raise the working poor out of poverty. In this case, with $0 < z \leq \hat{w}$, all those who work are out of poverty and the unemployed are in it. This corresponds most closely to the conventional theory's identification of unemployment, and only unemployment, with poverty. Since a higher minimum wage will increase unemployment in the textbook model, it follows that in this case it will increase poverty too. More precisely, the $P_\alpha$ poverty index in this case is

$$P_\alpha = (1-x)\left(\frac{z-0}{z}\right)^\alpha = 1-x \tag{2}$$

for all $\alpha$. When the minimum wage is raised, the effect on $P_\alpha$ is

$$\frac{dP_\alpha}{d\hat{w}} = -\frac{dx}{d\hat{w}} = -D'(\hat{w}) > 0. \tag{3}$$

Thus if a minimum wage is higher than the poverty line, further increases will increase poverty. But what about the range where the minimum wage is below the poverty line, as it is, for example, in the United States—in other words, $0 < \hat{w} < z$? The poverty population then consists of $x$ poor people who receive the minimum wage $\hat{w}$ and $1 - x$ poor people who are unemployed and receive zero. The extent of poverty in this case is

$$P_\alpha = (1-x) + x\left(\frac{z-\hat{w}}{z}\right)^\alpha. \tag{4}$$

Various subcases are useful to consider. When $\alpha = 0$, the poverty measure is the headcount ratio. The tradeoff between the incomes of the working and non-working poor is not present since with this parameter value what matters is whether a person is poor, not how poor the person is. But everyone is below the poverty line and so the headcount ratio is 100% and stays that way as the minimum wage changes in this range. Thus:

$$P_0 = 1 \tag{5}$$

and

$$\frac{\mathrm{d}P_0}{\mathrm{d}\hat{w}} = 0. \tag{6}$$

Thus, in order for the tradeoff in poverty between the working poor and the non-working poor to bite, we need to consider the range $\alpha \geq 1$. In this case, the extent of poverty is given by Eq. 4. The effect of a higher minimum wage is found by differentiating Eq. 4 with respect to $\hat{w}$. Denoting the (local) absolute value of the wage elasticity of demand for labor by $\eta$ and rearranging, we obtain:

$$\frac{\mathrm{d}P_\alpha}{\mathrm{d}\hat{w}} = \frac{x}{\hat{w}}\left[\eta\left\{1-\left(1-\frac{\hat{w}}{z}\right)^{\alpha}\right\}-\alpha\frac{\hat{w}}{z}\left(1-\frac{\hat{w}}{z}\right)^{\alpha-1}\right]. \tag{7}$$

From this it follows that

$$\frac{\mathrm{d}P_\alpha}{\mathrm{d}\hat{w}} \gtrless 0 \Leftrightarrow \eta \gtrless \frac{\alpha\frac{\hat{w}}{z}\left(1-\frac{\hat{w}}{z}\right)^{\alpha-1}}{1-\left(1-\frac{\hat{w}}{z}\right)^{\alpha}}. \tag{8}$$

The condition given in Eq. 8 simplifies as follows for $\alpha = 1$:

$$\frac{\mathrm{d}P_\alpha}{\mathrm{d}\hat{w}} \gtrless 0 \Leftrightarrow \eta \gtrless 1. \tag{9}$$

Thus, in the case $\alpha = 1$, poverty increases with the minimum wage if the demand for labor is elastic and decreases if the demand for labor is inelastic. The intuition behind this result is straightforward. When $\alpha = 1$, what matters for poverty is the sum of the differences of income from the poverty line for the poor. The income of the unemployed stays fixed at zero, while the total income of the employed falls or rises depending on whether the elasticity of labor demand is greater than or less than unity. Hence the result.

When $\alpha = 2$, there is a different critical value of $\eta$:

$$\frac{dP_\alpha}{d\hat{w}} \gtrless 0 \Leftrightarrow \eta \gtrless \frac{2\left(1-\frac{\hat{w}}{z}\right)}{2-\frac{\hat{w}}{z}}. \tag{10}$$

Note that the right-hand side of Eq. 10 is decreasing in $\frac{\hat{w}}{z}$. Thus, for a given $\eta$, a higher $\frac{\hat{w}}{z}$ makes it more likely that $\frac{dP_\alpha}{d\hat{w}} > 0$.

Expressions Eqs. 8, 9, and 10 highlight the precise role of the labor demand elasticity in adjudicating the tradeoff between the poverty of the working and non-working poor as the minimum wage is raised. Specifically, poverty increases with the minimum wage when the elasticity of labor demand is sufficiently high, since a sufficiently large amount of additional unemployment is created to overwhelm the opposite force of an improvement in the standard of living of the working poor. The opposite is true when the labor demand elasticity is sufficiently low. How low? The critical value depends on the poverty aversion parameter. For $\alpha = 1$, the critical value is unity (see Eq. 9). Since most empirical estimates of labor demand elasticities are indeed between 0 and 1 (81% according to a comprehensive survey by Hamermesh (1993), Table 3.2), this condition says that poverty so measured is likely to fall as the minimum wage increases while staying below the poverty line.

But as the concern for the poorest of the poor grows, as in the case $\alpha = 2$, this critical value of the labor demand elasticity falls to below unity. Thus, for example, if the minimum wage is 3/4 of the poverty line, from Eq. 10, the critical value of the labor demand elasticity is 0.4. Estimated

elasticities frequently exceed this (Hamermesh, 1993), with the result that at this level of the minimum wage, further increases will raise poverty as measured by the $P_\alpha$ index with $\alpha = 2$. But if the minimum wage is only $1/2$ of the poverty line, then the critical value of $\eta$ is $2/3$, which is in the range of empirical labor elasticity estimates.

The conclusions we have reached on the poverty effects of a higher minimum wage in the textbook model are rich in their empirical and policy implications. If the minimum wage is above the poverty line, further increases will raise poverty. But if the minimum wage is below the poverty line, then the impact on poverty of increasing the minimum wage depends neatly on two observable parameters and one value judgment parameter. The observable parameters are the labor demand elasticity and the ratio of the minimum wage to the poverty line, while the value judgment is captured in the poverty aversion parameter. Our analysis shows the precise configurations of these three parameters such that an increase in the minimum wage will, or will not, reduce poverty.

## 3 The Social Sharing Model

One feature of economies is the sharing of income between employed and unemployed members of society. The poorer the country, the more pervasive income-sharing appears to be. To the best of our knowledge, income-sharing has not until now been integrated into theoretical minimum wage models. At one extreme is perfect income-sharing. In this case, income per person is simply the per capita wage bill. Hence, poverty increases or decreases with the minimum wage according to whether the wage elasticity of demand for labor $\eta$ is greater or less than one in absolute value. At the other extreme is zero income-sharing. That case was analyzed in Sect. 2.

In between perfect income-sharing and zero income-sharing is partial income-sharing among employed and unemployed members of society, which is the subject of this section. Let the $i$th worker's pre-sharing income be denoted by $y$, which is the wage per hour $w$ multiplied by the number of hours worked. Let $y^*$ denote that worker's post-sharing income. We suppose that an employed worker pays a "marginal tax" at rate $b$, which finances a fixed income grant of $a$ for all including the employed themselves. In a rich country context, an example of such a system would be a universal family allowance program financed by a proportional payroll tax. In a poor country context, an example would be a "tax" on employed

persons, the proceeds of which are used to supplement the contents of the community cooking pot, from which all partake.

With such a program of social sharing, the pre- and post-sharing incomes are related to one another by the relationship:

$$y^* = a + (1-b)\,y. \tag{11}$$

Before a minimum wage, all workers are employed and receiving the same income, so there is no sharing. When a minimum wage is imposed at level $\hat{w}$, the pre-sharing income distribution is

$$\begin{aligned} y &= \hat{w} \text{ for } x \text{ employed workers,} \\ &= 0 \text{ for } 1-x \text{ unemployed workers.} \end{aligned}$$

After sharing, the income distribution is

$$\begin{aligned} y^* &= a + (1-b)\,\hat{w} \text{ for } x \text{ employed workers,} \\ &= a \text{ for } 1-x \text{ unemployed workers.} \end{aligned}$$

Self-financing of the transfer among workers requires that

$$x\hat{w} = (1-x)\,a + x\left[a + (1-b)\,\hat{w}\right], \tag{12}$$

from which it follows that

$$a = xb\hat{w}. \tag{13}$$

Then post-sharing income is given by

$$\begin{aligned} y^* &= \hat{w}\left[1 - b(1-x)\right] && \text{for the employed,} \\ &= xb\,\hat{w} && \text{for the unemployed.} \end{aligned} \tag{14}$$

The zero-sharing and perfect-sharing cases are given by $b = 0$ and $b = 1$, respectively.

As before, let the poverty line be $z$ and the poverty index be $P_\alpha$. In the previous section the income of the unemployed was zero, so they were in

poverty for any positive poverty line. With income-sharing, the possibility arises that the poverty line is so low that nobody is in poverty:

$$z < xb\hat{w} < \hat{w}\left[1 - b\left(1 - x\right)\right].$$

In this case there is no poverty, and small changes in the minimum wage do not change poverty at all.

As the poverty line rises, we come to a range where the unemployed are in poverty despite the transfers they receive, but the employed are not in poverty:

$$xb\hat{w} < z < \hat{w}\left[1 - b\left(1 - x\right)\right].$$

Accordingly, the extent of poverty in the economy is

$$P_\alpha = \left(1 - x\right)\left(1 - \frac{bx\hat{w}}{z}\right)^\alpha. \tag{15}$$

Note that when $b = 0$, Eq. 15 collapses to Eq. 2.

We turn now to various subcases. When $\alpha = 0$, what matters is the number of the poor, not their incomes. Hence income-sharing does not affect poverty so measured. What matters is the increase in unemployment as the result of the increased minimum wage. In this subcase $P_0 = (1_x)$,

$$\frac{\mathrm{d}P_0}{\mathrm{d}\hat{w}} = -\frac{\mathrm{d}x}{\mathrm{d}\hat{w}} > 0, \tag{16}$$

and poverty increases with the minimum wage.

With $\alpha \geq 1$ the minimum wage affects poverty as follows:

$$\frac{\mathrm{d}P_\alpha}{\mathrm{d}\hat{w}} = \frac{x}{\hat{w}}\left[\eta\left(1 - \frac{bx\hat{w}}{z}\right)^\alpha + \left(1 - x\right)a\frac{b}{z}\hat{w}\left(\eta - 1\right)\left(1 - \frac{bx\hat{w}}{z}\right)^{\alpha - 1}\right]. \tag{17}$$

As in the no income-sharing case, there is also a possible tradeoff. As the minimum wage rises, the number of poor increases and poverty rises on this account; this effect is captured by the first term in square brackets

in Eq. 17. But the incomes of the (non-poor) employed also change and so, with sharing, do the incomes of the (poor) unemployed. The impact depends crucially on whether the *total income* of the employed increases or decreases since, with the self-financing constraint, this is the pool of resources that is being redistributed. Hence the importance of the magnitude of the elasticity of labor demand relative to unity, which is captured in the second term in the square bracket in Eq. 17. One result that follows immediately is that

$$\eta \geq 1 \Rightarrow \frac{\mathrm{d}P_{\alpha}}{\mathrm{d}\hat{w}} > 0, \tag{18}$$

that is, a higher minimum wage increases poverty when the demand for labor is elastic. This is not surprising. When the demand for labor is elastic, an increase in the minimum wage lowers the wage bill, thereby reducing the (transfer) income of the unemployed while increasing their numbers.

So the interesting tradeoff case is when $\eta < 1$, that is, the demand for labor is inelastic. In this case we can derive:

$$\frac{\mathrm{d}P_{\alpha}}{\mathrm{d}\hat{w}} \gtrless 0 \Leftrightarrow \frac{\eta}{1-\eta} \gtrless \frac{(1-x)\alpha \dfrac{b\hat{w}}{z}}{\left(1-\dfrac{bx\hat{w}}{z}\right)}. \tag{19}$$

Equation 19 thus gives us critical values of the labor demand elasticity below which an increase in the minimum wage (in this case, where only the unemployed are poor) will reduce poverty. Some further insight can be derived from special cases. If we start at the market-clearing wage $w^*$, there is full employment, that is, $x = 1$. A minimum wage $\hat{w}$ slightly higher than $w^*$ imposed at this point starts with $x = 1$, and therefore the numerator of the right-hand side of Eq. 19 equals zero. Given that we are working with the inelastic subcase $0 < \eta < 1$,

$$\frac{\eta}{1-\eta} > 0 \Rightarrow \frac{\mathrm{d}P_{\alpha}}{\mathrm{d}\hat{w}} > 0. \tag{20}$$

Thus, starting at market-clearing, when the demand for labor is inelastic, a small minimum wage increases poverty.

The results so far can be compared to the textbook case in the previous section where only the unemployed were poor and there was no income-sharing. There, with Eq. 3 we found that an increase in the minimum wage always increased poverty because it increased unemployment. Now we have to set against that force the force of income-sharing by the now better-off employed. So poverty reductions are now possible, but they will not happen for small increments around the market-clearing wage, and outside this neighborhood they will happen only if the elasticity of labor demand is low enough. The critical value is given in Eq. 19. Notice one thing, however. The critical value also depends on the poverty aversion parameter, $\alpha$. If the income of the poorest of the poor matters sufficiently in our value judgments, then a minimum wage will reduce poverty for labor demand elasticities in the empirically plausible range.

Let us finally turn to the case where the poverty line is so high that both the employed and the unemployed are poor:

$$xb\hat{w} < \hat{w}\left[1 - b\left(1 - x\right)\right] < z.$$

We saw in the previous section the playing out of the tradeoff between the poverty of the working poor and the poverty of the unemployed. The same tradeoff will be in play here, but mediated by income-sharing. The amount of poverty in this case is given by

$$P_\alpha = \left(1 - x\right)\left(1 - \frac{bx\hat{w}}{z}\right)^\alpha + x\left(1 - \frac{\hat{w}\left[1 - b\left(1 - x\right)\right]}{z}\right)^\alpha, \tag{21}$$

which corresponds to Eq. 4 in the no income-sharing case. Notice that Eq. 21 collapses to Eq. 4 when $b = 0$.

Some basic intuitions from the earlier discussion still hold in this case. If the elasticity of labor demand exceeds unity, then the total wage bill falls at the same time as the number of the very poorest (the unemployed) increases. Poverty must therefore rise for any value of $\alpha$. When the elasticity of labor demand is less than unity, then all incomes rise but the numbers of the very poorest rise as well. If $\alpha = 1$, then what matters is simply the total poverty gap, irrespective of how it is divided among the employed and the unemployed. Thus poverty will fall. But when $\alpha$ exceeds 1, then

with successive increases in $\alpha$, greater and greater weight is put on the well-being of the unemployed relative to the employed. For any given degree of partial sharing it must therefore be the case that an increase in the minimum wage will raise poverty for $\alpha$ high enough.

## 4 The Family Sharing Model

For the analysis of this section, we have individuals living in families. Suppose that each family consists of two individuals, each of whom is a potential earner. Conceptually, poverty is a function of individuals' levels of consumption. In practice, however, empirical researchers rarely know what individual family members consume. Accordingly, for this analysis, poverty is defined as a function of per capita family income, not individual consumption. The poverty line in this economy is an income of $z$ per capita.

As before, employment $x$ is given by the demand function $x = D(\hat{w})$, where $\hat{w}$ is the minimum wage. Normalizing the population size at unity, $x$ is also the employment rate. Denote $\frac{dx}{d\hat{w}} = D'(\hat{w}) < 0$ and assume a constant elasticity of labor demand $\eta \equiv -\frac{\hat{w}}{x}\frac{dx}{d\hat{w}}$.

Let each potential earner in this economy have the same chance as any other of being employed at the minimum wage $\hat{w}$ with probability $x$ and unemployed with probability $1 - x$. The distribution of income in the economy is then as follows:

Some families have both members employed. These families earn (and consume) $2\hat{w}$, or $\hat{w}$ per capita. The number of individuals in such families is $x^2$.

Some families have one member employed. These families earn (and consume) $\hat{w}$, or $\frac{1}{2}\hat{w}$ per capita. The number of individuals in such families is $2x(1 - x)$.

Some families have both members unemployed. These families earn (and consume) zero. The number of individuals in such families is $(1 - x)^2$.

There are three cases to consider, depending on where the poverty line is relative to the minimum wage. *Case A* is where the poverty line is so low that any family with at least one employed member is above the poverty line—that is, $0 < z < \frac{1}{2}\hat{w}$. *Case B* is where the poverty line is at an intermediate level such that families with one employed member are below the

poverty line, while those with both members employed are above the poverty line—that is, $0 < \frac{1}{2}\hat{w} < z < \hat{w}$. *Case C* is where the poverty line is so high that all families are poor—that is, $0 < \hat{w} < z$.

Again using the $P_\alpha$ index to measure poverty, the extent of poverty in the three cases is given by

$$\text{Case A}: \quad P_\alpha = (1-x)^2. \tag{22}$$

$$\text{Case B}: \quad P_\alpha = (1-x)^2 + 2x(1-x)\left[\frac{z-\frac{1}{2}\hat{w}}{z}\right]^\alpha. \tag{23}$$

$$\text{Case C}: \quad P_\alpha = (1-x)^2 + 2x(1-x)\left[\frac{z-\frac{1}{2}\hat{w}}{z}\right]^\alpha + x^2\left[\frac{z-\hat{w}}{z}\right]^\alpha. \tag{24}$$

Let us now analyze the effect of a higher minimum wage in each of these three cases.

### *Case A*

The analysis in this case is straightforward:

$$\frac{dP_\alpha}{d\hat{w}} = -2(1-x)\frac{dx}{d\hat{w}} > 0. \tag{25}$$

Poverty increases when the minimum wage does. This is because a higher minimum wage raises unemployment and, in this case, the only poor households are those with both members unemployed, the number of which is now greater.

### *Case B*

After some manipulation, one obtains, in this case,

$$\frac{dP_\alpha}{d\hat{w}} = 2\eta\frac{x}{\hat{w}}\left[(1-x)-(1-2x)\theta^\alpha\right] - x(1-x)\frac{\alpha}{z}\theta^{\alpha-1}, \tag{26}$$

where

$$\theta \equiv \left[1 - \frac{\frac{1}{2}\hat{w}}{z}\right]. \tag{27}$$

To sign the expression in Eq. 26, note two things. First, $\frac{1}{2} > \theta > 0$. Second, given that $\theta < 1$, we have that $(1 - 2x)\theta^{\alpha} < (1 - 2x) < (1 - x)$ for all $\alpha > 1$. Thus, the expression in square brackets in Eq. 26 is positive. Noting that $\frac{\frac{1}{2}\hat{w}}{z} = 1 - \theta$ and solving for the critical value of $\eta$, we get for Case B:

$$\frac{dP_{\alpha}}{d\hat{w}} \begin{matrix} > \\ < \end{matrix} 0 \Leftrightarrow \eta \begin{matrix} > \\ < \end{matrix} \frac{(1-x)\alpha(1-\theta)\theta^{\alpha-1}}{\left[x\theta^{\alpha} + (1-x)\left(1-\theta^{\alpha}\right)\right]} \equiv K. \tag{28}$$

Equation 28 gives the general result. For specific values of $\alpha$, the following results are readily derived:

When $\alpha = 0$ (i.e., the poverty measure used is the poverty headcount ratio), $K = 0$. Given that $\eta > 0$, it follows that $\eta > K$ and therefore $\frac{dP_{\alpha}}{d\hat{w}} > 0$, that is, the headcount ratio rises with the minimum wage.

When $\alpha = 1$, the critical value $K$ is given by

$$K_1 = \frac{(1-x)(1-\theta)}{\left[x\theta + (1-x)(1-\theta)\right]} < 1. \tag{29}$$

Thus, labor demand has to be sufficiently elastic (inelastic), the critical value given by Eq. 28, for poverty to increase (decrease) when the minimum wage rises. Equations 29 and 27 together give the critical value as a function of $x$, $\hat{w}$, and $z$.

Finally, when $\alpha = 2$, the critical value $K$ is given by

$$K_2 = \frac{2(1-x)(1-\theta)\theta}{\left[x\theta^2 + (1-x)\left(1-\theta^2\right)\right]}. \tag{30}$$

The denominator of Eq. 30 can be rewritten as

$$x\theta^2 + (1-x)(1-\theta^2) = 2(1-x)(1-\theta)\theta + x\theta^2 + (1-x)(1-\theta)^2,$$

which is the numerator of Eq. 30 plus two additional positive terms. Thus, in this subcase as well, labor demand has to be sufficiently elastic (inelastic) for poverty to increase (decrease) when the minimum wage rises. Expressed as a function of $x$, $\hat{w}$, and $z$, the critical value may be found by combining Eqs. 30 and 27.

We may also analyze how the critical value $K_\alpha$ changes with $\alpha$. First, for integer values of $\alpha$, it may be shown that

$$K_1 \gtrless K_2 \Leftrightarrow \left(\frac{1-\theta}{\theta}\right)^2 \gtrless \left(\frac{x}{1-x}\right),$$

both of which are possible. Second, for general values of $\alpha$, the corresponding condition is

$$\frac{\partial K}{\partial \alpha} \gtrless 0 \Leftrightarrow \frac{1+\alpha \log\theta}{\theta^\alpha} \gtrless \frac{1-2x}{x},$$

both of which are also possible. Thus, we conclude that a higher value of the poverty aversion parameter $\alpha$ has an ambiguous effect on the critical labor demand elasticity above (below) which an increase in the minimum wage raises (lowers) poverty.

### *Case C*

This case has simple conclusions for $\alpha = 0$ and for $\alpha = 1$. For $\alpha = 0$ (i.e., the poverty measure is the poverty headcount ratio), everyone is always poor and therefore $\frac{dP_\alpha}{d\hat{w}} = 0$. For $\alpha = 1$ (i.e., the normalized average income shortfall), since everyone is poor, all that matters is total labor income, not its distribution. Thus $\frac{dP_\alpha}{d\hat{w}} \gtrless 0 \Leftrightarrow \eta \gtrless 1$. Finally, for $\alpha > 1$, the change in poverty with respect to an increase in the minimum wage is given by

$$\frac{dP_\alpha}{d\hat{w}} = 2\eta \frac{x}{\hat{w}}\left[-(1-x)+(1-2x)\theta^\alpha + x(2\theta-1)^\alpha\right] - \left[x(1-x)\frac{\alpha}{z}\theta^{\alpha-1} + x^2\frac{a}{z}(2\theta-1)^{\alpha-1}\right]. \tag{31}$$

From this, we get

$$\frac{dP_\alpha}{d\hat{w}} \gtrless 0 \Leftrightarrow \eta \gtrless \frac{(1-x)\alpha(1-\theta)\theta^{\alpha-1} + x^\alpha(1-\theta)(2\theta-1)^{\alpha-1}}{\left[x\theta^\alpha + (1-x)(1-\theta^\alpha) - x(2\theta-1)^\alpha\right]}. \tag{32}$$

Once again, labor demand has to be sufficiently elastic (inelastic) for poverty to increase (decrease) when the minimum wage rises.

To sum up, in this section, we have analyzed the family sharing model. We have found instances in which a higher minimum wage necessarily increases poverty, instances in which a higher minimum wage may reduce poverty, and one instance in which poverty is necessarily unchanged. We have also demonstrated when each result arises as a function of how high the minimum wage $\hat{w}$ is relative to the poverty line $z$, the elasticity of demand for labor $\eta$, and the poverty aversion parameter $\alpha$.

## 5 Discussion and Conclusion

A standard result in labor economics is that a higher minimum wage reduces employment. In the standard single-sector labor market model, reduced employment results in higher unemployment. The expected increase in unemployment leads many analysts to worry about the adverse effects of minimum wages or even to oppose them outright. Certainly if unemployment is equated with poverty, then this translates into a concern that a higher minimum wage would increase poverty. On the other hand, many trade unions argue that a higher minimum wage reduces poverty through raising incomes of the working poor and, even in cases where the employed are not all poor, through income-sharing between the employed and the unemployed.

The results of this chapter lead us to a more nuanced view about minimum wages than is commonly found in the literature. A higher minimum wage does not necessarily increase poverty because of the unemployment

it creates. On the other hand, a higher minimum wage does not necessarily reduce poverty simply because it might increase total labor income, and some of this increased income is shared with the unemployed, either through family sharing or through social sharing. Thus the "standard labor economist's view" and the "standard trade unionist's view" are both simplistic. Not only does the truth lie somewhere in between, but it can be characterized precisely in terms of empirically observable parameters.

We have shown how the poverty effects of a minimum wage increase depend on four parameters: how high the minimum wage is relative to the poverty line, how elastic the demand for labor is, how much income-sharing takes place, and how sensitive the poverty measure is to the depth of poverty. The results of this chapter, summarized in Table 1, give the precise conditions under which a higher minimum wage raises poverty, a higher minimum wage lowers poverty, and a higher minimum wage leaves poverty unchanged. The implication for policy is that in order to be able to reach a judgment about whether a minimum wage would make things better or worse in poverty terms in a given setting, the analyst must know the values of these parameters.

The analysis presented in this chapter may be extended to incorporate heterogeneous workers, multiple employment sectors, variations in household size and composition, endogenous labor force participation decisions, and partial income-sharing within the family. Our basic point will certainly remain: that the simple policy views found in the literature are far too simplistic.

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# What Is Unemployment in Europe? Concepts and Measurement in the European Community Household Panel

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## 1 Introduction

The rate of unemployment is one of the most important indicators of success or failure in economic policy. At the same time unemployment has well-known costs at the individual level in the form of loss of human capital and lower well-being for the affected persons and their families. At the

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aggregate level the cost is lower production in the economy. There are thus many arguments for having a precise and relevant measure of unemployment as a guide for many aspects of economic policy as well as for social, regional and educational strategies. There exists a multitude of national procedures and conventions for measuring unemployment. In the present context we use data from the European Community Household Panel (ECHP) to compare unemployment measured in two different ways. One approach is to follow ILO criteria where individuals are classified as unemployed conditional on recent active job search and availability for job offers. While the ILO criteria are based on actual behaviour, an alternative measure is based on attitudes, that is, persons are classified as unemployed if they themselves report to be so in the survey.

In the present context the issue of unemployment measurement is related to two theoretical approaches. The first one is based on the welfare state typology proposed by Esping-Andersen (1990) arguing that different countries can be categorized into different types of welfare regimes, that is, the liberal, the social democratic and the continental type of welfare state. This has been used also in a labour market context in Berthoud and Iacovou (2004). The contributions by Kaiser (2004), Muffels and Schils (2004) and Deding et al. (2004) focus on the labour market aspects of such typologies. Policy differences regarding taxes, benefits and labour market policies may well produce different patterns of individual behaviour depending on welfare state type and labour market regime. Examples are the degree of labour market attachment among older individuals and gender differences in labour market behaviour depending on differences in family structures and in attitudes regarding labour force participation for married women. A possible empirical observation based on this line of theory would be cross-country differences in the two measures of unemployment mentioned above.

The second theoretical approach is based on the theory of discouraged workers, see Long (1958). The issue in this approach is whether unemployment and out of the labour force are distinct states or whether a two-state situation, employment and non-employment, is the most relevant

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classification. Regarding unemployment measurement, a self-reported measure may well be more relevant when studying discouragement, or the eventual "grey area" between employment and non-employment, than a measure based on respecting the ILO criteria to remain eligible for benefit and assistance programmes. The hypotheses in the present chapter relate to these two theoretical approaches. We estimate whether individual characteristics explaining the transitions out of unemployment relate more strongly to the ILO measure or to the self-reported state of unemployment.

In the following, Sect. 2 contains a brief survey of the literature on measurement of unemployment. Section 3 focuses on some of the differences between the two unemployment measures in the EU countries using the eight waves in the ECHP between 1994 and 2001. The ECHP measures are benchmarked against the official unemployment rates based on labour force surveys. The focus in Sect. 4 is on the overlapping between the two unemployment concepts, both in the aggregate and disaggregated by a number of demographic variables. Section 5 presents the results from estimation of a multinomial logit model for the transition from unemployment, measured by either self-reporting or the ILO criteria. The destination state of these transitions will either be employment, outside the labour force or attrition from the sample in the subsequent wave. Remaining unemployed by the chosen criterion will constitute the baseline. Section 6 concludes this chapter.

## 2 Unemployment Measures: A Brief Survey of the Literature

The discussion in the literature on measurement of unemployment is focused on the two specific issues. One is the question of whether unemployment according to the ILO criteria or to self-reporting is the better guide to understanding behaviour in the labour market. This is the main issue investigated here reflecting the hypothesis stated in the introduction. The other, broader question is whether unemployment and out of the labour force are distinct states or whether employment and non-employment is a more relevant two-state interpretation of the labour market.

A number of national studies have addressed the later broader issue of measurement. Long (1958) using US data demonstrates the existence of discouraged workers moving in and out of the labour force with the business cycle. The classic study analysing whether unemployment and out of

the labour force are distinct states is Flinn and Heckman (1983) concluding that unemployment and out of the labour force are distinct and well-defined states. This was in contrast to Clark and Summers (1979, 1982) where the conclusion was the opposite. Similar issues have been analysed in van den Berg (1990), Tano (1991), Gönül (1992), Jones and Riddell (1999) and Benati (2001) using different approaches without finding any clear cross-country pattern. Murphy and Topel (1997) argue based on US 1967–1994 data that a measure of joblessness is more informative than the conventional unemployment rate. The findings in these studies can be related to labour market regimes in different countries; see Sorrentino (2000). A recent contribution using both unemployment and non-employment as a measure of regional labour market performance in the UK can be found in Robson (2008), stressing the importance of distinct labour market statuses in evaluating labour market performances in different contexts.

A number of contributions have dealt with definitional issues in relation to different labour market states. Rettore et al. (1993) use the Italian labour force survey to show that the distinction between unemployment and being out of the labour force is quite sensitive to minor changes in definitions. For South Africa, Kingdon and Knight (2000) conclude that a broader unemployment concept built on self-reporting may be more relevant than formal search behaviour in a high unemployment economy. Garrido and Toharia (2004) analyse the consequences in Spain of a new EU criterion requiring more intensive search activity to be formally classified as unemployed. They find that passive job seekers are significantly different from the active job seekers but that passive job seekers at the same time are significantly different from non-seekers willing to work. Jones and Riddell (2006) use Canadian data, and Schweitzer (2003) uses the UK labour force survey to find that being formally outside the labour force is a composite where some individuals in this category exhibit behaviour closely linked to unemployment.

The main issue in the present chapter concerns the measurement of unemployment based on different criteria and principles. A number of studies have used internationally comparable data to analyse this issue. A recent survey of the measurement discussion is found in Bradbury (2006). Brandolini et al. (2006) use the European Community Household Panel (ECHP) and the Italian labour force survey. They conclude that European labour markets tend to contain four states, that is, employment, unemployment, potentially in the labour force and non-active. The part of the analysis based on the Italian labour force survey concludes that a focus on

behaviour instead of sticking to the arbitrary ILO two weeks' criterion regarding availability for a job offer would increase the Italian unemployment rate by 2 percentage points. Richiardi (2002) analyses the relationship between the two unemployment measures using the European Community Household Panel (ECHP) and finds big regional variation in the ratio between the two measures. Holst and Spieß (2002, 2004) use ECHP data to sub-divide individuals outside the labour force, where one sub-group called the attached are considered to be a hidden labour force.

The results from the literature therefore indicate that the very precise requirements inherent in the ILO criteria for being counted as unemployed might be too simple as a representation of the broader phenomenon of joblessness. In the present chapter we use the ECHP to approach the question of measuring formal versus self-reported unemployment in a setting where the same survey questions have been posed in an eight wave long panel collected annually from 1994 to 2001. The questions in the ECHP have been phrased in slightly different ways in Germany and the UK where the ECHP is based on existing national surveys, that is, the German Socioeconomic Panel (GSOEP) for part of the period in Germany and the British Household Panel (BHPS) in the UK. The ECHP does however in general have the advantage that the ILO criteria have been applied to the questionnaire making it possible to identify individuals in the sample who are unemployed according to these criteria, i.e. active job search and being available to take a job with a maximum of two weeks' notice. At the same time, respondents report their own subjective opinion regarding their main activity with unemployment as one of the possible states. We thus have a unique opportunity to compare unemployment measured in two different ways in the setting of a big cross-country panel study covering a period of eight years with differences in the cyclical situation over time and across countries.

## 3 Benchmarking the Unemployment Measures in the ECHP[1]

The most recent ECHP data were collected in 2001 covering about 60,500 households or 130,000 adults aged 16 years or more. It is based on harmonized questionnaires and has a follow-up procedure to ensure

[1] The unemployment rates for the EU countries in 2001—the last year of the ECHP—based on the OECD normalized unemployment rates showed a range between 2 per cent

the panel property of the data. The focus in the ECHP is on household income and a broad range of living conditions. The data includes items on health, education, housing and demographic and employment characteristics. Data were collected in eight waves from 1994 to 2001. Full ECHP data formats are available for Belgium, Denmark, France, Greece, Ireland, Italy, the Netherlands, Spain and Portugal. For Austria and Finland, data are available for, respectively 1995–2001 and 1996–2001. For Germany and the UK, ECHP data formats are derived from National Surveys for part of the period. For Luxembourg and Sweden this is also the case for the years 1997–2001. Full ECHP data format is available for Luxembourg for the first three waves, 1994–1996. Three features of the ECHP are especially valuable for the present study, that is, the multidimensional character of the issues covered, the cross-national comparability and the longitudinal or panel property.

A relevant starting point is to examine the eventual consistency between official unemployment rates measured in annual labour force surveys (UALFS) and the ILO compatible (UILO) and self-reported unemployment rates (USELF) based on the ECHP data.[2] This is done in Fig. 1 where the average unemployment rates for the countries for which

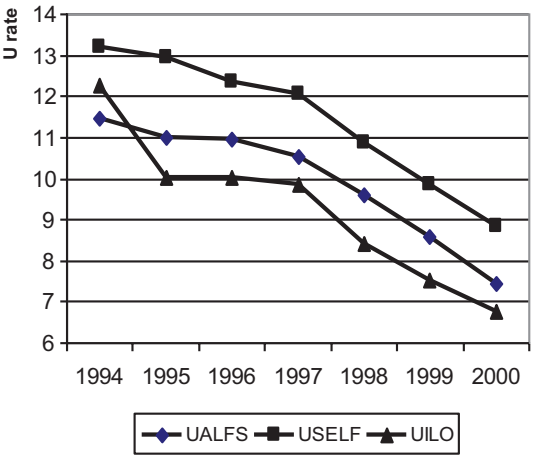


**Fig. 1** Average annual values across countries in the ECHP of the official labour force survey unemployment rates and the two ECHP based unemployment rates, 1994–2000. (Source: OECD and own calculations from the ECHP)

in Luxembourg and 10 per cent in Spain. The range has however narrowed very much over the eight years in which the ECHP were collected.

[2] These rates are calculated as the number of ILO unemployed, respectively self-reported unemployed in the ECHP relative to the number of individuals in the labour force.

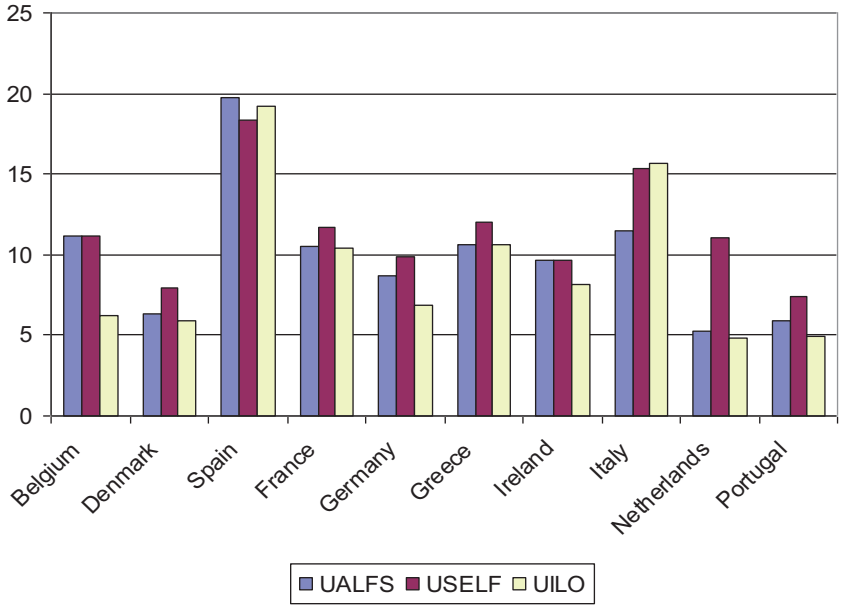


**Fig. 2** Average values of the official labour force survey unemployment rates and the two ECHP-based unemployment rates across countries in the ECHP. (Source: OECD and own calculations from the ECHP)

ECHP data are available are presented for each of the three measures.[3] With the exception of 1994, the official unemployment rates from the labour force surveys fall in a 2-percentage point band between self-reported unemployment and ILO compatible unemployment from the ECHP.

Next, Fig. 2 shows for each of the countries the average values over the period 1994–2001 for the three measures of unemployment. For most of the countries they are fairly close to each other. The three main exceptions are Belgium, Italy and the Netherlands. For Belgium, Fig. 2 shows ILO unemployment based on the ECHP to be about half the level of the two other measures. In Italy, the ECHP measures are close to each other and somewhat higher than the official labour force survey-based unemployment measure. Finally, in the Netherlands the official and the ILO compatible unemployment rates are about equal while the self-reported is at

[3] The countries are weighted equally when calculating the average values in Fig. 1.

about double the level of the two other measures. Looking at the eventual consistency between the ECHP measures abstracting from the labour force survey measures, Belgium and the Netherlands are the big outliers with ILO unemployment much lower than the self-reported while the two measures are nearly equal in Italy. Finally, comparing the unemployment measures in the ECHP with the official labour force survey-based measures shows a fairly high correlation on average.

## 4 What Makes the Unemployment Measures Differ in and Between the ECHP Countries?

The topic in this section is to look into the extent to which the two unemployment measures overlap or not in the EU countries. Figure 2 showed that the two measures were quite close in size in most of the countries. This, however, does not imply a perfect overlap. To illustrate this, Figure 3

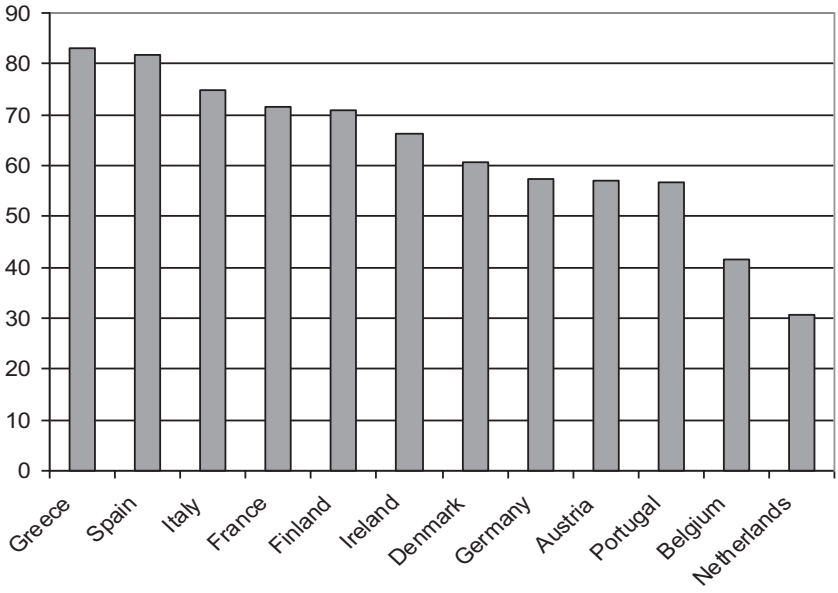


**Fig. 3** Number of people unemployed according to both criteria relative to the number of self-reported unemployed. Average values for all eight waves. (Source: ECHP and own calculations)

shows the average ratio over all eight waves between the number of people who are unemployed both by the ILO criterion and by self-reporting relative to the number of self-reported unemployed. Comparing Figs. 2 and 3, we find some interesting differences, that is, for Belgium the overlapping is very low in spite of the two measures having the same magnitude while in Italy the overlapping is high in spite of a quite big difference in the magnitude of the two measures.

To increase the understanding of these differences in overlapping between the two unemployment concepts, we go on to look at the variability of the ratio between the ILO and the self-reported measure when we disaggregate by gender and age. Figure 4 presents the ratio between the two unemployment concepts by gender.

The difference in the ratio by gender is fairly big, with the highest ratio for women in Spain, Italy, Ireland and Austria. For Ireland the level of the ratio is nearly twice as high for women as for men. For both Spain, Italy and Ireland it is surprising to find the ratio between ILO and self-reported

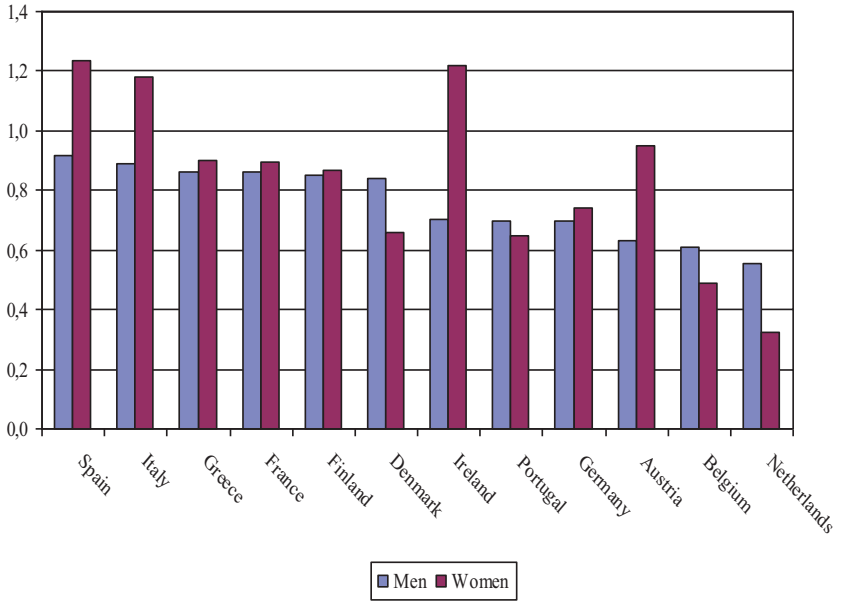


**Fig. 4** Ratio between unemployment by ILO and self-reporting by gender. Waves 1–8. (1994–2001). (Source: ECHP and own calculations)

unemployment for women to be higher than 1 as the ILO criterion is usually seen as the stricter of the two criteria, cf. Figure 2 showing the ILO measure to be the smallest in most of the countries when no distinction is made by gender. All three countries have employment rates for married women well below the EU average indicating the prevalence of a more traditional gender role situation where women might respect the ILO criteria but in their self-reported state tend more often to consider themselves as housewives. In Denmark, Belgium and the Netherlands the ratio is somewhat higher for men than for women. Gender therefore seems to be an important factor when focusing on differences between unemployment concepts across Europe.

Another important dimension in the labour market choices of individuals is the lifecycle perspective of remaining active in the labour market or retiring. As individuals approach the official retirement age, unemployment may come to function as a pathway to early retirement implying that self-reported unemployment may dominate the ILO concept. In the early stages of the labour market career education is an alternative state for many 18–24 years old, which might also result in differences between the two unemployment measures for this age group. Figure 5 shows the ratio between the two unemployment concepts for two age groups, 18–24 years and 55–59 years for whom the distinction between unemployment and being out of the labour force may be more blurred than for those in the intermediate age groups

For the youngest group, the Netherlands, Finland and Spain appear to be outliers with more ILO than self-reported unemployed. For the other countries, ILO unemployment lies between 80 and 100 per cent of the self-reported level. For the group of older workers, on the other hand, self-reported unemployment dominates ILO unemployment for the majority of the countries. This especially applies to Belgium, the Netherlands and Austria where self-reported unemployment is about five times higher than the ILO measure. The very low ratio for the 55–59 years old in some of the counties could reflect either discouragement explaining the absence of active job search or self-reported unemployment acting as a pathway to early retirement.

Another approach to the overlapping question is to allocate all individuals—unemployed by at least one of the measures—into three relevant states. One group consists of people unemployed according to both measures. The two remaining interesting groups are people who are unemployed according to the ILO criteria but do not report themselves to be

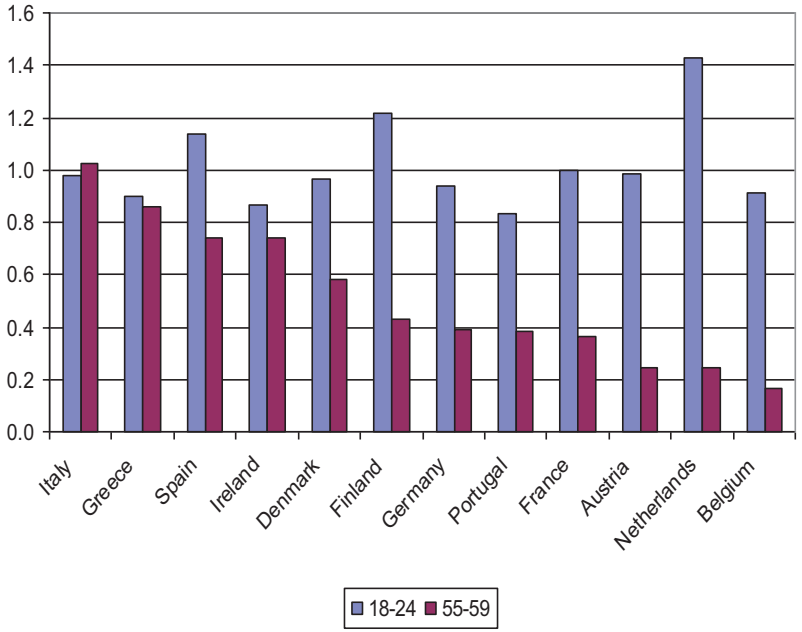


**Fig. 5** Ratio between unemployment by ILO and self-reporting by age groups. Waves 1–8. (1994–2001). (Source: ECHP and own calculations)

unemployed, and a last group reporting themselves to be unemployed but not fulfilling the ILO criteria. In order to make the number of people in these two groups comparable across countries, we have standardized by dividing with the number of people in each country who are unemployed by both measures.[4]

The last of these groups is the biggest consisting typically of discouraged workers who have given up on active search but who still consider themselves to be part of the labour force. This group of discouraged workers dominates in all the countries except Spain and Italy where there is a fairly high occurrence of married women who are ILO unemployed without reporting themselves to be unemployed. Except in these two countries, discouragement is more widespread among women, among married people and among people with reported health problems. Discouragement

[4] A detailed table containing the numbers is available on request.

does, however, not follow any clear pattern relative to labour market regimes or welfare state types. At a "high discouragement end" we find Austria, Belgium and the Netherlands and at the "low end" we find France, Italy, Spain and Greece, that is, mostly the Southern type welfare state. There is no clear pattern for the countries in between.

## 5 Model and Estimation Results

The descriptive analysis above pointed to the importance of different characteristics in terms of, for example, gender and age relative to the use of different unemployment measures. The focus in this section is on transitions out of unemployment according to each of the two criteria—ILO unemployed and self-reported unemployed. Given the big cross-country variation, the analyses in this section will use country-specific data rather than pooling data across countries. The purpose is to evaluate whether one of the measures of unemployment is more strongly related to a set of relevant background factors than the other and whether these relationships differ between countries.

We estimate a multinomial logit model on data pooled over all waves of the ECHP for individuals 18–59 years old. All individuals who are unemployed by one of the two criteria in one of the first seven waves are allocated in the subsequent wave either to unemployment, to a job, to a state outside the labour force or to attrition and missing. Four states lead to four types of transitions from unemployment. The base category in the multinomial logit is remaining unemployed. The transitions are therefore specific to the unemployment measure used, for example, remaining unemployed between two periods according to ILO criteria is the base category for the multinomial logit using transitions according to ILO criteria and remaining unemployed between two periods according to self-reported criteria is the base category for the multinomial logit using transitions according to self-reporting criteria. The transitions using either set of unemployment measures exhaust the possible outcomes after having been unemployed as the base category is an unchanged labour market status, and the three possible transitions are respectively to become employed, inactive or to attrition/missing. The analysis is based on pooled data across all waves for the different countries and estimates are corrected for within clustering by repeated observations on the same person. The choice of estimating multinomial models as compared to alternative longitudinal analyses of the transitions is motivated by three factors. The first concerns the potential

problem of attrition. A longitudinal analysis is more sensitive to attrition and is more concerned with persistence. The present analysis is focused more on recurrence in the sense that any transition between any two time periods is being considered in spite of potential problems of later attrition, that is, we use an unbalanced sample. The second issue concerns the nature of the ECHP data. These data are low-frequency data (annual data) that can essentially be considered as grouped data. There is some higher frequency information on labour market states in the ECHP, but the background variables are only available at a lower, annual frequency. A final, third issue is the initial conditions problem dealt with in, for example, Flinn and Heckman (1983) by restricting the sample to one cohort entering the labour market. Given the rather scarce data available for a number of countries, such an approach would not be possible in the present context, and pooling data across waves is pursued instead. The present analysis attempts an alternative to instrument the initial conditions problem through use of retrospective variables relative to labour market experiences.

The background variables used in the estimations are for easy reference collected in Box 1.[5] The variables include gender, age, education, health and interaction terms between gender and marital status. The interactive terms are intended to capture an eventual impact from a "traditional" male breadwinner hypothesis as the labour force participation rates for married women in spite of some convergence stills differs quite much across the EU countries. Further, two retrospective variables on labour market experience are included, that is, one variable indicates the number of times the individual has been unemployed during the past five years, and the other is a dummy variable for having experienced long-term unemployment at some point in time during the past five years. The three following variables are expected to capture the impact from pre-labour market education and from more recent training while in the labour force. Next follows a variable capturing self-reported health with the response categories aggregated to a (0,1) variable. Finally, we include an attitude indicator, being a dummy variable indicating whether the unemployed person considers her or his financial situation to be unsatisfying. The motivation for this variable comes from basic search theory, that is, an unsatisfying financial situation is expected to induce intensified job search, thereby influencing the transition probability.

[5] Mean values and standard deviations for each of the variables in each of the countries can be found in an Appendix table available on request.

**Box 1** Explanatory variables in the multinomial estimations

| *Variable* | *Definition* |
|---|---|
| Female | Takes the value 1 if female and 0 otherwise |
| Age | |
| Maletimesmarried | Product of male (takes value 1 if male, and 0 otherwise) and married (takes value 1 if married and 0 otherwise) |
| Femaletimesmarried | Product of female and married |
| Unempspells | Number of times being unemployed during the last five years |
| Duroneyear | Takes the value 1 if one of the unemployment spells during the last five years was longer than a year and 0 otherwise |
| Training | Takes the value 1 if the person has been under education or training since January last year and 0 otherwise |
| Secondeduc | Takes the value 1 if highest level of education completed is second stage of secondary education and 0 otherwise |
| Thirdeduc | Takes the value 1 if highest level of education completed is third level and 0 otherwise |
| Health | Takes the value 1 if health is reported to be fair, bad or very bad and 0 otherwise |
| Badfinance | Takes the value 1 if financial situation is reported to be unsatisfying and 0 otherwise |

Referring to the overlap described in Sect. 4, we expect much bigger differences in the estimation results regarding the two unemployment measures for countries where a big share of the self-reported unemployed do not fulfil the ILO criteria, a situation we interpret as a significant occurrence of discouragement. For countries like Greece and Spain, on the other hand, where the number of unemployed according to the two criteria is close to being identical with a high degree of overlap, the estimation results are as a consequence also expected to be close to each other.

Tables 1 and 2 present the estimation results for the transitions from unemployment to employment for the ILO criteria and self-reporting respectively, whereas Tables 3 and 4 presents the results for the transitions from unemployment to being inactive in relation to the labour force for the ILO criteria and self-reporting, respectively.[6] Tables 1, 2, 3 and 4

[6]The results for the transition from unemployment to attrition/missing are available on request. The absolute number of transitions to attrition is however small and no systematic patterns are found; see also Peracchi (2002).

**Table 1** Coefficients, z-statistic and marginal effects in a multinomial logit analysis of the transition from unemployment to employment. Other categories being out of the labour force and attrition/missing. Excluded category unemployment. ILO criterion. Age group 18–59 years

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 0.41 | -0.34 | -0.54* | -0.47*** | 0.29 | -0.26 | 0.21 | -0.52*** | 0.26 | -0.24 | -0.30 | -0.47* | 0.43 |
| | (0.98) | (-1.01) | (-2.07) | (-4.98) | (1.57) | (-1.24) | (0.56) | (-3.68) | (1.04) | (-1.72) | (-0.44) | (-2.03) | (1.12) |
| | 0.07 | -0.09 | -0.17 | -0.10 | 0.01 | -0.05 | 0.06 | -0.11 | -0.02 | -0.08 | -0.19 | -0.08 | -0.02 |
| Age | -0.04 | -0.04** | -0.01 | -0.02*** | -0.03*** | -0.04*** | -0.01 | 0.01 | -0.00 | -0.01 | -0.04 | -0.02* | -0.05*** |
| | (-1.96) | (-3.13) | (-1.24) | (-5.61) | (-4.01) | (-4.39) | (-0.55) | (1.03) | (-0.10) | (-0.75) | (-1.51) | (-2.50) | (-4.04) |
| | -0.01 | -0.01 | -0.00 | -0.01 | -0.00 | -0.01 | -0.00 | 0.00 | -0.00 | -0.00 | -0.01 | -0.01 | -0.01 |
| Male*mar | 0.40 | -0.10 | -0.41 | 0.330** | 0.84*** | 0.28 | 0.66 | 0.50** | 0.36 | 0.40 | 0.85 | 0.10 | 0.93*** |
| | (0.88) | (-0.25) | (-1.30) | (2.98) | (4.32) | (1.07) | (1.60) | (2.60) | (1.55) | (2.22) | (0.63) | (0.31) | (3.39) |
| | 0.16 | 0.01 | -0.05 | 0.11 | 0.14 | 0.05 | 0.16 | 0.12 | 0.09 | 0.08 | -0.06 | 0.07 | 0.14 |
| Female*mar | -0.70 | -0.28 | -0.07 | -0.06 | 0.63** | 0.07 | -0.39 | -0.16 | 0.13 | -0.06 | 1.07 | 0.25 | 0.76 |
| | (-1.57) | (-0.87) | (-0.28) | (-0.60) | (3.11) | (0.31) | (-1.26) | (-0.92) | (0.31) | (-0.35) | (1.58) | (1.14) | (1.41) |
| | -0.15 | -0.06 | 0.05 | -0.04 | 0.12 | -0.01 | -0.09 | -0.11 | -0.03 | -0.04 | 0.19 | -0.01 | 0.13 |
| Unemp_spells | -0.16* | 0.01 | 0.03 | -0.02 | -0.03 | 0.08* | -0.01 | -0.02 | 0.12 | -0.01 | -0.05* | 0.01 | -0.02 |
| | (-1.98) | (0.09) | (0.60) | (-1.45) | (-0.84) | (1.97) | (-0.15) | (-0.58) | (1.39) | (-0.86) | (-2.06) | (1.51) | (-0.26) |
| | -0.02 | 0.00 | 0.01 | -0.00 | 0.01 | 0.01 | 0.03 | 0.00 | 0.03 | -0.00 | 0.00 | 0.00 | -0.01 |
| Dur_one_ | -0.76* | -1.13*** | -1.00*** | -0.46*** | -0.36* | -0.64*** | -0.81*** | -0.32** | -0.96*** | -0.82*** | 0.40 | -0.54** | -1.19*** |
| year | (-2.44) | (-4.46) | (-4.91) | (-6.07) | (-2.41) | (-3.84) | (-3.38) | (-2.68) | (-4.05) | (-6.02) | (0.69) | (-3.18) | (-4.66) |
| | -0.24 | -0.27 | -0.20 | -0.09 | -0.06 | -0.10 | -0.16 | -0.08 | -0.23 | -0.16 | 0.07 | -0.12 | -0.26 |
| Training | -0.26 | 0.32 | 0.35 | -0.28*** | 0.17 | 0.24 | 0.42 | -0.09 | 0.24 | 0.35 | 1.71 | 0.31 | 0.18 |
| | (-0.84) | (1.40) | (1.95) | (-3.36) | (1.09) | (1.19) | (1.66) | (-0.51) | (0.94) | (2.02) | (1.37) | (1.03) | (0.60) |
| | 0.02 | 0.13 | 0.09 | -0.04 | 0.01 | 0.06 | 0.11 | -0.04 | 0.05 | 0.05 | 0.20 | 0.03 | 0.05 |
| Second_educ | 0.17 | 0.07 | 0.02 | 0.21* | 0.36* | 0.04 | -0.03 | -0.07 | 0.18 | 0.18 | 0.86 | 0.38 | 0.30 |
| | (0.52) | (0.27) | (0.10) | (2.33) | (2.13) | (0.26) | (-0.11) | (-0.57) | (0.97) | (1.46) | (1.14) | (1.47) | (1.12) |
| | 0.01 | 0.07 | -0.00 | 0.04 | 0.08 | 0.04 | 0.00 | -0.01 | 0.03 | 0.03 | -0.03 | 0.12 | 0.08 |
| Third_educ | 1.14 | -0.01 | -0.09 | 0.37*** | 0.35 | 0.34 | 0.67 | -0.09 | 1.02 | 0.59* | 1.26 | 1.36 | 0.55 |
| | (1.36) | (-0.03) | (-0.39) | (3.75) | (1.72) | (1.25) | (1.74) | (-0.56) | (1.88) | (2.56) | (1.63) | (1.72) | (1.43) |
| | -0.15 | 0.03 | 0.04 | 0.09 | 0.13 | 0.06 | 0.13 | 0.00 | 0.17 | 0.09 | 0.34 | 0.23 | 0.10 |

(*continued*)

**Table 1** (continued)

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Health | -0.04 | 0.21 | -0.22 | -0.11 | -0.26 | 0.10 | -0.77** | -0.47* | -0.43 | -0.35** | 0.22 | -0.12 | -0.44 |
| | (-0.10) | (0.84) | (-0.88) | (-1.18) | (-1.65) | (0.63) | (-2.62) | (-2.22) | (-1.85) | (-2.80) | (0.40) | (-0.59) | (-1.52) |
| | -0.01 | 0.04 | -0.06 | -0.04 | -0.09 | -0.01 | -0.20 | -0.12 | -0.12 | -0.08 | 0.08 | -0.02 | -0.16 |
| Bad_finance | -0.39 | -0.75** | -0.14 | 0.05 | 0.07 | -0.47* | -0.11 | 0.10 | -0.14 | -0.46** | -0.91 | 0.00 | 0.01 |
| | (-1.19) | (-3.05) | (-0.72) | (0.43) | (0.47) | (-2.21) | (-0.40) | (0.49) | (-0.54) | (-2.59) | (-1.25) | (0.01) | (0.01) |
| | -0.04 | -0.09 | -0.03 | 0.03 | 0.03 | -0.01 | 0.00 | 0.07 | -0.01 | -0.07 | -0.06 | 0.03 | 0.03 |
| No. of obs. | 719 | 1210 | 1088 | 8467 | 1891 | 4222 | 3956 | 3582 | 1797 | 8636 | 1423 | 1887 | 725 |

Note: Each cell contains parameter estimates in the first line, z-statistic in the second line and the marginal effects in the third line of each cell and a * denotes significant at a 1 per cent level, while ** denotes significant at a 5 per cent level. The parameter estimates are obtained from a multinomial logit estimation using the unchanged state of remaining unemployed as the base category. Estimations on pooled data over eight waves correcting for clustering in terms of within interdependence for same individual

*significance at 10%

**significance at 5%

***significance at 1%

**Table 2** Coefficients, z-statistic and marginal effects in a multinomial logit analysis of the transition from unemployment to employment. Other categories being out of the labour force and attrition/missing. Excluded category unemployment. Self-reported criterion. Age group 18–59 years

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 0.31 | -0.38* | -0.49** | -0.44*** | 0.22 | -0.34*** | -0.02 | -0.57*** | 0.10 | -0.42*** | -0.57** | -0.32* | 0.55*** |
| | 1.26 | -2.07 | -2.74 | -5.80 | 1.44 | -3.58 | -0.13 | -5.67 | 0.61 | -5.79 | -3.13 | -2.40 | 3.65 |
| | 0.05 | -0.05* | -0.13** | -0.11*** | 0.02 | -0.06*** | -0.02 | -0.13*** | -0.02 | -0.08*** | -0.08** | -0.08* | -0.03*** |
| Age | -0.06*** | -0.06*** | -0.02** | -0.03*** | -0.04*** | -0.04*** | -0.05*** | 0.00 | -0.01 | 0.00 | -0.06*** | -0.05*** | -0.02*** |
| | -5.34 | -9.28 | -2.90 | -8.95 | -7.81 | -9.66 | -14.96 | -0.07 | -1.78 | 0.14 | -9.31 | -9.51 | -3.57 |
| | -0.01*** | -0.01*** | 0.00** | -0.01*** | -0.01*** | -0.01*** | -0.01*** | 0.00 | 0.00 | 0.00 | -0.01*** | -0.01*** | 0.00*** |
| Male*mar | 0.81** | 0.36 | -0.12 | 0.52*** | 0.76*** | 0.41** | 0.30** | 0.49*** | 0.34* | 0.56*** | 0.25 | 0.59*** | 0.33* |
| | 2.78 | 1.65 | -0.55 | 5.65 | 4.64 | 2.86 | 2.63 | 3.39 | 2.11 | 5.23 | 1.24 | 3.52 | 2.11 |
| | 0.19** | 0.05 | 0.00 | 0.16*** | 0.14*** | 0.07** | 0.06** | 0.13*** | 0.09* | 0.13*** | 0.04 | 0.17*** | 0.05* |
| Female*mar | 0.16 | -0.18 | 0.06 | 0.16 | 0.26 | 0.05 | -0.03 | 0.01 | 0.88** | 0.46*** | -0.57*** | 0.15 | 0.64* |
| | 0.50 | -0.99 | 0.35 | 1.67 | 1.63 | 0.41 | -0.25 | 0.11 | 2.66 | 4.06 | -3.83 | 1.12 | 2.42 |
| | -0.03 | -0.03 | 0.03 | -0.02 | 0.05 | 0.00 | -0.02 | -0.07 | 0.13** | 0.02*** | -0.08*** | 0.02 | 0.08* |
| Unemp_ | -0.01 | 0.06* | 0.04 | -0.02 | 0.01 | 0.05 | 0.00 | -0.02 | 0.06 | 0.01 | -0.02* | 0.01 | 0.08 |
| spells | -0.12 | 2.06 | 0.89 | -1.53 | 0.25 | 1.63 | -0.08 | -0.70 | 1.18 | 1.10 | -2.24 | 1.27 | 1.64 |
| | 0.01 | 0.01* | 0.01 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00* | 0.00 | 0.02 |
| Dur_one_ | -0.91*** | -1.11*** | -0.69*** | -0.31*** | -0.43*** | -0.47*** | -0.51*** | -0.23** | -1.16*** | -0.14 | 0.49* | -0.14 | -0.81*** |
| year | -3.79 | -7.65 | -5.35 | -5.28 | -3.80 | -3.87 | -5.96 | -2.62 | -9.15 | -1.96 | 2.00 | -1.29 | -5.93 |
| | -0.17*** | -0.14*** | -0.12*** | -0.06*** | -0.08*** | -0.07*** | -0.09*** | -0.06** | -0.25*** | -0.02 | 0.08* | -0.02 | -0.18*** |
| Training | 0.40* | 0.40** | 0.31* | -0.05 | 0.19 | 0.22* | 0.39*** | -0.01 | 0.51*** | 0.50*** | 0.31 | 0.19 | 0.48*** |
| | 2.05 | 2.71 | 2.50 | -0.69 | 1.62 | 2.46 | 4.25 | -0.13 | 3.36 | 6.22 | 1.49 | 1.30 | 3.49 |
| | 0.09* | 0.05** | 0.05* | -0.01 | 0.01 | 0.03* | 0.09*** | -0.03 | 0.09*** | 0.06*** | 0.04 | 0.00 | 0.11*** |
| Second_ | 0.43* | 0.42** | 0.02 | 0.32*** | 0.29* | 0.17* | 0.55*** | 0.08 | 0.43*** | 0.12 | -0.08 | 0.17 | 0.59*** |
| educ | 2.15 | 2.97 | 0.17 | 4.25 | 2.29 | 2.00 | 6.59 | 0.86 | 3.30 | 1.89 | -0.70 | 1.31 | 3.99 |
| | 0.09* | 0.05** | 0.00 | 0.07*** | 0.06* | 0.04* | 0.11*** | 0.03 | 0.09*** | 0.03 | -0.01 | 0.06 | 0.13*** |
| Third_educ | 0.61 | 0.67*** | 0.26 | 0.46*** | 0.66*** | 0.42*** | 1.02*** | 0.14 | 0.61* | 0.39** | 0.26 | 0.93** | 0.70*** |
| | 1.21 | 3.75 | 1.54 | 5.42 | 4.20 | 3.91 | 8.12 | 1.25 | 2.32 | 3.22 | 1.53 | 2.87 | 5.09 |
| | 0.04 | 0.09*** | 0.09 | 0.10*** | 0.14*** | 0.08*** | 0.21*** | 0.05 | 0.14* | 0.09** | 0.05 | 0.18** | 0.14*** |

(*continued*)

**Table 2** (continued)

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Health | -0.69** | -0.42** | -0.34* | -0.17* | -0.43*** | -0.22* | -0.39*** | -0.42** | -0.61*** | -0.18* | -0.74*** | -0.04 | -0.24* |
| | -3.02 | -2.66 | -2.07 | -2.12 | -3.40 | -2.55 | -5.23 | -2.95 | -3.97 | -2.44 | -5.99 | -0.35 | -2.05 |
| | -0.14** | -0.04** | -0.10* | -0.06* | -0.09*** | -0.04* | -0.09*** | -0.10** | -0.14*** | -0.04* | -0.08*** | -0.02 | -0.11* |
| Bad_finance | -0.16 | 0.02 | -0.13 | -0.06 | 0.21 | 0.02 | 0.14 | 0.34** | -0.02 | -0.27** | -0.05 | 0.06 | 0.09 |
| | -0.81 | 0.15 | -1.00 | -0.78 | 1.92 | 0.16 | 1.22 | 2.61 | -0.14 | -2.74 | -0.42 | 0.38 | 0.65 |
| | -0.01 | 0.01 | -0.03 | 0.02 | 0.05 | 0.02 | 0.03 | 0.07** | -0.01 | -0.03** | 0.01 | 0.05 | 0.05 |
| No. of obs. | 931 | 2233 | 1518 | 7777 | 2188 | 4746 | 5480 | 4055 | 2120 | 8392 | 3749 | 2792 | 2329 |

Note: Each cell contains parameter estimates in the first line, z-statistic in the second line and the marginal effects in the third line of each cell and a * denotes significant at a 1 per cent level, while ** denotes significant at a 5 per cent level. The parameter estimates are obtained from a multinomial logit estimation using the unchanged state of remaining unemployed as the base category. Estimations on pooled data over eight waves correcting for clustering in terms of within interdependence for same individual

*significance at 10%

**significance at 5%

***significance at 1%

**Table 3** Coefficients, z-statistic and marginal effects in a multinomial logit analysis of the transition from unemployment to out of the labour force. Other categories being employment and attrition/missing. Excluded category unemployment. ILO criterion. Age group 18–59 years

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 0.32 | 0.12 | 0.30 | 0.05 | 0.45* | 0.04 | 0.11 | -0.09 | 0.76*** | 0.25*** | 0.27 | 0.06 | 1.32*** |
| | 1.06 | 0.52 | 1.18 | 0.61 | 2.53 | 0.33 | 0.78 | -0.67 | 4.23 | 3.44 | 1.14 | 0.29 | 4.32 |
| | 0.02 | 0.04 | 0.09 | 0.05 | 0.06* | 0.03 | 0.02 | 0.04 | 0.14*** | 0.08*** | 0.09 | 0.08 | 0.20*** |
| Age | 0.01 | 0.03* | -0.02 | 0.01** | -0.03*** | -0.00 | 0.02** | 0.01 | 0.02** | 0.01 | -0.02** | 0.01 | -0.01 |
| | 0.89 | 2.53 | -1.76 | 2.64 | -3.98 | -0.30 | 3.27 | 1.75 | 2.91 | 1.93 | -2.81 | 1.75 | -1.20 |
| | 0.01 | 0.01* | -0.00 | 0.00** | -0.00*** | 0.00 | 0.01** | 0.00 | 0.01** | 0.00 | 0.00** | 0.01 | 0.00 |
| Male*mar | -0.25 | -0.46 | -0.47 | -0.55*** | 0.36 | -0.02 | -0.38** | -0.13 | -0.19 | -0.15 | -0.34 | -0.33 | 0.70* |
| | -0.69 | -1.50 | -1.49 | -4.75 | 1.65 | -0.13 | -2.63 | -0.61 | -0.98 | -1.23 | -1.09 | -1.31 | 2.54 |
| | -0.09 | -0.10 | -0.04 | -0.10*** | -0.02 | -0.04 | -0.07** | -0.06 | -0.07 | -0.07 | -0.14 | -0.07 | 0.05* |
| Female*mar | 0.08 | 0.16 | -0.55* | 0.51*** | 0.23 | 0.22 | 0.21 | 0.98*** | 0.28 | 0.74*** | 0.12 | 0.38* | 0.53 |
| | 0.26 | 0.84 | -2.19 | 6.02 | 1.16 | 1.86 | 1.58 | 7.42 | 1.25 | 8.64 | 0.64 | 2.25 | 1.49 |
| | 0.07 | 0.07 | -0.07* | 0.11*** | -0.00 | 0.04 | 0.07 | 0.20*** | 0.08 | 0.14*** | 0.09 | 0.02* | 0.04 |
| Unemp_spells | -0.30** | -0.08 | -0.08 | -0.09*** | -0.14*** | 0.02 | -0.30*** | -0.12*** | -0.11 | -0.01 | -0.33 | 0.00 | -0.02 |
| | -3.05 | -1.34 | -1.05 | -4.86 | -3.32 | 0.59 | -5.30 | -3.38 | -1.45 | -0.92 | -1.59 | 0.07 | -0.26 |
| | -0.05** | -0.02 | -0.02 | -0.01*** | -0.02*** | -0.00 | -0.05*** | -0.02*** | -0.03 | -0.00 | -0.08 | -0.00 | -0.01 |
| Dur_one_ | 0.11 | 0.08 | -0.49* | -0.33*** | -0.22 | -0.35* | -0.26* | -0.01 | -0.21 | -0.12 | 0.06 | -0.31* | -0.36 |
| year | 0.46 | 0.45 | -2.41 | -5.21 | -1.54 | -2.90 | -2.51 | -0.12 | -1.28 | -1.71 | 0.14 | -2.23 | -1.55 |
| | 0.08 | 0.10 | 0.01* | -0.02*** | 0.01 | -0.02* | 0.01* | 0.02 | 0.06 | -0.02 | -0.06 | -0.01* | 0.03 |
| Training | -0.19 | -0.20 | 0.04 | 0.00 | 0.32* | 0.07 | -0.14 | 0.32* | 0.26 | 0.55*** | 0.18 | 0.08 | 0.18 |
| | -0.73 | -1.11 | 0.21 | 0.02 | 2.16 | 0.75 | -1.18 | 2.34 | 1.40 | 7.26 | 0.84 | 0.44 | 0.70 |
| | -0.02 | -0.04 | -0.03 | 0.02 | 0.04* | 0.01 | -0.05 | 0.06* | 0.02 | 0.10*** | 0.09 | 0.04 | 0.01 |
| Second_educ | 0.26 | -0.41* | 0.04 | 0.02 | 0.00 | -0.26** | -0.25* | -0.14 | 0.01 | -0.11 | -0.18 | -0.03 | -0.19 |
| | 1.08 | -2.38 | 0.21 | 0.29 | 0.01 | -2.79 | -2.51 | -1.30 | 0.06 | -1.86 | -1.17 | -0.14 | -0.83 |
| | 0.02 | -0.12* | 0.01 | -0.01 | -0.03 | -0.05** | -0.07* | -0.02 | -0.03 | -0.03 | -0.02 | -0.03 | -0.05 |
| Third_educ | 0.19 | -0.41 | -0.45 | -0.35*** | -0.42* | 0.00 | -0.12 | -0.44** | 0.51 | -0.43** | -0.43 | 0.31 | -0.08 |
| | 0.32 | -1.79 | -1.81 | -3.76 | -2.04 | 0.03 | -0.73 | -3.24 | 1.44 | -3.19 | -1.78 | 0.64 | -0.25 |
| | -0.01 | -0.12 | -0.07 | -0.09*** | -0.11* | -0.03 | -0.09 | -0.07** | -0.01 | -0.10** | -0.16 | -0.09 | -0.04 |

(*continued*)

**Table 3** (continued)

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Health | 0.22 | 0.06 | 0.02 | 0.25*** | 0.40** | 0.15 | 0.19* | 0.28 | 0.25 | 0.10 | 0.16 | -0.04 | 0.57* |
| | 0.88 | 0.34 | 0.08 | 3.37 | 2.59 | 1.72 | 2.03 | 1.69 | 1.38 | 1.41 | 0.99 | -0.25 | 2.48 |
| | 0.05 | 0.04 | 0.04 | 0.05*** | 0.11** | 0.03 | 0.06* | 0.08 | 0.09 | 0.03 | 0.09 | 0.00 | 0.15* |
| Bad_finance | -0.18 | -0.49** | -0.06 | -0.28*** | -0.14 | -0.45*** | 0.18 | -0.32* | -0.36* | -0.25** | -0.16 | -0.17 | -0.34 |
| | -0.74 | -2.94 | -0.31 | -3.42 | -1.03 | -4.52 | 1.37 | -2.27 | -2.39 | -2.80 | -1.01 | -0.68 | -1.41 |
| | -0.02 | -0.07** | -0.02 | -0.04*** | -0.04 | -0.07*** | 0.06 | -0.06* | -0.06* | -0.02** | -0.01 | -0.03 | -0.09 |
| No. of obs. | 719 | 1210 | 1088 | 8467 | 1891 | 4222 | 3956 | 3582 | 1797 | 8636 | 1423 | 1887 | 725 |

Note: Each cell contains parameter estimates in the first line, z-statistic in the second line and the marginal effects in the third line of each cell and a * denotes significant at a 1 per cent level, while ** denotes significant at a 5 per cent level. The parameter estimates are obtained from a multinomial logit estimation using the unchanged state of remaining unemployed as the base category. Estimations on pooled data over eight waves correcting for clustering in terms of within interdependence for same individual

*significance at 10%

**significance at 5%

***significance at 1%

**Table 4** Coefficients, z-statistic and marginal effects in a multinomial logit analysis of the transition from unemployment to out of the labour force. Other categories being employed and attrition/missing. Excluded category unemployment. Self-reported criterion. Age group 18–59 years

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Female | 0.36 | 0.50 | 0.32 | 0.41*** | 0.50** | -0.18 | 0.34* | 0.17 | 1.07*** | 0.29*** | 0.14 | 0.26 | 1.60*** |
| | 0.99 | 1.80 | 1.54 | 4.17 | 2.73 | -1.49 | 2.41 | 1.21 | 4.82 | 3.37 | 0.71 | 1.55 | 9.45 |
| | 0.03 | 0.05 | 0.09 | 0.08*** | 0.05** | -0.01 | 0.05* | 0.06 | 0.10*** | 0.05*** | 0.07 | 0.06 | 0.25*** |
| Age | 0.04*** | -0.01 | -0.02 | 0.00 | -0.05*** | -0.02*** | -0.03*** | 0.00 | 0.02* | 0.01* | 0.00 | -0.01 | 0.00 |
| | 3.58 | -1.28 | -1.85 | 0.55 | -7.11 | -4.10 | -6.28 | 0.35 | 2.49 | 2.00 | 0.80 | -1.50 | 0.67 |
| | 0.01*** | 0.00 | 0.00 | 0.00 | 0.00*** | 0.00*** | 0.00*** | 0.00 | 0.00* | 0.00* | 0.00 | 0.00 | 0.00 |
| Male*mar | -0.08 | -0.19 | -0.20 | -0.59*** | 0.55* | 0.20 | 0.12 | -0.24 | -0.44 | -0.50*** | -0.11 | -0.31 | 0.33 |
| | -0.24 | -0.52 | -0.64 | -4.59 | 2.46 | 1.18 | 0.86 | -1.07 | -1.76 | -3.18 | -0.50 | -1.35 | 1.84 |
| | -0.05 | -0.02 | -0.01 | -0.09*** | 0.03* | 0.01 | 0.00 | -0.05 | -0.04 | -0.07*** | -0.03 | -0.07 | 0.03 |
| Female*mar | 1.07** | 0.46* | -0.10 | 0.88*** | 0.21 | 0.33** | 0.31* | 1.17*** | 1.49*** | 1.28*** | 0.09 | 0.18 | 0.72** |
| | 3.19 | 2.52 | -0.55 | 9.11 | 1.13 | 2.62 | 2.55 | 8.46 | 3.99 | 12.10 | 0.78 | 1.19 | 2.83 |
| | 0.15** | 0.05* | -0.02 | 0.13*** | 0.01 | 0.04** | 0.05* | 0.19*** | 0.12*** | 0.19*** | 0.05 | 0.02 | 0.07** |
| Unemp_ spells | -0.17 | -0.03 | -0.04 | -0.12*** | -0.14*** | -0.02 | -0.22*** | -0.20*** | 0.09 | 0.00 | -0.01 | 0.00 | 0.03 |
| | -1.76 | -0.62 | -0.65 | -5.07 | -3.46 | -0.48 | -4.53 | -5.31 | 1.28 | -0.27 | -0.56 | 0.33 | 0.59 |
| | -0.02 | 0.00 | -0.01 | -0.01*** | -0.02*** | 0.00 | -0.03*** | -0.03*** | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 |
| Dur_one_ year | -0.13 | -0.11 | -0.50** | 0.02 | -0.27 | -0.27* | -0.32*** | 0.22* | -0.74*** | -0.24** | -0.13 | -0.15 | -0.10 |
| | -0.55 | -0.68 | -3.04 | 0.26 | -1.90 | -2.09 | -3.34 | 2.08 | -3.72 | -2.84 | -0.60 | -1.21 | -0.67 |
| | 0.02 | 0.01 | -0.02** | 0.02 | -0.01 | -0.02* | -0.02*** | 0.05* | -0.02*** | -0.02** | -0.06 | -0.01 | 0.05 |
| Training | -0.05 | 0.18 | 0.19 | 0.10 | 0.58*** | 0.28* | -0.04 | 0.43** | 0.86*** | 0.66*** | 0.16 | 0.50** | 0.03 |
| | -0.17 | 0.89 | 1.26 | 1.19 | 4.17 | 2.57 | -0.32 | 3.05 | 3.83 | 6.80 | 0.99 | 2.79 | 0.15 |
| | -0.02 | 0.01 | 0.00 | 0.02 | 0.07*** | 0.03* | -0.03 | 0.06** | 0.06*** | 0.07*** | 0.03 | 0.06** | -0.04 |
| Second_educ | -0.09 | 0.11 | 0.05 | -0.05 | 0.09 | 0.02 | 0.10 | -0.23* | 0.22 | -0.24** | -0.05 | -0.41* | 0.18 |
| | -0.37 | 0.64 | 0.32 | -0.53 | 0.60 | 0.16 | 1.15 | -2.06 | 1.08 | -3.20 | -0.65 | -2.10 | 1.02 |
| | -0.03 | 0.00 | 0.01 | -0.02 | 0.00 | 0.00 | -0.01 | -0.03* | 0.00 | -0.03** | 0.00 | -0.06* | -0.02 |
| Third_educ | 0.23 | 0.31 | -0.39 | -0.03 | 0.18 | 0.20 | 0.40** | -0.38** | 0.36 | -0.44** | -0.33* | 0.50 | 0.28 |
| | 0.61 | 1.43 | -1.76 | -0.30 | 0.96 | 1.58 | 2.70 | -2.60 | 1.08 | -2.85 | -2.02 | 1.40 | 1.76 |
| | -0.03 | 0.02 | -0.07 | -0.03 | -0.01 | 0.01 | -0.01** | -0.06** | 0.01 | -0.06** | -0.08* | 0.00 | -0.02 |

(*continued*)

**Table 4** (continued)

| | *Austria* | *Belgium* | *Denmark* | *Spain* | *Finland* | *France* | *Germany* | *Greece* | *Ireland* | *Italy* | *Netherlands* | *Portugal* | *UK* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Health | -0.06 | -0.24 | 0.32 | 0.30*** | 0.17 | 0.01 | 0.06 | 0.33* | 0.15 | 0.17* | -0.03 | 0.22 | 0.59*** |
| | -0.27 | -1.51 | 1.83 | 3.51 | 1.12 | 0.14 | 0.67 | 1.98 | 0.75 | 2.09 | -0.37 | 1.80 | 4.61 |
| | 0.02 | -0.02 | 0.08 | 0.05*** | 0.05 | 0.01 | 0.03 | 0.08* | 0.03 | 0.03* | 0.03 | 0.03 | 0.13*** |
| Bad_finance | -0.45* | -0.47** | -0.11 | -0.27** | -0.11 | -0.42*** | 0.08 | 0.02 | 0.15 | -0.42*** | -0.28** | -0.38* | -0.36** |
| | -2.01 | -3.27 | -0.74 | -3.03 | -0.79 | -4.03 | 0.54 | 0.14 | 0.74 | -4.05 | -2.96 | -2.01 | -2.58 |
| | -0.05* | -0.05** | -0.01 | -0.03** | -0.02 | -0.06*** | 0.00 | -0.02 | 0.01 | -0.05*** | -0.06** | -0.06* | -0.07** |
| No. of obs. | 931 | 2233 | 1518 | 7777 | 2188 | 4746 | 5480 | 4055 | 2120 | 8392 | 3749 | 2792 | 2329 |

Note: Each cell contains parameter estimates in the first line, z-statistic in the second line and the marginal effects in the third line of each cell and a * denotes significant at a 1 per cent level, while ** denotes significant at a 5 per cent level. The parameter estimates are obtained from a multinomial logit estimation using the unchanged state of remaining unemployed as the base category. Estimations on pooled data over eight waves correcting for clustering in terms of within interdependence for same individual

*significance at 10%

**significance at 5%

***significance at 1%

present the parameter estimates and corresponding test-statistics in the first two lines of each cell, while the third line contains the corresponding marginal effects.[7]

Focusing first on the results in Tables 1 and 2 regarding transition to a job, we find a bigger number of significant coefficients in the self-reporting case shown in Table 2 compared with the results using the ILO criterion shown in Table 1. This could to some extent reflect the fact that the number of self-reported unemployed is higher and presumably more varied in composition than the ILO unemployed in all the countries. Comparing across the tables and the countries we find a clear tendency that women have lower transition rates to a job than men. This is much more pronounced in the self-reporting case. Next, we find the opposite for married men having mostly a significantly higher transition rate to a job, which is also more pronounced using the self-reporting criterion. We find, however, no indication of a stereotype-gender role where married women are expected to have significantly lower transition rates to a job. We actually find for three countries that being married results in a significantly higher transition rate to a job compared with single women. Only in one case, for the Netherlands using the self-reporting criterion, do we find a significant negative impact on the job transition rate from being a married woman. Age has mostly, and especially in the self-reported case, a significant negative impact on transitions to a job.

Turning to the labour market variables, there seem to be very little and unclear impacts from the number of unemployment spells on the transition rate out of unemployment. This presumably reflects that the number of spells is an unclear indicator as having had many spells, on the one hand, may indicate a somewhat marginal attachment to the labour force but, on the other hand, is a manifest indication of an individual ability to return to a job from unemployment. The experience of long-term unemployment in the past is, on the other hand, a very significant indicator of a reduced probability of entering a job. This is the case using both unemployment measures.

The broad variable Training captures not just part of the active labour market policy but also other kinds of post-school education. The coefficient to Training is significantly positive for eight countries in the self-reporting case in contrast to the ILO results where no impact is found.

[7] Nonlinear functions of the parameter estimates evaluated at the means of the independent variables.

The indicator for having a second- or third-level education with no formal or professional education as the left-out category has the expected positive impact in the self-reporting case while very few significant coefficients are found in the ILO case.

The final two covariates relate to individual evaluations of two different life situations, that is, a self-assessed health status and an evaluation of the current individual financial situation. Regarding self-assessed health, we find a much stronger and consistent impact in the expected direction using the self-reported criterion. A significant impact from the variable measuring self-reported financial hardship during unemployment is only significant in a few cases and here without consistency regarding the sign. This may reflect that a search theory-based approach is not applicable to data without a duration dimension.

Next, Tables 3 and 4 show the results regarding transitions from unemployment to a state outside the labour force. As we use a sample of people 18–59 years old, most programmes for non-health-related early retirement are excluded. A gender difference regarding this type of transitions shows up in the finding of 4 significantly positive coefficients for women in the ILO case and 6 significantly positive coefficients in the self-reporting case. In the self-reporting case this is even more pronounced for married women with the finding of 9 significantly positive coefficients. For Denmark and Finland, with employment rates for married women around 80 per cent in 2001, the coefficients are insignificant. They are highly significant for countries with employment rates for married women below 50 per cent, indicating that a transition from unemployment to a state outside the labour market is more usual in these countries.

The labour market variables have—with one exception for Greece—a negative impact in all cases with significant coefficients. Overall, this does not support an idea of exit to non-activity relative to the labour market due to discouragement induced by individual unemployment problems encountered in the labour market. The variable Training is significantly positive in a number of cases, mostly using the self-reporting criterion. Considering the age group included in the sample, it seems obvious that the interpretation of this positive coefficient is that many people exit from unemployment to enter an education in which they are active one year later. This is supported by the data as training in one period is significantly related to training also in the subsequent period.[8]

[8] Using Denmark as an example, for those who have training = 1 in wave 6 two-thirds have training = 1 also in wave 7. For those who have training = 0 in wave 6 only one-third have training = 1 in wave 7.

Turning to the educational variables, about the same number of fairly few coefficients are significant for the two unemployment measures. With one exception, the significant coefficients have the expected negative sign, reducing the exit from the labour force for more educated individuals in the active age groups.

Moving on to the attitudinal variables, self-assessed health problems increase as expected the exit rate from the labour force significantly. Finally, an unsatisfying financial situation reduces the exit rate significantly, most pronounced in the self-reporting case. The interpretation seems to be that staying on in the labour force, even under some financial hardship, is clearly preferred or at least as good as exit to a situation on even worse financial terms. Once again, however, notice that we estimate on a sample of people younger than the lowest age for entry into (most) early retirement programmes in the individual countries.

Summarizing the results from the multinomial estimations by categories of the variables, we find:

- A strong impact from purely demographic variables on transitions to a job from self-reported unemployment. The transition rates are significantly lower for women and they are decreasing with age. Much less significance is found regarding the impact from demographic variables on the transition to a job from ILO unemployment. A hypothesis of significantly lower-transition rates for married women is clearly rejected using both unemployment measures. In contrast, we find significantly higher-transition rates to a job for married men.
- We find a significantly higher propensity to leave the labour force for married women in the self-reported case. Fewer significant coefficients are found in the ILO case.
- The number of spells of unemployment in the past five years has no impact on transitions from unemployment to a job. For a number of countries, the number of spells has a negative influence on the transition to a state outside the labour force. Having experienced long-term unemployment has a strong scarring effect, that is, reducing the transition probability to a job from unemployment using both measurement criteria. At the same time, for a smaller number of countries, having experienced long-term unemployment reduces the probability of exit from the labour force.

- Having undergone training or education to some extent since January the preceding year has in the majority of cases a significantly positive impact on exit to a job for self-reported unemployed while no impact is found in the ILO case. For a smaller number of countries it increases the transition rate out of the labour force, probably to a period of further education.
- Education indicators have a positive impact on the transition to a job for the self-reporting case while an impact is only found for two countries in the ILO case. For transitions out of the labour force, we expect a negative impact from education, but only little impact is found no matter which unemployment measure we use.
- Self-assessed health has a strong negative impact on the transition rate to a job for the self-reported case. In the ILO case this impact is found for only three countries. For four countries the health indicator has an impact in the expected direction on exit from the labour force. Finally, self-reported financial hardship has hardly any impact on the transition rate to a job. We find, on the other hand, that self-reported financial hardship tends to keep people in the labour force as a preferred alternative to exit.

## 6 Concluding Remarks

The focus in the present chapter is on the opportunity to derive two different unemployment measures from the ECHP data, one comprising respondents who fulfil the ILO criteria for being classified as unemployed and the other one comprising respondents who report themselves to be unemployed. Those two groups of respondents overlap in different degrees in the individual countries.

The main questions addressed in the chapter are first whether the unemployment concepts according to either self-reporting or ILO definitions differ and secondly whether relevant background factors correlate differently with the transition rates out of unemployment depending on which unemployment concept is being used. These questions are motivated by theories of differences in labour market regimes and welfare state types and by theories of discouraged worker effects.

Regarding the first question it turns out that the ratio between the two unemployment concepts differ considerably between the EU countries from equality in Spain and Italy to self-reported unemployment being about twice as high as ILO unemployment in Belgium and the Netherlands.

When we disaggregate by gender and age groups, more variation appears in the ratio between the two concepts as is to be expected. But the overall ranking between countries regarding the size of the ratio relative to 1 does not shift much.

Further, calculation of the ratio of overlapping between the unemployment concepts—measured as the number of cases where a person is unemployed according to both criteria relative to the number of self-reported unemployed—shows a fairly big variation from a minimum overlapping in Belgium and the Netherlands to a maximum close to perfect overlapping in Greece and Spain. Using the number of individuals unemployed according to both criteria as the benchmark, we find major occurrence of discouragement, that is, being self-reported unemployed without fulfilling the ILO requirements, for women, married individuals and individuals reporting a less satisfactory health situation. Discouragement in this sense is widespread in Austria, Belgium and the Netherlands while it is nearly absent in the South European countries.

The second question is addressed in a multinomial logit estimation run separately for each country on data pooled over all eight waves of the ECHP. The estimation is on all recorded transitions from unemployment in one wave, according to either ILO criteria or self-reporting, to one of three states in the subsequent wave: employment, outside the labour force or attrition. The left-out category is the transition from unemployment to be unemployed also in the next wave. The explanatory variables are a battery of background factors from the ECHP, consisting of demographic, labour market, education and attitude variables. The main result is that many more of these variables turn out to be significant in the estimation of transitions to a job from unemployment as a self-reported state. The finding of more significance using unemployment as a self-reported state is consistent across all EU countries, that is, also in cases where the ratio of the two measures are close to each other, even though it is less pronounced here. The number of significant coefficients is lower in estimations on transitions to states outside the labour force than in estimations of the transition to a job.

The findings in the present chapter point to the relevance of tracking unemployment measured and evaluated in different ways in the current cyclical downturn in the OECD countries. Evaluating the impact from the many expansionary policy packages implemented since 2008 makes it highly relevant to follow the labour market reactions based on alternative unemployment indicators.

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# Workers and Labour Market Outcomes of Informal Jobs in Formal Establishments

## A Job-Based Informality Index for Nine Sub-Saharan African Countries

*Kea Tijdens, Janna Besamusca, and Maarten van Klaveren*

### 1 Introduction

Over the last three decades, the awareness has grown among researchers and in governments and international organizations that informal employment is a complex phenomenon, encompassing more than a simple contradiction with the formal sector. In particular in developing countries, formal employment turns out to include, to a greater or lesser extent, elements of informality. This article explores how jobs in formal

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enterprises can be defined by developing an informality index. It then analyses how the positions of workers on that index relate to their personal and workplace characteristics, and whether labour market outcomes are related to these positions. Using a unique dataset based on recent surveys of nine sub-Saharan African countries, we aim to contribute to the body of knowledge on informal work beyond single-country as well as qualitative analyses.

## 2 Informal Work: Theoretical Perspectives and Empirical Findings

### *Defining the Informal Economy*

In the past decades, the informal economy has evoked considerable interest of researchers, aiming to estimate and explain its size in developing countries. Defining and subsequently measuring the informal economy has proven a hard task. Over the years a variety of views on informality have proliferated and the range of indicators has been broadened accordingly, as can be grasped from ILO, IMF and World Bank publications. In their joint overview study about globalization and informal jobs in developing countries, ILO and WTO distinguish three schools of thought on informality that have developed: 'Dualists view the informal sector as the inferior segment of a dual labour market, with no direct link to the formal economy, while structuralists see it as comprising small firms and unregistered workers, subordinated to large capitalist firms. Legalists consider the informal sector to comprise micro-entrepreneurs who prefer to operate informally to avoid the costs associated with registration' (Bacchetta et al., 2009, p. 40). From ILO's labour relations point of view, the informal economy is excluded from the benefits and rights incorporated in labour laws and social security systems. From WTO's industrial point of view, the informal economy is not subject to tax regulations and is excluded from administrative rules covering property relationships, financial credit systems and commercial licensing.

The plurality of views on informality grown in the last three decades tends to collide with the limited possibilities to empirically test the dimensions suggested, often resulting in a return to simple dichotomies. The viewpoints in question predominantly refer to characteristics of individuals or establishments, assuming survey data for the empirical underpinning.

Yet, due to a lack of cross-country comparable micro-data previous empirical studies have taken refuge to aggregate, country-level data, aiming to explain the relative size of the informal sector across countries, as is noticed by, among others, Freeman (2009). Vuletin (2008), comparing 32 Latin American countries, finds that the tax burden, the importance of the agricultural sector and the significance of labour rigidities are decisive for the size of the national informal economy, representing 79 per cent of the informal economy variance, whereas inflation does not contribute to the explanation. Other cross-country analyses have demonstrated that standard poverty yardsticks, such as the shares of the population living below 1.25 or 2 US Dollar (USD) a day, are closely related to a country's share of informal employment (Kucera & Roncolato, 2008). Measures of income inequality, such as the Gini coefficient, are also highly correlated with the country's level of informal employment (Kucera & Xenogiani, 2009a, 2009b). This remains the case when controlling for various other factors, such as the quality of governance or government spending as a share of GDP, or when using different indicators to measure the prevalence of informality, as has been proven for Latin America, the Caribbean and the Arab world (Elbadawi & Loayza, 2008; Loayza et al., 2009).

However, a two-sector model, mostly dividing between a largely informal agricultural sector and a more formal urban labour market, masks differences among informal and formal workers. Across countries, the informal economy is quite heterogeneous and depending on its specific type, informal employment is remunerated at vastly different levels (Cf. Carr & Chen, 2002). Bargain and Kwenda (2009) show for Brazil, South Africa and Mexico that the measured wage gap varies substantially between segments and tiers of the respective informal economies, though Rand and Torm (2012) do not confirm for Vietnamese manufacturing enterprises once wages are measured as a share of value-added. A recent ILO study on measuring informality tries to disentangle the complexity of the actual conceptual framework by treating the related data collection methods, departing from the sampling unit. The study distinguishes surveys of establishment, households and individuals, either separate or in combination. Informality measured at the level of economic units usually defines the informal economy according to their registration status, access to social coverage or size. Informality measured at the level of households focuses predominantly on the degree of self-provision, whereas informality measured at the level of individual workers focuses on the degree to which they are subject to labour regulation and social security (ILO, 2012a).

### *Job-Based Definitions of Informal Work*

An ongoing debate addresses how to distinguish formal from informal workers statistically. In 1993 and 2003, ILO's International Conference of Labour Statisticians (ICLS) broke with the two-sector model. The 17th ICLS (2003) distinguished formal and informal jobs according to their status in employment, defining informal employment as comprising: (a) own-account workers and employers employed in their own informal sector enterprises; (b) all contributing family workers; (c) employees holding informal jobs, that is, employees not covered by legal protection or social security as employed persons, or not entitled to other employment benefits; (d) members of informal producers' cooperatives; and (e) own-account workers producing goods exclusively for own final use by their household (if considered employed). This definition challenges the measurement of informal employment, not least through national labour force surveys (ILO, 2012a, p. 51). The ILO/WTO study emphasizes that empirical information on informal employment could be drawn from labour force surveys if these surveys include questions concerning self-assessed labour market status and coverage by social security systems (Bacchetta et al., 2009, p. 56). Some statistical agencies, such as that of South Africa, have indeed included these types of questions in their surveys. This approach, however, is not free from weaknesses as one aims to explore an economy's size and scope of informality, and may rather easily fail, for example, if respondents do not have appropriate information regarding the registration status of the enterprise in which they work.

A step forward in the empirical assessment of informal work has been made by Luebker (2008) in his analysis of the data of Zimbabwe's 2004 Labour Force Survey. This author departs from the complementary concepts of informality, the enterprise-based and the job-based concept. The first concept builds on the characteristics of the production unit, contrasting establishments registered under national legislation with all other production units. Households employing paid domestic workers and those involved in communal farming are not considered as production units. Whereas the grouping of own-account workers, employers and unpaid family workers follows from the characteristics of the production unit, the jobs-based concept of informality includes a proxy to distinguish between formal and informal employees: all paid employees (permanent) are classified as formal, and all paid employees (casual/temporary/contract/seasonal) as informal. Due to data limitations, Luebker (2008) could not include being subject to

labour legislation as a criterion to distinguish formal from informal jobs. Hence, neither contributing to or receiving social security, nor being subject to dismissal regulations, entitlement to paid annual or sick leave, or contributing to income tax could be operationalised. The ILO/WTO study implicitly follows Luebker by stating that informality can also be defined at the worker level, based on employment relations (Bacchetta et al., 2009, p. 52). Our study follows Luebker's job-based concept by taking workers as the unit of analysis, and extends it by including social security criteria, while using an establishment-based sampling strategy. It aims to contribute to a growing body of knowledge beyond the two-sector model by making a multi-dimensional definition of informality operational, using survey data covering workers in formal employment in nine African countries in 2012.

### *The Socio-demographic Characteristics of Informal Workers*

The multi-dimensional definitions combined with survey data enable explorations of the socio-demographic characteristics of informal workers and the labour market outcomes of informal work, in particular the extent to which informal work has poor labour market outcomes. Gender is the most prominent and most studied socio-demographic characteristic. Although near-universally women's share in informal employment is much higher than men's (ILO, 2012b), the evidence concerning the gendered nature of the enterprise-based formal workforce is not overwhelming. Budlender (2011, p. 12), using the 2008 Namibia Labour Force Survey, finds few gender differences in the respective shares of employees and, within the employee category, between formally and informally employed. For Zimbabwe, Luebker (2008, p. 28) reveals an uneven gender distribution: by either concept of informality, men account for nearly three-quarters of employment in the formal sector and of formal jobs, while women hold the majority of informal jobs and dominate the informal sector as well as employment in households. Yet, research into the gender pay gap has learned that sex-related differences need to be studied in a multivariate setting in order to filter out the effects of women's often inferior occupational status (Cf. Carr & Chen, 2002; Fafchamps et al., 2009).

Informality seems to be age-related as well. For Namibia, Budlender (2011, p. 17) notices that informal workers are more dominant in the groups up to age 30, whereas formal workers dominate in age groups 30 and over, but informal workers again outnumber formal workers among those aged 60 and over. For Zimbabwe, Luebker (2008, p. 28) also reveals

age-related differences in access to formal employment: young people aged 15–24 account for almost one-third of all workers, but only for 20 per cent of those employed in the formal sector and only 14 per cent of those with a formal job, whereas the groups aged 25–34 and 35–54 are over-represented in the formal sector and among the formally employed.

Informality seems to be strongly related to low levels of education, leading the ILO/WTO report to advocate for training facilities and training programmes for informal employees (Bacchetta et al., 2009, p. 17). For Namibia, Budlender (2011, p. 17) finds a marked decrease in informality as the educational level of the employed individual rises. For Zimbabwe, Luebker (2008, p. 43) notices that while formal sector workers have generally higher educational attainments, the informal sector shows a mismatch between its largely unskilled work and the educational background of workers: 64 per cent have attended secondary school, and a further 8 per cent have obtained a diploma or certificate after secondary school. Luebker concludes that many workers in the informal sector perform work that falls far short of their educational background. Yet, this may well be a country-specific conclusion, taking into account the economic and political conditions in Zimbabwe at the time. Our study will explore relevant personal characteristics in relation to informality such as gender, age and education.

Among the workplace characteristics firm size is most widely studied, or, to phrase it differently, firm size is often used to empirically distinguish between formal and informal employment. Many statistical agencies define micro-enterprises of five or less workers to belong to the informal sector, obviously as they mostly lack other, possibly more relevant, variables. 'Sector' or 'industry' have been applied to distinguish between formal and informal employment, usually defining the agricultural sector as belonging to the informal economy. Few studies have pointed out which other sectors would be prone to informal employment. Budlender (2011, p. 15) introduces the category 'type of workplace' and finds the highest share of formal employment in Namibia in the type 'factory, office, shop'. Our study will explore how firm size, industries and occupation relate to informality.

### *The Labour Market in the Nine African Countries*

In 2013 the nine countries at stake—Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal and Togo—jointly had a population of about 161 million. They show considerable variation, not least as six of them are located in West Africa and three in East Africa. Six countries, five

West African countries and Madagascar, share French as their main language and gained independence from France; among the nine, Ghana is the only West African country with English as main language and a British colonial past. Kenya also gained independence from the United Kingdom, but recognized both English and Swahili as its official languages. Rwanda had Belgium as its last colonizator and has three official languages: Kinyarwanda, English and French. The countries also differ considerably according to population size, from Kenya (44 million) to Togo (7 million) (CIA World Factbook; UN Data).

Across countries, the level of development as measured by the 2012 Human Development Index (HDI) does not vary drastically, though Guinea (0.355) and Ghana (0.558) are to some extent outliers in the negative and positive sense, respectively; the 2012 HDI values of the others vary between 0.434 (Rwanda) and 0.483 (Madagascar) (UNDP, 2013). Ghana has the lowest share of the population living under the USD 1.25 per day poverty line. In Madagascar, by contrast, the large majority of the population found themselves below the USD 1.25 yardstick (81 per cent) or the national poverty line (69 per cent) (http://data.worldbank.org.cn/indicator/SI.POV.GAPS/countries). In Madagascar individuals in informal employment account for over 70 per cent of non-agricultural employment (ILO, 2012b); this may be equally true for the other countries, but data is not available here.

Concerning social security, all nine countries have an (earnings-related) mandatory system for retirement income in place; by contrast, official social security programmes providing unemployment benefits are currently non-existent. In all nine countries, retirement and general social security reservations are paid through both employee and employer contributions. Most countries have qualifying conditions, including a minimum period for which contributions must have been paid, the number of hours or days worked during a period directly preceding the benefits and the length of service at the employer from whom benefits are claimed (Social Security (US), 2013).

## 3 Methods and Data

### *Research Objectives and Choice of Countries*

As outlined in the introduction, this chapter aims to explore the characteristics of informal and formal jobs in formal enterprises in nine sub-Saharan countries. The research objectives are fourfold. First, we aim to elaborate

on the multiple dimensions of informality and develop an informality index for individuals in formal enterprises. Second, we will explore how personal and workplace characteristics of individual workers relate to their position on the index. We assume that workers are more likely to hold informal jobs when they have personal characteristics that have been linked with labour market vulnerability, notably being a woman, young, low-educated, or living in a single-headed household, and when having unfavourable workplace settings, notably when working in small workplaces, in agriculture or in retail trade, or in a low-status occupation (Cf. Bertola et al., 2007; Giovannone & Sargeant, 2012). Third, we will investigate how our informality index relates to labour market outcomes. We assume that the more informal the workers, the lower the monetary outcomes of their jobs, the more likely they are to be paid below the national minimum wage or poverty level, the longer their working hours, and the less likely they are to be covered by a collective bargaining agreement. Fourth, we want to explore whether and to what extent countries differ in the personal and workplace effects and in the labour market outcomes.

The data used come from face-to-face surveys aiming to collect representative and comparable data concerning wages and working conditions in nine countries, namely, Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal and Togo. The surveys and related reports are part of projects coordinated by the WageIndicator Foundation in close cooperation with the University of Dar-es-Salaam, Tanzania, and funded by Netherlands development aid (http://www.wageindicator.org/main/Wageindicatorfoundation/researchlab/wageindicatorquestionnaires/wageindicator-offline-paper-salary-surveys-africa; http://www.wageindicator.org/main/Wageindicatorfoundation/publications). This implies that the choice of countries has been defined by the funders. The data is particularly suited for our research objectives, because the survey questions allow for a multi-country exploration of the multiple dimensions and characteristics of informality in formal employment. As far as we are aware, such data is currently not available from any other survey.

### *Sampling Strategy, Questionnaire, Interviews and Dataset*

In the nine countries the same two-stage sampling design was followed, typically used in the World Bank's Living Standard Measurement Study household surveys in developing countries (Grosh & Munoz, 1996). The first stage included design weights by geographical population size,

thereby controlling for distributions over districts according to the most recent national labour force surveys. Although the survey design covered all districts, in a few countries problems arose related to travelling of interviewers; in those cases as many districts as possible have been included. In the second stage a sample was drawn from official registers such as the List of Establishments from the National Bureau of Statistics, the List of Enterprises from the Employers Association, the List of Business Registry and alike. These registers are maintained for a range of purposes. The government of Rwanda, for instance, registers establishments for licensing purposes, but also registers their domestic or foreign ownership, whether the owner is the manager, whether they contribute to income tax, VAT, social security and the number of persons owning the establishment or being employed. The database holds 127,662 registered establishments, employing in total 277,010 persons, slightly over 5 per cent of the country's 5.5 million labour force. The Rwandese register includes 70 per cent single-person establishments; another 16 per cent is a two-person establishment, 7 per cent include 3–5 persons, 4 per cent has between 5 and 100 persons, and less than 0.1 per cent has more than 100 employees (average establishment size is 2.2 persons, including the owner). Half of all establishments are in wholesale and retail, followed by one-quarter in accommodation and food services. In most countries, these registers only include the private sector; additionally public organizations were randomly selected from lists of public sector institutions. Hence, informality in the sample refers to informal jobs within registered establishments, here used as a proxy for formal employment. Given that the number of workers in the establishment is not included in all registers, a normal sampling procedure was followed, whereby each establishment had the same chance of being included in the sample, using the design weights. Hence, the sample underrepresents workers in large establishments.

In each country, in cooperation with the University of Dar-es-Salaam, an interview agency was selected. These agencies selected and trained the interviewers, for which an interview instruction document was prepared. The interviewers were instructed to interview the owner if the selected unit turned out to be a single-person establishment. For two-person units, the owner and the worker were alternatingly interviewed. In units with three or more workers, interviews were held with a few workers in different occupations. In the nine countries 16,747 interviews have been conducted, ranging from 1413 in Ghana to 2074 in Rwanda. Eight out of nine agencies rated the cooperation of respondents during the interview

on average as good, while the agency in Ghana rated cooperation as moderate and added that respondents did not like the topic. Each day interviewers handed in the completed questionnaires, which were checked and shipped to Dar-es-Salaam for data-entry. All interviews were held in 2012 and field periods lasted one to three months.

The questionnaire is extracted from a web-survey on work and wages, which is posted on the national WageIndicator websites in currently 80 countries. These websites provide information on wages by occupation, minimum wages, labour law and collective agreements, receiving millions of visitors. This web-survey is in the national language(s) and has questions on wages, occupations, socio-demographics and work-related topics. For the face-to-face interviews the main questions from the web-survey have been selected. The data from the web-survey is not included in our analysis.

The dataset has 123 variables. For all variables, missing values are below 4 per cent, with the exception of the contribution to social security (Niger 13 per cent and Benin 8 per cent missing) and firm size (Niger 8 per cent missing). Observations with missing values on the informality index and the personal and workplace characteristics are excluded (12.8 per cent), more than half of them due to the question about contribution to social security, and the remainder predominantly due to missing values for firm size, wages and coverage by collective agreement. The final sample includes 14,608 observations. Due to a lack of recent surveys using establishments as the sampling basis, our sample descriptives could not be compared to other data.

### *Operationalization of Characteristics and Outcomes*

To explore the relationship between personal characteristics and informal work, we use the respondent's gender, age and educational attainment using UNESCO's International Standard Classification of Education (ISCED 1997), derived from the national educational categories used in the questionnaires. ISCED classes 1 and 2 are coded as 'low education', 3 and 4 as 'middle education' and 5 and 6 as 'high education'. A binary variable for living in a single-headed household is defined when respondents do not live with a partner, but do have children living in their households. For workplace characteristics we use firm size, sector and occupation. For firm size we use the logarithmic transformation of ten categories, ranging from 1–9 to >5000. More than half of the respondents work in an

establishment with 1–9 workers (54 per cent), while only a very small minority works in an establishment with more than 5000 workers (0.3 per cent). For sector we use three dummy variables for industries, notably agriculture, manufacturing and construction (ISIC A-F), trade, transport and hospitality (ISIC G-J), commercial and other services (K-N and R-S), with the public administration, education, and human health and social work activities (ISIC O-Q) as reference category. To define low-status occupations we use the skill levels of the International Standard Classification of Occupations (ISCO-08), notably unskilled, semi-skilled, skilled and highly skilled, with the latter two merged because of the relatively low number of highly skilled respondents.

Four labour market outcomes have been researched, notably hourly wages, being paid below the national minimum wage, working long hours, and being covered by a collective agreement. For the first outcome, we use the log net hourly wages, based on the surveys' detailed wages and working hours questions. The wage questions addressed the employees in the sample. The phrasing was adapted for the self-employed and the employers. In case data about the net wage is missing (less than 2 per cent), the gross wage is used. Note that non-monetary remuneration is not included in the wages. The majority (61 per cent) receives their earnings in cash, a third (37 per cent) in a bank account, while only 1 per cent receive their wage in kind and 1 per cent in a combination. In case more than 80 working hours per week are reported, the hourly wage is based on 80 hours per week. The hourly wages are measured in national currencies and standardized into USD using 2012 World Bank purchasing power parity (PPP) data. For working long hours we use a binary variable, defined as working more than 48 hours per week. Bargaining coverage is also a binary variable, derived from the survey question about coverage by a collective agreement, whereby the answers 'don't know/not applicable' are considered to be 'no' answers.

For the likelihood of being paid below the national minimum wage level a binary variable is computed, using the information collected by the national experts of WageIndicator (for amounts, see Tijdens et al., 2014). Rwanda has no minimum wage and we therefore use the national poverty line, which is defined per month. Three countries apply a minimum wage per month (Benin, Niger, Togo), two do so per day (Ghana, Kenya) and three per hour (Guinea, Madagascar, Senegal). All minimum wages were converted into monthly amounts, given the national standard working hours per week (40, but Rwanda 45, Kenya 52). For the calculation into

a monthly minimum wage we assumed for Kenya a 6-day working week, of which 5 days of 9 hours and 1 day of 7 hours. Three countries specify their minimum wages: Madagascar and Senegal have separate minimum wages for the agricultural and non-agricultural sectors, whereas Kenya has 22 minimum wages specified by occupation, industry and region. In these countries, the appropriate minimum wage could be identified for all respondents. To classify if the respondent was paid below the relevant threshold, we compared the monthly minimum wages or poverty line with the individuals' monthly wages.

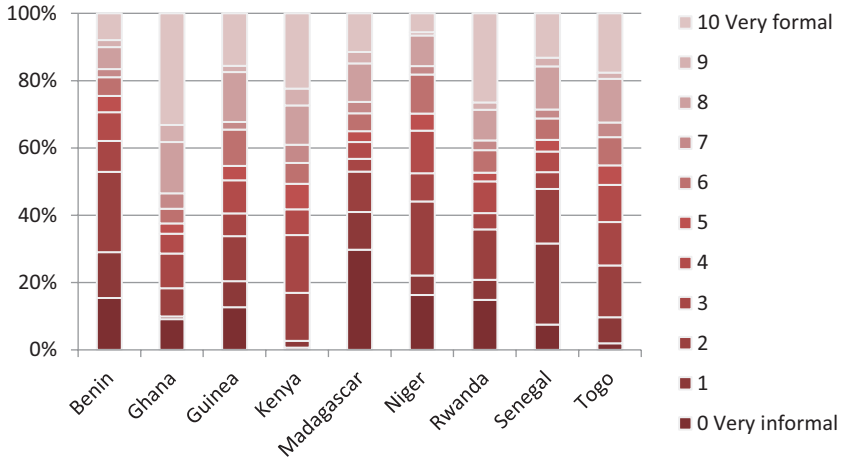
## 4 Findings: Determinants and Outcomes of Informality

### *The Informality Index*

The first aim of this chapter is to explore the multiple dimensions of informality in formal employment and to develop an informality index. Based on our literature review and the available data, we use five dimensions, notably (1) workers' contribution to social security; (2) their entitlement to paid leave, pension or social security benefits; (3) their employment status; (4) whether their working hours have been agreed; and (5) whether they receive their earnings in cash or in a bank account. Each dimension has three ascending values (Table 1). Adding up values results in an 11-point interval scale, ranging from 0 = very informal to 10 = very formal. Graph 1 depicts the distribution over the index, showing that within

**Table 1** The five dimensions of the informality index

| | *Low (=0)* | *Middle (=1)* | *High (=2)* |
|---|---|---|---|
| Entitled to paid leave/ pension/social security | No | Not sure | Yes |
| Receives earnings | In cash or in kind | Combination | In bank account |
| Employment status | Own-account worker | Employee no contract | Employee permanent or fixed-term contract, employer >=5 staff |
| Working hours agreed | No | Yes verbally | Yes in writing |
| Contributes to social security | No | – | Yes |




**Graph 1** Distribution over the informality-index by country. (Source: WageIndicator face-to-face surveys 2012 (n = 14,608))

countries the index peaks at either or both ends of the tail. In five of nine countries, the mean informality score falls in the lower half of the index, with Ghana, Kenya, Rwanda and Togo just in the upper half (Table 2). The high mean value for Ghana is particularly due to the 33 per cent in the very formal category, indicating that one-third of the Ghanaians working in formal employment effectively have a formal job. Niger has the largest share of workers in the middle categories, whereas for Benin and Madagascar this is the case for the lowest three categories.

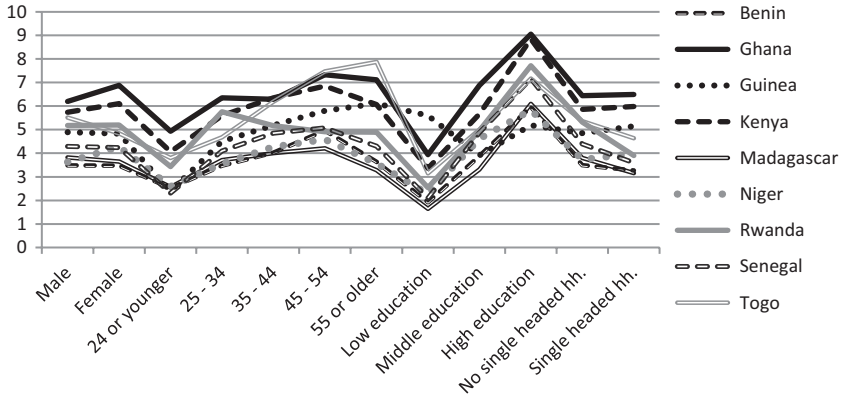
### *Personal and Workplace Variation of Informality*

The second aim of this chapter is to explore how personal and workplace characteristics relate to the informality index (for descriptive statistics of the characteristics by country, see Table 2). The mean values of the index by the personal characteristics reveal a rather similar pattern across the nine countries (Graph 2). In all countries the young and low-educated workers show the lowest scores. The scores for gender and single-headed households are small and not unidirectional across countries. The mean values of the workplace characteristics reveal a rather similar pattern across the nine countries, though less pronounced than for the personal characteristics (Graph 3). In almost all countries the workers in small

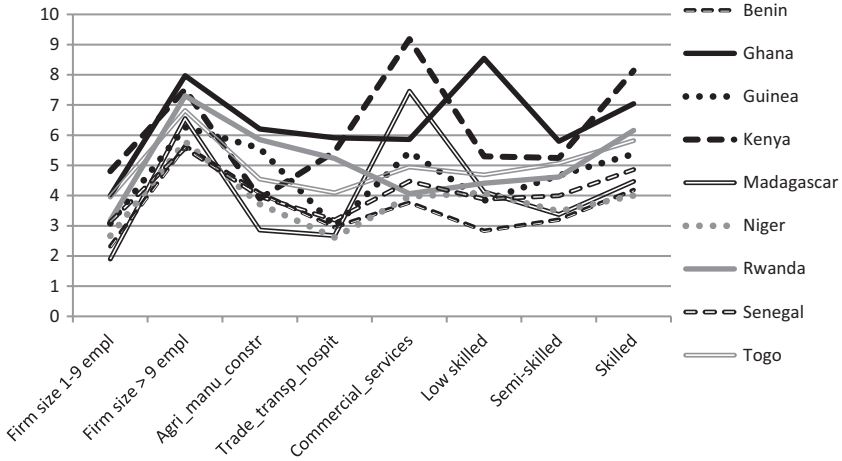
**Table 2** Summary statistics: means of dependent, personal and workplace variables by country and means and standard deviations of total (unweighted) sample

| | *Benin* | *Ghana* | *Guinea* | *Kenya* | *Madagascar* | *Niger* | *Rwanda* | *Senegal* | *Togo* | *Mean _Total* | *Std. Dev. _Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Dependent variables* | | | | | | | | | | | |
| Informality (0 = inform, …, 10 = form) | 3.48 | 6.45 | 4.87 | 5.88 | 3.75 | 3.76 | 5.19 | 4.28 | 5.28 | 4.74 | 3.49 |
| Net hourly wage (0.01–21.48 standardized USD) | 1.46 | 2.69 | 1.96 | 1.37 | 1.26 | 1.75 | 2.47 | 2.25 | 1.70 | 1.87 | 2.47 |
| Works > 48 hrs pw (0, 1) | 0.64 | 0.50 | 0.45 | 0.45 | 0.44 | 0.51 | 0.68 | 0.50 | 0.41 | 0.51 | 0.50 |
| Falls below MW (0, 1) | 0.46 | 0.32 | 0.36 | 0.36 | 0.42 | 0.37 | 0.62 | 0.31 | 0.46 | 0.41 | 0.49 |
| Not covered by coll. agr. (0, 1) | 0.90 | 0.62 | 0.69 | 0.69 | 0.88 | 0.73 | 0.65 | 0.78 | 0.70 | 0.74 | 0.44 |
| *Personal characteristics* | | | | | | | | | | | |
| Female | 0.34 | 0.36 | 0.27 | 0.37 | 0.38 | 0.20 | 0.36 | 0.25 | 0.35 | 0.32 | 0.47 |
| Age (13–82) | 31.1 | 37.6 | 36.9 | 36.3 | 37.6 | 33.9 | 32.0 | 35.9 | 33.3 | 34.9 | 9.92 |
| Single-headed hh (0, 1) | 0.05 | 0.06 | 0.07 | 0.14 | 0.07 | 0.09 | 0.10 | 0.15 | 0.12 | 0.10 | 0.29 |
| High educated (0, 1) | 0.18 | 0.06 | 0.25 | 0.15 | 0.28 | 0.17 | 0.30 | 0.19 | 0.29 | 0.22 | 0.41 |
| Low educated (0, 1) | 0.40 | 0.19 | 0.38 | 0.11 | 0.20 | 0.46 | 0.25 | 0.37 | 0.19 | 0.28 | 0.45 |
| *Workplace characteristics* | | | | | | | | | | | |
| Firm size (1 = 1–9, …, 10 = >5000) | 1.67 | 2.44 | 2.42 | 1.75 | 1.81 | 1.79 | 2.19 | 1.99 | 2.03 | 2.01 | 1.53 |
| Agri_manu_cons (0, 1) | 0.13 | 0.27 | 0.16 | 0.26 | 0.36 | 0.11 | 0.29 | 0.21 | 0.10 | 0.21 | 0.41 |
| Trade_transp_hospit (0, 1) | 0.42 | 0.30 | 0.36 | 0.35 | 0.38 | 0.42 | 0.41 | 0.38 | 0.40 | 0.38 | 0.49 |
| Commercial_services (0, 1) | 0.13 | 0.09 | 0.16 | 0.01 | 0.05 | 0.15 | 0.14 | 0.20 | 0.21 | 0.13 | 0.33 |
| Skilled occupation (0, 1) | 0.33 | 0.41 | 0.43 | 0.22 | 0.29 | 0.38 | 0.38 | 0.34 | 0.33 | 0.34 | 0.48 |
| Unskilled occupation (0, 1) | 0.14 | 0.05 | 0.12 | 0.16 | 0.09 | 0.13 | 0.10 | 0.16 | 0.10 | 0.12 | 0.32 |

Source: WageIndicator face-to-face surveys 2012 (n = 14,608)




**Graph 2** Mean values of the informality-index (0 = very informal, …, 10 = very formal) by gender, age, education and household composition, breakdown by country. (Source: WageIndicator face-to-face surveys 2012 (n = 14,608))




**Graph 3** Mean values of the informality-index (0 = very informal, …, 10 = very formal) by firm size, industries and occupations by country. (Source: WageIndicator face-to-face surveys 2012 (n = 14,608))

establishments have particularly low scores, as do workers in trade, transport and hospitality. Workers in unskilled and semi-skilled occupations have low scores on the index, with the exception of Ghana, where the unskilled workers score relatively high, predominantly because this group has relatively often an employment contract with agreed hours.

We test the effects of the four personal and three workplace characteristics on the probability of holding an informal or a formal job in formal enterprises, using the 11-point informality index. Although this index is measured on an interval level, OLS regressions could not be used due to violations of the assumption of normally distributed errors. We tested the hypotheses using both an ordered probit model and a multinomial logistic regression model, yielding the same conditional and absolute odds. The latter model is chosen over the former because of its greater ease in interpretation. For the analyses the informality scale is recoded into three categories by joining the upper three and the lower three categories into 'formal', 'informal' and an in-between category, respectively. A multinomial logistic model estimates the proportional odds, or relative risk, of holding an informal job for workers with a set of characteristics compared to workers with different characteristics. The first panel in Table 3 explores how the chance of holding an informal job relates to the chance of holding an in-between one, while the second panel explores does so for holding an informal job versus a formal one. Estimates of these chances are presented as odds ratios, which can be read as the proportional odds or multiplicative chance that one group holds an informal job rather than an in-between or formal job, compared to the chance of another group. An odds ratio of one indicates an equal chance (one times as likely to hold an informal job), whereas ratios below one represent a smaller chance and those above one a larger chance. In both cases we present a first model excluding and a second model including the country dummies. We only discuss the significant results in the second model, unless large discrepancies exist between the first and second models.

Do personal characteristics affect the chance of working in an informal job in formal establishments? The analysis shows that education is the main factor. For high-educated workers, the odds ratio of holding an informal versus an in-between job decreases with 27 per cent (11 per cent in the first model) and holding an informal versus a formal job decreases with 71 per cent (59 per cent first model). Low-educated workers reveal the opposite tendency. They are 2.2 times more likely to hold an informal versus an in-between job and 3.8 times (4.6 times first model) more likely

**Table 3** Parameter estimates of workers' characteristics on their probabilities of holding an informal job versus an in-between or formal job (odds ratios; standard errors in brackets)

| | *Informal vs in between* | | *Informal vs formal* | |
|---|---|---|---|---|
| | *M1a* | *M2a* | *M1b* | *M2b* |
| Female | 0.955 | 0.938 | 0.871** | 0.911 |
| | (0.05) | (0.05) | (0.05) | (0.06) |
| Young (<35 yrs) | 1.044 | 1.079 | 1.919*** | 1.945*** |
| | (0.04) | (0.05) | (0.05) | (0.05) |
| Single-headed hh | 1.030 | 1.111 | 1.132 | 1.209** |
| | (0.07) | (0.08) | (0.09) | (0.09) |
| High educated | 0.885* | 0.730*** | 0.407*** | 0.290*** |
| | (0.07) | (0.07) | (0.07) | (0.07) |
| Low educated | 2.504*** | 2.218*** | 4.666*** | 3.760*** |
| | (0.05) | (0.05) | (0.06) | (0.07) |
| Agri_manuf_construction | 2.539*** | 2.410*** | 2.722*** | 3.011*** |
| | (0.07) | (0.07) | (0.07) | (0.08) |
| Trade_transp_hospitality | 1.956*** | 1.871*** | 3.911*** | 4.024*** |
| | (0.06) | (0.06) | (0.07) | (0.07) |
| Commercial services | 1.665*** | 1.590*** | 1.978*** | 1.829*** |
| | (0.08) | (0.08) | (0.08) | (0.09) |
| Firm size 1–9 workers | 3.714*** | 4.125*** | 10.391*** | 11.198*** |
| | (0.05) | (0.05) | (0.05) | (0.06) |
| Skilled occupations | 1.090 | 0.952 | 0.736*** | 0.677*** |
| | (0.05) | (0.05) | (0.06) | (0.06) |
| Unskilled occupation | 0.970 | 0.911 | 1.181** | 1.089 |
| | (0.07) | (0.07) | (0.08) | (0.08) |
| Benin | | 2.860*** | | 3.490*** |
| | | (0.09) | | (0.12) |
| Ghana | | 1.150 | | 0.397*** |
| | | (0.11) | | (0.12) |
| Guinea | | 1.997*** | | 1.736*** |
| | | (0.09) | | (0.11) |
| Kenya | | 0.559*** | | 0.354*** |
| | | (0.10) | | (0.12) |
| Madagascar | | 4.615*** | | 3.326*** |
| | | (0.09) | | (0.11) |
| Niger | | 1.585*** | | 3.079*** |
| | | (0.09) | | (0.13) |
| Rwanda | | 2.315*** | | 1.093 |
| | | (0.09) | | (0.10) |

(*continued*)

**Table 3** (continued)

| | *Informal vs in between* | | *Informal vs formal* | |
|---|---|---|---|---|
| | *M1a* | *M2a* | *M1b* | *M2b* |
| Senegal | | 3.525*** | | 2.241*** |
| | | (0.09) | | (0.11) |
| Chi-Square | 5882.20 | 7171.11 | 5882.20 | 7171.11 |
| Nagelkerke | 0.373 | 0.437 | 0.373 | 0.437 |

Source: WageIndicator face-to-face surveys, 2012 (n_ Informal vs in-between = 10,055 and n_ Informal vs formal = 9,936)

***$p < 0.01$;**$p < 0.05$;*$p < 0.10$; reference categories: Togo; middle educated; public sector and healthcare; semi-skilled occupation

to hold an informal compared to a formal job. Gender, age and household composition are less important here. In contrast to expected, female workers are less likely to hold an informal job versus a formal job (odds ratio 0.871), and gender does not reveal significant results once the country dummies are included. For people below 35 years of age, the odds ratio of holding an informal versus an in-between job is insignificant, but holding an informal versus a formal job is 1.94 times more likely. Hence, for young persons it is particularly difficult to enter formal jobs. Living in a single-headed household significantly affects the chance of holding an informal versus a formal job, but not of holding an informal versus an in-between job.

Do workplace characteristics affect informality? Both sector and firm size are important here. Workers in agriculture, manufacturing and construction are 2.41 and 3.01 times more likely to hold an informal versus an in-between job respectively versus a formal job. Workers in trade, transport and hospitality reveal a similar pattern, as the chances of working in an informal job compared to an in-between job increase with 187 per cent and compared to a formal job with 402 per cent. For workers in commercial services a similar though less outspoken pattern emerges. The chance that these workers hold an informal versus an in-between job increases with 159 per cent and versus a formal job with 183 per cent. Workers in small establishments are 4.1 and 11.2 times more likely to hold an informal versus an in-between job respectively versus a formal job, suggesting that small firms can sometimes offer some degree of formality to employees but hardly ever offer fully formal jobs. Finally, working in a skilled occupation does not significantly affect the chance of holding an informal

versus an in-between job, but decreases the odds ratio of holding an informal versus a formal job with 32 per cent. Working in an unskilled occupation does not significantly affect the chance of holding an informal job, except compared to formal jobs in the first model.

The odds ratios for the personal and workplace characteristics hardly vary between the two models, pointing at a rather similar pattern across the countries, thereby supporting the conclusions from the bi-variate analyses. Compared to Togo the odds ratios for holding an informal versus an in-between job decrease for Kenya and increase for all others, with insignificant findings for Ghana. Compared to Togo the odds ratios for holding an informal versus a formal job increase or decrease for the same countries, apart from insignificant findings for Rwanda, while for Ghana the odds ratio significantly decreases.

We conclude that our assumption that women, young people, low educated and single-headed household are vulnerable to hold informal jobs is confirmed for age and education, but not concerning gender and household composition. Our assumption that people working in the non-public sector industries, small establishments and unskilled occupations are vulnerable for holding informal jobs is confirmed. Particularly working in trade, transport and hospitality and in establishments with 1–9 workers have a major chance to hold an informal job. The country dummies show that national differences do exist and that most countries are significantly different from the reference country Togo.

### *Labour Market Outcomes*

The third objective in our study is to test to what extent informal work in formal enterprises has poor labour market outcomes. In order to test the first outcome—the more informal the lower the monetary outcomes of the jobs—we run OLS regressions on the log net PPP standardized hourly wages (Table 4). For testing the second outcome—informal workers are more likely to be paid below the national minimum wage level or poverty line—we apply a binary logistic model (Table 5). As to test the third outcome—informal workers are more likely to be working long hours—and the fourth one—informal workers are less likely to be covered by a collective agreement—we apply binary logistic models too (Table 5). All analyses are controlled for country and for the same personal and workplace characteristics used in the previous section in order to isolate the true effect of informality.

**Table 4** OLS Parameter estimates of workers' characteristics on their wages (log net hourly wage in standardized USD) (unstandardized coefficients; standard errors in brackets)

| | *M1* | *M2* |
|---|---|---|
| Constant | -2.077*** | -2.233*** |
| | (0.12) | (0.12) |
| Informality (0 = inform, …, 10 = form) | 0.130*** | 0.127*** |
| | (0.00) | (0.00) |
| Female | -0.041** | -0.001 |
| | 0.02) | (0.02) |
| Age (13–82) | 0.058*** | 0.062*** |
| | 0.01) | (0.01) |
| Age_squared | -0.001*** | -0.001*** |
| | (0.00) | (0.00) |
| Single-headed hh (0, 1) | -0.028 | -0.044 |
| | (0.03) | (0.03) |
| High educated (0, 1) | 0.506*** | 0.534*** |
| | (0.03) | (0.03) |
| Low educated (0, 1) | -0.307*** | -0.389*** |
| | (0.02) | (0.02) |
| Agri_manu_cons (0, 1) | -0.109*** | -0.054* |
| | (0.03) | (0.03) |
| Trade_transport_hospitality (0, 1) | -0.198*** | -0.195*** |
| | (0.03) | (0.02) |
| Commercial_services (0, 1) | 0.035 | -0.025 |
| | (0.03) | (0.03) |
| Log firm size | 0.167*** | 0.146*** |
| | (0.02) | (0.02) |
| Skilled occupation (0, 1) | 0.286*** | 0.250*** |
| | (0.02) | (0.02) |
| Unskilled occupation (0, 1) | 0.089*** | 0.057* |
| | (0.03) | (0.03) |
| Benin | | 0.325*** |
| | | (0.04) |
| Ghana | | 0.207*** |
| | | (0.04) |
| Guinea | | 0.051 |
| | | (0.04) |
| Kenya | | -0.138*** |
| | | (0.04) |
| Madagascar | | -0.427*** |
| | | (0.04) |

(*continued*)

**Table 4** (continued)

| | *M1* | *M2* |
|---|---|---|
| Niger | | 0.128*** |
| | | (0.04) |
| Rwanda | | 0.178*** |
| | | (0.04) |
| Senegal | | 0.433*** |
| | | (0.04) |
| R | 0.52 | 0.59 |

Source: WageIndicator face-to-face surveys 2012 (n = 14,608)

***$p < 0.01$;**$p < 0.05$;*$p < 0.10$; reference categories: Togo; middle educated; public sector and healthcare; semi-skilled occupation

**Table 5** Parameter estimates of workers' characteristics on their probabilities of being paid below the relevant minimum wage or poverty line; working more than 48 hours per week; of not being covered by a collective agreement (odds ratio; standard errors in brackets)

| | *Paid below the MW* | | *Working long hours* | | *Not covered by a collective agreement* | |
|---|---|---|---|---|---|---|
| | *M1a* | *M2a* | *M1b* | *M2b* | *M1c* | *M2c* |
| Informality (0 = inform, …, 10 = form) | 0.837*** (0.01) | 0.810*** (0.01) | 0.875*** (0.01) | 0.856*** (0.01) | 0.733*** (0.01) | 0.738*** (0.01) |
| Female | 1.117*** (0.04) | 1.025 (0.04) | 0.744*** (0.04) | 0.713*** (0.04) | 0.990 (0.05) | 0.945 (0.05) |
| Young age (<35 yrs) | 1.767*** (0.04) | 1.640*** (0.04) | 1.276*** (0.04) | 1.138*** (0.04) | 1.246*** (0.04) | 1.314*** (0.05) |
| Single-headed hh | 1.026 (0.07) | 1.043 (0.07) | 0.985 (0.06) | 1.020 (0.06) | 0.905 (0.08) | 0.959 (0.08) |
| High educated | 0.324*** (0.06) | 0.273*** (0.06) | 0.628*** (0.05) | 0.635*** (0.05) | 0.960 (0.05) | 0.908* (0.06) |
| Low educated | 1.413*** (0.04) | 1.628*** (0.05) | 1.387*** (0.04) | 1.381*** (0.05) | 0.985 (0.06) | 1.065 (0.06) |
| Agri_manu_cons | 1.342*** (0.06) | 1.149** (0.06) | 1.332*** (0.05) | 1.240*** (0.06) | 1.149** (0.06) | 1.122* (0.06) |
| Trade_transp_hospit | 1.879*** (0.05) | 1.763*** (0.05) | 2.560*** (0.05) | 2.529*** (0.05) | 1.229*** (0.05) | 1.261*** (0.06) |
| Commercial_services | 1.463*** (0.07) | 1.345*** (0.07) | 1.395 (0.06) | 1.400*** (0.06) | 1.177** (0.07) | 1.224*** (0.07) |

(*continued*)

**Table 5** (continued)

| | *Paid below the MW* | | *Working long hours* | | *Not covered by a collective agreement* | |
|---|---|---|---|---|---|---|
| | *M1a* | *M2a* | *M1b* | *M2b* | *M1c* | *M2c* |
| Firm size 1–9 | 1.475*** | 1.460*** | 1.280*** | 1.294*** | 1.300*** | 1.312*** |
| | (0.04) | (0.05) | (0.04) | (0.04) | (0.05) | (0.05) |
| Skilled occupation | 0.632*** | 0.633*** | 0.97 | 0.951 | 0.829*** | 0.867*** |
| | (0.04) | (0.05) | (0.04) | (0.04) | (0.05) | (0.05) |
| Unskilled occupation | 0.833*** | 0.875** | 0.759*** | 0.752*** | .941 | 0.949 |
| | (0.06) | (0.06) | (0.06) | (0.06) | (0.07) | (0.07) |
| Benin | | 0.473*** | | 2.044*** | | 2.826*** |
| | | (0.08) | | (0.08) | | (0.11 |
| Ghana | | 0.583*** | | 1.999*** | | 1.065 |
| | | (0.09) | | (0.08) | | (0.09) |
| Guinea | | 0.604*** | | 1.194** | | 0.948 |
| | | (0.08) | | (0.08) | | (0.09) |
| Kenya | | 0.618*** | | 1.477*** | | 1.189** |
| | | (0.09) | | (0.08) | | (0.09) |
| Madagascar | | 0.601*** | | 0.923 | | 3.201*** |
| | | (0.08) | | (0.08) | | (0.10) |
| Niger | | 0.337*** | | 1.051 | | 0.703*** |
| | | (0.09) | | (0.08) | | (0.09) |
| Rwanda | | 2.525*** | | 3.828*** | | 0.759*** |
| | | (0.08) | | (0.08) | | (0.08) |
| Senegal | | 0.284*** | | 1.226*** | | 1.321*** |
| | | (0.08) | | (0.08) | | (0.09) |
| Constant | 0.763*** | 1.531*** | 1.081 | 0.900 | 12.908*** | 9.941*** |
| | (0.07) | (0.10) | (0.07) | (0.09) | (0.08) | (0.10) |
| Chi-square | 3873.02 | 4749.21 | 2555.61 | 3106.91 | 3361.89 | 3781.96 |
| –2 Log likelihood | 15950.07 | 15073.88 | 17689.77 | 17138.47 | 13346.81 | 12926.74 |

Source: WageIndicator face-to-face surveys 2012 (n = 14,608)

***$p < 0.01$;**$p < 0.05$;*$p < 0.10$; reference categories: Togo; middle educated; public sector and healthcare; semi-skilled occupation

Are workers in informal jobs being paid less than workers in formal jobs? We estimate two models, the first model holds the variables of interest and the second model includes the country dummies. In both models informality indeed significantly lowers the hourly wages: with every step towards formality on the 11-point scale the log hourly wage increases with 12.7 per cent. Being a female worker decreases one's wages with 4 per

cent, but once controlled for country this effect is not significant, leading to the conclusion that the gender pay gap is most likely not found within formal and informal jobs in formal enterprises, but across formal and informal employment. As age increases, people have higher wages, but this effect diminishes as people get older. Living in a single-headed household does not significantly affect wages. This effect holds after controlling for countries. Being highly educated increases the hourly wages with 53 per cent, whereas being low educated lowers the wages by 39 per cent. Working in two of the three industries results in lower wages compared to the public sector and healthcare. Particularly working in trade, transport and hospitality negatively affects the wages with 19 per cent. Working in the commercial services does not significantly affect one's wages. The smaller the establishment, the lower one's wages. With every step towards an establishment of 5000 employees or more, the wages increase by 15 per cent. Working in a skilled occupation increases the hourly wages with 25 per cent, while working in an unskilled occupation increases the wages with 6 per cent, indicating that working in a medium-skilled occupation in particular leads to lower wages. Compared to Togo, significantly higher wages are earned in Kenya and Madagascar, while wages are lower in Benin, Ghana, Niger, Rwanda and Senegal. Guinea reveals insignificant effects.

Are informal workers more likely to be paid below the national minimum wage or poverty line? As assumed, the odds ratio of being paid below the minimum wage or poverty line decreases by 16 per cent for every step on the index towards formality and when controlled for country, the odds ratio even decreases with 19 per cent (Table 5). The results further reveal no significant effect for women, once we control for country. Living in a single-headed household does not affect the probabilities significantly. As expected, the odds ratios increase by 64 per cent for a young worker, by 63 per cent for a low-educated worker, by 46 per cent when working in a small establishment, by 15 per cent when working in agriculture, manufacturing or construction (34 per cent in first model), by 76 per cent when working in trade, transport or hospitality (88 per cent in first model) and by 34 per cent when working in the commercial services (46 per cent in first model). Working in a skilled or an unskilled occupation decreases the odds ratio by 37 respectively 13 per cent, leaving workers in the medium-skilled occupations as the vulnerable group. Compared to the workers in the reference country Togo, the odds ratio of being paid below the

threshold decreases for workers in all other countries apart from Rwanda where they increase.

Are informal workers more likely to work long hours? Indeed, the odds ratio to work over 48 hours per week decreases by 13 per cent for every step on the index towards formality when controlled for personal and workplace characteristics, and when controlled for country, the odds ratio still decreases with 14 per cent (Table 5). For female workers the odds ratio decreases by 29 per cent. In contrast, for young workers the odds ratio increases with 14 per cent (28 per cent in first model) compared to workers aged 35 and over. Living in a single-headed household has no effect. The odds ratio decreases by 37 per cent for a high-educated worker whereas it increases by 38 per cent for a low-educated worker. Working in the agriculture, manufacturing or construction increases the odds ratio by 24 per cent (33 per cent in first model) and commercial services by 40 per cent, but working in trade, transport and hospitality increases the odds ratio much more, notably by 153 per cent. Working in a micro-enterprise increases the odds ratio by 29 per cent. Working in a skilled occupation does not significantly affect the chance, but working in an unskilled occupation lowers the chance: the odds ratio decreases by 25 per cent. Compared to workers in the reference country Togo, the odds ratio for working long hours increases for workers in all other countries, apart from Madagascar and Niger where they are insignificant. Particularly in Rwanda, followed by Benin, the odds ratios of working long hours increase largely.

Are informal workers more likely not to be covered by a collective agreement? Indeed, our models show that the odds ratio of not being covered decreases by 26 per cent for every step on the index towards formality, when controlled for personal and workplace characteristics and for country. The results further reveal that for female workers and for workers living in a single-headed household the odds ratio is insignificant. For young workers the odds ratio increases with 31 per cent (25 per cent in first model) compared to workers aged 35 and over. For the high- and the low-educated workers, the odds ratios of not being covered are insignificant with the exception of the high-educated worker in the second model, showing that the chance of not being covered slightly decreases for this group. Working in the agriculture, manufacturing and construction increases the odds ratio by 12 per cent, working in trade, transport and hospitality does so by 26 per cent and working in the commercial services does so by 22 per cent. Working in a small establishment increases the odds ratio of not being covered by 31 per cent. Working in a skilled

occupation decreases the chance of not being covered by 13 per cent, whereas it is insignificant for a person in an unskilled occupation. Compared to workers in the reference country Togo, the odds ratio of not being covered increases in Benin, Kenya, Madagascar and Senegal, whereas it decreases in Niger and Rwanda, while the coefficients for Ghana and Guinea are insignificant.

## 5 Conclusions

How can an informal job be defined within formal enterprises, who has an informal job, what are the labour market outcomes of these jobs, and do countries vary in this respect? These four research questions are central here, focusing on nine sub-Saharan countries—Benin, Ghana, Guinea, Kenya, Madagascar, Niger, Rwanda, Senegal and Togo. We use data of comparable face-to-face surveys, sampled from national establishment registers; hence the survey addresses the formal and informal workers in registered, thus formal, establishments, thereby following Luebker's operationalization of job-based informality. An 11-point informality index is derived from workers' contribution to social security, entitlement to social security, and employment status, showing that within countries the index peaks at either or both ends of the tail of the index. On the scale from very informal (value 0) to very formal (value 10), the mean score varies between 3.5 for Benin and 6.4 for Ghana.

In line with previous research findings our data reveals that working in a small establishment is the most important factor determining a low score on the index. Most research used a binary variable for sector, but we use four categories, showing that workers in trade, transport and hospitality are the most likely to score low on the index. Furthermore, a low education proved to be a major factor for a low score. In contrast to expectations, we do not find that women are more likely to hold an informal job than men. This may be due to the fact that our analyses are restricted to formal establishments: findings would have been different if all workers had been included, suggesting that only a relatively high-skilled selection of women enters into formal employment in the first place. Our analyses show that informal work in formal establishments has poor labour market outcomes, as lower scores on the index strongly and significantly affect the wages, while the chance of being paid below the minimum wage, of working more than 48 hours per week is higher, as well as of not being covered by a collective agreement.

Two limitations to this study should be mentioned. First, we explored country-level indices for explaining aggregate variation, but did not elaborate hypotheses on the aggregate country level. We did so because we assessed commonly used indicators, like the level of urbanization or the share of agricultural work, as unhelpful for our analysis of job-based informality in registered establishments. Moreover, the effects of labour market institutions remain contentious, the country-level variation is relatively small with only nine countries, and the available aggregate data proved insufficiently reliable in various tests. Nevertheless, further investigation of country-level variation is needed. A second limitation is that our data does not allow to be generalized to all forms of informal work: due to the sampling frame, only the informal workers within formal workplaces are covered.

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# The Rigidity of Labour Informality in Peru: The Need for a Paradigm Switch

*Hugo Ñopo*

## 1 Defining and Understanding Informality

Originally, labour informality was thought of as the result of rigid and costly labour market regulations. In that view it was understood as a flexible escape for productive workers and employers towards simpler ways of expanding the possibilities frontier. Also, in this way, workers that otherwise would be labelled as "unemployed", became labelled as "informal" (Benanav, 2019). Thus, to reduce labour informality two sets of conditions were needed: reduction of non-wage costs and economic/productive growth.

During the last 20 years in Peru, non-wage labour costs remained almost steadily at around 40% of average wages for the general employment regime (Heckman & Pagés, 2003; Alaimo et al., 2017), but they dropped substantially for small and micro enterprises (Labor Ministry, 2019). At the same time GDP doubled in real terms (BCRP, 2021).

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Meanwhile, labour informality just moved from around 80% to around 75%. Informality just proved to be more rigid than previously thought. Globally, "a stylized prediction of the development economics discourse is that informality will disappear with development, and yet in the last 20 years conventional measures of informality, far from declining, have either remained stagnant or have actually increased" (Kanbur, 2017).

This gives credence to the idea that economic explanations for labour informality are just partial and this is a deeper and wider phenomenon. Informality, in fact, appears to be a central stylized fact defining the development problem. Yet it has been surprising that since its beginnings it lacked a clear definition. Actually, "given the prominence of the formal–informal dichotomy in the development discourse, one might expect to see a clear definition of the concepts, consistently applied across the whole range of theoretical, empirical and policy analyses. We find no such thing. Instead, it turns out that formal and informal are better thought of as metaphors that conjure up a mental picture of whatever the user has in mind at that particular time" (Guha-Khasnobis et al., 2006).

The widespread operational way of defining informality has been through the coverage of social insurance. A labour relationship is formal if it offers the worker, as mandated by the labour regulations, coverage against risks related to health and old-age poverty, for himself and his relatives. This implies the imposition of labour taxation and embeds the idea of one job per household which a century and a half later is, to an important extent, outdated. As noted by Levy (2008), this idea of providing social insurance from labour resources dates back to Bismarckian Prussia in the late nineteenth century. As he argues, and we will second in this note, it is time to challenge that paradigm.

With this definition, it is possible to conceptualize the agents' decision-making process in three layers. In the first one, the economic, individuals and firms make decisions based on rational expectations about the benefits and costs of being in a formal versus informal labour relationship. Informality is a rational choice when the costs of being in a formal labour relationship are high enough with respect to the informal alternative, the probabilities of being caught if informal are low enough and the costs of being caught in informality are not that severe. This cost-benefit analysis leads many labour relationships to opt for being informal.

The second layer to understand the decision-making process around informality is cognitive. Many agents cannot perform the cost-benefit analysis of the first layer with a minimum reliability for two reasons: lack of

skills and information overload. Peru is one of the countries with the lowest development of reading and mathematical skills in its population. This has been the case for two decades, as measured by the PISA test (OECD, 2019). It is a real challenge for most Peruvians to understand the regulations and analytically deduct the best course of action in their decision-making problem. This problem exacerbates with information overload as the compendium of labour regulations contains more than 1800 pages (Labor Ministry, 2020). This makes it very hard for an entrepreneur or a worker to understand the law and its intricacies. This lies at the core of the "good intentions, bad outcomes" argument for a simplified labour code that will be elaborated in the next section.

The third layer relies on a social norm's explanation. It has been historically the case that, out of ten workers, between seven and eight of them have an informal job. Then, for a new worker it is a "no brainer" choice to opt for an informal job as well. It is also "competitive" for the firms to make the decision of hiring informally. This social norm explanation gains extra credit when realizing that the rule of law is low, beyond the labour markets, in Peru. It is lower than both the Latin American and the Global averages. Also, it is particularly low in the corruption and justice dimensions (JWP, 2021). Being at the margin of the law has low probabilities of being severely punished.

## 2 A Spiral of Good Intentions and Bad Outcomes

As in most of the world, the legislation stipulates that workers and their family members must be covered by a safety net, financed by contributions from the labour relationship. This is the contributory social protection. Such legislation is either evaded or has exceptions such that most workers do not enjoy contributory social protection. The demand for such protection is then satisfied by other means. Families and communities provide safety nets to their members in different forms of solidarity that have been in place for centuries. But also, the state after realizing the huge lack of contributory social protection, especially among the poor, provides non-contributory alternatives for the same goal.

That governmental action in the short run covers their population is laudable. However, when the state provides social protection for those who did not formally obtain it in the labour market, it introduces distortions because the incentives to contribute formal work are reduced. The good intentions exacerbate labour informality, starting a spiral. This grows

after realizing that the self-employed, unpaid family workers and workers for micro and small enterprises prevail among those who do not contribute to social protection. As a reaction, the state has been creating special schemes to contribute to social protection, with reduced rates and even exemptions. These special regimes have not only been ineffective in their objective of providing social protection but also have brought additional distortions as firms now face incentives against their growth. This is a serious issue in a country where 95% of firms are either individual, micro, or small. The dwarfism of the productive network limits the nation's productivity frontier. Another undesired result of these badly designed good intentions is that it legalizes informality: around two-thirds of informal jobs are legal (Ñopo, 2021).

This is how this spiral of good intentions and bad results is formed: the original good intentions do not materialize in the desired results, that induce partial solutions, that bring new problems and ultimately that lead society to a balance of low social protection and low productivity. The solution to this problem should point to the focus of the problem, the labour legislation that conceptualizes social protection as a worker's right instead of a citizen's right.

Almost a century ago we tried to imitate a foreign idea that seemed right and benevolent, but it is time to realize it has not been working. Even more, the idea that a (male) breadwinner provides income and social protection for the whole family needs revision. This has not been the prevalent family model through all our time on earth (Horrell & Humphries, 1997). Additionally, with recent changes in the labour markets, it will be more common for people to hold multiple jobs. All these distort the idea of one-family-one-job that was at the core of the contributory social protection paradigm. Times are changing.

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# (In)decent Work for Youth in Agro-Industrial Value Chains in Uganda

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## 1 Decent Work for Youth and Women in Uganda

Creating decent work is a priority agenda as captured in Sustainable Development Goal 8, the African Union's 2019 proposal on the transformation of the informal economy and national policies. Decent work provides fair income, security, social protection, voice and gender equality and equal treatment (ILO, n.d.). To achieve this, some countries have

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formulated decent employment policies. Enhancing decent work would require understanding how decent employment policies reflect the work which youth and women do. This chapter assesses the extent the daily work of youth and women reflects features of decent work articulated in national employment policies and opportunities exist to enhance the decency of work in Uganda.

In Uganda, about 89% of all jobs are informal (International Labour Organisation, 2021). Self-employment increased to 81.5% in 2013/2014 from 70.9% in 2009/2010 but formal employment fell to 18.5% from 21.5% in the same period (NPA, 2015, p. xxii). Women and youth are engaged in work with varying levels of informality. These jobs include street vendors, market traders, farming, transport, cleaning, and casual work for formal companies. Four in ten women are employed in unpaid family work, and a majority are self-employed in survivalist enterprises (Kasirye, 2011). In agriculture, youths are less likely to use improved technologies, own or access productive land and access credit (Ahaibwe et al., 2014, p. 2). Young female entrepreneurs face difficulties accessing formal credit, and businesses owned by female entrepreneurs generate lower income than those owned by men (Guloba et al., 2017).

In this context, promotion of decent work predominantly in informal work settings is important. Creating a safe environment for self-employed and micro-enterprises deserves precedence over creating private sector formal jobs for a few people (Ssembajjiwe, 2020). The Government of Uganda (GoU) views decent work as gainful employment in terms of availability, diversity, income, increased industrial investments, increased production and productivity (NPA, 2010). The GoU seeks to achieve this through the formulation and enforcement of labour laws, skills development, youth empowerment programmes and prioritisation of agro-industrial value chains. The analysis presented in this chapter draws on INCLUDE's African Policy Dialogue (APD) on productive and decent work for youth and women in cotton and fish value chains in Uganda. Fish and cotton are among the nine key agricultural commodities driving agro-industrialisation (EPRC, 2021b).

## 2 The Daily Work of Youth and Women in Uganda

Workers in the cotton value chain include farmers, merchants, ginners, spinners, and those who extract oil from the seeds. Most workers in this value chain are involved in farming and fewer are employed as you move up the chain (Kahunde & Guloba, 2020). Smallholder cotton farmers' involvement largely ends at selling. The farmers earn less due to fluctuating cotton prices, non-functional or missing cotton farmer associations, exploitation by middlemen (EPRC, 2021a). High-value activities such as selling, ginning, oil extraction, which require skilled workers, are mostly done by firms which pay higher wages but hire fewer workers.

The fish value chains in Uganda employ over 5 million people directly and indirectly in production, trading and processing (Odokonyero et al., 2020). Youths and women working in the Nile perch, Tilapia and Silver fish value chains are mostly involved in fishing and petty trading activities. For example, in Nile perch chain, fishermen work for long hours at night and are sometimes paid in the form of fish. Women traders are disadvantaged because they buy Nile perch after the best catch has been sold to processing or exporting firms. Traders earn little due to unregulated fish maw markets and exploitation by middlemen (EPRC, 2021a).

In both chains, the decency of work depends on position of work along the chains and opportunities available. Most youth and women work at the base of the chains where more opportunities are available, but the work is exhausting, wages are low and income sometimes depends on other actors. In addition, producers and small traders are fragmented, which leads to exploitation by middlemen and makes it difficult to bargain for better prices. These are inconsistent with the features of decent work in national policies and makes the work less fulfilling for the youth. Instead, youth prefer work that allows them to thrive, care for dependents, is meaningful and provides security, health and safety and social protection (Tuyisabe et al., 2020).

## 3 Opportunities for Decent Work

In its approach, the GoU is targeting employment creation and high productivity by strengthening labour regulations and promoting growth in key agro-industrial value chains (Ministry of Gender, Labour and Social Development, 2011; NPA, 2020). This approach harbours a range of

programmes—some specifically intended to relieve youth and women's constraints in businesses and accessing credit, land and markets. In line with this, attention is needed to the organisational features such as strengthening of informal linkages between value chain actors, organisation of producers for better price negotiations and representation in government policies. This is because value chains are characterised by informality but also have some forms of organisation (Guloba et al., 2017) and producers are linked to merchants and manufacturers throughout value chains (EPRC, 2021a, 2021b). This presents opportunities for more decent work.

## 4 Conclusion

Uganda aims to create decent work through enforcement of labour laws, formalisation of businesses and bridging skills gaps but this is yet to completely align with the daily work of youth and women. This is not unique to Uganda because many countries have a large and heterogeneous informal sector. These jobs exhibit working conditions, opportunities, levels of organisation and linkages, and factors of (in)decency that are yet to be adequately addressed by policy. Therefore, an immediate jump to decent formal employment is unlikely to be attained especially in economies with a growing labour force and low labour demand. Instead, priority should be a move towards more decency within the work-life realities that exist. In Uganda, focus should be on attainable decent work opportunities within informal work such as the potential gains from organising and associating youth and women at various levels of cotton and fish value chains. This would allow them to negotiate for better prices and wages, income gains, working conditions, add value to production, enlarge a network for information sharing and skills development, income stability and better position of workers, which make up key elements of decent work.

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# Corporate Responsibility and Gender: Failing Women Workers in Global Production

*Stephanie Barrientos*

## 1 Introduction

Corporate responsibility has received much attention as a 'panacea' to address rights and conditions for workers in global value chains. Corporate responsibility has been channelled through various initiatives. These include multinational companies (MNCs) requiring their global suppliers to comply with codes of labour practice. An international industry has evolved to monitor and audit codes, but this has at best had limited success in improving labour standards. A significant proportion of workers engaged in the production of consumer goods in global value chains (GVCs) are female. But women are often concentrated in more insecure precarious work, in contrast to men who are more likely to be employed in permanent and supervisory jobs. As precarious workers, women not only face poorer rights and labour conditions, but also gender-specific issues including discrimination, harassment, and abuse (gender-based

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violence). Social audits have singularly failed to highlight or address issues faced by women workers, and (until recently) gender has largely remained out of sight in most social compliance programmes.

This chapter provides a brief overview of corporate responsibility, focusing on social compliance as one of its most pervasive tenets. It then highlights the types of issues faced by women workers in global value chains and why social audits have failed to highlight gender (with examples from apparel). Finally, it examines why some MNCs are beginning to focus on gender within corporate responsibility and considers whether social compliance provides an effective channel for addressing gender discrimination and abuse.

## 2 Corporate Responsibility: The Role of Social Compliance

Corporate responsibility has become a pervasive dimension of multinational operations in the global economy. This includes company-specific initiatives, social compliance and business and human rights (Barrientos et al., 2019). The focus of this chapter is on social compliance, which expanded rapidly from the 1980s in response to civil society campaigns over poor labour rights and working conditions in MNC value chains. An initial MNC response was that they were not responsible for their subcontractors' employees (Knight, 2016). However, pressure intensified as campaigners connected MNCs to poor working conditions amongst subcontractors in GVCs with close buyer-supplier linkages. In the face of adverse publicity, many risk-averse MNCs adopted their own corporate codes (e.g., Nike and Gap). Other companies joined multi-stakeholder initiatives or adopted independent codes, such as the UK Ethical Trading Initiative or SA 8000 in the USA (Barrientos, 2019).

Better codes of labour practice are based on Core ILO Conventions covering Decent Work, combined with other commitments such as health and safety.[1] They also require compliance with national labour regulation where it provides greater protection. Codes have been classified as combining *measurable standards* (such as health and safety) which are more easily verified through physical inspection and *enabling rights* (freedom of

[1] Core ILO Conventions cover freedom of association, no discrimination, no forced or child labour. For more detail, see https://libguides.ilo.org/c.php?g=657806&p=4649148 (accessed June 2001).

association and no discrimination) through which workers can organise and negotiate access to entitlements (Elliott & Freeman, 2003; Barrientos & Smith, 2007). Implementation of codes of labour practice fuelled a multi-billion-dollar social compliance industry that includes social auditors, monitors, and consultants. Yet serious labour issues continue to persist (Terwindt & Armstrong, 2018). Research indicates social auditing may have contributed to addressing measurable standards, but rarely identifies or addresses 'enabling rights' including gender discrimination and sexual harassment or freedom of association (Barrientos, 2019).

## 3 Women Workers in Global Value Chains: The Failure of Social Audits

MNC sourcing through global value chains has generated hundreds of millions of jobs in low-income countries, a significant proportion female.[2] A key driver of global sourcing is the search for quality low-cost products for sale to North American and European consumers, whilst MNCs capture a significant share of value. Global buyers pressure suppliers to meet product and social standards, including codes of labour practice, on a 'just in time' (rapid turnover) basis at ever-lower prices (Anner, 2020; ILO, 2017). To comply, suppliers employ a core permanent workforce, combined with 'flexible' precarious workers with poor wages that can be hired and fired depending on order fluctuations. Research indicates that in many consumer goods sectors men are more concentrated in permanent work, and women more concentrated in precarious work (Barrientos, 2019). This strategy is underpinned by traditional societal norms in many sourcing countries where the subordination of women relative to men is deeply embedded. Hence, gender discrimination is systemic to commercial global value chains, facilitating a low-cost 'just in time' model from which MNCs benefit.

Paid work in GVCs has provided opportunities for many women, who previously had limited labour market access, to gain an independent income. However, as precarious workers they have less rights, experience poorer working conditions and have least protection in comparison to permanent workers. Women workers face additional risks, including sexual

[2] It was estimated in 2015 there were 453 million workers in GVCs within OECD and middle-income countries, 42% female. But this excludes low-income countries such as Bangladesh where much low-cost labour-intensive sourcing takes place (Barrientos, 2019).

harassment and gender-based violence (FWF, 2018). Women in precarious work are particularly vulnerable to sexual demands by male supervisors and managers responsible for their continued employment. They also face personal risks when travelling to and from work, often at night in unsafe transport. In addition, most women combine paid work with caring responsibilities within their households and communities.

Codes of labour practice designed to ensure all workers' rights should on paper address gender discrimination and abuse. Yet most have singularly failed to do so. For example, a study of audits carried out in 2447 Asian garment factories in 2009–2012 found that less than 1% identified these as non-compliance issues (Barrientos, 2019). Yet these audits were undertaken in countries, including Bangladesh, India, and Indonesia, which rank very low on international equality indices. Other studies have found very high levels of gender discrimination and gender-based violence prevalent in garment factories within the same countries (FWF, 2018).

Many reasons help explain the lack of gender sensitivity in social compliance. These include insufficient gender awareness by buyers and auditing bodies, social auditors imbued with local cultural norms, inadequate training, and reluctance by women to identify issues and risking their jobs (BSR, 2018). However, social compliance has failed to protect MNCs from continued exposure of abuse of women workers' rights, and civil society campaigns persist for enhanced gender equality and rights (Barrientos, 2019).

## 4 Social Compliance: A Channel for Addressing Gender Discrimination?

Many MNCs now recognise the limitations of social compliance, despite the enormous resources involved. Some are exploring 'beyond compliance' initiatives, including with a gender focus (Barrientos et al., 2019). *However, there are questions over the extent to which top-down corporate responsibility can address gender discrimination.*

At a minimum, more gender-sensitive social auditing could better highlight more overt forms of discrimination and abuse experienced by women workers. At a wider level, some corporate initiatives aim to promote more women into senior and managerial roles within GVCs (e.g. a goal indicated in Marks & Spencer's 'Plan A' strategy). Training and education need to vigorously address management cultures in many buying,

sourcing, and auditing companies where discrimination is rife. Whilst corporate responsibility alone is unable to change gendered societal norms, it could have a significant influence. Fundamentally, however, the commercial model of global value chains needs to change. No longer should buyers depend on production of quality low-cost goods supplied through use of flexible often female workers. Women workers need better rights, job security, and recognition of their contribution to value creation, including more equitable remuneration and a living wage (Barrientos, 2019). MNCs are unlikely to acquiesce without extensive pressure from workers, civil society, and governments.

In sum, whilst corporate responsibility has to date failed on gender, there are signs of change. Whilst it has a role to play in addressing discrimination and promoting gender equality, this is fundamentally undermined by commercial sourcing strategies within GVCs. The business model itself also needs to fundamentally change, requiring ever-more rigorous campaigns and contestation.

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# How Family-Friendly Work Environments Affect Work/Family Conflict: A Meta-Analytic Examination

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## 1 Introduction

Today's employees are facing numerous complex challenges in their struggle to meet the demands of both work and family. One contributing factor is likely the increasing prevalence of dual-breadwinner families and single

*When authors reported separate correlations for different subgroups (e.g., males and females), samples, administrations (as in a longitudinal study), or measures of the same construct, those correlations were examined separately. The studies included in this meta-analysis are listed in the references prefixed with an asterisk.

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working parents (Duxbury & Higgins, 1984). Furthermore, in a technologically advanced, global marketplace, traditional nine-to-five schedules have fallen by the wayside. The introduction of cellular phones, pagers, portable computers, and e-mail is making it harder for workers to draw boundaries physically and psychologically between their work and family life. Consequently, the demands originating from these domains are frequently in competition, leading to conflict between work and family. Recurring conflicts between work and family may result in a variety of negative outcomes including risks to physical and mental health, poor job performance, poor parental performance, incidence of work withdrawal behaviors (e.g., tardiness, absenteeism, turnover, and low job involvement), low morale, and low satisfaction with job, life, marriage, and family (Aryee, 1992; Duxbury & Higgins, 1984; Frone et al., 1992; Hammer et al., 2003; Leiter & Durup, 1996; O'Driscoll et al., 1992).

Organizations now recognize that negative outcomes associated with work/family conflict may affect their performance, for example, via absenteeism, turnover, and decreased job performance (Galinsky et al., 1996; Goff et al., 1990), and unions are increasingly incorporating potential solutions to these issues in contract negotiations. To reduce the occurrence of these negative outcomes and to aid their members in balancing the role requirements of work and family, unions are urging organizations to create family-friendly work environments (FFWEs) by instituting various family-friendly programs, for example, flexible arrangements with regard to work schedule or location, dependent care assistance, and by promoting supportive work/family cultures, such as promoting support from supervisors, co-workers, and the work environment (Frone, 2003).

Our research explores the role of various facets of an FFWE in reducing work/family conflict using a meta-analytic methodology and employs these results to provide recommendations to research and practice toward the creation and implementation of family-friendly initiatives. Although the role of these programs has been examined in relation to several other relevant outcomes of interest, for example, turnover, absenteeism, job satisfaction, and organizational commitment, surprisingly little research has examined the role of FFWEs in reducing work/family conflict and in promoting work/family balance (Frone, 2003). As such, an empirical examination of their effectiveness is sorely needed so that researchers and practitioners, including union officials and human resource managers, may focus their efforts on initiatives that are most likely to benefit workers struggling to balance work and family. Moreover, since prior research has

established the importance of spousal support in the management of work/family conflict (Adams et al., 1996; Duxbury & Higgins, 1984; Leiter & Durup, 1996; Parasuraman et al., 1996), we use this variable as a benchmark to assessing the relative value of these facets of FFWE.

## 2 Work-Family Conflict

Work/family conflict is "a form of inter-role conflict in which the role pressures from the work and family domains are mutually incompatible in some respect. That is, participation in the work (family) role is made more difficult by virtue of participation in the family role" (Greenhaus & Beutell, 1985, p. 76). In general, the demands of each role may include the responsibilities, requirements, duties, commitments, and expectations that are related to effective performance in a given domain (Netemeyer et al., 1996). The physical and psychological resources required to fulfill such role demands are finite. When these resources are in a state of imbalance, feelings of inter-role conflict emerge. Reoccurrence of conflict may lead to preoccupation, fatigue, or burnout and further restrict a worker's ability to perform role functions adequately in the other domain (Greenhaus & Beutell, 1985).

Initially, work/family conflict was conceptualized as an all-inclusive construct, whereby work conflicting with family and family conflicting with work equated to a worker's overall sentiment of work/family conflict. As research in this area has progressed, work/family conflict has increasingly been measured from two perspectives: work-to-family (WFC), where requirements in the work domain impede performance in the family domain, and family-to-work (FWC), where family demands impede performance in the work domain (Frone et al., 1992; Netemeyer et al., 1996). Arguments have been made that the antecedents differ for the two types of conflict, and therefore, the impact of different programs, policies, and initiatives may differ across the three types of conflict (global, WFC, and FWC). Our meta-analysis explores the role of different components of family-friendly work environments in reducing overall reports of work/family conflict as well as specific reports of WFC and FWC. Arguably, examining the impact of these programs on global work/family conflict is less informative (than with respect to directional assessments of conflict), though such an analysis will facilitate a more comprehensive understanding of the effects of these programs/policies.

## 3 Components of Family-Friendly Work Environments

Because the ultimate goal of creating a family-friendly work environment is to facilitate work/family balance and to reduce work/family conflict and its associated negative outcomes, unions might negotiate over approximately 30–40 programs/policies that might be implemented within organizations. These initiatives can be divided into two conceptually distinct categories: (1) work/family programs, policies, or benefits, including flexible work arrangements, for example, flextime, telecommuting, compressed workweek, and job sharing; family/medical leaves, for example, maternal/paternal leaves; dependent care assistance, for example, childcare/elder care referral services and on-site child care; resource services, for example, work/family seminars and employee assistance programs; and (2) family-friendly culture, for example, perceptions of a supportive work/family culture, supportive and flexible supervisors and co-workers, reduction/elimination of negative career consequences for utilization of family-friendly benefits, and so on (Flye et al., 2003; Frone, 2003).

Conceptually, these facets appear to address many instigating factors of work/family conflict. Granted, facets of an FFWE may have a direct effect, that is, not mediated by work/family conflict, on other outcomes of interest, such as job satisfaction, organizational commitment and attachment, and organizational citizenship behaviors. However, in this meta-analysis, we focus solely on the link between common facets of FFWE and work/family conflict. We provide a brief overview of each facet below.

### *Work/Family Programs and Policies*

Work/family policies and programs commonly include flexible work arrangements, dependent care assistance and referral services, paid and unpaid family leaves, and general coping resources like employee assistance programs (Frone, 2003). Although the explicit aim of each of these programs may not necessarily be to reduce work/family conflict (rather to increase job satisfaction, organizational citizenship behaviors, etc.), logically the availability and use of these programs should benefit workers' efforts to balance work and family. For instance, workers given formal or informal flexibility in work schedule/location are probably better able to juggle conflicting work and family schedules. Similarly, employed parents are likely to experience work/family conflict in greater frequency and

intensity if child care is unavailable or unsatisfactory. As such, the provision of dependent care assistance likely diminishes such family-related interruptions during work hours, that is, family-to-work conflict, particularly for employed parents. That said, dependent care assistance might be welcomed by nonparents as well, such as those responsible for dependent elders. As the parents of baby boomers become less self-sufficient, elder care will become an increasingly important family-friendly benefit.

### *Family-Friendly Culture*

Work/family culture refers to the collective perception by members of an organization that it "supports and values the integration of employee's work and family lives" (Thompson et al., 1999, p. 394). In general, family-friendly organizations lack expectations that their employees should prioritize work above family. Managers in these organizations do not make long hours or unrealistic work schedules a prerequisite to favorable career consequences (Flye et al., 2003). And, employees of these organizations believe that their careers will not be negatively affected by using family-friendly benefits (Indovino et al., 2003; Thompson et al., 1999). Furthermore, these employees see their workplaces as sources of coping resources rather than as sources of increased conflict (Warren & Johnson, 1995).

Employee perception of a positive work/family culture is crucial for the effective reduction in work/family conflict as a function of these policies. After all, what use to organizations are these (sometimes costly) benefits if their employees feel uncomfortable or unable to take advantage of them (Frone, 2003)? Work/family culture has been related to positive organizational outcomes, like organizational commitment, job satisfaction, prevalence of organizational citizenship behaviors, and decreased work/family conflict (Flye et al., 2003; Indovino et al., 2003; Thompson et al., 1999). However, organizations that provide family-friendly benefits in the absence of a family-friendly work culture have suffered increased turnover, decreased job satisfaction, and higher rates of work/family conflict (Behson, 2002; Flye et al., 2003; Rosen & Korabik, 1991). Interestingly, the availability of work/family policies has been found to be negatively related to employee perceptions of a family-friendly culture (Flye et al., 2003), suggesting that these policies are not necessarily the main determinant of work/family culture. In this case, is the presence of a family-friendly culture sufficient to reduce employee work/family conflict, even in the absence of related benefits?

Supervisor support, another facet of a family-friendly work environment, describes the extent to which a supervisor is sensitive to an employee's family responsibilities and is accommodating when conflicting work and family demands arise (Warren & Johnson, 1995). Supportive supervisors not only accept, but also endorse organizational family-friendly policies and make every effort to manage employee work-family problems fairly (Flye et al., 2003). Although supervisor support is often considered a component of work/family culture (Thompson et al., 1999), it tends to be examined separately (Flye et al., 2003). This distinction results from the often inconsistent views held by immediate supervisors versus the organization as a whole as to the level of flexibility and sensitivity that ought to be provided to employees experiencing problems balancing work and family demands (Warren & Johnson, 1995). For example, while an organization as a whole may have a family-friendly work culture, an individual supervisor may not support worker family responsibilities and ultimately discourage subordinates from utilizing benefits offered by the organization. Alternatively, an immediate supervisor may be quite sensitive and flexible to an employee experiencing conflict between work and family demands, yet the organization does not provide policies/programs consistent with this view. Research has shown that employees who perceive their supervisor as supporting their attempts to coordinate work and family demands reported less work/family conflict, decreased absenteeism, turnover, and burnout, and increased organizational commitment (Carlson & Perrewe, 1999; Ray & Miller, 1994; Thomas & Ganster, 1995; Warren & Johnson, 1995).

## 4 The Present Study

Our objective herein is to explore the effects of the two main facets of FFWEs, work/family programs/policies and family-friendly culture, in decreasing work/family conflict reported by workers, and to provide organizations with recommendations regarding the most effective ways to aid workers in achieving work/family balance. Furthermore, we seek to offer unions' recommendations about the programs/policies that might be most beneficial to their members and therefore most worth incorporating into contractual negotiations.

We agree that characteristics of FFWEs are only one piece of the equation calculating work/family conflict; characteristics of the family domain are another large contributor. Of the family domain factors that have been examined, such as spouse and family support, marital status and

satisfaction, family involvement, and number and ages of children, spousal support is considered one of the largest family-related correlates of work/family conflict (Erdwins et al., 2001). As such, spousal support is our benchmark, and we examine the effects of FFWEs in reducing work/family conflict over and above what is already provided by a supportive spouse. Such a comparison may afford more complete information related to the value of these programs to the employee and to the organization. If, for instance, facets of an FFWE do not add incremental variance over spousal support, perhaps workers would be better served if their employers (unions) instituted (negotiated) programs to help workers identify areas where a spouse's support is lacking and provide suggestions to the worker to aid in soliciting spousal support. In a similar vein, we expect spousal support to impact family-to-work conflict in a greater way than work-to-family conflict, and for FFWE to impact work-to-family conflict more than family-to-work conflict. If, for instance, FFWE affects FWC, we need to identify other programs/policies that would affect the other piece of the work/family conflict pie.

If, on the other hand, facets of FFWE affect more or different portions of the variance in work/family conflict than spousal support, further credence will be afforded to justify the provision of such programs/policies and the costs associated with them. Finally, if characteristics of FFWE relate to only small portions of the variance in work/family conflict, then researchers and practitioners will be charged with finding additional or alternative means by which to aid workers in balancing work and family.

## 5 Method

### *Database*

One hundred and five correlations from 38 articles (total $N$ = 13,605) examining work/family conflict (including global work/family conflict, WFC, and FWC) and facets of FFWE were included in this meta-analysis. To ensure a comprehensive search, these studies were located using the following strategies: (1) conducting a computerized search of the PsycInfo (1887 to present) and ABI Inform (1971 to present) databases using appropriate keywords and phrases (e.g., *work AND family, work-to-family conflict* OR *work-family conflict, family-to-work conflict* OR *family-work conflict, work-nonwork conflict, work-family interference, job interference, off-job interference, WFC, FWC,* AND *supportive work environment, work/family*

*culture, flextime, child care, childcare satisfaction, elder care, dependent leave, supervisor support, co-worker support, spouse support*), (2) conducting a manual search of references cited in studies included in this meta-analysis and those cited in recently published and in press reviews (Eby et al., 2005; Frone, 2003; 1999), and (3) obtaining related, but as yet unpublished, studies from recent conference presentations.

Studies were included only if a measure of global work/family conflict, work-to-family conflict, or family-to-work conflict was administered and a correlation between that construct and at least one measure indicating an FFWE reported (e.g., presence of family-friendly programs/policies, work/family culture). Studies were omitted if they included only qualitative data or dealt with constructs that differed from those examined herein. When authors reported separate correlations for different subgroups (e.g., males and females), samples, administrations (as in a longitudinal study), or measures of the same construct, those correlations were examined separately. The studies included in this meta-analysis are listed in the references prefixed with an asterisk.

### *Coding Procedure*

The first author undertook an independent effort to code the 38 studies that met the criteria for inclusion in the analysis. A random subset of the articles was coded by the second author in an effort to determine coder reliability. Inter-coder agreement was very high (100 percent) likely due to the objective nature of the information coded. Data coded included study sample size, type of work/family conflict measure utilized, reported a correlation between work/family conflict and facets of family-friendly work environments and spouse support, and reported reliability coefficients for measures.

### *Analysis*

The meta-analytic methods outlined by Hunter and Schmidt (1990) were employed. Individual corrections for observed correlations were employed. No recourse was made to artifact distributions. Corrections were made for unreliability in the two measures and coefficient alphas were used. No corrections for range restrictions or other artifacts were possible. Interactive correction methods were used to compute the sample size weighted mean observed correlation as well as the reliability-corrected mean correlation.

Ninety percent credibility intervals around the reliability-corrected correlations were constructed to test whether the specific organizational intervention differed from zero (i.e., was the intervention useful in reducing conflicts in at least 95 percent of the situations?). In addition, a file-drawer analysis (File Drawer k) was conducted based on the sample-size weighted mean observed correlations (Hunter & Schmidt, 1990, p. 513). This value represents the number of missing studies averaging null results that would be needed to reduce the observed sample-size weighted mean correlation to a specified level (we used a level of 0.05 in computing this value).

### *Facets of Family-Friendly Work Environments*

Among the 38 studies, five variables representing an FFWE were examined in multiple studies (i.e., flexibility of work location and schedule, dependent care availability and satisfaction, work/family culture, supervisor support, and co-worker support). Global work/family conflict, work-to-family conflict (WFC), and family-to-work conflict (FWC) were examined in relation to these five variables. We grouped these variables into categories of similarity, yielding two categories of FFWEs: (1) work/family programs, policies, or benefits, in which we included flexibility and dependent care, and (2) family-friendly culture, in which we included work/family culture, supervisor support, and co-worker support. Although supervisor support and co-worker support could be considered aspects of work/family culture, we examine these variables separately as such specification would allow more detailed analyses of the impact of the various facets of family/friendly work environments. Certainly, there are other characteristics of FFWEs (e.g., compressed workweek, job sharing, family/medical leaves, child care/elder care referral services, work/family seminars, and employee assistance programs); however, an insufficient number of studies have been conducted to examine their utility using meta-analysis.

### *Incremental Variance of Family-Friendly Work Environments over Spousal Support*

To determine whether facets of FFWEs add incremental variance over and above spousal support in explaining variance in work/family conflict, we computed partial correlations between work/family conflict and these facets while partialing out the variance explained by spousal support. The variance reduction ratio was also computed to assess how much the

variance explained in work/family conflict by a family-friendly facet decreased due to partialing out the effects of spousal support.

## 6 Results

The results of the meta-analysis of the correlations between global work/family conflict, work-to-family, and family-to-work conflict with five characteristics of family-friendly work environments are summarized in Tables 1–3.

Overall, meta-analytic results suggest that FFWEs, including work-family programs and policies, that is, dependent care availability and satisfaction, work schedule and location flexibility, and family-friendly culture, that is, supervisor and co-worker support, work/family culture, play a relatively small role in worker reports of work/family conflict. Specifically, any one feature of a family-friendly organization accounts for less than 7 percent of the variance in felt conflict between work and family.

Examinations of the correlations between global work/family conflict and family-friendly work characteristics reveal a consistent negative relationship between these characteristics and perceived conflict. Although this relationship is expected, these correlations are lower than we

**Table 1** Correlations between global work/family conflict and family-friendly work environment characteristics

| *Meta-analysis* | *k* | *N* | *r* | $SD_r$ | ρ | $SD_\rho$ | *90% CI* | *File drawer k* |
|---|---|---|---|---|---|---|---|---|
| I. Work/family programs and policies | | | | | | | | |
| Flexibility | 9 | 4800 | -0.12 | 0.10 | -0.14 | 0.11 | -0.32 to 0.04 | 13 |
| Dependent care | 9 | 1269 | -0.13 | 0.09 | -0.14 | 0.09 | -0.29 to 0.01 | 14 |
| II. Family-friendly culture | | | | | | | | |
| Work-family culture | 9 | 2946 | -0.27 | 0.13 | -0.28 | 0.14 | -0.51 to -0.05 | 40 |
| Supervisor support | 10 | 3061 | -0.19 | 0.14 | -0.21 | 0.15 | -0.46 to 0.04 | 28 |
| Co-worker support | 4 | 1019 | -0.05 | 0.07 | – 05 | 0.04 | -0.12 to 0.02 | – |
| Spouse support | 6 | 1147 | -0.16 | 0.06 | -0.21 | 0 | -0.21 to -0.21 | 13 |

Notes: *k* = number of correlations meta-analyzed; *N* = total sample-size across the correlations meta-analyzed; *r* = sample-size weighted mean observed correlation; $SD_r$ = sample-size weighted standard deviation of the correlations; ρ = sample-size weighted mean observed correlation corrected for unreliability in both measures; $SD_\rho$ = standard deviation of *r*; 90% CI = 90 percent credibility interval computed as ρ = + or – 1.645 ($SD_\rho$); File Drawer *k* = the number of studies averaging null results to reduce the sample-size weighted mean observed correlation (*r*) to 0.05

**Table 2** Correlations between work-to-family conflict and family-friendly work environment characteristics

| *Meta-analysis* | *k* | *N* | *r* | $SD_r$ | ρ | $SD_\rho$ | *90% CI* | *File drawer k* |
|---|---|---|---|---|---|---|---|---|
| I. Work/family programs and policies | | | | | | | | |
| Flexibility | 5 | 1571 | -0.01 | 0.12 | 0.00 | 0.12 | -0.20 to 0.20 | – |
| Dependent care | 3 | 1079 | -0.04 | 0.13 | -0.04 | 0.12 | -0.24 to 0.16 | – |
| II. Family-friendly culture | | | | | | | | |
| Work-family culture | 5 | 2104 | -0.19 | 0.16 | -0.24 | 0.18 | -0.54 to 0.06 | 14 |
| Supervisor support | 7 | 2428 | -0.17 | 0.17 | -0.19 | 0.18 | -0.49 to 0.12 | 17 |
| Co-worker support | 2 | 1070 | -0.10 | 0.01 | -0.11 | 0 | -0.11 to -0.11 | 2 |
| Spouse support | 4 | 1486 | 0.06 | 0.10 | 0.07 | 0.11 | -0.11 to 0.25 | 1 |

Note: See notes to Table 1

**Table 3** Correlations between family-to-work conflict and family-friendly work environment characteristics

| *Meta-analysis* | *k* | *N* | *r* | $SD_r$ | ρ | $SD_\rho$ | *90% CI* | *File drawer k* |
|---|---|---|---|---|---|---|---|---|
| I. Work/family programs and policies | | | | | | | | |
| Flexibility | 4 | 1226 | 0.04 | 0.14 | 0.06 | 0.15 | -0.19 to 0.31 | – |
| Dependent care | – | – | – | – | – | – | – | – |
| II. Family-friendly culture | | | | | | | | |
| Work-family culture | 4 | 1916 | -0.08 | 0.09 | -0.10 | 0.09 | -0.27 to 0.07 | 2 |
| Supervisor support | 6 | 1921 | -0.07 | 0.11 | -0.08 | 0.11 | -0.26 to 0.10 | 2 |
| Co-worker support | 2 | 1070 | 0.00 | 0.05 | 0.00 | 0.03 | -0.05 to 0.05 | – |
| Spouse support | 2 | 624 | -0.14 | 0.01 | -0.17 | 0.00 | -0.17 to -0.17 | 4 |

Note: See notes to Table 1

anticipated. For example, the sample-size weighted mean relationship between global work/family conflict and flexibility, dependent care, and co-worker support ranged from only -0.05 (for co-worker support) to only -0.13 (for dependent care). Furthermore, except for work/family culture and supervisor support, the correlation between spousal support ($r$ = -0.16) and work/family conflict was larger than these other features.

Given the conceptually strong influence of spousal support over worker feelings of work/family conflict, we conducted another analysis to assess the incremental variance accounted for by FFWE factors over and above spousal support. To compute partial correlations between these factors and work/family conflict, removing spousal support, we computed the

correlations between spousal support and each family-friendly factor. The results of this meta-analysis are presented in Table 4. Partial correlations between work/family conflict and the five family-friendly work environment characteristics, removing the variance accounted for by spousal support, are reported in Table 5. Partial correlations remained fairly stable with spouse support removed, suggesting that these facets do add incremental variance over and above what is already provided by a supportive spouse. Moreover, the relationship between flexibility and work/family conflict actually became stronger with spousal support removed.

In light of the recent trend in measuring work/family conflict from a bi-directional perspective, we opted to examine the correlations between these two forms of conflict and family-friendly work environment characteristics separately (Tables 2 and 3). Studies measuring one or both

**Table 4** Correlations between spousal support and family-friendly work environment characteristics

| *Meta-analysis* | *k* | *N* | *r* | $SD_r$ | ρ | $SD_\rho$ | *90% CI* | *File drawer k* |
|---|---|---|---|---|---|---|---|---|
| I. Work/family programs and policies | | | | | | | | |
| Flexibility | 3 | 1054 | -0.08 | 0.07 | -0.09 | 0.06 | 0 to -0.19 | 2 |
| Dependent care | 5 | 1058 | 0.06 | 0.08 | 0.06 | 0.05 | -0.0 to 0.14 | 1 |
| II. Family-friendly culture | | | | | | | | |
| Work-family culture | 4 | 630 | 0.13 | 0.10 | 0.15 | 0.07 | 0.04 to 0.27 | 6 |
| Supervisor support | 3 | 915 | 0.10 | 0.06 | 0.11 | 0.02 | 0.08 to 0.14 | 3 |
| Co-worker support | 1 | 372 | 0.01 | 0.00 | 0.01 | 0.00 | – | – |

Note: See notes to Table 1

**Table 5** Partial correlations of family-friendly work environment with work/family conflict

| *Work characteristic* | *W/FC* | $r_{13.2}$ | *VRR* |
|---|---|---|---|
| Supervisor support | -0.19 | -0.18 | 14% |
| Co-worker support | -0.05 | -0.05 | 4% |
| Flexibility | -0.12 | -0.13 | 27% |
| Dependent care | -0.13 | -0.12 | 12% |
| Culture | -0.27 | -0.26 | 11% |

Notes: $r_1$ = supportive work environment characteristic, $r_2$ = spousal support, and $r_3$ = work/family conflict, $r_{13.2}$ indicates the correlation between supportive work environment and work/family conflict with spouse support partialed out. VRR indicates the percent reduction in variance explained

bi-directional conceptualizations are far fewer in number than those measuring a global construct, so our cell sizes for each of these meta-analyses are smaller than those reported in Table 1. Taken in combination with wider variability in findings related to family-friendly features reported by these authors, a few unexpected results surfaced.

Results of the meta-analysis between work-to-family conflict (WFC) and family-friendly features reveal the anticipated negative relationship for WFC and supervisor support ($r$ = -0.17), co-worker support ($r$ = -0.10), and work-family culture ($r$ = -0.19). However, contrary to our expectations, flexibility was not related to reports of work-to-family conflict ($r$ = -0.01). Interestingly, though spousal support was largely related (compared to other family-friendly features) to global measures of work/family conflict, we found a low, positive correlation with WFC, which suggests that a supportive spouse may actually increase this form of conflict. This result is representative of wide variability in reported correlations between WFC and spousal support. Specifically, of the four studies included in this meta-analysis, two reported a positive correlation (0.13 and 0.16) and two reported a negative correlation (-0.05 and -0.07) between WFC and spousal support. Our findings suggest that there may be other factors related to spousal support, such as the type of support offered, like instrumental, emotional, or career, or related to WFC, such as the reason for work interfering with family responsibilities, that determine a positive or negative association.

As expected, we found a negative correlation between family-to-work conflict (FWC) and spousal support ($r$ = -0.14). Analyses also revealed a small negative correlation between FWC and supervisor support and work-family culture (-0.07 and -0.08, respectively). Co-worker support was not related to worker reports of FWC. Interestingly, a small, positive correlation surfaced for flexibility and FWC. However, the standard deviation of this correlation was relatively large, leading to a credibility interval that ranged from -0.19 to 0.31.

## 7 Discussion

Our purpose was to examine the value of facets of family-friendly work environment in reducing worker reports of work/family conflict. Several studies have explored the utility of different programs and a review of these studies should facilitate the assessment of the comparative utility of the different interventions. Using a meta-analytic approach, we cumulated

findings across 38 studies to determine the relationship between work/family conflict and two main facets of FFWEs, that is, work/family policies and programs, including flexibility and dependent care, and family-friendly culture, including work/family culture, supervisor support, and co-worker support. Furthermore, we examined the incremental validity of these initiatives over what is already determined by spousal support. Overall, our results suggest that facets of FFWEs likely provide less assistance to workers in managing work/family conflict than one may suspect or wish. Not one of these factors appears to explain more than 7 percent of the variance in reports of work/family conflict. Surprisingly, spousal support appears to play a similar (small) role in reports of work/family conflict. Importantly, however, an examination of partial correlations reveals that facets of FFWE impact different portions of the variance in work/family conflict than does spousal support, suggesting that they offer unique (if not valuable) assistance to workers in balancing work and family. Also important is our finding that aspects of a family-friendly work culture are more strongly related to global work/family conflict and WFC, and spousal support is more strongly related to FWC than either global or WFC.

As expected, correlations between global work/family conflict and facets of family-friendly work environments reveal a consistent negative relationship, suggesting that these factors help mitigate conflict between work and family. Interestingly, work/family culture was the most strongly related to work/family conflict, a finding consistent with past research suggesting that work/family culture is a critical prerequisite to effectiveness and utilization of other family-friendly benefits (Allen, 2001; Flye et al., 2003). Similarly, Allen (2001) noted that worker perceptions of work/family culture better indicated felt work/family conflict, job satisfaction, organizational commitment, and turnover intentions than any other family-friendly benefit.

Though worker perceptions of a work/family culture were the most strongly related to work/family conflict and WFC, supervisor support was a close second. We argue that work/family culture, supervisor support, and co-worker support are all part of a family-friendly culture. Given the comparatively large role each factor may play in a worker's perception of family-friendly culture, we examined them separately. Our findings suggest that work/family culture and supervisor support are critical, though not necessarily distinct, influences on a worker's feelings of work/family conflict.

The flexibility of work schedule and/or location has been touted as one of the most important family-friendly benefits offered by organizations (Rodgers, 1993), or negotiated by unions. Intuitively, workers given some leeway to manage their work schedule around family demands should experience less work/family conflict overall. Programs like flextime and compressed workweeks were resisted to some degree by management during negotiations with unions (or human resources departments) due to the perception that they may lead to diminished job performance and involvement, as well as to a lessened emphasis on meeting client and task demands. However, in recent years, management seems to have become more willing to accept these programs/policies (as well as their intrusion into normal scheduling) expecting that the organization's performance would benefit (via a reduction in the negative outcomes associated with work/family conflict). Our findings reveal a relatively small negative correlation between flexibility and global measures of work/family conflict (-0.12), and almost no correlation between flexibility and either bi-directional measure of work/family conflict (-0.01 for WFC and 0.04 for FWC). It would be interesting to meta-analytically correlate flexibility with work/family culture. The relationship we have found may be a function of a negative work/family culture present in countless organizations. Specifically, if workers fear negative reprisals for utilizing flexible benefits, like flextime, perhaps they are unlikely to use them. If workers are not using these benefits, the benefits cannot reduce work/family conflict. Alternatively, our findings may indicate that flexibility and compressed workweeks are valuable to workers overall in managing work/family conflict, but do not operate consistently in impacting either WFC or FWC. Rather, at times flexibility, for instance, may allow workers to manage work/family conflict by minimizing WFC, and at other times by minimizing FWC.

We found a relatively small relationship between dependent care assistance and work/family conflict (-0.13) and an even smaller relationship for WFC (-0.04). Although such small correlations were surprising, as compared to flexibility, dependent care is a benefit that may be desired and used by only a small percentage of workers. Specifically, not all workers are parents of young children or require assistance caring for an elder. In contrast, schedule and location flexibility (e.g., flextime, compressed workweek, and telecommuting) are policies that benefit all employees, regardless of parental or marital status. Galinsky et al. (1996) found that compared to nonparents, employed parents cited dependent care

availability and flexibility in schedules as the most important family-friendly benefits offered by their employers or negotiated by their union representatives; however, satisfactory dependent care was more strongly related to reports of work/family conflict.

The relatively small relationship between work/family conflict and dependent care may also be the result of inclusion of studies not strictly focused on working parents. However, the majority of studies included in this analysis included working parents in their samples. An additional explanation may be a known difference between males and females in the correlation between satisfactory and available dependent care and work/family conflict (Galinsky et al., 1996). Specifically, an examination of the correlations included in our meta-analysis indicates that perceptions of work/family conflict may be differentially affected by dependent care characteristics for employed fathers versus employed mothers. For example, Aryee and Luk (1996) examined satisfaction with childcare for husbands and wives of a dual-earner marriage. While the correlation between childcare satisfaction and work/family conflict was -0.12 for husbands, it was twice that for wives (-0.24). Therefore, future research should examine the differential influence of such policies for males and females, and parents and nonparents. Interestingly, despite the assumption that family variables influence FWC more so than work variables, we were able to find no studies examining dependent care availability or satisfaction with FWC. This is a much-needed topic for future research endeavors.

### *Limitations and Implications for Future Research*

Although these programs/policies that we have examined do play a role in attenuating work/family conflict, a large portion of the variance in this construct remains unexplained. Future research should examine other factors that may affect work/family conflict to provide a more complete picture. For example, research suggests that some individuals are more susceptible to the negative outcomes caused by work/family conflict (Frone, 2003). Therefore, future research may focus on individual differences in coping abilities and tendencies, stress threshold, and personality to explain additional variance in worker reports of work/family conflict.

An obvious limitation of our study is the small number of studies included in our meta-analyses of WFC and, especially, FWC. The utilization of bi-directional measures of work/family conflict is only recently emerging in the literature. Few studies were available that examined the

effects of facets of FFWEs on work-to-family and family-to-work conflict. As such, we urge researchers to cautiously apply these findings to work/family theory and research methodology. Research is still needed that incorporates a bi-directional perspective of work/family conflict to address whether these work environment characteristics may benefit workers in achieving work/family balance or may benefit organizations in other capacities (organizational commitment and attachment, increased demonstration of organizational citizenship behaviors, etc.). However, note that some relationships were stronger for global work/family conflict than for either directional measure. This may indicate that, overall, certain facets of FFWE are helpful, but that they do not operate consistently either within or across individuals. Rather, depending on the situation, a family-friendly benefit may reduce conflict in one direction, but under different circumstances it may operate in the reverse.

A second potential limitation relates to our reliance on only published articles or presented research reports in the meta-analyses. Arguments can be made that only significant findings are published, and as such by confining ourselves largely to the published literature we have overestimated the effect sizes. This is the classic "file-drawer effect" (Rosenthal, 1979). To address this potential concern, we conducted file-drawer analyses and found that in many instances we would need a large number of null findings to reverse our substantive results.

### *Implications for Organizational Practice*

Our results suggest that work/family conflict is most affected by perceptions of a positive work/family culture and by support originating from a worker's supervisor and spouse. This suggests that organizations can influence employee feelings of work/family conflict most by providing a climate in which employees perceive (a) that they are not required to prioritize work above family or manage long hours or unrealistic schedules to achieve desired career consequences, (b) that there will be no negative career consequences associated with using family-friendly benefits, and (c) that their workplace is a source of coping resources rather than a source of increased conflict (Flye et al., 2003; Indovino et al., 2003; Thompson et al., 1999; Warren & Johnson, 1995). Given this, union representatives might assess members' perceptions of this culture and type of support and may address these specifically with the organization.

Our results further indicate that support received from a worker's supervisor is another central influence on work/family conflict. Past research findings suggest that a positive work/family culture can be undermined by an unsupportive supervisor (Flye et al., 2003; Thompson et al., 1999). Therefore, organizations should pay particular attention to grooming supervisors to (a) support organizational family-friendly policies, (b) be sympathetic to workers' needs to achieve a balance between work and family, (c) be flexible when family demands arise that impede the accomplishment of work requirements, and (d) be fair in managing work/family problems and when implementing family-friendly benefits. These actions might also be encouraged by union leaders.

Finally, given the role a worker's spouse plays in determining levels work/family conflict, human resources managers and union representatives might consider implementing programs aimed at helping the worker to (a) understand how a spouse's support can ease conflict between work and family domains, (b) identify areas where spouse support is currently deficient, and (c) provide suggestions to the worker to aid in soliciting spousal support. To provide a more thorough intervention, future research should examine differential impact provided by varying forms of spousal support (e.g., emotional, instrumental, and career). Furthermore, researchers should consider the reasons for work interference with family that may govern the level and type of spousal support that is offered.

## 8 Conclusion

Union and organizational attempts at assisting their members/employees in achieving a balance between the demands of the work and family domains are a worthy cause. While the results of this meta-analysis suggest the utility of several common features of family-friendly work environments in reducing work/family conflict is less than hoped for, it provides a new point from which researchers and practitioners may continue the search for interventions that will effectively promote work/family balance. We know that spousal support is not a substitute for support provided by a supervisor or an organization's culture and that work/family conflict will be better addressed if support from these two spheres is provided in concert. Furthermore, employers must understand that the creation of a family-friendly culture is crucial to the effective implementation of work/family programs and policies. Future research focused on the role of individual differences (e.g., coping ability and tendency, threshold for stress,

and personality) as potential moderators of the relationship between perceptions of a family-friendly work environment and reports of work/family conflict may paint a clearer picture of the true potential of these programs and policies to assist workers who are struggling to meet the demands of both work and family.

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# How Employed Mothers in Australia Find Time for Both Market Work and Childcare

*Lyn Craig*

## 1 Introduction

How households balance work and family commitments is currently an issue of major and growing concern. Increasingly, both men and women participate in the paid workforce, with the consequence that finding time for unpaid work, including parental childcare, is problematic. This has

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given rise to concern that children are missing out on valuable parental attention.

Time use analysis allows empirical investigation of how families manage their responsibilities to both earn money and to care for their children. Previous time use research shows that children absorb an enormous amount of parental time, particularly from mothers (Hill et al., 2004; Sayer et al., 2004; Tausig & Fenwick, 2001). Intriguingly, research also consistently shows that being employed or using non-parental childcare does not reduce parental childcare time on an hour-for-hour basis (Bianchi, 2000; Bittman et al., 2004; Booth et al., 2002; Bryant & Zick, 1996a, 1996b; Hofferth, 2001; Nock & Kingston, 1988; Sandberg & Hofferth, 2001). Why not? The aim of this chapter is to find out, given there are only 24 hours in a day, how parents who allocate substantial periods of time to market work manage to also spend substantial periods of time caring for their children.

## 2 Review of the Literature

Children are hugely time-consuming. The most consistent family characteristic predicting work-family imbalance is being a parent (Tausig & Fenwick, 2001). When children are born into a household, time in the unpaid labor activities of housework, shopping and childcare rockets. Depending on the number and age of children, time in unpaid work has been found to be up to six and a half hours a day higher in families with children than in childless households (Craig & Bittman, 2005). These time impacts do not fall evenly by sex. Most of the time required to care for children is allocated within households to mothers (Bianchi, 2000; Cohen & Bianchi, 1999; Hill et al., 2004; Sayer et al., 2004; Tausig & Fenwick, 2001). Of the over six hours' time impost associated with a first child, women contribute about four-fifths (Craig & Bittman, 2005).

Households with children allocate less time to market work than childless households (Cohen & Bianchi, 1999), largely because most women, on becoming a mother, lower their time commitment to paid work (Hill et al., 2004). However, while this is the most common response, it is no longer as frequent as it was in the past. Many mothers are now unwilling or unable to accept the opportunity costs entailed in leaving market work (Ciscel et al., 2000). Withdrawing from the paid workforce is a financial risk that leaves both women as individuals, and their families, vulnerable to poverty (Joshi, 1998; O'Connor et al., 1999). A series of studies have

established that as a result of withdrawal from continuous full-time labor force participation, becoming a mother is associated with lower lifetime earnings than men, or than women who remain childless (Apps & Rees, 2000; Beggs & Chapman, 1988; Browning & Lechene, 2003; Gray & Chapman, 2001; Joshi, 1998; Waldfogel, 1997). Perhaps as a consequence, increasingly mothers are not forgoing workforce participation, but attempting to maintain a time commitment to both employment and family.

Recent Australian census figures show that more than half of the mothers in two-parent families are employed by the time their youngest child is one or two. The father-breadwinner, mother-homemaker family represents just 27.5% of families with children under 5. Only 18.1% of families with children under 8 conform to the stereotype (ABS Census, 2000). In the U.S., maternal employment has tripled over the past 30 years (Spain & Bianchi, 1996). In 1997, 63.9% of women with children under 6 and 78.3% of women with children aged 6–17 were employed (Perry-Jenkins et al., 2000). Women with very young children are also showing stronger workforce attachment. In 1994 almost 60% of U.S mothers with children under three were employed, compared with 21.2% in 1966 (Blau et al., 1998). Similar patterns are found throughout industrialized nations. It is projected that by 2010, female workers will account for 47.9% of the employed population in the U.S. (NIOSH, 2004).

Some see this workforce participation as underpinned by non-parental care. The provision of good quality institutional childcare was seen by feminist reformers as an essential prerequisite to women's freedom to earn a living (Bergmann, 1986). Care which substitutes for mothers' time with children is fundamental to how women can manage motherhood and market work (Brennan, 1998). However, institutional care has not been universally accepted as a solution. As the trend to maternal workforce participation grew, so did the concern that children would receive insufficient parental attention as a result (Hewlett & West, 1998; Hochschild, 1997). Despite employed motherhood being the statistical norm, there is unease over the consequences for children of the effect of substituting the care of others for parental care (Arundell, 2000; Gornick & Meyers, 2004; Presser, 1995). Concern that employed mothers are depriving their children of vital maternal care persists.

Attachment theory, developed by John Bowlby, theoretically underpins this disquiet (Bowlby, 1953, 1972, 1973). During the twentieth century, child welfare became a matter of professional concern (Cowan, 1976,

1983; de Mause, 1974; Donzelot, 1979; Oakley, 1979; Reiger, 1985; Shorter, 1977) and the prevalent view of child rearing became that "children require constant attention from well informed persons" (Reiger, 1985). Further, it was thought paramount for individual development that the person delivering care to children was their own mother (Bowlby, 1953). Theories of child development and psychology, developed over the last century, suggest that maternal bonding, attentive parenting and high time inputs are necessary for optimal educational and social outcomes for children (Belsky, 2001; Bowlby, 1972, 1973).

If these precepts are accepted, mothers are faced with a choice between economic independence and providing optimum care for their children. The wish or need of women to work and the belief that children require the full-time presence of a mother are incompatible. Women who violate such normative expectations of full-time motherhood must contend not only with others' judgments but also with their own feelings of ambivalence and guilt at leaving their children (Arundell, 2000). Unsurprisingly, therefore, there has been a great deal of interest, both from those who believe that it is harmful and from those who seek reassurance that it is not, into the effect of maternal workforce participation and non-parental care upon children.

An enormous body of research has been generated into the effect of non-parental care on child outcomes, but the results are inconclusive (Bianchi & Robinson, 1997; Han et al., 2001; Presser, 1995; Zick et al., 2001). Some have found negative effects on behavioral and cognitive outcomes if children attend day care when under a year old (Belsky, 2001; Brooks-Gunn et al., 2002; Han et al., 2001; Hoffman & Youngblad, 1999). However, negative outcomes are influenced by mediating factors including day-care quality, child characteristics and family characteristics such as income and parental education (Belsky, 2001; Blau, 2000; Han et al., 2001; NICHD, 1997; Shonkoff & Phillips, 2000). Some suggest that the most important mediator is the influence of the family environment (Shonkoff & Phillips, 2000). The National Institute of Child Health and Human Development (NICHD, 1997) found that if poor quality care was combined with insensitive mothering, child outcomes were poorer, but that otherwise there was no evidence that non-maternal care had a detrimental effect on children's development. In a study which disaggregated parent/child time into particular activities, Zick et al. (2001) found maternal employment to be associated with an increase in reading/homework activities, and with fewer behavioral problems and higher school

grades. They found no association with child outcomes in the medium term from the mothers being employed while the children were under school age.

This research suggests that it is the quality of parenting, rather than maternal employment or the use of non-parental childcare, that is the overriding factor in child outcomes. Further, it may indicate that the debate has rested on inaccurate assumptions. It was assumed that paid work and time with children would be traded off against each other—women who worked or used non-parental care would necessarily lower the time they spent caring for their children. But perhaps the picture on child outcomes is inconclusive partly because maternal employment time and time in non-parental care are both only approximate indicators of parental time with children. The assumption that non-parental childcare and maternal employment actually equate with a substantial loss of parental attention appears misplaced.

While mothers' employment is widely used as a proxy measure of maternal time spent with children (Zick et al., 2001), a growing body of time use study shows that mothers do not reduce the amount of time they spend with children by the same amount of time as they spend in paid work. The research consistently shows that maternal childcare is reduced by far less than an hour for every hour the mother works (Bianchi, 2000; Bittman et al., 2004; Booth et al., 2002; Bryant & Zick, 1996b; Hofferth, 2001; Nock & Kingston, 1988; Sandberg & Hofferth, 2001). Overall, time with children has not decreased alongside the increase in female employment. Time use studies indicate that historically parental time with children has not declined (Hofferth, 2001; Nock & Kingston, 1988; Sayer et al., 2004). Moreover, rising levels of maternal employment have occurred at the same time as fertility rates have dropped. Therefore, although mothers' time may be more limited, it is spread among fewer children. While the time children spend at home has decreased, the time that parents spend in activities with children has not. Bryant and Zick (1996a) report similar levels of parental activity time in the U.S. in the 1920s and the 1970s, by white, two-parent families. Bianchi reports similar findings over the period from 1965 to 1998 for time spent with children under the age of 18 (Bianchi, 2000). It appears that the impact of structural change in female employment practices upon time with children has been outweighed by behavioral change in time mothers spend with children (Sandberg & Hofferth, 2001; Sayer et al., 2004).

Some contend that part of these time allocation adjustments can be attributed to male behavior. Fathers have been found to be somewhat more involved in childcare when non-parental childcare is used (Bittman et al., 2004). Studies in the U.S. found co-resident fathers with wives in paid employment spend slightly more time with their children than men with stay-at-home wives (Bittman, 1999; Fisher et al., 1999; Gershuny & Robinson, 1988; Sandberg & Hofferth, 2001). However, others find fathers' time allocation is not closely linked to maternal employment. Nock and Kingston (1988) find no difference in fathers' time with children according to whether or not their wives worked. Also, changes to male behavior are not as marked as the compensatory time adjustments made by mothers (Bianchi, 2000; Bryant & Zick, 1996b). When mothers work, "quality time", in particular, is preserved or protected. Active, engaged childcare time is not reduced as much as non-engaged supervision (Bryant & Zick, 1996b; Nock & Kingston, 1988; Sandberg & Hofferth, 2001).

The use of non-parental childcare, also, does not completely replace mothers' time with their own children (Bittman et al., 2004; Booth et al., 2002). As with the findings relating to mothers' work-time, mothers who use non-parental care appear to change the composition of the time they are with their children in order to preserve time in certain particularly valued activities. Non-parental childcare is associated with reduced non-engaged supervisory time, but about half of physical care time is retained, and there is no reduction at all in parental interactions involving talking, listening, helping with homework, reading and playing (Bittman et al., 2004).

The research discussed above implies that women, even those who allocate substantial time to market work, may target a certain minimum amount of interaction time with their children, and then seek ways of meeting that target (Bittman et al., 2004). Employed mothers make compositional changes in their time with children (Bittman et al., 2004; Sandberg & Hofferth, 2001), and preserve their time with children over the longer term (Cohen & Bianchi, 1999; Sayer et al., 2004). This seems to support the idea that social norms of involved motherhood have not been reconciled with the trend toward increased female workforce participation. For women who wish to earn a living through market work and also feel a strong imperative to care intensively for their own children, a difficult friction point results. If women value both paid work and attentive parenting, they will be reluctant to trade off childcare time for time in

market work, and will instead try to retain both. Even in the cross-section, mothers do not lower their maternal childcare by an equivalent amount of time as they spend in the workforce. This is perhaps reassuring from the perspective of child welfare. However, it does suggest an obvious question: how do they do it?

The question that the current study addresses is: how do mothers who undertake paid labor or place their children in non-parental care manage to spend substantially similar amounts of time in childcare activities as non-employed mothers? If market work and parental childcare are both prioritized, the logical corollary is that other forms of time use, that is, non-employment and non-childcare activities, must be adjusted. Apart from doing more at once time for children can be found by reducing time in other activities and directing it to childcare time, or by rescheduling time with children around other activities.

It has been noted that adults, particularly mothers, in households with children spend less time in sleep, personal care, recreation and leisure than adults in childless households (Bianchi et al., 2000; Craig & Bittman, 2005). If employed mothers do not completely trade off market work and childcare, the implication is that they need to reduce such activities even further than do mothers who are not employed. Employed mothers presumably maintain their time commitments to both paid work and childcare by rescheduling (shifting) their child interaction time and their other time commitments around their market work. One of the ways mothers may do this is by using non-parental care. In addition to replacing some parental care time, non-parental childcare may be used to facilitate the shifting and rescheduling of parental childcare time. An assumption in much of the literature is that non-parental childcare and maternal employment are interchangeable measures in that the residual of either will be time available to care for children. However, because non-parental childcare is used for both work and non-work purposes, this is misleading (Bittman et al., 2004). Many mothers use non-parental care to do things other than paid work, and some work is undertaken with children present. Non-parental care is used not only to replace time that mothers are employed, but also time that mothers are spending in other activities. Therefore, to assume that they are commensurate, or to rely on either as a proxy for time with children, will yield noisy results. There is a possibility that widespread childcare usage for non-work purposes and the practice of using no childcare while employed may have obscured the possibility, investigated in this study, that in addition to replacing some parental care

time, non-parental childcare is used to facilitate the shifting and rescheduling of parental childcare time.

This study will address two hypotheses:

1. Employed mothers try to avoid trading off time in market work and childcare, and therefore in comparison with non-employed women,
   (a) Reduce the time they spend in activities that are neither paid work nor childcare
   (b) Reschedule childcare activities to later or earlier in the day and reschedule other activities to weekends
2. Parents use non-parental childcare to make adjustments in other forms of time use and to shift the times when they are together with their children.

## 3 Data and Method

The study used data from the Australian Bureau of Statistics (ABS) *Time Use Survey (TUS) 1997*. The survey was the most recent in a regular series of cross-sectional time use surveys conducted by the ABS, which meet the highest standard of time use investigation.[1] The survey was a national probability sample of 4059 households. There was a low non-response distortion because under Australian law, cooperation with the ABS is mandatory and the rate for full response was over 70% and for partial response (e.g. only one diary-day) over 84%. The survey used the time-diary method, which is recognized by international specialists to be the most accurate method of time data collection (Andorka, 1987; Juster & Stafford, 1991; Robinson & Godbey, 1997). The diaries were collected at four different points in time over the year, in order to capture seasonal variation in time allocation. They required each person aged 15 years or older resident in each sampled household to record all his or her activities over 2 days. This yielded a sample of 7269 persons. Activities were divided into 9 broad categories (personal care, employment-related activities, education activities, domestic activities, childcare activities, purchasing goods and services, voluntary work and care activities, social and community interaction and recreation and leisure) with up to 53 subcategories each.

[1] The Australian Bureau of Statistics (ABS) survey has been described by the U.S. National Academy of Sciences as "the Mercedes of time-use surveys."

Activities were recorded at five-minute intervals. The average number of episodes per day (over 30) garnered by the *TUS* indicates higher than usual data quality (Juster & Stafford, 1991; Robinson & Godbey, 1997).

For the present study, the sample was restricted to families in which the parents were of prime employed age (25–54) and had at least one child under the age of five. Households with more than two adults were excluded, because other adults could provide substitute care to the children. Both married/cohabiting and single-parent families were included, but because the sample yields only four single custodial fathers, the analysis of single parents was based on mothers only (N=90).[2] For the purpose of the analysis, the sample was further divided into fathers (N=801), mothers who worked more than 35 hours a week (N=168) and non-employed mothers (N=421). It was decided to separate the sample in this way to disaggregate the impact of maternal work time and non-parental childcare use. In the sample, paid work and the use of non-parental childcare had a correlation of 0.47 for married mothers and 0.31 for sole mothers. Twenty-six mothers worked 35 or more hours a week but accessed no non-parental care. Two hundred and fifty mothers who did no market work used non-parental care.

The ABS *TUS* asked respondents to record what they were doing as a main activity in each interval (primary activity), what they were doing at the same time (secondary activity)[3] for whom they were doing the activity and who was present. Respondents recorded the start and finish time of activities, which allowed the present study to look specifically at when during the day childcare activities were being performed. The *TUS* gathered detailed information, not found in comparable national time use studies, on the time children spent in formal and informal care[4] outside the home. This allowed the present study to investigate whether parents used non-parental care to juggle their other time commitments.

The measures investigated in this study were a composite variable "active childcare", and four separate types of non-employment and non-childcare activity that may be sacrificed to either employment or parental

[2] The ABS treats legally married and de facto married couples alike, reflecting their treatment in the Australian legal system.

[3] This information together provides a very comprehensive picture of total time devoted to children, but because the concern of the present study is substitution of one type of activity for another, in the bulk of the analysis, primary activity only is analyzed. Secondary activity *is* included in the variable "active childcare".

[4] Informal care is non-regulated care undertaken in either the child's home or elsewhere, for no payment, often done by the child's relatives (most usually by grandparents).

childcare (namely, unpaid work excluding childcare, sleep, personal care, and childfree recreation). The variables were defined as follows:

1. "Active childcare"—this variable was created for this analysis from ABS activity codes 500–530 and 550–599. It includes all types of childcare that are active (physical care, interactive care, child-related travel and communication[5]), rather than supervisory[6] performed as either a primary or a secondary activity.
2. Hours a day spent in unpaid work (ABS activity codes 400–499 and 600–699:—domestic activities; food and drink preparation/clean up; laundry and clothes care; housework; grounds/animal care; home maintenance; household management; purchasing goods; purchasing services associated travel; associated communication). Note that this variable does not include time performing parental childcare.
3. Hours a day spent sleeping (ABS activity codes 100–112).
4. Hours a day spent in personal care activities (ABS activity codes 131–199: personal hygiene—bathing, dressing, grooming; health care; eating/drinking; associated communication; associated travel).
5. Hours a day childfree recreation time (ABS activity codes 800–999: social and community interaction; recreation and leisure; associated communication; associated travel MINUS time in which the respondent records in the "with whom" column in the survey that they are in the company of children). This variable was specifically created for this analysis to capture that part of a person's leisure during which they are *not also* looking after young children, because such time is arguably more pure, relaxing and leisurely (Mattingly & Bianchi, 2003).

[5](1) Interactive childcare (ABS activity codes 521 and 531): face-to-face parent-child interaction in activities teaching, helping children learn, reading, telling stories, playing games, listening to children, talking with and reprimanding children. (2) Physical childcare (ABS activity codes 511 and 512): face-to-face parent-child interaction that revolves around physical care of children. Feeding, bathing, dressing, putting children to sleep, carrying, holding, cuddling, hugging, soothing (3) Travel and communication (ABS activity codes 57 and 58): travel can be associated with transportation to school, visits, sports training, music and ballet lessons, parents and teacher nights. Travel time includes time spent waiting, and meeting trains or buses. Communication (in person, by telephone or written) includes discussions with a spouse, other family members, friends, teachers and child workers when the conversation is about the child.

[6]Passive child care (ABS activity code 54): supervising games and recreational activities such as swimming, being an adult presence for children to turn to, maintaining a safe environment, monitoring children playing outside the home, keeping an eye on sleeping children.

### *Descriptive Analysis*

The variable "active childcare" described above was used as a marker of when childcare was being performed. The chapter investigated whether respondents were participating in "active childcare" in each five-minute block of time during the 24-hour day. It compared the average participation in "active childcare" at each end of the day by mothers who worked full-time (35 hours a week or more) and by mothers who did no paid work. The intention was to see whether the lack of trade-off between work and care may be partly achieved by employed mothers shifting the times they (e.g.) bath children, feed children, help children with their homework or read to children, to earlier or later in the day.

### *Multivariate Analysis*

Second, this chapter used multivariate analysis to investigate whether non-parental care was used as a tool to assist mothers minimize the effect of their market work time on their parental childcare.

Entered as dependent variables in a regression model were the non-employment and non-childcare activities described as variables 2 to 5 above. Ordinary Least Squares (OLS) regression analysis was used when the dependent variables were sleep and personal care. The analysis was performed using SPSS version 12. For the dependent variable childfree recreation, and (for men) domestic labor, in which there are a high number of zero observations, Tobit regressions were run. This analysis was conducted using STATA 9. To generate measures comparable to OLS, the marginal effects were calculated using the tobit mfx c, dydx predict STATA command.

The independent variable of most interest was the use of non-parental childcare. Respondents to the ABS *TUS* are asked to record the number of hours that the reference child usually spends in formal and informal childcare each week. Hours of formal and informal care are coded as 1–15, 16–30, 31–45 and 45 hours or more. For this study, total non-parental care was calculated by summing midpoints of the ranges for formal and informal care and creating a single continuous variable "hours of non-parental care".

Also of interest was the day of the week, as this gives an indication of whether time in the dependent variables is rescheduled to weekends.

"Saturday" (yes=1) and "Sunday" (yes=1) were entered into the model as dummies.

Entered into the model as controls were variables that previous research has found to independently affect time allocation in sleep, personal care, housework and recreation time (Craig & Bittman, 2005). These were number of children (one child is the omitted category "2 children" yes=1, "three or more children" yes=1) spouses' hours in market work (0–50+), respondent's age (dummies "aged 25–34" yes=1, "aged 45–54" yes=1, "aged 35–44" is omitted), respondent's educational qualifications ("university qualification" yes=1, "vocational qualification" yes=1, no post-school qualifications is omitted), household income in dollars per week ($0–$2300), and whether there was a disabled person in the household (yes=1). For the male analysis, hours per week in market work (0–69) was included as a continuous variable; for the female analysis "single parent" (yes=1) was included as a dummy. The constant terms represent time spent doing the specified activity on a weekday by a married parent of one child under five, who used no non-parental care, had no tertiary educational qualifications and did not live with a disabled household member. The analysis was run separately on fathers, mothers who worked more than 35 hours a week and non-employed mothers.

Neoclassical economic theory holds that time spent in market work and time caring for children fundamentally rests on the price of the mother's time, and are simultaneously determined (Becker, 1981). This implies that if parent-child time is estimated as a function of the mothers' employment in multiple regression modeling, the coefficients will contain simultaneous equations bias. Some address this endogeneity problem by calculating a predicted hours of employment variable from external factors such as local employment rate and female wage, and entering it into the model as a predictor variable (Bryant & Zick, 1996b; Zick et al., 2001). Such use of instrumental variables has not become common practice in the time use literature. Most time use studies use hours of employment as a predictor variable in equations predicting time in childcare and/or unpaid labor (e.g. see Bianchi, 2000; Bittman et al., 2004; Nock & Kingston, 1988; Sandberg & Hofferth, 2001; Sayer et al., 2004). This may partly arise from the difficulty of finding appropriate instruments, and partly from the different intellectual underpinnings of those who study the issue. Whereas economists view the decision to participate in paid work as simultaneous with the decision to spend time performing childcare, sociologists are more likely to regard the decisions as hierarchical, and profoundly influenced by gender

norms (Anxo & Carlin, 2004; Bianchi, 2000; Duncan & Edwards, 2003; England, 2003; Greenstein, 2000; Lewis & Giullari, 2005). This study investigated the time use that is peripheral to the work-care trade-off specifically to elucidate how that trade-off is minimized. The female sample was separated into the two categories of mothers employed full-time and mothers not in the labor force rather than creating instrumental variables, because the multivariate analysis focused not on the work-childcare decision, but rather on the effect of non-parental childcare upon the time that employed women and non-employed women spent in activities that are neither market work nor childcare. The model, variable means and standard deviations can be found in the appendix.

## 4 Results

This chapter first investigated whether childcare was rescheduled around work commitments. In other words, did mothers who both worked and used non-parental childcare shift the time they spent caring for their own children to earlier or later in the day?

Figure 1 shows the percentage of households doing "active childcare" between 6:30 a.m. and 8:00 a.m. The black line represents mothers who work full-time (35 or more hours a week). The dotted line represents mothers who do not participate in the paid workforce. Until 8:00 a.m., the average participation rate in "active childcare" was up to 10 percentage points higher in households in which the mother was employed full-time than in households in which the mother was not employed (significant at <0.05). This suggests that some families with employed mothers began their days earlier, and tapered off their childcare activity earlier in the morning than households with non-employed mothers.

Figure 2 suggests that a similar picture can be found at the other end of the day. Between 8:30 p.m. and 9:30 p.m., employed mothers had a higher average participation rate in "active childcare" tasks than non-employed mothers. Employed mother households were up to 8 percentage points more likely to be involved in "active childcare" tasks after 8:30 p.m. than other families (significant at <0.05). The results imply that children in some of these families were going to bed later than children in non-employed mother households. It should be remembered that these data represent families with children under five years old. The phenomenon of time shifting may be more pronounced in families with older children.

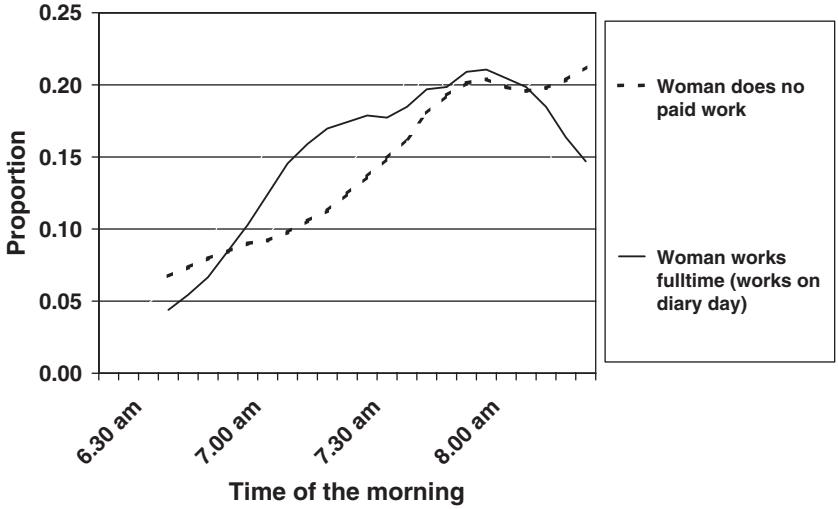


**Fig. 1** Proportion participating in active childcare by workforce status (morning). (Source: ABS Time Use Survey 1997)

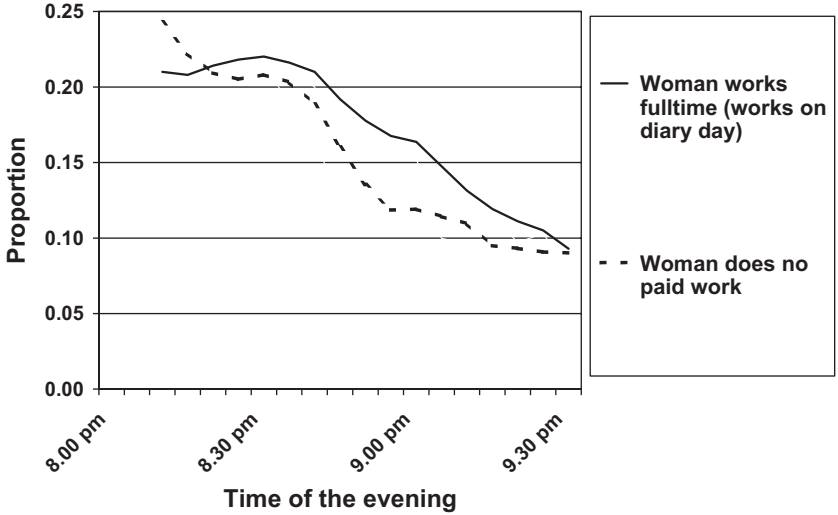


**Fig. 2** Proportion participating in active childcare by workforce status (evening). (Source: ABS Time Use Survey 1997)

### *Multivariate Analysis*

*Unpaid Work*

The constant term for the time employed mothers in the base category[7] spent in unpaid work was just less than 3 hours a day. For comparable non-employed mothers, it was over 5 hours a day, and for fathers with a similar demographic profile it was 2 hours a day, much less time than for either group of women. This reflected the results found by simple descriptive analysis (see Table 5, Appendix), and suggests that some of the time devoted by employed mothers to care of their own children was time that non-employed women allocated to domestic labor such as housework and shopping (see Table 1).

The use of non-parental childcare was associated with a further reduction of women's time in unpaid work such as housework and shopping. Employed women's time in domestic labor was reduced by 1.2 minutes a day in association with every weekly hour of non-parental care (amounting to over half an hour a day for 30 hours of care a week). Employed women's time in domestic labor was predicted to go up with each extra hour of paid work done by their spouses. This amounted to about 15 minutes a day if he worked a standard 35-hour week.

Both fathers and employed mothers were found to catch up on domestic duties on the weekends. Men spent about an hour and a half longer in domestic chores on weekends than on weekdays. The model predicted that employed mothers would do over an hour and a half more housework on a Sunday than on a weekday. Non-employed mothers did not appear to reschedule like this, and averaged no more housework at the weekends than on weekdays.

*Sleep*

Parents get less sleep than non-parents, and relative to the childless, mothers lose more sleep than fathers (Craig & Bittman, 2005). In this study, the mean sleep time of mothers who worked and mothers who do not was fairly similar (Table 5, Appendix), but using non-parental care was associated with a small but significant increase in sleep time for employed mothers. The predicted increase would amount to about 20 minutes a day if the child were in day care for 20 hours a week (see Table 2). The same was the

[7] Aged 35–44, on the average weekly income, has one child under 5, who uses no non-parental care, has no disabled family member and who responded to the diary on a weekday.

**Table 1** Coefficients of hours a day spent in domestic labor

| | *Domestic labor* | | | | | |
|---|---|---|---|---|---|---|
| | *Fathers* | | *Mothers* | | | |
| | | | *Employed* | | *Not Employed* | |
| Constant | 2.01 | *** | 2.98 | *** | 5.09 | *** |
| Non-parental care (hours a week) | -0.00 | | -0.02 | * | -0.00 | |
| Market work (hours a week) | -0.19 | *** | N/A | | N/A | |
| Spouse's market work (hours a week) | 0.10 | | 0.01 | * | 0.01 | |
| Household income ($ a week) | -0.00 | | -0.00 | | -0.00 | |
| Single parent | N/A | | 0.86 | | 0.40 | |
| Number of children | | | | | | |
| Two | 0.09 | | -0.29 | | 0.10 | |
| Three or more | 0.03 | | 0.45 | | 0.71 | * |
| Disabled person in household | 0.43 | ** | 0.16 | | -0.01 | |
| Age | | | | | | |
| 25–34 | 0.12 | | 0.03 | | -0.17 | |
| 45–54 | 0.24 | | -0.64 | | 1.20 | |
| Qualifications | | | | | | |
| University | 0.02 | * | -0.19 | | -0.48 | |
| Vocational | 0.23 | | 0.09 | | 0.03 | |
| Day of the week | | | | | | |
| Saturday | 1.57 | *** | 0.73 | | -0.41 | |
| Sunday | 1.46 | *** | 1.58 | ** | -0.52 | |
| R square | 0.139 | | 0.139 | | 0.075 | |
| N | 801 | | 168 | | 421 | |

Source: ABS Time Use Survey 1997; **P*-value < 0.05, ***P*-value < 0.01, ****P*-value < 0.001

Male table shows marginal effect from Tobit regression analysis

case for fathers, but there was no equivalent effect for non-employed mothers.

On average, all parents got some extra sleep on a Sunday. Fathers averaged an hour and six minutes more, employed mothers 42 minutes more, and non-employed mothers 37 minutes more sleep than on weekdays. Fathers, but not mothers in either group, also enjoyed extra sleep on Saturdays (25 minutes). For women, post-school education was associated with less time sleeping—for non-employed women with either university or vocational qualifications it was about half an hour a day. Employed women with a university education were predicted to average about 40 minutes less sleep than other employed women.

**Table 2** OLS coefficients of hours a day spent sleeping

| | *Sleep* | | | | | |
|---|---|---|---|---|---|---|
| | *Fathers* | | *Mothers* | | | |
| | | | *Employed* | | *Not employed* | |
| Constant | 8.81 | *** | 8.37 | *** | 8.36 | *** |
| Non-parental care (hours a week) | 0.01 | * | 0.01 | ** | 0.00 | |
| Market work (hours a week) | -0.00 | | N/A | | N/A | |
| Spouse's market work (hours a week) | 0.00 | | 0.00 | | 0.00 | |
| Household income ($ a week) | -0.00 | *** | 0.00 | | 0.00 | |
| Single parent | N/A | | 0.30 | | 0.05 | |
| Number of children | | | | | | |
| Two | 0.01 | | -0.18 | | -0.18 | |
| Three or more | -0.14 | | -0.25 | | -0.45 | * |
| Disabled person in household | -0.20 | | -0.17 | | -0.03 | |
| Age | | | | | | |
| 25–34 | -0.18 | | 0.18 | | -0.01 | |
| 45–54 | 0.19 | | -0.02 | | -1.59 | |
| Qualifications | | | | | | |
| University | -0.10 | | -0.57 | *** | -0.56 | ** |
| Vocational | 0.02 | | -0.29 | | -0.46 | ** |
| Day of the week | | | | | | |
| Saturday | 0.42 | ** | 0.29 | | 0.37 | |
| Sunday | 1.10 | *** | 0.70 | * | 0.63 | ** |
| R square | 0.098 | | 0.111 | | 0.068 | |
| N | 801 | | 168 | | 421 | |

Source: ABS Time Use Survey 1997; *$P$-value < 0.05, **$P$-value < 0.01, ***$P$-value < 0.001

*Personal Care*

The constant terms of the regression results suggested that there was a considerable difference in the average amount of time employed and non-employed women in the reference category spent in personal care activities such as eating, drinking, bathing, grooming and dressing (see Table 3). This was another activity in which employed mothers in the reference group averaged substantially less daily time than otherwise similar non-employed mothers. Employed mothers in the reference category spent, on average, just under two hours a day in personal care activities, whereas non-employed women in the reference category averaged just over three hours a day. So personal care time is another activity that could be a source of time that employed mothers devote to childcare. Fathers in the

**Table 3** OLS coefficients of hours a day spent in personal care

| | *Personal care* | | | | | |
|---|---|---|---|---|---|---|
| | *Fathers* | | *Mothers* | | | |
| | | | *Employed* | | *Not employed* | |
| Constant | 2.38 | *** | 1.90 | *** | 3.08 | *** |
| Non-parental care (hours a week) | 0.00 | | -0.04 | | 0.03 | * |
| Market work (hours a week) | -0.00 | | N/A | | N/A | |
| Spouse's market work (hours a week) | -0.00 | | 0.00 | | 0.00 | |
| Single parent | N/A | | 0.19 | | 0.23 | |
| Number of children | | | | | | |
| Two | -0.00 | | -0.11 | | -0.55 | ** |
| Three or more | -0.04 | | -0.11 | | -0.67 | *** |
| Disabled person in household | -0.05 | | 0.12 | | 0.25 | |
| Age | | | | | | |
| 25–34 | 0.01 | | -0.10 | | -0.34 | * |
| 45–54 | 0.33 | | -0.46 | | 0.02 | |
| Qualifications | | | | | | |
| University | 0.04 | | 0.07 | | -0.22 | |
| Vocational | -0.12 | | -0.07 | | -0.23 | |
| Household income | 0.00 | | 0.00 | | -0.00 | |
| Day of the week | | | | | | |
| Saturday | 0.20 | | 0.52 | * | 0.30 | |
| Sunday | 0.43 | ** | 0.18 | | -0.20 | |
| R square | 0.036 | | 0.051 | | 0.091 | |
| N | 801 | | 168 | | 421 | |

Source: ABS Time Use Survey 1997; **P*-value < 0.05, ***P*-value < 0.01, ****P*-value < 0.001

reference category averaged nearly two hours and twenty minutes a day in personal care which, though 48 minutes less than non-employed mothers, was 25 minutes more than employed mothers.

The use of non-parental care did not predict that employed mothers would be freed up to increase their time in their own personal care. Non-employed mothers, in contrast, did gain personal care time from the use of extra-household childcare. For every hour a non-employed mother used day care for her child, she added 0.03 of an hour to her personal care time. This would mean an increase of 23 minutes a day for the average duration of non-parental care (for non-employed mothers who use care) of 13 hours a week.

There was no difference in the time non-employed mothers spent in personal care on the weekends than during the week. In contrast, both

fathers and employed mothers made up the deficit in their daily personal care time at weekends by spending, for fathers, 24 minutes longer on Sundays, and for employed mothers, half an hour more on a Saturday. Lower personal care time was for non-employed women associated with having more children (33 minutes less when there were two children, and 40 minutes less when there were three children or more).

*Childfree Recreation*

None of the independent variables, including non-parental childcare use, was associated with an increase in childfree leisure time for employed mothers (see Table 4). In contrast, using non-parental childcare did increase fathers' childfree leisure time. The gain in childfree leisure for a

**Table 4** Tobit regression analysis: marginal effects of one unit change upon hours a day spent in childfree recreation

| | *Childfree recreation* | | | | |
|---|---|---|---|---|---|
| | *Father* | | *Mothers* | | |
| | | | *Employed* | *Not employed* | |
| Constant | 0.63 | *** | -0.01 | 0.26 | ** |
| Non-parental care (hours a week) | 0.01 | ** | -0.00 | 0.08 | ** |
| Market work (hours a week) | -0.00 | | N/A | N/A | |
| Spouse's market work (hours a week) | -0.01 | * | -0.00 | -0.00 | |
| Single parent | N/A | | 0.27 | 0.00 | |
| Number of children | | | | | |
| Two | -0.34 | ** | -0.00 | -0.17 | |
| Three or more | -0.26 | ** | 0.00 | -0.33 | ** |
| Disabled person in household | -0.14 | | 0.00 | -0.00 | |
| Age | | | | | |
| 25–34 | -0.12 | | 0.14 | -0.11 | |
| 45–54 | 0.17 | | -0.10 | 0.38 | |
| Qualifications | | | | | |
| University | -0.34 | *** | 0.01 | -0.06 | |
| Vocational | -0.23 | ** | 0.05 | -0.03 | |
| Household income | 0.00 | | 0.00 | 0.00 | * |
| Day of the week | | | | | |
| Saturday | 0.37 | * | 0.05 | 0.13 | |
| Sunday | 0.18 | | 0.06 | -0.13 | |
| N | 801 | | 168 | 421 | |

Source: ABS Time Use Survey 1997; **P*-value < 0.05, ***P*-value < 0.01, ****P*-value < 0.001

father of a child who spent 20 hours a week in non-parental care was 12 minutes a day. This may suggest that when the employed couples did not use day care, the fathers were to some degree participating in childcare and losing some childfree leisure time.

Non-employed mothers also were found to gain childfree leisure from the use of extra-household childcare. They were predicted to gain nearly five minutes childfree leisure a day for every hour their child spent in non-parental care. This would amount to just over an hour a day if the average care duration of 13 hours a week (for non-employed mothers who use care) were used. Also, there was an extremely small (less than 0.001 of an hour for every extra dollar earned) but significant effect on childfree leisure of non-employed women associated with household income. No similar effect was found for employed mothers. No mothers gained childfree leisure on the weekends. Fathers, in contrast to both groups of women, averaged 24 minutes more childfree leisure on a Saturday than on a weekday.

In summary, the results of this study provide some support for the hypothesis that employed mothers try to avoid trading off time in market work and childcare by, in comparison with non-employed women, reducing the time they spend in non-work and non-childcare activities. In particular, employed mothers averaged less time in unpaid work other than childcare, and in personal care activities such as grooming, dressing and bathing. The study found some evidence that these activities may be squeezed out because employed mothers reschedule childcare activities later or earlier in the day. Mothers employed full-time were more likely to begin childcare activities earlier in the morning, and end them later at night, than non-employed mothers.

On the question of whether parents use non-parental childcare to make adjustments in other forms of time use and to shift the times when they are together with their children, the results were mixed. While employed mothers averaged less time in housework, personal care and childfree leisure time than other parents, the results of the multivariate analysis indicate that the use of non-parental childcare did not assist employed mothers to find more time in these activities than employed mothers who used no non-parental childcare. This may indicate that employed mothers used non-parental care to shift childcare time, rather than time in other activities. Fathers and non-employed mothers both gained more flexibility from the use of non-parental care than did employed mothers. The use of non-parental care was found to be associated with more daily sleep and childfree recreation for fathers, and with more daily personal care and childfree recreation for non-employed mothers. Employed mothers got almost no childfree recreation, and the use

of non-parental care on a workday did not predict any increase. The results imply that non-employed mothers use non-parental childcare to reschedule daily activities, and employed mothers just give up daily time in those activities and direct it to either paid work or childcare.

There was, however, a slight gain in daily sleep time found from the use of non-parental childcare for employed mothers. Also, employed mothers did use the weekends for rescheduling. They caught up on the weekends on some of the non-work and non-childcare activities they did not do during the week. Employed mothers spent more time in personal care on the weekend. That non-employed mothers did not imply that they had time during the week to perform sufficient personal care activity. Employed mothers also performed more unpaid work on a Sunday, again partially making up for time non-employed mothers could find during the week. Even with this weekend input, however, employed mothers did not match the average amount of time non-employed mothers devoted to unpaid work, which suggests that in households with employed mothers, some housework was simply left undone. The exception to the weekend time catch-up was childfree leisure. Employed mothers spent any leisure time they had with their children also present. Even at weekends, employed mothers did not allocate time to leisure away from their children. In contrast, fathers found a little more childfree leisure time on Saturdays.

## 5 Conclusion

This study set out to investigate how Australian mothers who undertake paid labor or place their children in non-parental care manage to spend substantially similar amounts of time in childcare activities as other mothers. It hypothesized that employed mothers try to avoid an unacceptable trade-off between time in paid work and time in care for their own children through shifting or reducing other forms of time allocation. Specifically, it investigated whether employed mothers average less time in the non-work and non-childcare activities of unpaid work, sleep, personal care and childfree recreation, whether they reschedule these activities to weekends, and/or reschedule childcare to later or earlier in the day, and whether non-parental childcare is used to facilitate such time reduction and rescheduling. It is acknowledged that how parents arrange their time around work and childcare will be influenced by a wider range of factors than is addressed in this study. However, previous research has found employed mothers of young children report feeling the most time-pressured of all demographic groups (Bittman, 1999), and the findings in

this study contribute to understanding of why this is so. They suggest that contemporary mothers place a very high value on both maintaining their attachment to the paid workforce and spending time with their own children and are reluctant to trade the one off against the other. Since some of the time that working mothers preserve for market work and childcare is found by reducing time in personal care and leisure activities, the findings imply that they may seek to avoid adverse outcomes to their employers or to their children at a potential cost to themselves. Research using data from other countries would test and extend this investigation.

## Appendix

**Table 5** Means and standard deviations of variables

| | *Fathers N=801* | | *Mothers* | | | |
|---|---|---|---|---|---|---|
| | | | *Employed fulltime N=168* | | *Not employed N=421* | |
| | *Mean* | *S.D.* | *Mean* | *S.D.* | *Mean* | *S.D.* |
| *Dependent variable* | | | | | | |
| Hours a day domestic labor | 1.98 | 1.85 | 3.05 | 2.17 | 5.07 | 2.33 |
| Hours a day sleep | 8.18 | 1.74 | 8.32 | 1.47 | 8.24 | 1.55 |
| Hours a day personal care | 2.13 | 1.21 | 1.98 | 0.98 | 2.27 | 1.40 |
| Hours a day childfree recreation | 0.62 | 1.55 | 0.24 | 0.69 | 0.28 | 0.72 |
| *Independent variables* | | | | | | |
| Non-parental care (hours a week) | 11.30 | 13.94 | 27.27 | 16.5 | 5.36 | 9.50 |
| Market work (hours a week) | 39.45 | 14.27 | N/A | | N/A | |
| Spouse's market work (hours a week) | 13.01 | 16.12 | 35.6 | 17.8 | 31.9 | 19.5 |
| Household income ($ a week) | 940 | 434 | 1235 | 469. | 668 | 312 |
| Single parent | N/A | N/A | 0.09 | 0.29 | 0.11 | 0.32 |
| Number of children | 2.09 | 0.92 | 1.70 | 0.78 | 2.25 | 0.91 |
| Disabled person in household | | | | | | |
| Age | 35.39 | 5.48 | 0.21 | 0.44 | 0.25 | 0.44 |
| Qualifications | | | | | | |
| University | 0.32 | 0.47 | 0.35 | 0.48 | 0.30 | 0.35 |
| Vocational | 0.34 | 0.48 | 0.18 | 0.38 | 0.20 | 0.40 |
| Day of the week | | | | | | |
| Saturday | 0.15 | 0.30 | 0.13 | 0.33 | 0.14 | 0.30 |
| Sunday | 0.13 | 0.34 | 0.12 | 0.30 | 0.15 | 0.36 |

Source: ABS Time Use Survey 1997

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PART III

# Labour and Institutions

# Labour Policies for All Tastes

*Pedro Goulart, Gianluca Ferrittu, and Raul Ramos*

## 1 Introduction

In recent years, the role of institutions has been acknowledged as paramount to labour markets and in recent syllabi and textbook revisions have led to the mainstreaming of its crosscutting influence (e.g., Rodrik et al., 2004; Boeri & van Ours, 2021). The term itself, institutions, related concepts, and what it encompasses for different social sciences has been a

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topic of debate (Hodgson, 2006).[1] A loose definition is the framework that constrains (or enables) the action of social actors. Institutional change can occur either from evolution, as emphasised by North (1991), but also from rupture as noted by Piketty (2015).

Structural reforms are strongly associated with institutional change, and social dialogue has been a key venue to discuss these matters in an inherently political process (Afonso, 2013; Amable, 2016). In the post-Cold War and pre-great recession setting, Baccaro and Howell (2011) argue centralised bargaining contributed towards market liberalisation, after reviewing quantitative evidence for 15 advanced countries and 6 country case studies. This was the time of increasing the age of retirement, decreasing layoff requirements, or even increasing the working hours. As one of our students put it: "these refer to bad changes, that hurt people". While it is certainly more complex than this, most reforms seemed to decrease the well-being of individuals and households or, at least, relative power of workers. Nowadays, structural changes seem to be going on in the other direction, with increasing minimum wages and calls for reduction in working hours—see, for instance, Gomes (2021, 2022).

Minimum wage, unemployment, or anti-discrimination policies are key institutions in developed economies. Preferences regarding inequality or deprivation can certainly play a role in which stance to take, but it is what we decide to act that will condition outcomes. In short, it "depends on the institutions and policies that societies choose to adopt" (Piketty & Saez, 2014).

## 2 Minimum Wage

Perhaps one of the most topical debates on institutions has been on minimum wages. Evidence for the US tends to favour increases as there seems to be no trade-off with unemployment/labour demand, since the influential Card and Krueger (2015 [published originally in 1995]) and more recently confirmed by Dube et al. (2007) and Dube et al. (2010). Evidence in the literature suggests there is no effect on more vulnerable workers as low earners (Cengiz et al., 2019) or as teens (Allegretto et al., 2017). Organisational productivity seems to be able to support the wage increase in what can be understood as a matter of primary redistribution.

[1] Granovetter (2005) stresses the role of social structure and social networks on labour markets.

But the generalisation of these results should be made with caution. The degree of product and labour demand elasticity is relevant for assessing potential consequences on minimum wage increases.[2] Cengiz et al. (2019) do find an effect of increasing unemployment for tradeable sectors. For a small open economy such as Portugal, Alexandre et al. (2020) find significant increases in minimum income are positively correlated with firm exit. Pereira (2003) finds the equalisation of youth to adult minimum wages increased youth unemployment in Portugal. In the Netherlands, the existence of an increasing minimum wage until 25 years old has been used as a quasi-experiment for the employment trade-off (Marimpi & Koning, 2018; Kabátek, 2021). For developing countries, many informal workers may not be covered by minimum wage legislation (Gindling, 2018).

Once seen as potentially causing unemployment, minimum wages are currently some kind of silver bullet for inequality. While there are marked differences in minimum-wage settings across the world, namely depending on development status, in the developed world, there is a strong policy move towards increases in minimum wages (Dingeldey et al., 2021). For example, the European Commission has endorsed higher minimum wages in Europe in 2020.[3] General increases across countries facilitate the implementation, but unilateral country decisions may have detrimental effects. Paul Krugman, who was once a visiting junior economic adviser to Portugal in his early years, was cautious when confronted with the recent programmed minimum wage increases in this country: "I am a great supporter of minimum income increase in the U.S., but there the wage is very low and we have our own currency" (Aguiar & Jorge, 2015). The importance of the context to fully understand the impact of the minimum wage increase and other other policies cannot be overstated (see, e.g., Rodrik, 2009).

In the end, balancing out benefits and downsides should be fundamental to implement the change. Wage compression can also be a downside for the job satisfaction of low-wage workers (Storer & Reich, 2021). In contrast, there are other benefits of an increase in the minimum wage. It

[2] See, for example, the discussion in Rodrik's (1998) "Has Globalization Gone Too Far" where he argues that "the main impact of globalization on labor markets may well be the increase in the (actual or perceived) elasticity of demand for unskilled workers".

[3] "[T]he political embrace of high minimum wages seems to partially emerge from a shift in the way some political and economic elites view the sources of economic growth (see, e.g., Georgieva, 2019), from focusing on 'cost-competitiveness' to labour productivity (Miró, 2021)" (Miró, 2021, p. 2).

can upgrade the production technology by helping firms to take technological choices to improve average productivity and support higher wages and/or eliminate the firms that do not (van den Berg, 2003; Alexandre et al., 2020). In difficult moments, it can be a way of mobilising low-wage workers and signal concern for everyone's standard of living. But if this is the case, maybe broader approaches such as the living wage may be more adequate, because it includes other considerations than the wage that may affect disposable income such as transfers or taxes (Reich et al., 2005; Anker, 2011; Prowse & Fells, 2016; Fields & Kanbur, 2022).

## 3 Unemployment

Card et al. (2010) perform a meta-analysis and contrast four main potential active labour market policies: training; job-search assistance; subsidised private sector employment; and subsidised public sector employment. Job-search assistance has on average higher short-run impact, while training increases considerably its impact in the medium run. Lalive et al. (2008) find that results of active labour market policies are sensitive to estimation issues. The spillover effects can also be relevant, and public employment can lead to (modest) increases in employment in the private sector (Becker et al., 2021). Apart from public sector initiatives, informal networks are also important and when social ties of immigrants are stronger, their likelihood of getting a job offer increases (Goel & Lang, 2019). Large recessions create additional challenges with widespread consequences, often unpreparedness of policymakers and advisors, and a need to revise the policy options until then more used (Islam & Verick, 2011).

Countries have opted systematically for different strategies regarding employment policies. Figure 1 contrasts unemployment rates between China, Europe, Japan, and the USA with their very different systems throughout the period under analysis. China and Japan present systematically low unemployment rates, reflecting Chinese high labour demand and Japan's subsidised employment given the high social value attributed to employment. The United States presents a very volatile unemployment rate following the business cycle, forcing labour to adjust accordingly, including internal migrations, but recovering fast. Europe presents high unemployment, with subsidies smoothing the life of the unemployed, but on average unable to offer an occupation to many. Nonetheless, the by far best results regarding employment seem to be associated with lower

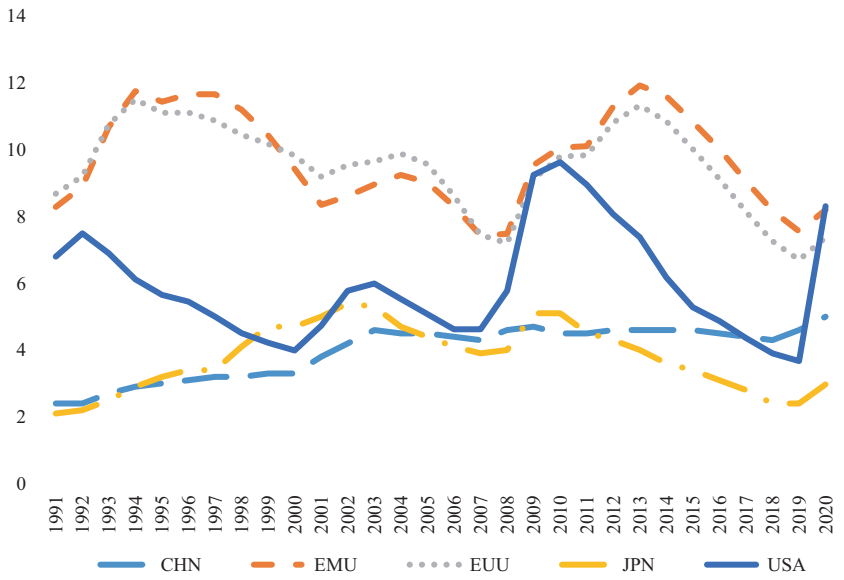


**Fig. 1** Unemployment levels (%), selected countries, 1991–2020. (Note: EMU: Euro Area; EUU: European Union. Source: World Bank)

economic growth (Japan) or a long-term increasing trend of unemployment (China).

However, not all jobs are the same. Rodrik and Stantcheva (2021) elect labour market dualisation as the main problem in today's labour market and propose a four-pronged approach to promote "good jobs". In short, the co-production of policies by the State, firms, and other actors can be the way forward.

## 4 Fighting Discrimination

The mainstreaming of concerns on gender and/or ethnic discrimination was a mark of this post-Cold War scenario and we know today considerably more about this. We have extensively measured sectoral and female wage discrimination compared to male workers of similar characteristics (e.g., Card et al., 2016). Measuring discrimination in the recruitment process presented additional challenges, but the experimental design followed in many pieces of research has opened new avenues. Auditions for

orchestras in which the evaluators cannot see the gender of the candidate given that he/she is behind a curtain have improved 50 per cent the probability of a woman to pass to the next phase, and even more the chances of being selected (Goldin & Rouse, 2000). However, in most organisations, you cannot "blindly" access one's work, and it is more difficult to correct for discrimination. For example, organisations that promote and reward meritocracy may in fact reinforce discrimination (Castilla & Benard, 2010).

Ethnical discrimination is cumulative and starts much sooner than the labour market. By applying mocked "twin" exams, Sprietsma (2013) finds that students with a Turkish name in Germany have a small but persistent penalty, with teachers with more experience being more biased. Measuring discrimination in the recruitment process has used extensively the technique of sending mocked "twin" CVs that only differ in the characteristic(s) of interest, with the applicant's name identifying his/her as a member of the "norm" or "minority" population. Bertrand and Mullainathan's (2004) seminal paper finds that applicants associated with the white population in the US had a 50 per cent higher probability of being called for an employment interview than their Afro-Americans "twins". In addition, having better qualifications improve the probability of being called for whites, but only negligibly for blacks.

Studies in other countries find also 50 per cent higher callback rates for Swedish versus Middle Eastern-sounding names (Carlsson & Rooth, 2007) or even double for Belgians versus Turks (Baert et al., 2015). In Australia, Booth et al. (2012) find that in order to get as many interviews as an applicant with Anglo-Saxon sounding names, an Indigenous person must submit 35 per cent more applications, a Chinese person 68 per cent more applications, an Italian person 12 per cent more applications, and a Middle Eastern person 64 per cent more applications. Discrimination can start as early as in traineeship in Germany (Kaas & Manger, 2012), and smaller companies discriminate more in Sweden and Germany (Aslund et al., 2014; Kaas & Manger, 2012).

While most of the literature has focused on the analysis of interview call rates, nothing secures that there is no discrimination in the final choice of the job. Andriessen and Dagevos (2014) train "twin" actors to go to the interviews to homogenise their behaviour. While the Dutch have a 12–27 per cent increased likelihood to be called for an interview, discrimination in the selection to offer the post can be three times higher.

Tackling discrimination has been considerably difficult, but the literature provides clues. In difficult positions to fill in the market may help,

with Belgians and Turks having similar chances of being called for an interview (Baert et al., 2015). Employer-employee data for Sweden suggest employers hire within their ethnic group: Swedes contract Swedes, immigrants hire immigrants (Aslund et al., 2014), suggesting providing selected minorities with capital could make a difference. Discrimination seems also to be highly related to asymmetric information and filling that gap helps. Young "Turkish" candidates to traineeship with a recommendation letter (Kaas & Manger, 2012) or previous employees that are immigrants (Aslund et al., 2014) find no discrimination. However, Oreopoulos' (2011) study on the situation of skilled migrants in Canada suggests that the difference in callback rates is not reduced by self-reported information. Employers seem to lack faith in applicants and need to rely on their own or third-party experience that is perceived to be reliable.[4] Quotas, visible role models and self-help groups may also play an important role in fighting discrimination.

## 5 In This Section: Labour and Institutions

Since 1991, labour market institutions did not lose their importance in relation to megatrends and economic shocks, but they have impacted the characteristics and changes of labour, and the world of work itself. Part III, "Labour and Institutions", surveys these issues, by collecting nine contributions about changes and impacts of socioeconomic and labour institutions over the last three decades.

Since the end of the Cold War, the interest in the role that institutions can play in economic development has grown considerably. In this period prescribing and demanding certain institutional reforms to developing countries has been a largely implemented paradigm for overcoming development challenges. This has been based on the work of New Institutional Economics' famous scholars such as Douglas North, who defines institutions as the "economic rules of the game" of a given society (North, 1991: p. 98), emphasising the intrinsic importance of certain "liberalised" institutions for promoting economic development. These ideas were re-elaborated by the main development organizations, and have been largely integrated into the theoretical framework of the Washington Consensus

[4] Following traditional quotes: "Faith is to believe what you do not yet see; the reward for this faith is to see what you believe" (Saint Augustin, four to fifth centuries); "Seeing is believing, but feeling is the truth" (Thomas Fuller, seventeenth century).

paradigm and policies (Birdsall et al., 2010). But which institutions matter and how is it possible to acquire them?

Chapter 20 in this volume, by Rodrik (2022), addresses these questions by surveying the types of non-market institutions that may help markets to perform adequately, and by discussing the importance of participatory and democratic political systems as meta-institutions. Particularly, the chapter assesses five market-supporting institutions that better fit the path for development, namely "property rights, regulatory institutions, institutions for macroeconomic stabilisation, institutions for social insurance, and institutions of conflict management". It follows an analysis of the appropriate strategies for institution building, with a particular emphasis on the importance of local knowledge. Rodrik (2022) finds that participatory democracies seem to enable higher-quality growth, and allow to aggregate and exploit local knowledge efficiently. This would be possible thanks to the characteristics of these institutions, such as stability, predictability, and resilience. In this chapter, some implications for the design of conditionality are also considered. While institutional requirements and convergence may be useful, Rodrik highlights that international financial institutions models are still biased towards a neoliberal paradigm of the capitalist economy. According to the author, this may be restrictive in terms of potential institutional variations and can neglect the importance of local knowledge. Conditionality should thus be restricted to basic political freedom.

In line with the increasing importance of labour institutions in the international debate, since the end of the Cold War, efforts have been defined to promote a common international legal framework on labour and social standards. As such, international labour standards have been promoted in most of today's developing countries. But to what extent has this approach impacted the actual labour market outcomes around the Global South?

Chapter 21, by Caraway (2022), explores this topic by analysing the international influences on labour standards and labour market flexibility in East Asia. The author addresses this issue by evaluating to what extent international pressures, defined since the 1990s, have impacted labour standards and labour market flexibility in the region. This is done by studying trade legislation and trade agreements implementation through domestic policies, and codes of conduct from multinational corporations. Caraway's findings show that de jure labour standards, such as collective labour rights, have been developed since the 1990s, and that this trend did

not imply further de jure flexibilisation of labour markets in different types of regimes. Yet practice does not always reflect law regulations, and weak enforcement is still preponderant in the region studied. The author argues this issue may hamper more heavily labour rights now, in democracies, compared to the past, in authoritarian regulations. This is because lack of enforcement is unlikely to damage labour rights when unions and other labour agencies are mainly illegal or scarcely protected. Caraway (2022) suggests that the rising de facto flexibility in East Asia seems mainly driven by domestic initiatives, and it is deeply interlinked with ineffective labour law enforcement, which has pushed more workers towards illegal forms of work flexibilisation.

Historically, labour institutions have also played a fundamental role in regulating working hours. Chapter "The Recent Movement Towards a Four-Day Working Week", by Gomes, discusses the recent movement towards a four-day working week. Starting from his new book *Friday Is the New Saturday*, the author discusses the potential positive outcomes linked with reducing the number of working days, overviewing the beneficial impacts at the macro level. He also analyses the costs of the implementation and possible adjustment mechanisms necessary to minimise the disruptive effects of this transition. While the literature on the topic is generally focused on positive outcomes at the company level and management practices, Gomes innovates by surveying the potential macro-benefits of shorter working weeks for all labourers in the economy. By doing so, Gomes develops eight analytical arguments based on the theoretical assumptions of four famous economists, for example, Keynes, Schumpeter, Marx, and Hayek. In the chapter, the author argues that reducing working days may stimulate aggregate demand and supply, which will mitigate potential labour market risks such as underemployment and labour polarisation. Consequentially, this would also positively affect democracy stability through redistribution. Gomes also argues this change is not exclusively a matter of the most developed economies, highlighting the potentialities for developing countries. While the working week "is a social, political and economic construct", the chapter thus suggests reducing the number of working days should be a current issue of debate.

Trade unions are not only conceptualised as economic agents, but they can also be framed as social institutions historically given, which can influence the employment and unemployment rates of particular groups in the labour markets (see, for instance, Sugeno, 1994), and the access to and characteristics of work. Chapter 23, by Bertola et al. (2022), contributes

to this issue by studying the aggregate impact of collective bargaining on the employment and unemployment rates of youth, women, and older individuals. The authors provide a novel interpretation of the effects of labour markets institutions on demographic employment patterns, using a panel dataset from different OECD countries over the period 1960–1996. Bertola et al. (2022) find that countries where unions have a strong influence on labour market outcomes are likely to have relatively low employment levels among the young, older individuals, and women and relatively high unemployment rates among prime-aged women and young men. Hence, the findings show that unionisation is likely to reduce employment more for groups with the most elastic labour supply. Bertola et al. (2022) suggest this is because organised labour is more likely to accept low employment levels for these particular social groups (e.g., young, older individuals, and women) with strong alternatives to labour markets that are "nearly as good as paid employment", in exchange with higher average compensations.

Yet labour market institutions interact with employment and unemployment in several ways. Re-employment support schemes, and unemployment benefits and programmes can be important mechanisms for decreasing unemployment and fighting poverty. However, these institutions may also be responsible for the persistence of unemployment (Sachs & Smolny, 2015). This happens when more generous benefits reduce the profitability of search efforts of workers, thus reducing the unemployment outflow rate. Chapter 24 of this section, by Lalive et al. (2022), studies to what extent changes in the duration of unemployment benefits impact the equilibrium unemployment rate in Austria. The authors analyse the joint effects of benefit duration on the unemployment outflow and inflow by using microdata. This is possible thanks to a quasi-experimental event led by a change in the Austrian unemployment insurance system defined in 1989, which increased the maximum duration of unemployment benefits for specific groups of workers. The authors report that the policy change has increased the steady-state unemployment rate, especially for the older age group. Lalive et al. (2022) findings thus show that the potential benefits duration extension increases the profitability for employed workers to become unemployed, and that this inflow effect on the equilibrium unemployment rate is larger than the outflow effect. This implies that extended unemployment benefits are likely to increase the attractiveness of unemployment for workers. In terms of policy implications, Lalive et al.

(2022) suggest the importance of shortening potential benefits duration extension as an instrument to increase the employment rate.

Institutions as social protection schemes can also be extremely relevant in dealing with labour market risks, such as negative effects of labour market changes caused by external shocks, and multidimensional poverty. Chapter 25, by Shigute, Mebratie, and Bedi (2022), contributes by surveying two social protections systems defined in Ethiopia, namely the Productive Safety Net Programme (PSNP), and the Community-Based Health Insurance (CBHI) scheme. As the authors report, the objective of the PSNP is to cope with short- and long-term food security issues by providing food or cash in exchange for labour contributions for rural infrastructures and construction of local assets for agricultural production sustainability. This is done by distinguishing between direct support and public work beneficiaries of the scheme, and by implementing public works focused on soil conservation and flood control, as the two main identified causes of food insecurity in the country. The CBHI is aimed to promote universal access to the healthcare system and improve financial protection and healthcare services by generating revenues for improving quality care. It consists of collective health insurances, which bring together premium insurance payments of communities into common funds to cover healthcare services of the members of the community in local centres and hospitals. In this chapter, Shigute, Mebratie, and Bedi (2022) review the evolution of these schemes and the empirical work defined in the literature. Their analysis suggests both the schemes have been associated with positive social protection outcomes. While these interventions have been scaled up or replicated in urban areas, the geopolitical tension in the region risks compromising future promising development outcomes.

However, the methods applied to assess labour market policies are not undisputed. Chapter "How Impact Evaluation Is Shaping the Design of Labour Market Policies", by Escudero (2022), contributes to this section by studying to what extent impact evaluation is shaping the design of labour market policies. The author discusses theoretical and practical progresses achieved in labour economics in the implementation and evaluation of causal inference. She also overviews the ethical and political concerns and the practical limits of this type of methods. Escudero (2022) observes that in the last 20 years the popularity of impact evaluations has significantly increased in the discipline, but also, more generally, in applied empirical economics. According to the author, this process is linked with

changes in the conceptualisation of methods and research designs applied in empirical economics, and the availability of more and better data and tools to conduct experimental and quasi-experimental analyses. As such, Escudero (2022) reports the substantial increase of evaluation studies in labour economics and discusses the governmental and institutional support for applying these methods in policy formation and implementation. Despite the increased popularity and clear benefits of this approach, especially in academic debates (see, for instance, the 2019 Nobel Prize in Economics sciences awarded to Duflo, Banerjee, and Kremer for "their experimental approach to alleviating global poverty"[5]), evaluation studies are not undisputed (see Sindzingre, 2019). Unsolved methodological and ethical issues, such as who benefits from the intervention and who does not, political biases in the experimental implementation, and difficulties in aggregating and generalising the various findings, are thus discussed in this chapter.

Whilst various indices to assess changes in the world of work have been defined in the last years, it is still a challenge to identify signs of progress, especially in developing economies. Chapter 27 of this section, by Khalid, Sharma, and Dubey (2022), contributes by surveying the Sustainable Development Goals data gap and availability in India. The authors provide an analysis of existing SDG information gaps for the country indicators and propose a selection of the Most Representative Indicators ("MRI"). This set is then applied for developing and studying an alternative SDG index at the sub-national level. Khalid, Sharma, and Dubey (2022) show that, in India, for less than half of the SDG indicators there is scant availability of data. At the sub-national level, whilst southern states perform better than the rest of the country, the authors stress the importance to act towards some particular SDGs, such as "zero hunger, gender inequality, climate action, clean water and sanitation, decent work and economic growth, energy and sustainable cities". The authors argue that government interventions are thus required to strengthen the statistical and data collection capacity of the country, and that data gaps and quality may be improved through new data computation techniques and international collaborative programmes. Khalid, Sharma, and Dubey's (2022) results also confirm that high GDP per capita is not enough to ensure human development goals achievement in India, and that regional benchmarking

[5] See *Press release: The Prize in Economic Sciences 2019*. Available at [https://www.nobelprize.org/prizes/economic-sciences/2019/press-release/]. Last access: 01/09/2021.

states can be a functioning monitoring option for developing countries with similar regional diversity and governmental systems.

Last, it is well known institutional arrangements of labour are particularly important in dealing with economic crises and megatrends. Chapter 28, by Vos (2022), concludes this section by surveying the poverty reduction strategies adopted in Bolivia, Honduras, and Nicaragua since 1999 (e.g., The Poverty Reduction Strategy Papers), and by studying the impact of the 2008 global economic crisis on the achievement of the millennium development goals (MDGs) and poverty reduction targets. In the chapter, Vos (2022) analyses the macroeconomic and financing constraints associated with the poverty reduction strategies in Bolivia, Honduras, and Nicaragua, outlining the quantitative links between aggregate economic growth, social spending, and poverty reduction, accounting for economic shocks. This is done by reporting a model-based analysis about the macroeconomic trade-offs in achieving poverty reduction and human development goals. The findings show that macroeconomic financing constraints, also related to the great recession, are likely to be an obstacle to human development goals achievement in the three countries studied. Vos (2022) argues that for coping with the crisis, additional spending on education, health and basic services would be needed in order to achieve the MDGs. Yet this strategy seems unlikely to be enough to achieve the pre-crisis level of GDP and employment growth due to potential decreases in private sector demand. As such, the author reports that increased social spending would be important for promoting sustainable economic growth in the post-crisis period, together with "non-debt creating development assistance", stronger exports demand, and investments in public infrastructures. Vos (2022) also highlights the importance of defining effective medium-term macroeconomic interventions at the national level, accounting for potential shocks, to better identify future "needs for external development finance" and avoid policy conditionality.

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# Institutions for High-Quality Growth: What They Are and How to Acquire Them

*Dani Rodrik*

*Sakenn pe prie dan sa fason*
*(Everyone can pray as he likes.)*
—*Mauritian folk wisdom* (Taken from Miles (1999))

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## 1 Introduction

The comparative experience with economic growth over the last few decades has taught us a number of important lessons. One of the more important of these is the importance of private initiative and incentives. All instances of successful development are ultimately the collective result of individual decisions by entrepreneurs to invest in risky new ventures and try out new things. The good news here is that we have found *homo economicus* to be alive and well in the tropics and other poor lands. The idea of "elasticity pessimism"—the notion that the private sectors in developing countries would fail to respond quickly to favorable price and other incentives—has been put to rest by the accumulating evidence. We find time and again that investment decisions, agricultural production, or exports turn out to be quite sensitive to price incentives, as long as these are perceived to have some predictability.

The discovery that relative prices matter a lot, and that therefore neoclassical economic analysis has much to contribute to development policy, led for a while to what was perhaps an excessive focus on relative prices. Price reforms—in external trade, in product and labor markets, in finance, and in taxation—were the rallying cry of the reformers of the 1980s, along with macroeconomic stability and privatization. By the 1990s, the shortcomings of the focus on price reform were increasingly evident. The encounter between neoclassical economics and developing societies served to reveal the institutional underpinnings of market economies. A clearly delineated system of property rights; a regulatory apparatus curbing the worst forms of fraud, anti-competitive behavior, and moral hazard; a moderately cohesive society exhibiting trust and social cooperation; social and political institutions that mitigate risk and manage social conflicts; the rule of law and clean government—these are social arrangements that economists usually take for granted, but which are conspicuous by their absence in poor countries.

Hence it became clear that incentives would not work or would generate perverse results in the absence of adequate institutions. Some of the

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implications of this were recognized early on, for example, in discussions on rent seeking in the trade policy context (where corruption was the main issue) or in the discussions on common-property resources (where lack of adequately defined property rights was the problem). But the broader point that markets need to be supported by non-market institutions in order to perform well took a while to sink in. Three sets of disparate developments conspired to put institutions squarely on the agenda of reformers. One of these was the dismal failure in Russia of price reform and privatization in the absence of a supportive legal, regulatory, and political apparatus. A second is the lingering dissatisfaction with market-oriented reforms in Latin America and the growing realization that these reforms have paid too little attention to mechanisms of social insurance and to safety nets. The third and most recent is the Asian financial crisis, which has shown that allowing financial liberalization to run ahead of financial regulation is an invitation to disaster.

The question before policy-makers therefore is no longer "do institutions matter?"[1] but "which institutions matter and how does one acquire them?" Following Lin and Nugent (1995, pp. 2306–2307), it is useful to think of institutions broadly as "a set of humanly devised behavioral rules that govern and shape the interactions of human beings, in part by helping them to form expectations of what other people will do." I begin this chapter with a discussion of the types of institutions that allow markets to perform adequately. While we can identify in broad terms what these are, I shall argue that there is no unique mapping between markets and the non-market institutions that underpin them. The plausible variation in institutional setups is larger than is usually presupposed.[2]

I then turn to the more difficult question of how one thinks about appropriate strategies for institution building. I emphasize the importance

[1] See Lin and Nugent (1995) for an excellent review of the huge literature on institutions as it relates to economic development specifically. This literature has been enriched recently by a growing body of empirical cross-national work that quantifies the growth-promoting effects of superior institutions. See Hall and Jones (1999) on "social infrastructure," Knack and Keefer (1995, 1996) on bureaucratic quality and social capital; Temple and Johnson (1998) on "social capability"; Rodrik (1999c) on institutions of conflict management. Recent work by Kaufmann et al. (1999) has developed aggregate indicators of six different aspects of governance—voice and accountability, political instability and violence, government effectiveness, regulatory burden, rule of law, and graft—showing that all of these are significantly associated with income levels in the expected manner.

[2] I refer the reader to Unger (1998) for a broader discussion of this point and its implications. I have benefited greatly from talking with Roberto Unger on some of these issues.

of "local knowledge" and argue that a strategy of institution building must not overemphasize best-practice "blueprints" at the expense of local experimentation. I make the case that participatory and decentralized political systems are the most effective ones we have for processing and aggregating local knowledge. We can think of democracy as a meta-institution for building good institutions.

The penultimate section of the chapter provides a range of evidence indicating that participatory democracies enable higher-quality growth: they allow greater predictability and stability, are more resilient to shocks, and deliver superior distributional outcomes. The concluding section offers some implications for the design of conditionality.

## 2 Which Institutions Matter?

Institutions do not figure prominently in the training of economists. The standard Arrow-Debreu model with a full set of complete and contingent markets extending indefinitely into the future seems to require no assistance from non-market institutions. But of course this is quite misleading even in the context of that model. The standard model assumes a well-defined set of property rights. It also assumes that contracts are signed with no fear that they will be revoked when it suits one of the parties. So in the background there exist institutions that establish and protect property rights and enforce contracts. We must, in other words, have a system of laws and courts to make even "perfect" markets function.

Laws in turn have to be written and they have to be backed up by the use of sanctioned force. That implies a legislator and a police force. The legislator's authority may derive from religion, family lineage, or access to superior violence, but in each case she needs to ensure that she provides her subjects with the right mix of "ideology" (a belief system) and threat of violence to forestall rebellion from below. Or the authority may derive from the legitimacy provided by popular support, in which case she needs to be responsive to her constituency's (voters') needs. In either case, we have the beginnings of a governmental structure that goes well beyond the narrow needs of the market.

One implication of all this is that the market economy is necessarily "embedded" in a set of non-market institutions. Another is that not all of these institutions are there to serve the needs of the market economy first and foremost, even if their presence is required by the internal logic of private property and contract enforcement. The fact that a governance

structure is needed to ensure that markets can do their work does not imply that the governance structure serves only that end. Non-market institutions will sometimes produce outcomes that are socially undesirable, such as the use of public office for private gain. They may also produce outcomes that restrict the free play of market forces in pursuit of a larger goal, such as social stability and cohesiveness.

The rest of this section discusses five types of market-supporting institutions: property rights, regulatory institutions, institutions for macroeconomic stabilization, institutions for social insurance, and institutions of conflict management.

(a) *Property rights*

While it is possible to envisage a thriving *socialist* market economy in theory, as Oskar Lange established in the famous debates of the 1920s, today's prosperous economies have all been built on the basis of private property. As North and Thomas (1973) and North and Weingast (1989), among many others, have argued that the establishment of secure and stable property rights has been a key element in the rise of the West and the onset of modern economic growth. It stands to reason that an entrepreneur would not have the incentive to accumulate and innovate unless s/he has adequate *control* over the return to the assets that are thereby produced or improved.

Note that the key word is "control" rather than "ownership." Formal property fights do not count for much if they do not confer control fights. By the same token, sufficiently strong control rights may do the trick even in the absence of formal property rights. Russia today represents a case whereby shareholders have property rights but often lack effective control over enterprises. Township and village enterprises (TVEs) in China are an example in which control rights have spurred entrepreneurial activity despite the absence of clearly defined property rights. As these instances illustrate, establishing "property rights" is rarely a matter of just passing a piece of legislation. Legislation in itself is neither necessary nor sufficient for the provision of the secure control rights. In practice, control rights are upheld by a combination of legislation, private *and* public enforcement, and custom and tradition. They may be distributed more narrowly or more diffusely than property fights. Stakeholders can matter as much as shareholders.

Moreover, property rights are rarely absolute, even when set formally in the law. The right to keep my neighbor out of my orchard does not normally extend to my right to shoot him if he actually enters it. Other laws or norms—such as those against murder—may trump property rights. Each society decides for itself the scope of allowable property fights and the acceptable restrictions on their exercise. Intellectual property rights are protected assiduously in the United States and most advanced societies but not in many developing countries. On the other hand, zoning and environmental legislation restricts the ability of households and enterprises in rich countries to do as they please with their "property" to a much greater extent than is the case in developing countries. All societies recognize that private property rights can be curbed if doing so serves a greater public purpose. It is the definition of what constitutes "greater public purpose" that varies.

(b) *Regulatory institutions*

Markets fail when participants engage in fraudulent or anti-competitive behavior. They fail when transaction costs prevent the internalizing of technological and other non-pecuniary externalities. And they fail when incomplete information results in moral hazard and adverse selection. Economists recognize these failures and have developed the analytical tools required to think systematically about their consequences and possible remedies. Theories of the second best, imperfect competition, agency, mechanism design, and many others offer an almost embarrassing choice of regulatory instruments to counter market failures. Theories of political economy and public choice offer cautions against unqualified reliance on these instruments.

In practice, every successful market economy is overseen by a panoply of regulatory institutions; regulating conduct in goods, services, labor, assets; and financial markets. A few acronyms from the United States will suffice to give a sense of the range of institutions involved: FTC, FDIC, FCC, FAA, OSHA, SEC, EPA, and so on. In fact, the freer the markets are, the greater the burden is on the regulatory institutions. It is not a coincidence that the United States has the world's freest markets as well as toughest anti-trust enforcement. It is hard to envisage in any country other than the United States a hugely successful high-tech company like Microsoft being dragged through the courts for alleged anti-competitive practices. The lesson that market freedom requires regulatory vigilance

has been driven home recently by the experience in East Asia. In South Korea and Thailand, as in so many other developing countries, financial liberalization and capital-account opening led to financial crisis precisely because of inadequate prudential regulation and supervision.[3]

It is important to recognize that regulatory institutions may need to extend beyond the standard list covering anti-trust, financial supervision, securities regulation, and a few others. This is true especially in developing countries where market failures may be more pervasive and the requisite market regulations more extensive. Recent models of coordination failure and capital market imperfections[4] make it clear that strategic government interventions may often be required to get out of low-level traps and elicit desirable private investment responses. The experience of South Korea and Taiwan in the 1960s and 1970s can be interpreted in that light. The extensive subsidization and government-led coordination of private investment in these two economies played a crucial role in setting the stage for self-sustaining growth (Rodrik, 1995). It is clear that many other countries have tried and failed to replicate these institutional arrangements. And even South Korea may have taken a good thing too far by maintaining the cozy institutional linkages between the government and *chaebols* well into the 1990s, at which point these may have become dysfunctional. Once again, the lesson is that desirable institutional arrangements vary and that they vary not only across countries but also within countries over time.

### (c) *Institutions for macroeconomic stabilization*

Since Keynes, we have come to a better understanding of the reality that capitalist economies are not necessarily self-stabilizing. Keynes and his followers worried about shortfalls in aggregate demand and the resulting unemployment. More recent views of macroeconomic instability stress the inherent instability of financial markets and its transmission to the real economy. All advanced economies have come to acquire fiscal and monetary institutions that perform stabilizing functions, having learned the hard way about the consequences of not having them. Probably most

[3] See also the recent paper by Johnson and Shleifer (1999) that attributes the more impressive development of equity markets in Poland compared to the Czech Republic to the stronger regulations in the former country upholding minority shareholder rights and guarding against fraud.

[4] See Hoff and Stiglitz (1999) for a useful survey and discussion.

important among these institutions is a lender of last resort—typically the central bank—which guards against self-fulfilling banking crises.

There is a strong current within macroeconomic thought, represented in its theoretically most sophisticated version by the real business cycles (RBC) approach—that disputes the possibility or effectiveness of stabilizing the macroeconomy through monetary and fiscal policies. There is also a sense in policy circles, particularly in Latin America, that fiscal and monetary institutions—as currently configured—have added to macroeconomic instability, rather than reduced it, by following pro-cyclical rather than anti-cyclical policies (Hausmann & Gavin, 1996). These developments have spurred the trend toward central bank independence and helped open a new debate on designing more robust fiscal institutions.

Some countries (Argentina being the most significant example) have given up on a domestic lender of last resort altogether by replacing their central bank with a currency board. The Argentine calculation is that having a central bank that can *occasionally* stabilize the economy is not worth running the risk that the central bank will *mostly* destabilize it. Argentine history gives plenty of reason to think that this is not a bad bet. But can the same be said for Mexico or Brazil or, for that matter, Turkey or Indonesia? What may work for Argentina may not work for the others. The debate over currency boards and dollarization illustrates the obvious, but occasionally neglected, fact that the institutions needed by a country are not independent of that country's history.

(d) *Institutions for social insurance*

A modern market economy is one in which change is constant and idiosyncratic (i.e., individual-specific) risk to incomes and employment is pervasive. Modern economic growth entails a transition from a static economy to a dynamic one in which the tasks that workers perform are in constant evolution and movement up and down the income scale is frequent. One of the liberating effects of a dynamic market economy is that it frees individuals from their traditional entanglements—the kin group, the church, the village hierarchy, and the like. The flip side is that it uproots them from traditional support systems and risk-sharing institutions. Gift exchanges, the fiesta, and kinship ties—to cite just a few of the social arrangements for equalizing the distribution of resources in traditional societies—lose much of their social insurance functions. And the risks that

have to be insured against become much less manageable in the traditional manner as markets spread.

The huge expansion of publicly provided social insurance programs during the twentieth century is one of the most remarkable features of the evolution of advanced market economies. In the United States, it was the trauma of the Great Depression that paved the way for the major institutional innovations in this area: Social Security, unemployment compensation, public works, public ownership, deposit insurance, and legislation favoring unions (see Bordo et al., 1998, p. 6). As Jacoby (1998) notes, prior to the Great Depression the middle classes were generally able to self-insure or buy insurance from private intermediaries. As these private forms of insurance collapsed, the middle classes threw their considerable political weight behind the extension of social insurance and the creation of what would later be called the welfare state. In Europe, the roots of the welfare state reached in some cases to the tail end of the nineteenth century. But the striking expansion of social insurance programs, particularly in the smaller economies most open to foreign trade, was a post–World War II phenomenon (Rodrik, 1998). Despite a considerable political backlash against the welfare state since the 1980s, neither the United States nor Europe has significantly scaled back these programs.

Social insurance need not always take the form of transfer programs paid out of fiscal resources. The East Asian model, represented well by the Japanese case, is one in which social insurance is provided through a combination of enterprise practices (such as lifetime employment and enterprise-provided social benefits), sheltered and regulated sectors (mom-and-pop stores), and an incremental approach to liberalization and external opening. Certain aspects of Japanese society that seem inefficient to outside observers—such as the preference for small-scale retail stores or extensive regulation of product markets—can be viewed as substitutes for the transfer programs that would otherwise have to be provided (as it is in most European nations) by a welfare state. Such complementarities among different institutional arrangements within a society have the important implication that it is very difficult to alter national systems in a piecemeal fashion. One cannot (or should not) ask the Japanese to get rid of their lifetime employment practices or inefficient retail arrangements without ensuring that alternative safety nets are in place. Another implication is that substantial institutional changes come only in the aftermath of large dislocations, such as those created by the Great Depression or World War II.

Social insurance legitimizes a market economy because it renders it compatible with social stability and social cohesion. At the same time, the existing welfare states in Western Europe and the United States engender a number of economic and social costs—mounting fiscal outlays, an "entitlement" culture, and long-term unemployment—which have become increasingly apparent. Partly because of that, developing countries, such as those in Latin America that adopted the market-oriented model following the debt crisis of the 1980s, have not paid sufficient attention to creating institutions of social insurance (Rodrik, 1999d). The upshot has been economic insecurity and a backlash against the reforms. How these countries will maintain social cohesion in the face of large inequalities and volatile outcomes, both of which are being aggravated by the growing reliance on market forces, is a question without an obvious answer at the moment. But if Latin America and the other developing regions are to carve a different path in social insurance than that followed by Europe or North America, they will have to develop their own vision—and their own institutional innovations—to bridge the tension between market forces and the yearning for economic security.

(e) *Institutions of conflict management*

Societies differ in their cleavages. Some are made up of an ethnically and linguistically homogenous population marked by a relatively egalitarian distribution of resources (Finland?). Others are characterized by deep cleavages along ethnic or income lines (Nigeria?). These divisions, when not bridged adequately, can hamper social cooperation and prevent the undertaking of mutually beneficial projects. Social conflict is harmful both because it diverts resources from economically productive activities and because it discourages such activities by the uncertainty it generates. Economists have used models of social conflict to shed light on questions such as the following: Why do governments delay stabilizations when delay imposes costs on all groups (Alesina & Drazen, 1991)? Why do countries rich in natural resources often do worse than countries that are resource-poor (Tornell & Lane, 1999)? Why do external shocks often lead to protracted economic crises that are out of proportion to the direct costs of the shocks themselves (Rodrik, 1999c)?

All of these can be thought of as instances of coordination failure in which social factions fail to coordinate on outcomes that would be of mutual benefit. Healthy societies have a range of institutions that make such colossal coordination failures less likely. The rule of law, a

high-quality judiciary, representative political institutions, free elections, independent trade unions, social partnerships, institutionalized representation of minority groups, and social insurance are examples of such institutions. What makes these arrangements function as institutions of conflict management is that they entail a double "commitment technology": they warn the potential "winners" of social conflict that their gains will be limited and assure the "losers" that they will not be expropriated. They tend to increase the incentives for social groups to cooperate by reducing the payoff to socially uncooperative strategies.

## 3 How Are "Good" Institutions Acquired?

As I argued in the preceding section, a market economy relies on a wide array of non-market institutions that perform regulatory, stabilizing, and legitimizing functions. Once these institutions are accepted as part and parcel of a market-based economy, traditional dichotomies between market and state or laissez-faire and intervention begin to make less sense. These are not competing ways of organizing a society's economic affairs; they are complementary elements that render the system sustainable. Every well-functioning market economy is a mix of state and market, laissez-faire and intervention.

### (a) *Accepting institutional diversity*

A second major implication of the discussion is that the institutional basis for a market economy is not uniquely determined.[5] Formally, there is no single mapping between the market and the set of non-market institutions required to sustain it. This finds reflection in the wide variety of regulatory, stabilizing, and legitimizing institutions that we observe in today's advanced industrial societies. The American style of capitalism is very different from the Japanese style of capitalism. Both differ from the European style. And even within Europe, there are large differences between the institutional arrangements in, say, Sweden and Germany. Few would disagree about the existence of such differences. Yet much of

[5] I am reminded by Ruth Collier that the role of institutional diversity is obvious (or perhaps axiomatic) for many social scientists, even if it is not for economists. What is perhaps surprising in light of that is the "kind of ideological offensive on the part of certain actors to suggest a single, efficient, successful set of institutions" (Collier, personal correspondence).

institutional reform in developing countries is predicated on the assumption that there is a single set of institutions worth emulating.

The view that one set of institutional arrangements necessarily dominates others in terms of overall performance is a common journalistic error. Hence the fads of the decade: with its low unemployment, high growth, and thriving culture, Europe was the continent to emulate throughout much of the 1970s; during the trade-conscious 1980s, Japan became the exemplar of choice; and the 1990s have been the decade of U.S.-style freewheeling capitalism. It is anybody's guess which set of countries will capture the imagination if and when a substantial correction hits the U.S. stock market.[6]

The point about institutional diversity has in fact a more fundamental implication. The institutional arrangements that we observe in operation today, varied as they are, themselves constitute a *subset* of the full range of potential institutional possibilities. This is a point that has been forcefully and usefully argued by Roberto Unger (1998). There is no reason to suppose that modern societies have already managed to exhaust all the useful institutional variations that could underpin healthy and vibrant economies. Even if we accept that market-based economies require certain types of institutions, as listed in the previous section,

> such imperatives do not select from a closed list of institutional possibilities. The possibilities do not come in the form of indivisible systems, standing or falling together. There are always alternative sets of arrangements capable of meeting the same practical tests. (Unger, 1998, pp. 24–25)

We need to maintain a healthy skepticism toward the idea that a specific type of institution—a particular mode of corporate governance, social security system, or labor market legislation, for example—is the only type that is compatible with a well-functioning market economy.

### (b) *Two modes of acquiring institutions*

How does a developing society acquire functional institutions—functional in the sense of supporting a healthy, sustainable market-based

[6] Perhaps Europe will be back in fashion. As these words were being written, the *New York Times* published a major feature article with the title "Sweden, the Welfare State, Basks in a New Prosperity" (October 8, 1999).

system? An analogy with *technology transfer* is helpful. Think of institution acquisition/building as the adoption of a new technology that allows society to transform its primary endowments (land, raw labor, natural resources) into a larger bundle of outputs. Let us call this new technology a "market economy," where we understand that the term encompasses all of the non-market institutional complements discussed previously. Adoption of a market economy in this broad sense moves society to a higher production possibilities frontier and in that sense is equivalent to technical progress in economist's parlance.

But what kind of a technology is a market economy? To oversimplify, consider two possibilities. One possibility is that the new technology is a general purpose one, that it is codified, and that it is readily available on world markets. In this case, it can be adopted by simply importing a *blueprint* from the more advanced economies. The transition to a market economy, in this vision, consists of getting a manual with the title "how to build a market economy" (a.k.a. the "Washington Consensus") and following the directions: remove price distortions, privatize enterprises, harden budget constraints, enact legal codes, and so on.

A different possibility is that the requisite technology is highly specific to local conditions and that it contains a high degree of tacitness. Specificity implies that the institutional repertoire available in the advanced countries may be inappropriate to the needs of the society in question—just as different relative factor prices in LDC agriculture require more appropriate techniques than those that are available in the rich countries. Tacitness implies that much of the knowledge that is required is in fact not written down, leaving the blueprints highly incomplete.[7] For both sets of reasons, imported blueprints are useless. Institutions need to be developed locally, relying on hands-on experience, local knowledge, and experimentation.

The two scenarios are of course only caricatures. Neither the *blueprint* nor the *local-knowledge* perspective captures the whole story on its own.

[7] An example from South Korea's history with technology acquisition nicely illustrates the tacitness of technology. The Korean shipbuilder Hyundai started out by importing its basic design from a Scottish firm. But it soon found out that this was not working out. The Scottish design relied on building the ship in two halves, because the original manufacturer had enough capacity to build only half a ship at a time. When Hyundai followed the same course, it found out that it could not get the two halves to fit. Subsequent designs imported from European consulting firms also had problems in that the firms would not guarantee the rated capacity, leading to costly delays. In the end, Hyundai was forced to rely on in-house design engineers. This case is discussed in Amsden (1989, pp. 278–289).

Even under the best possible circumstances, an imported blueprint requires domestic expertise for successful implementation. Alternatively, when local conditions differ greatly, it would be unwise to deny the possible relevance of institutional examples from elsewhere. But the dichotomy—whether one emphasizes the blueprint or the local knowledge aspect of the process—clarifies some key issues in institution building and sheds light on important debates about institutional development. Consider the debate on Chinese gradualism.

One perspective, represented forcefully in work by Sachs and Woo (Forthcoming), underplays the relevance of Chinese particularism by arguing that the successes of the economy are not due to any special aspects of the Chinese transition to a market economy but instead largely due to a convergence of Chinese institutions to those in non-socialist economies. In this view, the faster the convergence, the better the outcomes. "[F]avorable outcomes have emerged not because of gradualism, but despite gradualism" (Sachs & Woo, Forthcoming, p. 3). The policy message that follows is that China should focus not on institutional experimentation but on harmonizing its institutions with those abroad. (To be fair to these authors, the harmonization that Sachs and Woo foresee seems to be with the institutions in the rest of East Asia, not those in the United States or Western Europe.)

The alternative perspective, perhaps best developed in work by Qian and Roland, is that the peculiarities of the Chinese model represent solutions to particular political or informational problems for which no blueprint-style solution exists. Hence Lau et al. (1997) interpret the dual-track approach to liberalization as a way of implementing Pareto-efficient reforms: an alteration in the planned economy that improves incentives at the margin enhances efficiency in resource allocation and yet leaves none of the plan beneficiaries worse off. Qian et al. (1999) interpret Chinese-style decentralization as allowing the development of superior institutions of coordination: when economic activity requires products with matched attributes,[8] local experimentation is a more effective way of processing and using local knowledge.

Sachs, Woo, and other members of the convergence school worry about the costs of Chinese-style experimentalism because they seem to say, "Well, we already know what a market economy looks like: it is one with

[8] Think again of the problem of fitting the two halves of a ship described in the previous footnote.

private property and a unified system of prices—just get on with it." Qian et al., on the other hand, find much to praise in it because they think the system generates the right incentives for developing the tacit knowledge required to build and sustain a market economy, and therefore they choose not to be bothered by some of the economic inefficiencies that may be generated along the way. These two contrasting visions of where the real action is in the transition to a market economy have been pervasive in our discussions of policy and have played a determining role in shaping our preferences for gradualism/experimentalism versus shock therapy.

Although my sympathies in this debate are with the experimentalists, I can also see that there are dangers to experimentalism. First, one needs to be clear between self-conscious experimentalism, on the one hand, and delay and gradualism designed primarily to serve privileged interests, on the other. The dithering, two-steps-forward, one-step-backward style of reform that prevails in much of the former Soviet Union and in many sub-Saharan African countries is driven not so much by a desire to build better institutions as it is by aversion to reform. This has to be distinguished from a programmatic effort to acquire and process local knowledge to better serve local needs. The gradualism that countries like Mauritius[9] or South Korea[10] have exhibited over their recent history is very different from the "gradualism" of Ukraine or Nigeria.

Second, it is obviously costly—in terms of time and resources—to build institutions from scratch when imported blueprints can serve just as well. Costs in this context have to be evaluated carefully, since forgoing experimentalism can have opportunity costs as well insofar as it forecloses certain paths *of future* institutional development. Nonetheless, experimentalism can backfire if it overlooks opportunities for institutional arbitrage. Much of the legislation establishing an SEC-like watchdog agency for securities markets, for example, can be borrowed wholesale from those countries that have already learned how to regulate these markets the hard way—by their own trial and error. The same goes perhaps for an anti-trust agency,

[9] See Wellisz and Saw (1993), Rodrik (1999a, chap, 3), and the discussion in the next subsection on two-track reforms in Mauritius.

[10] South Korea is often portrayed as a case where autonomous and insulated technocrats took a series of decisions without local input. Evans (1995) has usefully emphasized the "embedded" nature of bureaucratic autonomy in Korea, in particular the dense network of interactions between the bureaucracy and segments of the private sector that allowed for the exchange of information, the negotiation and renegotiation of policies, and the setting of priorities.

a financial supervisory agency, a central bank, and many other governmental functions. One can always learn from the institutional arrangements prevailing elsewhere even if they are inappropriate or cannot be transplanted. Some societies can go further by adopting institutions that cut deeper—in social insurance, labor markets, fiscal institutions. Perhaps one reason that a "big bang" worked for Poland is that this country had already defined its future: it wanted to be a "normal" European society, with full membership in the European Union. Adopting European institutions wholesale was not only a means to an end; it was also the ultimate objective the country desired.

The difficult questions, and the trade-offs between the blueprint and the experimentalist approaches, arise when the attainable objectives are not so clear-cut. What kind of a society does the Chinese want for themselves and can realistically hope to achieve? How about the Brazilians, Indians, or Turks? Local knowledge matters greatly in answering these questions. Blueprints, best practices, international codes and standards, and harmonization can do the trick for some of the narrowly "technical" issues. But large-scale institutional development by and large requires a process of discovery about local needs and capabilities.

### (c) *Participatory politics as a meta-institution*

The blueprint approach is largely top-down, relying on expertise on the part of technocrats and foreign advisors. The local-knowledge approach, by contrast, is bottom-up and relies on mechanisms for eliciting and aggregating local information. In principle, these mechanisms can be as diverse as the institutions that they help create. But I would argue that the most reliable forms of such mechanisms are participatory political institutions. Indeed, it is helpful to think of participatory political institutions as *meta-institutions* that elicit and aggregate local knowledge and thereby help build better institutions.

It is certainly true that non-democratic forms of government have often succeeded admirably in the task of institution building using alternative devices. The previously mentioned examples of South Korea (with its "embedded" bureaucratic autonomy) and China (with its decentralization and experimentalism) come immediately to mind. But the broad, cross-national evidence indicates that these are the exceptions rather than the rule. Nothing prevents authoritarian regimes from using local knowledge; the trouble is that nothing compels them to do so either.

The case of Mauritius illustrates nicely how participatory democracy helps build better institutions that lay the foundation for sustainable economic growth. The initial conditions in Mauritius were inauspicious from a number of standpoints. The island was a monocrop economy in the early 1960s and faced a population explosion. A report prepared by James Meade in 1961 was quite pessimistic about the island's future and argued that "unless resolute measures are taken to solve [the population problem], Mauritius will be faced with a catastrophic situation" (Meade, 1961, p. 37). Mauritius is also an ethnically and linguistically divided society and its independence in 1968 was preceded by a series of riots between Muslims and Creoles.

Mauritius' superior economic performance has been built on a peculiar combination of orthodox and heterodox strategies. To an important extent, the economy's success was based on the creation of an export processing zone (EPZ) operating under free-trade principles, which enabled an export boom in garments to European markets and an accompanying investment boom at home. Yet the island's economy has combined the EPZ with a domestic sector that was highly protected until the mid-1980s.[11] Mauritius is essentially an example of an economy that has followed a two-track strategy, not too dissimilar to that of China. This economic strategy was in turn underpinned by social and political arrangements that encouraged participation, representation, and coalition-building. Rather than discouraging social organization, governments have encouraged it. In the words of Miles (1999), Mauritius is a "supercivil society," with a disproportionately large number of civil society associations per capita.

The circumstances under which the Mauritian EPZ was set up in 1970 are instructive and highlight the manner in which participatory political systems help design creative strategies for building locally adapted institutions. Given the small size of the home market, it was evident that Mauritius would benefit from an outward-oriented strategy. But as in other developing countries, policy-makers had to contend with the import-substituting industrialists who had been propped up by the restrictive commercial policies of the early 1960s prior to independence. These industrialists were naturally opposed to relaxing the trade regime.

A Washington economist would have advocated across-the-board liberalization, without regard to what that might do to the precarious political

[11] Gulhati (1990: Table 2.10) reports an average effective rate of protection in 1982 for manufacturing in Mauritius of 89%, with a range from -4% to 824%.

and social balance of the island. Instead, the Mauritian authorities chose the two-track strategy. The EPZ scheme in fact provided a neat way around the political difficulties. The creation of the EPZ generated new opportunities for trade and employment, without taking protection away from the import-substituting groups and from the male workers who dominated the established industries. The segmentation of labor markets early on between male and female workers—with the latter predominantly employed in the EPZ—was particularly crucial, as it prevented the expansion of the EPZ from driving wages up in the rest of the economy, thereby disadvantaging import-substituting industries. New profit opportunities were created at the margin while leaving old opportunities undisturbed. There were no identifiable losers. This in turn paved the way for the more substantial liberalizations that took place in the mid-1980s and in the 1990s.

Mauritius found its own way to economic development because it created social and political institutions that encouraged participation, negotiation, and compromise. That it did so despite inauspicious beginnings and following a path that diverged from orthodoxy speaks volumes about the importance of such institutions. The following section presents some cross-national evidence suggesting that democracy tends in fact to be a reliable mechanism for generating such desirable outcomes.

## 4 Participatory Political Regimes Deliver Higher-Quality Growth

In policy circles, the discussion on the relationship between political regime type and economic performance inevitably gravitates toward the experience of a handful of economies in East and Southeast Asia, which (until recently at least) registered the world's highest growth rates under authoritarian regimes. These countries constitute the chief exhibit for the argument that economic development requires a strong hand from above. The deep economic reforms needed to embark on self-sustaining growth, this line of thought goes, cannot be undertaken in the messy push and pull of democratic politics. Chile under General Pinochet is usually exhibit no. 2.

A systematic look at the evidence, however, yields a much more sanguine conclusion. While East Asian countries have prospered under authoritarianism, many more have seen their economies deteriorate—think of Zaire, Uganda, or Haiti. Recent empirical studies based on

samples of more than 100 countries suggest that there is little reason to believe democracy is conducive to lower growth over long time spans.[12] Neither is it the case that economic reforms are typically associated with authoritarian regimes (Williamson, 1994). Indeed, some of the most successful reforms of the 1980s and 1990s were implemented under newly elected democratic governments—think of the stabilizations in Bolivia (1985), Argentina (1991), and Brazil (1994), for example. Among former socialist economies too, the most successful transitions have occurred in the most democratic countries.

In fact, the record is even more favorable to participatory regimes than is usually acknowledged. This section provides evidence in support of the following assertions:[13]

1. Democracies yield long-run growth rates that are more predictable.
2. Democracies produce greater short-term stability.
3. Democracies handle adverse shocks much better.
4. Democracies deliver better distributional outcomes.

The first of these implies that economic life is less of a crapshoot under democracy. The second suggests that whatever the long-run growth level of an economy, there is less instability in economic outcomes under democratic regimes than under autocracies. The third finding indicates that political participation improves an economy's capacity to adjust to changes in the external environment. The final point suggests that democracies produce superior distributional outcomes.

[12] Helliwell (1994) and Barro (1996) try to control for the endogeneity of democracy in estimating the effect of the latter on growth. Helliwell finds that democracy spurs education and investment, but has a negative (and insignificant) effect on growth when investment and education are controlled. On balance, he finds no "systematic net effects of democracy on subsequent economic growth." Barro finds a nonlinear relationship, with growth increasing in democracy at low levels of democracy and decreasing in democracy at higher levels. The turning point comes roughly at the levels of democracy existing in Malaysia and Mexico (in 1994), and somewhat above South Africa's level prior to its transition. A more recent paper by Chowdhurie-Aziz (1997) finds a positive association between the degree of non-elite participation in politics and economic growth. See also Tavares and Wacziarg (1996) who estimate a system of simultaneous equations and find a positive effect of democracy on growth through the channels of enhanced education, reduced inequality, and lower government consumption.

[13] Most of the evidence presented in this section comes from Rodrik (1997, 1999b, 1999c).

Taken together, these results provide a clear message: participatory political regimes deliver higher-quality growth. I would contend that they do so because they produce superior institutions better suited to local conditions.

(a) *Democracy and long-term performance*

Figure 1 shows a scatter plot for a sample of 90 countries. The figure shows the *partial* relationship between a country's level of democracy and its growth rate of GDP per capita during the 1970–1989 period, after initial income, education, and regional effects are controlled for. Democracy is measured on a scale from 0 to 1, using the Freedom House index of political rights and civil liberties. While the slope of the relationship is positive and statistically significant, this result is not very robust. As is clear from the figure, removing Botswana—which is an important outlier—would make a big difference to the results. This is in line with existing results in the literature, which suggest that there is no strong,

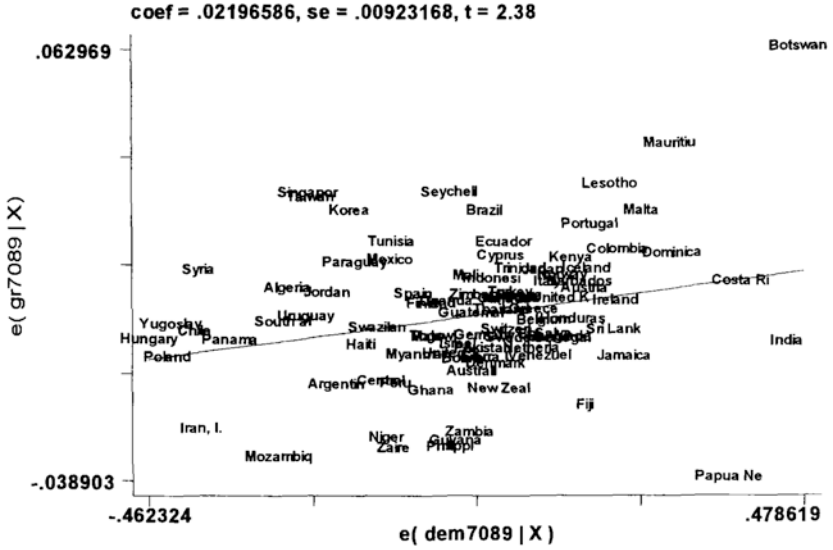


**Fig. 1** Partial correlation between democracy and economic growth, 1970–1989 (controlling for initial income, education, and regional dummies)

determinate relationship between political participation and average levels of long-run growth.

Looking at individual cases, it becomes quickly evident why this is so. Among high-growth countries, Taiwan, Singapore, and Korea rank low in terms of democracy (during the period covered by the regression), this being the source of the conventional wisdom among policy-makers reported above. But some other countries, Botswana and Mauritius in particular, have done equally well or even better under fairly open political regimes. (Note that the rankings in this figure have to be interpreted relative to the benchmarks established by the presence of the other controls in the regression.) Poor performers can similarly be found at either end of the democracy spectrum: South Africa and Mozambique have done poorly under authoritarian regimes, and Papua New Guinea and Jamaica under relatively democratic ones.

Hence *mean* long-run growth rates tend not to depend systematically on political regime type. But this is only part of the broader picture. A different question is whether democracy is the safer choice in the following sense: is the cross-national *variance* in long-run growth performance smaller under democracies than it is under autocracies? Since mean growth rates do not differ, a risk-averse individual would unambiguously prefer to live under the regime where expected long-run growth rates cluster more closely around the mean.

I first divide the country sample into two roughly equal-sized groups. I call those with values of the democracy index less than 0.5 "autocracies" ($n$ = 48), and those with values greater or equal to 0.5 "democracies" ($n$ = 45). The top panel in Table 1 shows the coefficients of variation of long-run growth rates, computed across countries for the 1960–1989 period, for the two samples. The first row shows the unconditional

**Table 1** Variance of economic performance under different political regimes

| | *Coefficient of variation of long-run economic growth rates under* | |
|---|---|---|
| | **Autocracies** | **Democracies** |
| Unconditional | 1.05 | 0.54 |
| Conditional | 0.70 | 0.48 |
| | **"Low democracy"** | **"High democracy"** |
| Unconditional | 1.02 | 0.61 |
| Conditional | 0.64 | 0.54 |

Note: See text for explanation

coefficients of variation, without any controls for determinants of growth rates. The second row displays the conditional version of the same, where the variation now refers to the unexplained component from a cross-national regression (separate for each sample) with the following control variables: initial GDP per capita, initial secondary school enrollment ratio, and regional dummies for Latin America, East Asia, and sub-Saharan Africa. I find that the coefficient of variation (whether conditional or unconditional) is substantially higher for autocracies than it is for democracies.

Since countries with authoritarian regimes tend to have lower incomes, perhaps this result reflects the greater randomness in the long-run growth rates of poor countries. To check against this possibility, I divided countries differently. First, I regressed the democracy index on income and secondary enrollment levels across countries ($R^2 = 0.57$). Then I regrouped my sample of countries according to whether their actual democracy levels stood below or above the regression line. Countries above (below) the regression line are those with greater (less) political participation than would be expected on the basis of their income and educational levels. In the bottom panel of Table 1, these two groups are labeled "high democracy" ($n = 49$) and "low democracy" ($n = 44$), respectively. The coefficients of variation for long-term growth rates are then calculated for each group in the same way as before. Our results remain qualitatively unchanged, although the gap between the two groups shrinks somewhat: the coefficient of variation is smaller in countries with greater political participation (where "greater" now refers to the benchmark set by the cross-national regression relating participation levels to income and education).

The bottom line is that living under an authoritarian regime is a riskier gamble than living under a democracy.

(b) *Democracy and short-term performance*

A point similar, but not identical, to the one just discussed was anticipated by Sah (1991), who argued that decentralized political regimes (and democracies in particular) should be less prone to volatility. The rationale behind this idea is that the presence of a wider range of decision-makers results in greater diversification and hence less risk in an environment rife with imperfect information. This is a point similar to the one made above regarding the importance of local knowledge. Note that this specific

argument is about short-term volatility in economic performance and not about the dispersion in long-term growth rates that was the focus of the previous section.

To determine the relationship between regime type and volatility in short-run economic performance, I focus on three national-accounts aggregates: (a) real GDP, (b) real consumption, and (c) investment. (All data are from the Penn World Tables, Mark 5.6.) In each case, volatility is measured by calculating the standard deviation of annual growth rates of the relevant aggregate over the 1960–1989 period (more accurately, by taking the standard deviation of the first differences in logs). Then each measure of volatility is regressed on a number of independent variables, including our measure of participation (democracy). The other independent variables included are log per-capita GDP, log population, exposure to external risk, and dummies for Latin America, East Asia, sub-Saharan Africa, and OECD.

Table 2 shows the results. The estimated coefficient on the measure of democracy is negative and statistically significant in all cases. A movement from pure autocracy (democracy = 0) to pure democracy (= 1) is associated with reductions in the standard deviations of growth rates of GDP, consumption, and investment of 1.3, 2.3, and 4.4 percentage points, respectively. These effects are fairly sizable. Figure 2 shows a partial scatter plot which helps identify where different countries stand. Long-standing democracies such as India, Costa Rica, Malta, and Mauritius have

**Table 2** Political participation and volatility of economic performance (estimated coefficient on democracy from multiple regression)

| | *Dependent variable* | | | |
|---|---|---|---|---|
| | | | *Standard deviation of growth rate of:* | |
| | *Real GDP OLS* | *Consumption OLS* | *Investment OLS* | *Consumption IV* |
| *Democracy* | -1.31** | -2.33** | -4.36* | -4.97** |
| | (0.60) | (1.09) | (1.61) | (2.10) |
| *N* | 101 | 101 | 101 | 88 |

Note: Additional regressors (not shown): log per-capita GDP, log population, a measure of exposure to external risk, dummies for Latin America, East Asia, sub-Saharan Africa, and OECD. Robust standard errors reported in parentheses. Secondary enrollment ratio used as instrument in IV estimation. Asterisks denote levels of statistical significance: ** 95 percent; * 99 percent

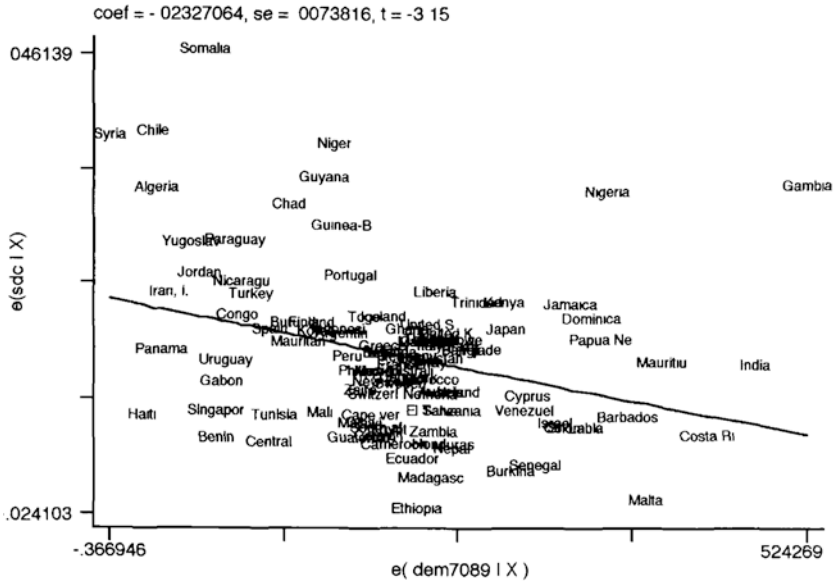


**Fig. 2** Partial correlation between democracy and consumption volatility

experienced significantly less volatility than countries like Syria, Chile, or Iran, even after controlling for country size and external shocks.[14]

Moreover, as the last column of Table 2 shows, causality seems to run directly from regime type to volatility (rather than vice versa). In this column I have used secondary enrollment ratio as an instrument for democracy (in addition to the other independent variables mentioned earlier). This variable has all the properties of a desirable instrument, as it is well correlated with democracy but virtually uncorrelated with the error term from the ordinary least squares (OLS) regression. With democracy instrumented in this fashion, the estimated coefficient actually *doubles* in absolute value.

The evidence strongly suggests, therefore, that democracy is conducive to lower volatility in economic performance.

[14] Similar findings have also been reported in Chandra (1998) and Quinn and Woolley (1998).

(c) *Democracy and resilience in the face of economic shocks*

The late 1970s were a watershed for most developing economies. A succession of external shocks during this period left many of them in severe payment difficulties. In some cases, as in most of Latin America, it took almost a decade for macroeconomic balances to be restored and for growth to resume. The question I now pose is whether democratic and participatory institutions helped or hindered adjustment to these shocks of external origin.

The main thing I am interested in explaining is the extent of economic collapse following an external shock. In another paper (Rodrik, 1999c), I have explored how social cleavages and domestic institutions of conflict management mediate the effects of shocks on economic performance. Here I focus on the role of participatory institutions specifically.

In a recent review of the growth experience of developing countries, Pritchett (1997) has looked for breaks in trend growth rates. These breaks tend to coalesce around the mid- to late 1970s, with 1977 as the median break year. I use the difference in growth rates before and after the break as my dependent variable.

The basic story in Rodrik (1999c) is that the adjustment to shocks will tend to be worse in countries with deep latent social conflicts and with poor institutions of conflict management. Consequently, such countries will experience larger declines in growth rates following shocks. These ideas are tested by regressing the *change* in growth on indicators of latent conflict and on proxies for institutions of conflict management (in addition to other variables[15]). Figure 3 displays a sample partial scatter plot, showing the relationship between ethnic cleavages and the growth decline. Controlling for other variables, there is a systematic relationship between these two: countries with greater ethnic and linguistic fragmentation experienced larger declines in economic growth.[16]

[15] Each regression in this chapter includes the following variables on the right-hand side in addition to those specifically discussed: log GDP per capita in 1975, growth rate prior to break year, measure of external shocks during the 1970s, ethno-linguistic fragmentation (e/f60), and regional dummies for Latin America, East Asia, and sub-Saharan Africa.

[16] A careful reader will notice that Rwanda—the scene of one of the most violent ethnic clashes in recent history—ranks at the low end of the ethnic fragmentation measure used here (*elf60*), which suggests that the measure in question leaves much to be desired. The reason for the ranking is that a single ethnic group constitutes the vast majority in Rwanda.

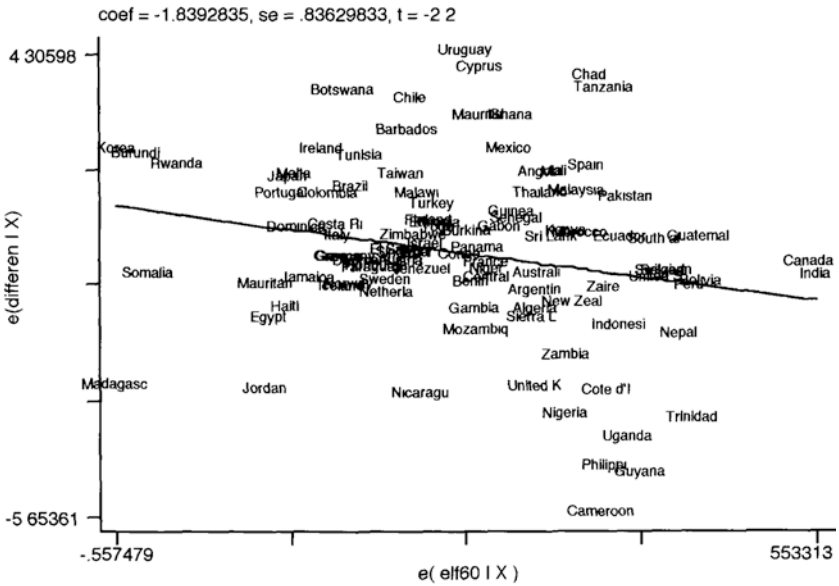


**Fig. 3** Ethnic cleavages and growth differentials (pre- and post-break year in trend growth)

Our interest in democratic institutions in this context derives from the idea that such institutions provide ways of regulating and managing social conflicts through participatory means and the rule of law and hence dissipate the adverse consequences of external shocks. To test this hypothesis, we check to see whether our measure of democracy—this time restricted to the 1970s only, to avoid possible reverse-causality—is related to changes in growth rates subsequent to the shocks. The partial scatter plot shown in Fig. 4, covering 101 countries, suggests a clear affirmative answer. Countries with greater political freedoms during the 1970s experienced *lower* declines in economic growth when their trend growth rate changed. The relationship is highly significant in statistical terms; the t-statistic on the estimated coefficient on democracy is 3.53, with a p-value of 0.001. Figure 5 shows the results when sub-Saharan African countries are excluded from the sample. The reason to exclude these is concerned with

I have not med to adjust for apparent anomalies of this kind, so as not to introduce subjective biases to the analysis.

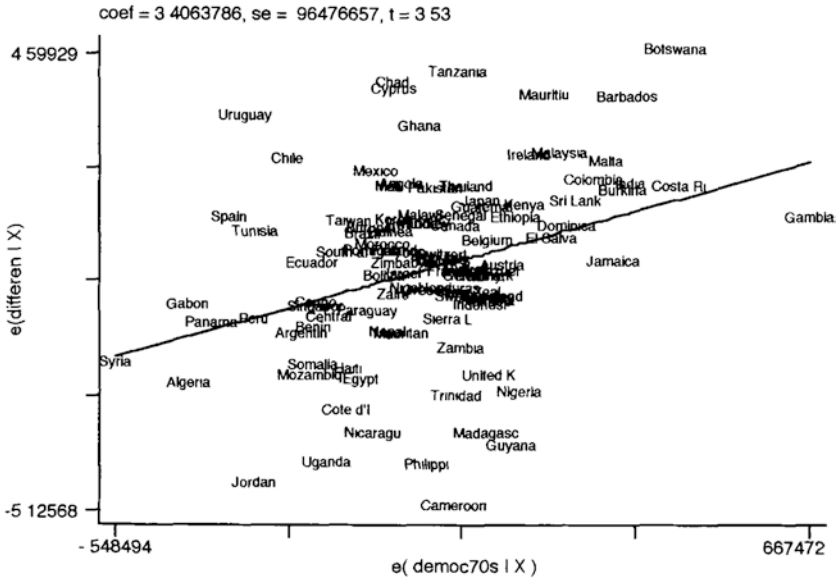


**Fig. 4** Democracy and growth differentials (pre- and post-break year in trend growth)

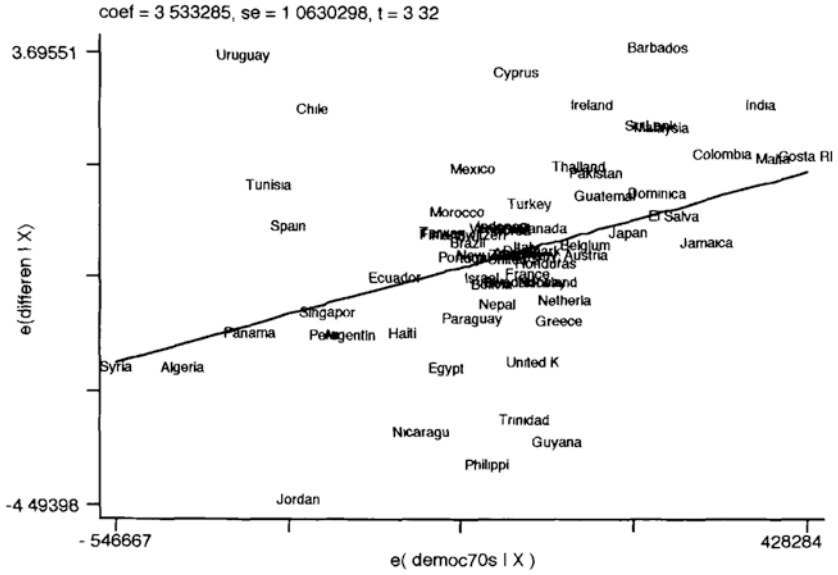


**Fig. 5** Democracy and growth differentials (pre- and post-break year in trend growth), excluding sub-Saharan African countries

both data quality and the possibility that the relationship is driven by a few African countries with extreme values. But the relationship holds just as well in the restricted sample: the partial slope coefficient is virtually unchanged and the t-statistic is almost as high (3.32). As these two figures show, the hardest hit countries tended to be those with few political liberties (relative to what would be expected of countries at their levels of income), such as Syria, Algeria, Panama, and Gabon. Countries with open political regimes, such as Costa Rica, Botswana, Barbados, and India, did much better.

These results are perhaps surprising in view of the common presumption that it takes strong, autonomous governments to undertake the policy adjustments required in the face of adversity. They are less surprising from the perspective articulated above: adjustment to shocks requires managing social conflicts, and democratic institutions are useful institutions of conflict management.

To probe the issues more deeply, I investigate the relationship between declines in growth and three other aspects of political regime: (a) the degree of institutional (de jure) independence of the executive, (b) the degree of operational (de facto) independence of the executive, and (c) the degree to which non-elites can access political institutions. These three variables come originally from the Polity III data (see Jaggers & Gurr, 1995) and have been recoded on a scale from 0 to 1 for the purposes of the current exercise. As before, I use the averages of the values reported for each country during the 1970s. Note that these three indicators are correlated with the Freedom House measure of democracy (which I have been using up to this point) in the expected manner: independence of the executive tends to be lower in democracies, and avenues of non-elite participation are larger. But there are interesting exceptions. The United States, for example, ranks highest not only on the democracy index, but also in the degree of *institutional* (de jure) independence of the executive. Other democracies with relatively autonomous executives (de jure) are France, Canada, and Costa Rica. By contrast, South Africa is coded as having had (during the 1970s) little democracy *and* little executive autonomy.

A nagging question in the literature on political economy is whether an insulated and autonomous executive is necessary for the implementation of economic reforms.[17] This question is somewhat distinct from the question about democracy proper, since, as the examples just mentioned

[17] This literature is briefly surveyed and evaluated in Rodrik (1996).

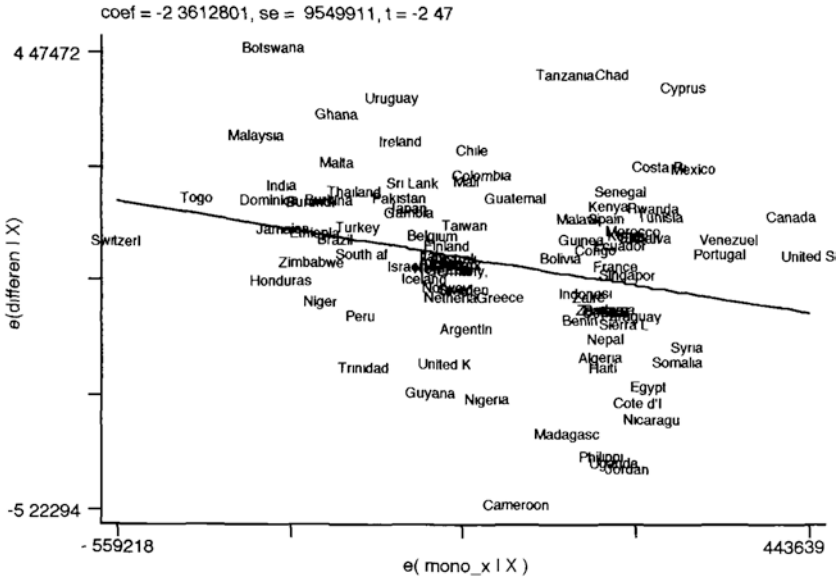


**Fig. 6** Institutional (de jure) independence of the executive and growth differentials (pre- and post-break year in trend growth)

illustrate, one can conceive of democratic systems that nonetheless have well-insulated executives. Therefore the Polity III indicators are particularly relevant.

The results shown in Figs. 6, 7, and 8 are again somewhat surprising—at least when approached from the technocratic perspective. I find that more significant growth declines are associated with *greater* institutional and operational independence of the executive and *lower* levels of political access by non-elites.[18] The estimated coefficients are statistically highly significant in all cases. Therefore, not only do we not find that executive autonomy results in better economic management, the results strongly suggest the converse: political regimes with lower executive autonomy and more participatory institutions handle exogenous shocks better![19] This

[18] Moreover, the estimated signs on these variables remain unchanged if the Freedom House index of democracy is entered separately in the regression.

[19] The finding on political participation echoes the argument in Isham et al. (1997) that more citizen voice results in projects with greater economic returns.

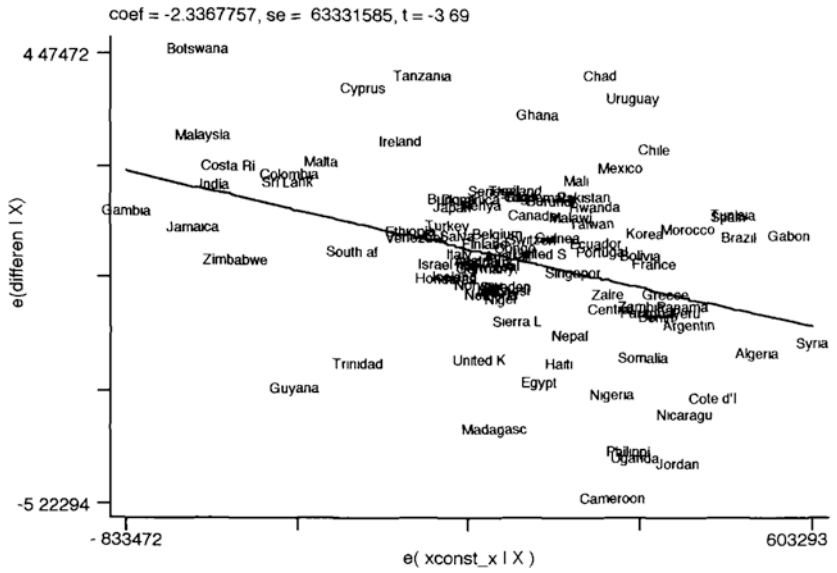


**Fig. 7** Operational (de facto) independence of the executive and growth differentials (pre- and post-break year in trend growth)

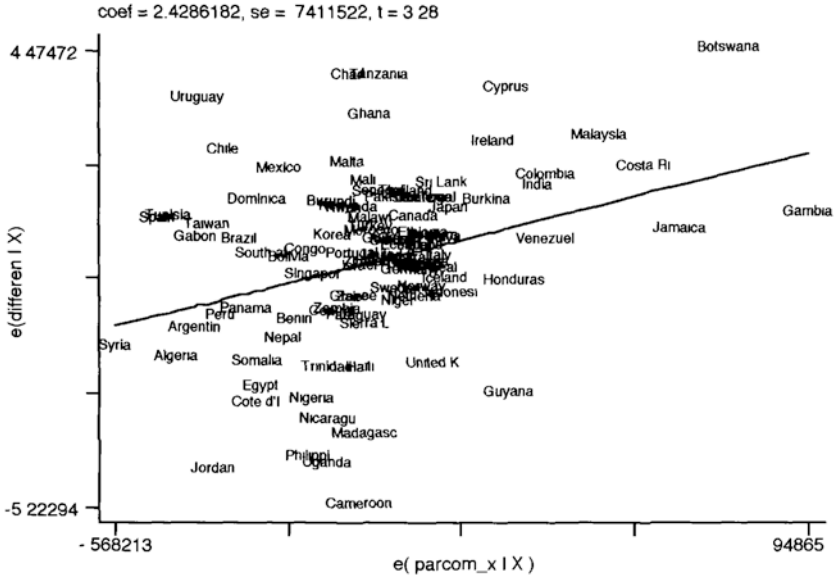


**Fig. 8** Ability of non-elites to access political institutions and growth differentials (pre- and post-break year in trend growth)

might be part of the explanation for why democracies experience less economic instability over the long run (as demonstrated in the previous sub-section).

It is worth mentioning in passing that the recent experience in East Asia strongly validates these results. South Korea and Thailand, with more open and participatory political regimes, handled the Asian financial crisis significantly better than Indonesia. I have argued in Rodrik (1999a) that democracy helped the first two countries manage the crisis for at least three reasons. First, it facilitated a smooth transfer of power from a discredited set of politicians to a new group of government leaders. Second, democracy imposed mechanisms of participation, consultation, and bargaining, enabling policy-makers to fashion the consensus needed to undertake the necessary policy adjustments decisively. Third, because democracy provides for institutionalized mechanisms of "voice," the Korean and Thai institutions obviated the need for riots, protests, and other kinds of disruptive actions by affected groups, as well as lowering the support for such behavior by other groups in society.

(d) *Democracy and distribution*

Finally, I turn to distributional issues. I have shown in Rodrik (1999b) that democracy makes an important difference in the distribution of the enterprise surplus in the manufacturing sectors of national economies. In particular, there is a robust and statistically significant association between the extent of political participation and wages received by workers, controlling for labor productivity, income levels, and other possible determinants. The association exists both across countries and over time *within* countries (i.e., in panel regressions with fixed effects as well as in cross-section regressions). Countries with greater political participation than would have been predicted from their income levels such as India, Israel, Malta, and Cyprus also have correspondingly higher wages relative to productivity. Some countries at the other end of the spectrum—lower-than-expected values for the democracy index and low wages—are Syria, Saudi Arabia, Turkey, and Mexico. Moving from Mexico's level of democracy to that of the United States is associated with an increase in wages of about 30 percent. Instrumental-variables and event-study evidence suggests strongly that the relationship is causal; that is, changes in political regime *cause* a redistribution of the enterprise surplus toward workers.

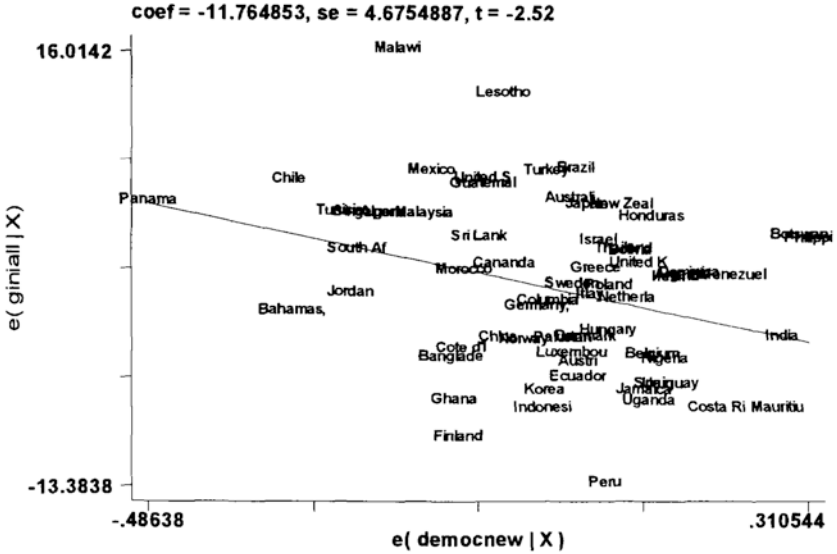


**Fig. 9** Partial association between democracy and economy-wide inequality (Gini coefficient), 1985–1989. Controls: log GDP/cap, log GDP/cap squared, urbanization; dummies for Latin America, East Asia, SSA, socialist countries, and oil exporters

Figure 9 shows a different type of evidence relating to *economy-wide inequality*. One problem with the evidence on the functional distribution of income within manufacturing (discussed above) is that a pro-labor distribution in manufacturing can go hand in hand with a more regressive distribution overall. This would be the case, for example, where pro-labor policies create a "labor aristocracy" to the detriment of the informal and rural sector workers. Figure 9 is quite comforting on that score. It shows that the relationship between democracy and economy-wide inequality (measured by the Gini coefficient from the high-quality Deininger-Squire data set) is in fact negative. More participatory regimes produce greater equality not only within the modern (manufacturing) sector but throughout the economy. And they do so—as the previous evidence indicates—without cost to economic growth and while producing greater stability and resilience overall.

## 5 Concluding Remarks

Institutional reform has become the buzzword of the day. Policy advisors and international financial institutions (IFIs) find it tempting to extend their advice and conditionality to a broad range of institutional areas, including monetary and fiscal institutions, corporate governance, financial and asset market supervision, labor-market practices, business-government relations, corruption, transparency, and social safety nets. While such efforts have got the basic diagnosis right—the development of a market-based economy requires a heavy dose of institution building—they suffer from two weaknesses.

First, it is not clear whether the IFIs can overcome their bias toward a particular, "neoliberal" social-economic model—a model that is approximated, if not fully replicated, in the real world by the United States. It is telling that when South Korea recently came under International Monetary Fund conditionality, the IMF asked the country to undertake an ambitious range of reforms in trade and capital accounts, government-business relations, and labor market institutions that entailed remolding the Korean economy in the image of a Washington economist's idea of a free-market economy. This model is not only untested, but it forecloses some development strategies that have worked in the past, and others that could work in the future. If Korea, a country with an exemplary development record, is subject to pressures of this kind, one can imagine what is in store for small countries with more checkered economic histories. As I have argued in this chapter, an approach that presumes the superiority of a particular model of a capitalist economy is quite restrictive in terms of the range of institutional variation that market economies can (and do) admit.

Second, even if the IFIs could shed their preference in favor of the neoliberal model, there would remain an organizational bias toward providing similar, even if not identical, advice to client governments. It would be difficult for institutions like the World Bank and the IMF to adopt a "let a hundred flowers bloom" strategy, as it would appear that some countries are being treated more or less favorably. The result is likely to be at best unfriendly to institutional experimentation on the part of client governments.

To be sure, some institutional convergence can be useful and proper. No one can be seriously against the introduction of proper accounting standards or against improved prudential supervision of financial intermediaries. The more serious concern with regard to IFI conditionality is that

such standards will act as the wedge with which a broader set of institutional preferences—in favor of open capital accounts, deregulated labor markets, arms-length finance, American-style corporate governance, and hostile to industrial policies—will be imparted on the recipient countries.

My focus on the importance of local knowledge, and on participatory democracy as a meta-institution for eliciting and aggregating it, suggests that conditionality is perhaps better targeted at basic political freedoms. I have shown in this chapter that democracies perform better on a number of dimensions: they produce less randomness and volatility, they are better at managing shocks, and they yield distributional outcomes that are more desirable. One interpretation of these results, and the one that I have emphasized throughout, is that democracy helps build better institutions. While I am a great believer in institutional diversity, I see no argument that would make it appropriate for some governments to deny their citizens basic political rights such as freedom of speech, the right to vote and stand for political office, or freedom of association.

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# Labor Standards and Labor Market Flexibility in East Asia

*Teri L. Caraway*

## 1 Introduction

The repression of labor has been a defining feature of political economies in Northeast and Southeast Asia (Deyo, 1987, 1989, 1997; Hadiz, 1997; Rasiah & von Hofmann, 1998; Caraway, 2006a). Beneath the miracle of rapid economic growth in the region was a demobilized and politically excluded working class. Today, although there are still authoritarian and semi-authoritarian regimes that severely limit freedom of association, a democratizing subset of countries has opened political space for unions and enacted new labor laws that have provided stronger guarantees for the collective rights of workers. Consequently, labor standards are stronger in the region today than they were 20 years ago. While the repression of labor is a well-known feature of these political economies, the relatively inflexible labor laws are a better-kept secret. Some of the fastest growing

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economies combined the repression of unions with highly protective laws regulating individual labor contracts. Even more surprising, few countries have flexibilized their labor regulations, and in recent years, the most notable trend is labor reforms that reduce labor market flexibility. Countries in the region have achieved high rates of growth in spite of having labor regulations that are not significantly more flexible than the rest of the world.

Labor standards in the region, however, still fall short in many ways. Most East and Southeast Asian countries, including some democracies, have failed to ratify all of the ILO's core conventions, signaling a reluctance to give these standards even a patina of legitimacy. Further, weak enforcement of existing labor laws exerts downward pressure on labor standards and increases the actual level of labor market flexibility. For most countries in the region, de facto labor standards are much worse than de jure standards, and de facto flexibility is much higher than de jure flexibility. Weak enforcement of the law raises de jure flexibility dramatically in about half of the countries in the region.

This chapter will explore the various international influences on labor standards and labor market flexibility in East Asia. International influences, of course, are mediated by domestic politics; the focus here is on assessing whether a plausible case can be made that international pressures contributed to significant changes in labor standards and labor market flexibility. Since some governments respond to international prodding by adopting measures that minimally affect de jure and de facto standards, I also evaluate how meaningful these changes were.

Many countries have taken action to improve labor standards that is at least in part a product of international pressure, but such action has seldom resulted in more than minor improvements in collective labor rights. Most notably, authoritarian regimes have proven relatively immune to international pressures to improve labor standards. The most significant improvements to labor standards usually came after democratization. In these cases, international influences worked in tandem with domestic pressures to produce improved labor standards. International actors have had little effect on improving labor standards in semi-democracies, with the exception of Cambodia, but progress there depended on a carrot, not a stick.

Demands by the international financial institutions to increase labor market flexibility have been minimal in East Asia—with the notable exception of South Korea. This fact is surprising given that labor laws in the

region are quite protective of individual labor contracts. Both democracies and authoritarian regimes have adopted laws that reduce labor market flexibility. Labor law reforms that have an impact on flexibility are driven more by domestic political concerns than by international influences. In addition, since democracies have the most inflexible labor laws in the region, attempts to pass labor law reforms that increase labor market flexibility inevitably provoke a strong response from organized labor, which raises the political cost of reform. Non-enforcement of labor regulations is usually an easier path to follow in these countries.

This chapter will first present background information about the countries in the region and then provide an assessment of de jure and de facto labor standards and labor market flexibility. The rest of the chapter will assess the impact of international influences on labor standards and labor market flexibility. The actors and mechanisms that will be examined directly are the international financial institutions and the Organisation for Economic Co-operation and Development (OECD), trade legislation and trade agreements, and codes of conduct from multinational corporations.

## 2 Background

Countries in Northeast and Southeast Asia range widely in terms of income category, population, and regime type (see Table 1). The majority of countries in the region are in the lower-middle-income and low-income categories (nine countries), with just one, Malaysia, in the upper-middle category and three—Singapore, South Korea, and Taiwan—in the high-income category. Economically, most of the countries in the region are relatively open to international trade and investment, but Burma, Laos, and North Korea are less integrated into the global political economy than the rest of the region. Politically, the region is divided equally between authoritarian regimes (Burma, China, Laos, North Korea, and Vietnam) and procedural democracies (Indonesia, the Philippines, South Korea, Taiwan, and Thailand[1]); communist parties rule in most of the authoritarian regimes. Three countries—Cambodia, Malaysia, and Singapore—are "semi-democracies" that hold regular competitive elections in which the dominant party uses electoral rules, restrictions on civil liberties, and political intimidation to constrain the ability of opposition parties to effectively

[1] In September 2006, a military coup took place in Thailand. The analysis in this chapter only goes through 2006, so Thailand will be treated as a democracy.

**Table 1** Economic and political summary data for East Asia

| *Country* | *GNI per capita (US dollars)* | *Population (in millions)* | *Regime type* | *Year of transition* | *Unionization rate (%)* |
|---|---|---|---|---|---|
| Burma | NA | 51 | Authoritarian | | 0.0 |
| Cambodia | 380 | 14 | Semi-democratic | | 1.0 |
| China | 1740 | 1305 | Authoritarian | | 54.7 |
| Indonesia | 1280 | 221 | Democratic | 1998 | 2.6 |
| Laos | 440 | 6 | Authoritarian | | 3.0 |
| Malaysia | 4960 | 25 | Semi-democratic | | 8.3 |
| North Korea | NA | 23 | Authoritarian | | NA |
| Philippines | 1300 | 83 | Democratic | 1986 | 12.3 |
| Singapore | 27,490 | 4 | Semi-democratic | | 15.7 |
| South Korea | 15,830 | 48 | Democratic | 1987 | 11.8 |
| Taiwan | 16,170 | 23 | Democratic | 1988 | 27.9 |
| Thailand | 2750 | 64 | Democratic | 1992/2007 | 3.1 |
| Vietnam | 620 | 83 | Authoritarian | | 10.0 |

Sources: Doing Business 2007, except for unionization rate. Unionization rates are from ILO (1997) for Cambodia, Malaysia, the Philippines, Singapore, South Korea, and Vietnam (unionization rate measured as percentage of non-agricultural workforce); US Department of Labor, *Foreign Labor Trends* reports (2000) for China, Indonesia, Taiwan, and Thailand; for Laos, the US State Department's Country Report on Human Rights Practices reports union membership of about 77,000 workers. The World Bank reports a labor force of about 2.5 million in 2000 (World Development Indicators)

challenge it (Case, 1996; McCargo, 2005). The democracies in the region are relatively young, with the exception of the Philippines, which has experienced more years of democratic governance than any other country in the region. Wealth and democracy are correlated in the region, with most of the poor countries being authoritarian and the richer countries being democratic or semi-democratic.

Most East Asian governments have not embraced trade unions. In contrast to Latin America where populist governments in some countries embraced unions in inclusionary corporatist arrangements, most in East Asia sought to demobilize workers (Deyo, 1989, 2006; Koo, 2001). In authoritarian countries ruled by communist parties, all unions are required to affiliate to the official union that is subordinate to the party (Gallagher, 2005; Clarke et al., 2007; Taylor & Li, 2007). Whereas unionization rates in the former Soviet Union and Eastern Europe under communist rule approached 100%, unionization rates in East and Southeast Asia's

communist countries are much lower. These low unionization rates are indicative not only of the large role of agriculture in their economies but also of the communist party's wariness of union organizing in the private sector and fear that such organizing might deter foreign investment. In non-communist countries, semi-democratic and authoritarian states banned unions (Thailand 1957–1972, Burma), controlled unions through exclusionary corporatist institutions in which state-backed unions enjoyed monopoly or near-monopoly status (the Philippines, Taiwan, Indonesia, South Korea, Singapore), or constrained unions through restrictive labor legislation (Malaysia, Thailand since the 1970s) (Deyo, 1981; Choi, 1989; Kleingartner & Peng, 1991; Arudsothy & Littler, 1993; Jomo & Todd, 1994; Hadiz, 1997; West, 1997; Brown, 2003). The domestication of unions in the region often required a heavy hand from the state, since many countries had small but vocal labor movements in the early years of independence, and even after many years of repression, workers from time to time took enormous risks and mounted protests to demand better wages and working conditions (Norlund et al., 1984; Deyo, 1989, 1997).

The history of labor exclusion is reflected in the low levels of unionization in the region today. With the exception of Taiwan, unionization rates are less than 20% in the non-communist countries. The relatively high union density in Taiwan is largely a product of increases in membership in occupational unions, composed of self-employed workers who join in order to receive health insurance (Chu, 1996).[2] Another legacy of labor exclusion in Northeast and Southeast Asia is the weak link between political parties and unions in most of the non-communist countries. The exceptions are Singapore and Taiwan. In Singapore, the National Trade Union Council (NTUC) and the People's Action Party (PAP) have an intimate relationship in which the NTUC has been co-opted by the PAP. The traditional political party in Taiwan (the KMT) also has a close relationship with the former state-backed union, the China Federation of Labor (CFL). Since the transition to democracy in Taiwan, the KMT has lost its dominant status, and the main rival to the CFL, the Taiwan Confederation of Trade Unions, has established links with the Democratic Progressive Party (Lee, 2006). Taiwan is the only country in the region where more than one union organizes a large share of unionized workers and has robust ties to an influential political party. China has the highest level of unionization in the region, which is mostly a consequence of

[2] Lee (2006) reports unionization rate of 10.5% in the industrial sector in 2002.

compulsory membership for state employees (Taylor & Li, 2007). The comparatively low rates of unionization in Vietnam and Laos are in part a function of the agricultural basis of their economies. Most union members work in the public sector, although Vietnam has recently begun to push for expanded unionization in the private sector, largely in response to repeated wildcat strikes in export factories (Taylor & Li, 2007).

Cambodia is a special case due to its tumultuous history. The reign of the Khmer Rouge (1975–1979) and the subsequent civil war and Vietnamese occupation in the 1980s devastated the country. Foreign investors began to invest heavily in the garment industry in the mid-1990s; protests over wages and working conditions soon followed. Leaders from the opposition Sam Rainsy Party seized the opportunity to organize disgruntled garment workers into a national organization (Hughes, 2007). Only after the opposition established a trade union in the garment sector did the ruling Cambodian People's Party (CPP) make an effort to channel workers in the private sector into unions that it controlled. In Cambodia, many unions thus have close relationships with either the CPP or opposition parties, but given the semi-democratic nature of politics there, opposition parties face enormous obstacles in influencing political outcomes that affect labor. The overwhelming importance of garment exports to the Cambodian economy, however, has made international influences on labor rights especially strong there.

## 3 Measuring Labor Standards and Flexibility

This section will assess labor standards—specifically collective labor rights pertaining to freedom of association, collective bargaining, and the right to strike—and labor market flexibility, with indices that measure both their de jure and de facto statuses. According to these measures, neither de jure nor de facto labor standards are strong in Northeast and Southeast Asia. De jure labor market flexibility is surprisingly low considering the region's reputation for flexible labor markets. Due to weak enforcement, however, de facto labor market flexibility is notably higher than de jure flexibility.

### *Labor Standards*

Respect for labor standards varies dramatically among countries in the region. Not a single country has labor laws that are in full compliance with ILO Conventions No. 87 and 98, and the average score in the region for

**Table 2** De jure and de facto labor standards and flexibility scores in East Asia

| *Country* | *De jure labor standards* | *De facto labor standards* | *De jure flexibility* | *De facto flexibility* |
|---|---|---|---|---|
| Authoritarian | 45.0 | 32.7 | 50.9 | 60.8 |
| Burma | 0.0 | 0.0 | n/a | n/a |
| China | 50.0 | 35.2 | 50.9 | 60.3 |
| Laos | 52.9 | 44.0 | 56.8 | 65.4 |
| Vietnam | 77.1 | 51.6 | 44.8 | 56.8 |
| Semi-democratic | 71.7 | 53.8 | 63.4 | 69.8 |
| Cambodia | 90.0 | 59.8 | 45.3 | 59.8 |
| Malaysia | 55.0 | 42.9 | 58.2 | 62.7 |
| Singapore | 70.0 | 58.8 | 86.8 | 87.0 |
| Democratic | 73.0 | 58.1 | 44.4 | 54.7 |
| Indonesia | 88.6 | 66.6 | 39.5 | 55.8 |
| Philippines | 74.3 | 52.0 | 43.4 | 56.2 |
| South Korea | 70.7 | 60.2 | 45.9 | 52.9 |
| Taiwan | 68.6 | 62.2 | 34.9 | 44.7 |
| Thailand | 62.9 | 49.4 | 58.1 | 63.9 |
| Regional average | 69.1 | 53.0 | 51.3 | 60.5 |
| World average | 72.5 | 55.2 | 51.7 | 60.6 |

Calculated according to methods described in text and appendix in Stallings (2010); world average is the average in the four regions analyzed in this project

de jure labor standards (DJLS) is 69 (out of 100) (see Table 2).[3] Although democracies have the highest average DJLS scores, they barely inch by the semi-democracies; scores within regime-type categories also vary considerably. The relatively high scores in democracies are a consequence of the significant reforms to labor legislation that occurred after transitions to democracy, but even so, the labor laws in most democracies retain many provisions that violate international labor standards. Although the three countries with the lowest scores are authoritarian, Vietnam has the third highest score in the region. One semi-democracy—Cambodia—has strong labor laws, but the laws in the two other semi-democracies—Singapore and Malaysia—are at or below the regional average. Cambodia invited the ILO to assist it with rewriting its labor legislation in 1994 (Bronstein

[3] North Korea is omitted from the analysis because there are insufficient data available to assess labor rights there.

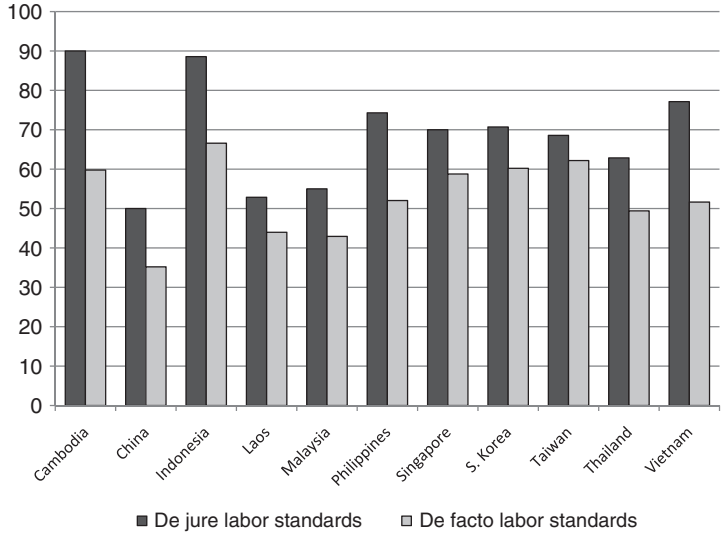


**Fig. 1** De jure and de facto labor standards in East Asia (based on Table 2)

2004–2005), which explains why it has the highest DJLS score in the region in spite of being a semi-democracy.[4]

Labor law, however, only tells part of the story of labor standards in the region. Labor standards are also affected by whether the laws are enforced and by the political climate in the country. To assess the effects of enforcement and political climate on labor standards, another measure, de facto labor standards (DFLS), will be used. As can be seen in Fig. 1, DFLS scores are much lower than the DJLS scores for almost every country, indicating that labor standards protected by law are in practice frequently violated. Democracies still have the highest scores and authoritarian countries the lowest; scores fall most sharply for semi-democracies. Indonesia has the strongest DFLS, and after Burma, China has the lowest DFLS score.

Most striking are the plummeting scores of the four countries with the strongest DJLS—Cambodia, Indonesia, Vietnam, and the Philippines. The falling scores on DFLS are in part a function of their high DJLS

[4] Consultations with the ILO began in 1994; the legislature approved the new Labor Code in 1997 (Bronstein, 2004–2005).

scores.[5] None effectively enforce their labor laws, and the consequences of poor enforcement are most severe in countries that have relatively protective laws. Most alarming, in both Cambodia and the Philippines, multiple trade unionists have been murdered. In one horrific case in the Philippines, the police and the army forcibly put down a strike at Hacienda Luisita sugar mill and plantation in November 2004, killing seven protestors (ICFTU, 2006c); in 2005 at least eight trade unionists were murdered or disappeared (ICFTU, 2005). In Vietnam, the violence is not as severe, but labor activists are harassed, civil liberties are frequently violated, and independent trade unions are prohibited. China's score, already low, fell dramatically as well as a consequence of the weakness of associational rights and rule of law, unfair labor practices, and the harassment and imprisonment of labor activists (ICFTU, 2006a). The ILO's Committee on Freedom of Association (CFA) has raised particularly grave concerns about the continued use of arrests, detention, and violence to suppress labor rights there (CFA Case 2031 and 2189). Brutal crackdowns on strikes and mass arrests of trade unionists mar Korea's labor rights record as well. The ICFTU estimates that over 1000 unionists were arrested between 1999 and 2005, most on charges of "obstruction of business" and for organizing unions in the public sector (ICFTU, 2006b).[6]

### *Labor Market Flexibility*

Renowned for its booming economies, it is perhaps unsurprising that the World Bank's data on labor market flexibility show that East Asia has comparatively flexible labor markets. The World Bank's assessment, however, hinges crucially on the inclusion of many small Pacific island nations with extremely flexible labor laws, as well as the exclusion of firing costs in its rigidity of employment index. Firing costs in Northeast and Southeast Asia are relatively high; incorporating them into a measure of flexibility significantly alters the picture. The average DJF in the region is 51, with semi-democracies having the most flexible laws and democracies having the most protective laws (see Table 2). Taiwan has the most protective laws, and Singapore has the most flexible laws. The relatively low scores

[5] Since countries with strong laws and weak enforcement are penalized more than countries with weak laws and weak enforcement, countries with strong laws are more likely to experience a large decrease in their scores than those with weak laws.

[6] Under Section 314 of Korea's Criminal Code, workers participating in strikes can be arrested and prosecuted on charges of "obstruction of business."

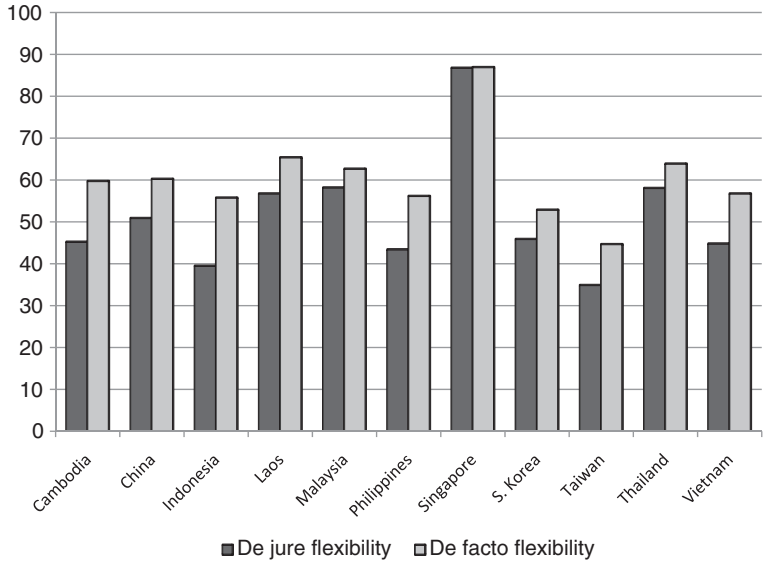


**Fig. 2** De jure and de facto labor flexibility in East Asia (based on Table 2)

for authoritarian countries are striking and indicate that the communist parties that rule them have opted to cushion the effects of market reforms on workers with fairly protective individual labor laws. Among democracies, Thailand stands out as having by far the most flexible labor laws. It differs from the other democracies in that Indonesia, the Philippines, South Korea, and Taiwan all had relatively protective individual labor laws under authoritarian regimes. Subsequent democratic governments have rarely undone these protections.[7] Even South Korea, the only democracy that has enacted reforms flexibilizing its individual labor laws, still has relatively protective laws.

An index based purely on legislation, however, underestimates the actual level of labor market flexibility in the region, since labor laws are only as strong as their enforcement. The de facto flexibility index (DFF) takes into account both legislation (the DJF) and law enforcement to estimate the actual level of labor market flexibility in the economy. As Fig. 2

[7] Caraway (2004, 2009) has coined the term "protective repression" to describe labor rights regimes in authoritarian countries that repress collective labor rights but protect individual labor rights.

shows, taking enforcement into account increases labor market flexibility in the region. Incorporating enforcement had particularly strong effects on labor market flexibility in Cambodia and Indonesia because both had relatively high DJF scores but extremely poor enforcement. The scores for China, Laos, the Philippines, and Vietnam also increase notably. Still, the effect of regime type remains—labor markets in democracies are less flexible than those in other regime types, and semi-democracies have the most flexible labor markets in the region.

## 4 Core Labor Standards

In comparison to other regions, countries in both Northeast and Southeast Asia have embraced core labor standards reluctantly. They have ratified fewer ILO core conventions and frequently violate those that they have ratified. Two countries, North Korea and Taiwan, are not members of the ILO.[8] Only three countries (Cambodia, Indonesia, and the Philippines) have ratified all eight conventions. For ILO members in the region, the average number of conventions ratified is 5.1, and the total ratification rate for the region is 65%, which is significantly lower than the worldwide ratification rate (see Table 3). The most widely ratified standards are those for discrimination and child labor; resistance is fiercest to Conventions No. 87, No. 98, and No. 105, on freedom of association/collective bargaining and forced labor, which fewer than half of the countries have ratified. The ILO's efforts to encourage the ratification of the eight conventions have had a notable impact on five conventions—No. 87, No. 105, No. 111, No. 138, and No. 182—at least 50% of the ratifications for these conventions took place in 1998 or later.[9] Democracies have ratified more conventions (6.25) than countries with other forms of government. Semi-democracies have ratified an average of 6.0 core conventions, and authoritarian countries have ratified just 3.5. Wide variation exists within the democratic and semi-democratic cases, however, ranging from four to eight conventions ratified in the democracies and five to eight for the semi-democracies.

[8] Taiwan is ineligible to join since it is not a member of the United Nations.

[9] Since Convention No. 182 on the Worst Forms of Child Labor was promulgated in 1999, all ratifications have taken place recently.

**Table 3** ILO core standards: ratifications by country and regime type in East Asia

| *Country* | *Freedom of association/ collective bargaining* | | *Forced labor* | | *Discrimination* | | *Child labor* | | *Total* |
|---|---|---|---|---|---|---|---|---|---|
| | *#87* | *#98* | *#29* | *#105* | *#100* | *#111* | *#138* | *#182* | |
| Authoritarian countries Average ratifications: 3.5 | | | | | | | | | |
| Burma | 1955 | | 1955 | | | | | | 2 |
| China | | | | | 1990 | 2006 | 1999 | 2002 | 4 |
| Laos | | | 1964 | | | 2008 | 2005 | 2005 | 4 |
| Vietnam | | | | | 1997 | 1997 | 2003 | 2000 | 4 |
| Semi-democracies Average ratifications: 6.0 | | | | | | | | | |
| Cambodia | 1999 | 1999 | 1969 | 1999 | 1999 | 1999 | 1999 | 2006 | 8 |
| Malaysia | | 1961 | 1957 | | 1997 | | 1997 | 2000 | 5 |
| Singapore | | 1965 | 1965 | | 2002 | | 2005 | 2001 | 5 |
| Democracies Average ratifications: 6.2 | | | | | | | | | |
| Indonesia | 1998 | 1957 | 1950 | 1999 | 1958 | 1999 | 1998 | 2000 | 8 |
| Philippines | 1953 | 1953 | 2005 | 1960 | 1953 | 1960 | 1998 | 2000 | 8 |
| South Korea | | | | | 1997 | 1998 | 1999 | 2001 | 4 |
| Thailand | | | | 1969 | 1969 | 1999 | 2004 | 2001 | 5 |
| Total/Average | 4 | 5 | 7 | 4 | 9 | 7 | 9 | 9 | 5.2 |
| Rate of ratification (%) | 36 | 45 | 64 | 36 | 82 | 64 | 82 | 82 | 65 |
| Since 1998 (%) | 50 | 20 | 14 | 50 | 33 | 83 | 100 | 100 | |

Sources: www.ilo.org/ilolex/cgi-lex; Malaysia ratified #105 in 1958, but renounced it in 1990; Singapore ratified the same convention in 1965 but renounced it in 1979

### *Preferential Trade Programs and Free Trade Agreements*

A number of pieces of trade legislation in both the USA and Europe have social clauses pertaining to labor rights. Some of these are unilateral instruments—the Generalized System of Preferences in both the USA and the European Union, and the US Trade Act—while others are bilateral. The regional trade agreement, the ASEAN Free Trade Area, does not contain provisions that permit countries to call into question respect for labor rights in other signatories.

The best-known trade instrument for promoting stronger labor rights worldwide is the US Generalized System of Preferences (GSP).[10] The GSP provides preferential access to US markets for a wide variety of products from developing countries. Countries receiving privileges under the GSP are required to respect internationally recognized worker rights, and interested parties who believe that a country is violating these rights may petition the United States Trade Representative (USTR) to request a review of the country's GSP status. Currently, only four countries in this study participate in the GSP program—Cambodia, Indonesia, the Philippines, and Thailand. In the past, Malaysia, Singapore, and South Korea have also participated in the GSP program.[11] American activists and unions have filed multiple petitions with the USTR, but results have been mixed. In the Philippines and Malaysia, the petitions had little effect on labor rights, while in Indonesia, South Korea, and Thailand evidence is mixed. In Cambodia, a GSP petition opened the door to establishing a unique monitoring program designed to strengthen labor standards. This change, however, depended crucially on Cambodia's dependence on textile exports and incentives, rather than punishment, for taking steps to improve labor standards.

GSP petitions have had the weakest effects in Malaysia and the Philippines. Malaysia underwent multiple reviews—but no continuing reviews—and took absolutely no steps to improve labor rights. The USA lacked the will to push Malaysia, an important ally and investment location for US electronics manufacturers (Compa & Vogt, 2005). The Philippines was under review in 1988 and 1989, and both petitions were accepted by the USTR. The Philippines had already amended its labor code soon after Cory Aquino took office and had already removed many of the repressive Marcos era amendments to the labor code. Although the ILO still found many shortcomings in the labor code, the USA was a stalwart supporter of the Aquino administration, and neither petition was extended. The International Labor Rights Fund (ILRF) filed a petition against the Philippines in 2007, demanding that the Philippines rectify its abysmal record of violence against trade unionists. In 2008, the ILRF attempted a creative new product-based strategy in response to Dole's request to include unsweetened pineapple juice on the list of products eligible for the

[10] See Compa and Vogt (2005) for a useful overview of GSP.

[11] Singapore and South Korea graduated in 1989 and Malaysia in 1997 (Elliot & Freeman, 2003, p. 152).

GSP program. Dole's main pineapple facility is in the Philippines, and the ILRF presented evidence that both Dole and state security forces have committed egregious labor rights violations on Dole's pineapple plantations. The ILRF believes that GSP privileges should not be extended to this new product until labor rights violations in its production cease. Both of these cases are still pending.[12]

In Indonesia, South Korea, and Thailand, evidence is mixed about the effects of the GSP petitions on labor rights. Indonesia was the target of multiple GSP petitions in the late 1980s and early 1990s. All of the petitions were accepted for review, and two underwent continuing reviews. Glasius (1999) documents a number of steps taken by the government, but none ultimately had much effect on collective labor rights, de jure or de facto. For example, although a strike ban in vital industries from the 1960s was revoked, the Suharto regime had long relied on other regulations to suppress strikes. A new ministerial regulation that permitted independent unions to form at the plant level also required them to later affiliate with the state-backed union. The increase of the minimum wage and stronger enforcement of this higher wage was a significant achievement, but gains in wages should not be confused with meaningful improvements in collective labor rights, on which the regime gave little ground. In addition, a massive wave of wildcat strikes swept through Indonesia during this period, and most of these strikes focused on minimum wages, so the interactive effect of international and domestic pressure is evident. Glasius is probably correct that part of the explanation for the limited effect of the GSP petition is that the USA was half-hearted in using its influence to pressure an important ally and trading partner. The memory of the unpleasant glare of the international spotlight during the GSP review, however, played a role in making labor reforms a high priority for the Habibie administration, which was eager to establish its democratic credentials after the fall of Suharto (Caraway, 2004).

South Korea came under review in 1987, in the midst of a democratic transition that was accompanied by massive worker protests (Koo, 2001). The legislature made some minor revisions to Korean labor laws that ended some restrictions on strikes and on bargaining above the enterprise level, and the USTR found it to be taking steps to improve labor rights and suspended the review. Although a step forward, the revisions to the

[12] Information about the status of these cases can be found at www.laborrights.org/creating-a-sweatfree-world/changing-global-trade-rules/gsp (accessed on 18 October 2009).

laws did not address the most serious violations of ILO standards and produced minimal improvements in collective labor rights.

In Thailand, evidence for the effect of GSP is also mixed, in part due to the timing of changes to the law and in part because the Thai government crafted changes to its labor laws in an extremely clever way that allowed it to achieve much of what it had hoped by violating international labor standards in the first place. American activists and unions filed a number of petitions against Thailand in the late 1980s and the early 1990s. All but one were accepted, and Thailand was under continuing review from 1992 to 2000. The main bone of contention was the right of state enterprise employees to organize. During the brief period of military rule in 1991–1992, the junta removed state enterprise employees, who had the strongest unions in Thailand, from the scope of the Labor Relations Act; consequently, workers in state enterprises could no longer unionize. In 1993, the USTR decided to continue its review of Thailand's GSP status (Compa & Vogt, 2005). Although Thailand was one of the top beneficiaries of the program, it did not change its laws until seven years later, when Supachai Panitchpakdi of Thailand became a top candidate to head the World Trade Organization. American unions exerted pressure on the Clinton administration to oppose Supachai's candidacy. Bending to pressure, Thailand finally enacted the State Enterprise Labor Relations Act (SELRA) of 2000. SELRA reinstated the right of state enterprise workers to unionize, but the law limited the scope of collective bargaining, forbade strikes, and prohibited state enterprise unions from forming federations with unions in other sectors of the economy.[13] Moreover, when state enterprises are privatized, unions formed under SELRA are dissolved. The law weakened state enterprise unions by gutting their right to bargain and strike and by limiting their ability to unite with other workers. SELRA became law in May 2000; the USA suspended its GSP review and Supachai was selected to be WTO Director-General in July.

In Cambodia, activists filed a GSP petition with the USTR in 1998, just as Cambodia began to enter negotiations with the USA about its textile quota. The coincidence in the timing of the petition and the trade negotiations, in combination with the dependence of Cambodia on textile

[13] In 2001 the restrictions on forming federations with unions in the private sector were amended. Federations of state enterprise unions were allowed to affiliate with federations of private sector unions; individual state enterprise unions, however, were still not allowed to affiliate directly to federations of unions in the private sector.

exports, opened the door for notable progress on labor standards. In response to the petition, Cambodia finally permitted the main independent federation in the garment sector to register (Abrami, 2003). But perhaps the most notable change came from the USA offering a big carrot—it agreed to raise Cambodia's quota if apparel production could be shown to be in substantial compliance with national labor law and international labor standards (Abrami, 2003; Polaski, 2006). Realizing that the Cambodian government lacked the capacity to effectively enforce its laws, which were already the strongest in the region, and that respect for labor rights would need to be verified by a credible source, Cambodia and the USA called on the ILO to monitor labor standards in Cambodia's garment industry. Although the ILO does not have the authority to enforce laws, most factories made some improvements in working conditions (Elliot & Freeman, 2003, p. 118). (This project is now known as Better Factories Cambodia.) The program is widely regarded as a resounding success, and efforts are being made to set up similar programs in other countries.

A ringing endorsement of this program, however, is perhaps premature. Hughes (2007) argues that the program undercut the dynamic labor movement that emerged in the late 1990s. Further, in spite of the success of the project in addressing wages and working conditions, few garment factories have collective bargaining agreements, and labor activists are still subjected to extreme intimidation and violence.[14] Hughes echoes the point made so well by Compa (2001) about unions and monitors being "wary allies." Monitoring programs run by international groups or by NGOs essentially accept the government's abdication of enforcement and potentially undermine unions by allowing workers to turn to monitors rather than worker-controlled organizations to address their grievances.

In addition to the US GSP program, Section 301 of the US Trade Act of 1974, as amended in 1988, allows the government to tie trade and labor standards. The law states that persistent violations of internationally recognized workers' rights constitute an "unreasonable" trade practice. The USTR can suspend benefits or impose sanctions in order to encourage a country to cease its unfair trade practices. The American Federation of Labor and Congress of Industrial Organizations (AFL-CIO) filed

[14] In 2004, two leaders of the Free Trade Union of Workers of the Kingdom of Cambodia (FTUWKC) were assassinated in broad daylight in Phnom Penh, yet the ILO's Garment Sector Monitoring Project failed to mention this in their report (Hughes, 2007).

petitions in 2004 and 2006 against China.[15] The Bush administration declined both petitions, so the petitions did not ultimately pose much of a threat to China's trading privileges with the USA.

The European Union also has a GSP program with two mechanisms for improving labor rights. The first provides civil society actors with the opportunity to request that GSP benefits be withdrawn from countries that violate the ILO's core conventions. The second is essentially a labor rights incentive provision referred to as GSP Plus. Countries that respect the "substance" of the ILO's core labor standards may apply for additional tariff preferences (Greven, 2005). Burma lost its GSP privileges in 1997 as a result of severe violations of the forced labor conventions, but has not subsequently taken steps to improve labor standards. No country in East Asia has applied for tariff preferences under the GSP Plus program.

Thus far only one bilateral trade agreement with labor provisions is in effect, the US–Singapore Free Trade Agreement (USSFTA).[16] Both countries committed to enforce their domestic labor laws, and the penalty for non-compliance is a fine (maximum $15 million); if a country refuses to pay a fine, trade sanctions may be imposed provided that trade is affected by the violation (Greven, 2005; Polaski, 2003). Unlike violations of the commercial aspects of the treaty, parties to the agreement may not submit labor rights issues to a formal dispute resolution process. Perhaps the most controversial aspect of the agreement is the "Integrated Sourcing Initiative" that allows some goods from Bintan and Batam islands in Indonesia to fall under the scope of the US–Singapore FTA. The labor chapter of the USSFTA does not, however, extend to Bintan and Batam. In addition, the pledge to merely enforce existing law means that neither country is obligated to improve its laws so that they comply fully with ILO conventions. Singapore amended the Industrial Relations Act in 2004, the year after the signing of the FTA, eliminating the restrictions on collective bargaining that had been imposed on "pioneer industries." The FTA may have influenced this outcome, although it should be noted that the USA had not invoked the labor rights provisions of the agreement and that other aspects of Singaporean law that violate international labor standards remain. Moreover, Singapore may have decided to undo this provision

[15] The 2004 petition was the first time that a petition was filed under Section 301 on worker rights grounds.

[16] The USA signed an FTA with South Korea in 2007 that contains labor provisions as well, but it has yet to be ratified by Congress.

because the restrictions on pioneer industries were anachronistic, given the country's level of industrial development, and because the state still retained the right to strike provisions of collective agreements deemed not to be in the "public interest."

### *Multinational Codes of Conduct*

Since the 1990s, many corporations have adopted or signed codes of conduct that obligate them and their supplier factories to respect labor rights. Although the codes vary in terms of the obligations imposed and the methods of monitoring compliance, most at a minimum prohibit child and forced labor and require compliance with local labor laws. The thorniest issue that has emerged is that some countries—China and Vietnam, for example—prohibit freedom of association by requiring all unions to be affiliated to the state-backed union. Requiring full respect for freedom of association would essentially mean that corporations and their suppliers could not produce in these countries. Most corporations are unwilling to boycott China and Vietnam as production sites, so the focus of monitoring has usually been on hours, wages, and health and safety issues.

Assessing the effects of codes of conduct on labor rights and working conditions is extremely difficult. Leaving aside the important issue of the quality of monitoring,[17] the effects of monitoring have been most noticeable in the areas of child labor, forced labor, and health and safety, while progress on hours, wages, and freedom of association have been minimal (Vogel, 2006; Locke et al., 2009). One study of Nike's internal monitoring system showed that years of monitoring had failed to improve working conditions in its supplier factories (Locke et al., 2007). Wal-Mart, which is one of the top export markets for Chinese goods, also reports that the vast majority of its suppliers worldwide fail to comply with its standards for suppliers (Wal-Mart, 2009).[18] Although some case studies find that suppliers for corporations with codes of conduct have better working conditions than those that do not, even these suppliers violate local laws pertaining to hours and wages (Ngai, 2005). Enforcing codes of conduct by severing

[17] For excellent discussions, see O'Rourke (1997) and Wells (2007).

[18] Most of Wal-Mart's stores in China are unionized, whereas none of its US stores have unions. After the All-China Federation of Trade Unions (ACFTU) waged a grass roots campaign to establish unions in several stores, Wal-Mart agreed to top-down unionization for the rest. Most of the union committees are dominated by management (Blecher, 2008).

relationships with repeat violators would require multinationals to fire most of their suppliers. Multinationals will not take such action, and activists are reluctant to demand the suspension of contracts since it results in layoffs of innocent workers. Part of the challenge in using codes of conduct to improve labor rights is that the very nature of the relationship between brands or retailers and their suppliers discourages long-term commitments to particular factories. Demands by multinationals to improve labor practices, on the one hand, and to lower production costs and tighten production schedules, on the other, send mixed messages to supplier factories. Unless multinationals are willing to pay for higher labor standards, allow for longer production schedules, and enter into long-term relationships that reward suppliers that are willing to absorb the extra cost of compliance, suppliers will invest their resources in duping monitors, doing just enough to avoid the cancellation of their contracts.

The weaknesses of the code of conduct model are evident in both Northeast and Southeast Asia. The following examples are well-known cases in which the code of conduct model has been put to a public test. Since most corporations do not release complete data on their monitoring and remediation efforts, these public cases are one of the only means of gaining insight into the effects of codes of conduct on labor rights. Some of these problems stem from the footloose nature of production, while others arise from a weak commitment by multinationals to making compliance a decisive factor in their sourcing decisions.

At PT Mulia Knitting in Indonesia, for example, investigators from the Worker Rights Consortium (WRC) uncovered evidence that management had busted a union by firing its leaders.[19] When the WRC asked the university licensee to exert pressure on the company, the licensee was in no position to do so because it no longer had any orders with PT Mulia. In another case in Indonesia, the PT Dae Joo Leports factory worked with the WRC to make significant improvements to address numerous violations uncovered by the WRC investigation team, but PT Dae Joo Leports later closed its factory, relocating to China, in part because of the increased

[19] The WRC is an NGO that carries out investigations of reported violations of its code of conduct by supplier factories that produce university-licensed products. It is the only monitoring organization free of corporate influence and is widely recognized as conducting the most thorough investigations of factory conditions, in particular with regard to violations of freedom of association (Esbenshade, 2004; Wells, 2007). The WRC's factory investigations are available at: www.workersrights.org/Freports/index.asp#freports (accessed on 18 October 2009).

costs imposed by complying with the WRC's recommendations. Similarly, in the famous case of the Gina factory in Thailand, activists forced the employer to recognize a union through mobilizing a dynamic transnational campaign targeting the international brands that had contracts with Gina (Robertson & Plaiyoowong, 2004). The union successfully negotiated wage increases and better benefits, but several years later the factory closed and relocated to China.

In a recent case in the Philippines, the WRC tried to persuade Wal-Mart and university licensees to exert pressure on a supplier factory, Chong Won. In 2006, the WRC investigation team not only found minimum wage violations, forced overtime, and abuses of freedom of association and collective bargaining, but also uncovered evidence that factory management had collaborated with state security agents to use violence against labor activists and lawfully striking workers. Chong Won responded by closing the factory in 2007 and to date neither Wal-Mart nor other multinationals have taken visible steps to remediate these labor rights violations. When the international spotlight shines too brightly, it is often easier to cut and run than to invest in improving labor standards.

### *IFIs and the OECD*

The international financial institutions (IFIs) active in the region—the International Monetary Fund (IMF), the World Bank, and the Asian Development Bank (ADB)—have paid some attention to core labor standards, but their activities have thus far not positively affected labor standards. Only the OECD has taken action that has produced improvements in labor rights.

The IMF was the first of the international financial institutions to recognize CLS (Hagen, 2003; Caraway, 2006b). In the last decade, Cambodia, Indonesia, Laos, the Philippines, South Korea, Thailand, and Vietnam have been under IMF programs. Although the IMF has raised labor rights issues behind the scenes in at least one case in the wake of the Asian financial crisis, Indonesia (Caraway, 2004), and has mentioned efforts to abide by ILO labor standards in the context of its analysis of garment exports in Cambodia, it has never imposed conditionality in the form of benchmarks or performance criteria or demanded progress on labor standards as prior actions—measures that must be taken before a loan is granted.[20]

[20] This assessment is based on a reading of publicly available letters of intent and IMF staff reports from 1980 to 2006.

As for the World Bank, it has pledged to integrate CLS into its Country Assistance Strategies (CAS), now called Country Partnership Strategies. Only Cambodia, Indonesia, Laos, the Philippines, Thailand, and Vietnam have concluded CAS in recent years. The CAS do not contain a section that addresses CLS. The most frequently raised issue is gender discrimination, although interestingly CLS are rarely mentioned explicitly, which suggests that its inclusion is a product of gender mainstreaming efforts in place at the Bank for many years. Of the eight recent CAS reviewed, six of them address discrimination against women, although often in an oblique way that voiced concern for gender inequality in general rather than discrimination against women in the workplace in particular. Four of the CAS had a more robust discussion of labor standards—Cambodia, Laos, Thailand, and Vietnam (2003–2006 CAS only). The Bank recognized the importance of CLS in maintaining Cambodia's competitive advantage in the garment sector and committed to funding a labor code compliance study; it also noted the problems with compliance with CLS and enforcement of the labor code in Laos. In Thailand, in response to demands by civil society groups to address labor issues and worker rights in its programs, the Bank noted its commitment to working with the Thai government to improve occupational health and safety and to reduce child labor. In Vietnam, the 2003–2006 strategy included a corporate social responsibility project designed to assist and highlight companies that respect Vietnam's labor code and CLS. The project supports the goal of strengthening the capacity of unions to protect worker rights and working conditions. The Better Work program, established jointly by the IFC and the ILO to help enterprises to comply with national labor law and CLS, is carrying out this project in Vietnam.

Trade unions have welcomed these steps by the World Bank but remain skeptical about implementation, in part because it is unclear how the Bank will verify that CLS are being respected but also because some Bank staff seem insufficiently committed to the goal. In a World Bank report submitted to China in November 2006, it advised the Chinese government that it could brush off the question of "so-called labor standards" (ITUC Online 2006). Although the World Bank has taken some steps to address CLS, thus far concrete improvements in labor standards as a consequence of these actions have yet to be demonstrated.

The ADB has also made an effort to engage the ILO with regard to labor standards. Since the ADB adopted its Social Protection Strategy in 2001, it has pledged to comply with CLS and to use them to guide its

operations. In line with this objective, the ADB recently published a handbook on CLS that offers ideas for integrating them into ADB operations (ADB, 2006). The ADB is careful to note that the recommendations "are not an expansion of any policy, and the user should note the distinction between good practice suggestions, i.e., the examples in this Handbook, and the policy requirements presented in ADB's Operations Manual" (ADB, 2006, p. 4). The ADB's equivalent of the CAS is the Country Strategy (CS), and in recent years the Bank has issued these reports for seven countries in the region—Cambodia, China, Indonesia, Laos, the Philippines, Thailand, and Vietnam. None provide an assessment of CLS and how to integrate them into their projects in each country; none even mention labor standards as such. Three discuss the need to deal with gender inequalities in labor markets, but in the context of gender assessments of country programs rather than in a discussion of labor standards.

The OECD, in contrast to the international financial institutions, positively influenced labor rights in South Korea. After South Korea joined the ILO in 1991, Korean and international unions began to file complaints with the ILO's Committee on Freedom of Association, which found violations of numerous principles of freedom of association (Park & Park, 2000). Korean governments ignored ILO recommendations for many years and made only modest changes to labor laws in response to demands by Korean unions (Koo, 2000). When Korea became a member of the OECD in 1996, however, the price of admittance was a commitment to bring its labor laws into compliance with international labor standards as interpreted by the ILO (Gills & Gills, 2000; Park & Park, 2000; Kim & Kim, 2003). The OECD instructed its Employment, Labor and Social Affairs Committee to monitor progress on labor law reform. Korea responded to this pressure by passing the Trade Union Labor Relations Adjustment Act in 1997, which addressed many but by no means all of the shortcomings in Korea's legislation. As with Cambodia, the government responded more favorably when international actors could withhold something that the government desperately wanted.

## 5 Labor Market Flexibility

In this section of the chapter, I will evaluate the influence of the international financial institutions on labor market flexibility and analyze the most notable labor law reforms that have affected individual labor laws in the region during the last decade. With the exception of South Korea, IFI

pressure on countries in the region to flexibilize their labor laws has been minimal. Most notable is that aside from South Korea, significant episodes of labor law reforms in East and Southeast Asia have produced less, not more, flexible labor laws.

### *IFI Pressures*

The international financial institutions are well known for their advocacy of labor market flexibility, so it is surprising that they have not aggressively pursued it in East Asia. One reason is that only seven countries in the region have accepted loans from the IMF since 1997—Cambodia, Indonesia, Laos, the Philippines, South Korea, Thailand, and Vietnam. The other is that many of the labor regulations in the region were already relatively flexible. The IMF has not pushed for greater labor market flexibility in East and Southeast Asia until very recently, and in all but South Korea, it has not been a top issue for reform. The IMF has not mentioned labor market flexibility in its Article IV consultations with Laos, Thailand, and Vietnam, and these countries have not committed to making labor law reforms in their letters of intent. Thailand's labor market is already quite flexible, so the lack of pressure there is unsurprising, but de jure flexibility scores in Laos and Vietnam exceed the world average, which makes the IMF silence puzzling.

In the remaining four countries—South Korea, Indonesia, the Philippines, and Cambodia—the IMF's strong preference for greater labor market flexibility has been evident, although, in all but South Korea, this is a recent development. The IMF targeted South Korea earliest, since it saw liberalizing layoffs as necessary for restructuring the *chaebol* in the wake of the Asian financial crisis (Kim & Moon, 2000; Koo, 2000). Even here, "hard" conditionality—benchmarks and performance criteria—were not used as sticks to compel Korea to make its labor laws more flexible. With the support of employers, the Korean government instituted reforms in two areas, liberalizing layoffs and outsourcing.[21] Korea did not go as far

[21] On labor market flexibility, the IMF and the OECD were singing the same tune (OECD, 2000). Previously, employers could only dismiss workers for "justifiable" reasons, and the Korean courts interpreted "justifiable" narrowly. In practice, it was difficult to fire workers on personal, behavioral, or economic grounds (Lee, 2002). The reforms allowed employers to dismiss workers for "managerial reasons," which included retrenchments, mergers, and acquisitions. Regarding outsourced labor, until 1998 the Minister of Labor tightly limited the use of labor supply services to security, janitorial, and engineering work unless the union agreed to permit the outsourcing of additional job categories (Lee, 2002). The Dispatched

as the international financial institutions wanted, however, and the IMF continues to push South Korea to further flexibilize its labor markets. Nonetheless, subsequent changes to Korea's laws have, on balance, lessened labor market flexibility by reducing the number of hours in the standard working week and introducing more conditions on the use of fixed-term and part-time workers.

Labor market flexibility escaped the IMF's notice in Cambodia, Indonesia, and the Philippines in the immediate aftermath of the Asian financial crisis, even though all had relatively inflexible labor regulations. Since 2004, however, the IMF has recently begun to highlight issues of labor market flexibility in its Article IV consultations with Cambodia, Indonesia, and the Philippines. In Indonesia, the new attention is the result of the passage of the Manpower Act of 2003, which reduced labor market flexibility. In response to both IMF and business pressure, the Indonesian government attempted to push through a reform of the Manpower Act, but labor unions mounted massive protests and thwarted this effort. The Filipino government has also committed to revise its labor code in the direction of greater flexibility but has yet to do so.

The main tool that the World Bank has used to promote labor market flexibility in Northeast and Southeast Asia has been the annual *Doing Business* report. Through the Employing Workers component of the study, the World Bank highlights which countries it considers to have inflexible labor regulations. Some CAS made explicit reference to the Employing Workers rating, but most do not. Of the eight CAS evaluated, only two refer outright to labor regulations as hurting the country's business climate (Indonesia 2009–2012, and the Philippines 2005–2008). Similarly, the ADB only mentions inflexible labor markets as an issue in one out of eight CS (Indonesia 2006–2009).

In sum, international financial institutions have had a minimal effect on labor regulations in East Asia. The most convincing case of international influence is South Korea, where significant flexibilizing reforms coincided with IMF and OECD pressure. Since both employers and the IFIs were pushing for more flexible labor markets, however, the outcome is overdetermined, and disentangling the effect of each set of actors is difficult. Of course, labor unions vehemently objected to these reforms. Most likely, the Korean government used the IMF as political cover to enact controversial reforms (Vreeland, 2003).

Workers Act of 1998 removed labor suppliers from the scope of the Employment Security Act and permitted outsourcing in 26 job categories.

### *Labor Market Reform*

In the last decade, several important reforms affecting labor market flexibility have taken place in the region, but most reforms have produced less flexible labor laws. The case of flexibilizing reforms in Korea has been discussed in some depth already, so the focus in this section will be on the major labor law reforms in Thailand, Indonesia, and China that reduced labor market flexibility. In addition, recent changes in Korea, while not undoing previous reforms, have made labor laws less flexible. Before analyzing these major reforms, it should first be noted that a number of countries have made minor changes to their labor laws that have increased flexibility modestly. Malaysia, Singapore, Taiwan, and Vietnam have all expanded the range of flexible working hour options available to employers; Vietnam has also raised the upper limit on yearly overtime.

The first episode of labor reform to be discussed, Thailand, took place soon after the Asian financial crisis hit. Drafted prior to the Asian financial crisis, the amendment to the Labor Protection Act was pushed through in spite of the increased costs it placed on companies that sought to downsize their workforce (*Bangkok Post*, 31 May 1998). The amended law provided for higher severance pay and limited fixed-term contracts to jobs of a temporary or seasonal nature. Lawmakers in Thailand had room to maneuver since the IMF had not imposed labor conditions in its rescue plan. Increasing severance pay and providing for greater employment security was a populist policy that politicians probably hoped would show their sympathy for the workers bearing the brunt of economic adjustment; mounting activism by Thai labor organizations in the mid- and late 1990s probably also played a role (Brown, 2003).

Indonesia is the second country that revised its laws in the direction of less flexibility. In 2000 the pro-labor Minister of Manpower issued a decree that dramatically increased severance pay. Unions were ecstatic and fought successfully to prevent the revocation of this decree. The Manpower Act of 2003 further increased protection by limiting outsourcing to "non-core" work and raising severance pay for most dismissals. Since 2003, the IMF has voiced its concern about Indonesia's inflexible labor markets, but government efforts to carry out flexibilizing reforms were greeted with massive protests by unions. In spite of the wish of employers to revisit labor reform, thus far the government has proven reluctant to try again.

China has also recently enacted a new law on labor contracts, which went into effect in 2008. The law places limits on the duration of

fixed-term contracts (through regulating the total length of time and the number of renewals), outsourcing (by setting a minimum contract period of two years), and overtime (Wang et al., 2009). The new contract law represents an effort by the Chinese government to defuse social conflict in the export sector and to encourage investment in higher value-added industries. The Chinese pushed ahead with the new contract law in spite of vocal protests by the Shanghai-based American Chamber of Commerce (Wang et al., 2009).

Recent reforms in Korea have traded increased flexibility in working hours for reductions in the standard workweek, which declined from 44 to 40 hours. The Fixed-Term and Part-Time Worker Protection Act, which went into effect in 2007, required employers to convert fixed-term contracts to indefinite-term contracts after two years and prohibited discriminatory treatment of contract and part-time workers who perform the same or similar duties as permanent workers. The effects of this law, if enforced, could be significant, since the main motivation for using contingent workers is their lower pay and benefits.[22] Korean unions were divided about the Act. The Korean Confederation of Trade Unions feared that loopholes and poor implementation would not stem the increase in contingent labor and argued that unless the rights of contingent workers to organize, bargain collectively, and strike were guaranteed, no meaningful improvements would occur. The more conservative Federation of Korean Trade Unions initially opposed the bill but in the end supported it (Doucette, 2005, 2007).

Labor reforms to reduce labor market flexibility are perhaps a signal of a Polyani-esque double-movement. Even though labor laws have been comparatively protective in the region, employers routinely violate them. Workers therefore experience increased precariousness, which leads to protest and discontent among working people. Since the Asian financial crisis, South Korea has experienced a dramatic increase in contingent labor (Yun, 2009; Kim & Park, 2006). In Indonesia, employers have responded to stronger protections for both labor standards and individual labor contracts by flexibilizing their labor force in flagrant violation of the law (Aliansi Serikat Buruh and Forum Pendamping Buruh Nasional, 2004; Forum Pendamping Buruh Nasional, 2004). Although Indonesian law

[22] The Seoul Administrative Court recently ruled that "non-payment of performance-based bonuses to fixed-term workers was illegal if there was no fundamental difference between the work performed by the regular workers and the fixed-term workers" (Shin&Kim, 2009).

has actually increased protections for individual labor contracts, more workers in manufacturing are on short-term contracts than in the past. One response by governments to the increased vulnerability of workers was to improve legal protections, but these steps have had little effect, as new laws do not deal with the underlying problem of weak enforcement.

## 6 Conclusion

While labor standards in East and Southeast Asia have improved in the last 20 years, labor laws in the region have become less flexible. Figure 3 reveals the negative association between de jure labor standards and labor market flexibility. With the exception of Singapore, which is an outlier, countries with stronger labor standards also have less flexible labor regulations, while those with lower labor standards also have more flexible labor laws. All countries are in the upper two quadrants of the chart, and differences in de jure labor standards are larger than differences in de jure flexibility. With the exception of Thailand, democracies cluster in the top left quadrant.

Figure 4 presents the data for de facto labor standards and flexibility. Once again, Singapore is an outlier. The most notable difference with respect to Fig. 3 is that labor standards fall and flexibility rises. All

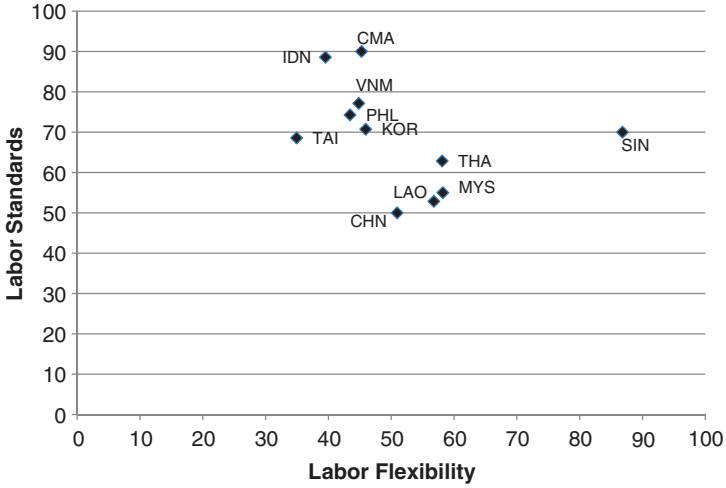


**Fig. 3** De jure labor standards and flexibility in East Asia (based on Table 2)

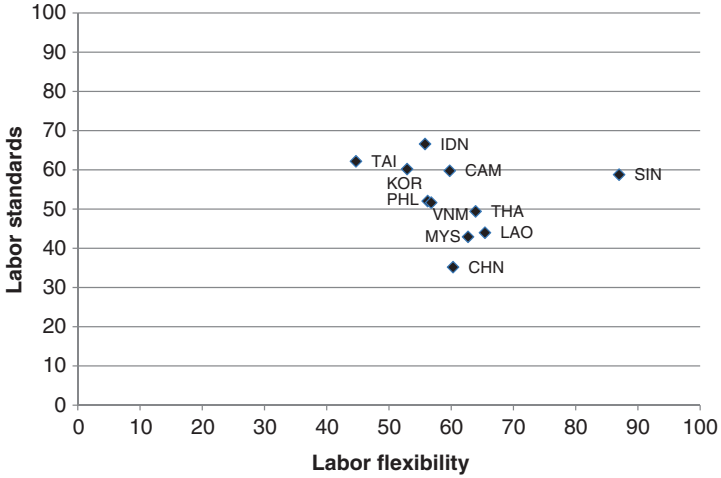


**Fig. 4** De facto labor standards and flexibility in East Asia (based on Table 2)

countries except Taiwan are in the upper right or bottom right quadrants of the chart. Differences in labor standards remain large among countries, but differences in flexibility have narrowed. Nevertheless, countries with higher DFLS still have lower DFF, and only one democracy, Thailand, is in the lower right quadrant of the chart. In de facto terms, labor standards are extremely poor and flexibility is quite high in East Asia.

The distance between law and practice is wide in most countries in the region. Scores drop less for democracies than non-democracies, but the gap between de jure and de facto labor standards and flexibility remains wide. Yet the experience of countries in the region does not support contentions that the price of improved labor standards is an increase in labor market flexibility. Collective labor rights have improved in the region, while labor law reforms have rarely promoted greater labor market flexibility. Weak enforcement, however, has a more toxic effect on labor rights now than in the past. Under authoritarian rule, labor laws provided far fewer protections for collective labor rights; weakly enforcing them did not lower labor standards. (If independent unions are illegal, then weakly enforcing that part of the law hardly damages labor rights!) When labor laws provide for better protection of labor rights, however, non-enforcement of the law has much more serious consequences for labor rights. For example, if the law provides guarantees for workers to form

unions, but the state does not punish employers who violate workers' right to freedom of association or actively collude with employers to prevent unionization, non-enforcement of the law has potentially dramatic effects on the capacity of workers to form unions.

While laws in the region have provided stronger protections for individual labor contracts, enforcement is weak; employers have therefore flexibilized a large proportion of the workforce in violation of the law. As Anner (2008) has argued, flexibility enters through the back door of ineffective labor law enforcement, which in turn has affected the organizing efforts of unions. Not only do unions face greater obstacles in persuading workers to join unions—employers simply refuse to renew the contracts of union members—ineffective enforcement also virtually assures that if workers dare to exercise their rights, they will be fired. As countries enact labor laws that provide better guarantees of labor standards and stronger protections for individual labor contracts, the struggle for effective enforcement becomes paramount.

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# The Recent Movement Towards a Four-Day Working Week

*Pedro Gomes*

In 1970, Paul Samuelson, one of the most widely regarded modern economists, called the four-day working week a "momentous social invention" comparing it to language (Poor, 1970). This is the view I espouse in my new book *Friday Is the New Saturday*. I view the four-day working week, not as a partisan policy or a win for the labour movement, but as a social innovation—a better way to organize economic activity in the twenty-first century. We should do it for—not in spite of—the economy (Gomes, 2021).

There have been many recent news on the four-day working week as a management practice—firms adopting it, with the objective of increasing the well-being of workers, improving their productivity and reducing stress and burnout. The book, *The 4 Day week*, provides a first-hand account of the implementation in a New Zealand company Perpetual Guardian (Barnes & Jones, 2020), and the book *Shorter* presents many case studies of firms from different industries around the world that have implemented it (Pang, 2020). My concept of a four-day working week is

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about much more than the enlightened management practice that has dominated headlines recently. I propose the four-day working week as something bigger: government legislation implemented to the entire economy. Such legislation would reduce the regular working week to a coordinated four days, from Monday to Thursday. All economic activities conducted during the working week—say office work, school, banks, stock market—would be conducted over those four days, and all economic activities conducted over the weekend would be conducted from Friday to Sunday—establishing four days as the norm for all workers.

There are many merits of flexible working arrangements (driven by workers), and the management practices supporting them (implemented by firms), and a number of my arguments can also be made to promote them. However, such arrangements are inferior to a four-day working week implemented by government legislation. Only in this way can the full economic benefits for society of reducing the working week be achieved. The gains of the four-day working week for society and the economy will be much bigger than the productivity gains for firms or the well-being of workers. To explain the economics behind each of these arguments, I have enlisted the help of four of the most influential economists of the nineteenth and twentieth centuries: John Maynard Keynes, Joseph Schumpeter, Karl Marx and Friedrich Hayek. I will view the economy through their eyes, emphasizing the positive effects of the four-day working week on the aggregate demand, aggregate supply, labour market and in the domain of political economy.

The four-day working week will stimulate the economy through the demand for leisure industries, hospitality and tourism. Imagine what you would do and where you would go over three-day weekends. Most likely it would involve spending money. If the four-day working week was implemented across the European Union, it could bring a rebalancing of the North-South divide. Where would the North Europeans go to spend their long weekend? We need money to consume, but we also need time. It is in our free time that we feel our needs.

The four-day working week will unleash innovation and entrepreneurship because many new ideas and products are born from passionate people with day jobs creating something new in their sheds during their leisure hours. The best example is Henry Ford, the greatest entrepreneur of all time, who took three years to build his first car with an internal combustion engine while having a six-day job at one of Thomas Edison's electricity plants. He became Henry Ford because of what he did in his leisure

time. Like Ford, there are countless examples of innovation born out of leisure. According to Edmund Phelps, an economics Laureate, the key to innovation is grassroots innovation, done by regular people in all corners of the economy (Phelps, 2013). The key to grassroots innovation is leisure.

The four-day working week will protect jobs at risk of automation reducing technological unemployment, increasing wages and reducing inequality. The economic argument does not rely on work-sharing, but on the idea that reduction of the working week will reduce the pace of job-separation in response to the implementation of the labour-saving technology and give time for workers to retrain to move to a more profitable occupation.

I'll argue that people will have more freedom to work more under a four-day working week than they work less under a five-day working week. Finally, by sharing the benefits of economic growth with everyone, it will reconcile a polarized society and crush populist movements, one of the biggest threats to our economies. Even if the economic benefits of the four-day working week are not enough to overcome the implementation costs, surely it is worth it if it can avoid other disastrous economic policies like Brexit, or the loss of political freedom that we already observe in the heart of the European Union.

My eight arguments will be more or less persuasive depending on your own ideological preferences, but they are all underpinned by sound economic reasoning and supported by the data. Ultimately, the core of each argument relates to what people would do with their extra day off work. They might rest more, which would increase their efficiency during their four working days. They might enjoy leisure activities that involve spending, which would stimulate consumption. They could decide to work, so they would be exercising their individual freedom. They could use the day for retraining and acquiring new skills to help them move to a more rewarding or promising occupation. Or they could devote their time to their passion and create the innovations of the future. Economists simplify reality. In most economic models, labour is viewed as the input for production and leisure as time away from the economy—a vacuum. But we are humans, and what we do in our leisure time also contributes to the economy. In the words of the Nobel Prize laureate economist James Tobin, "every leisure act has an economic pay-off to someone".

Once we think about the benefits of the four-day working week, we should then weigh them against the costs of the implementation. A transition to a four-day week is disruptive, but it could be made much more

smoothly than one might imagine. If, since starting reading this introduction, you have wondered whether everyone would take a 20 per cent pay cut by working a day less, the answer is no. The large majority of workers would not have any wage cuts. There are several possible adjustment mechanisms that will protect wages, ranging from increases in productivity, adjustments of hours worked in the remaining four days, reductions in oversized profits, price increases, subsidies and, most importantly, time. A period of approximately five years between the announcement of the four-day working week and its implementation would give workers, firms and the government enough time to prepare, restraining wage growth during this period to avoid cuts when the implementation takes place. Economic activity is very diverse and jobs throughout the economy are very different. Implementing the four-day working week in office jobs should be different for journalists, factory workers, university professors or waiters. It should also be different in the United Kingdom or in Spain. We shouldn't propose a one-size-fits-all adjustment, but use a combination of these eight mechanisms to find how to minimize the disruption.

The movement towards shorter working hours is not exclusive to advanced economies. The introduction of the five-day working week in China in 1995 has been singled out as an important cause of the subsequent boom in their domestic tourism market, now the largest in the world. The tourism and related industries now account for more than 10 per cent of Chinese GDP. India still has a standard working week of six days and forty-eight hours, but is reforming its labour laws to give more freedom for firms and workers to mutually agree whether they prefer the current to work the forty-eight hours over six, five or even four days. In the Philippines, the discussion around the four-day working week started in the early 2000s, and companies were given the discretion to implement it, much like the current proposal in India. In 2011, the president commissioned an official report on the four-day working week and, by 2019, most government agencies, including the central bank, had adopted it.

Paul Samuelson, in the very year he won the Nobel Prize that crowned him as the father of modern economics, called the four-day working week a "momentous social invention". He is alone amongst economists, who either oppose the idea or simply ignore it. While the four-day working week has generated academic research in sociology, political science, business administration, law, ecology or gender studies, there is no explicit research in mainstream economics. The working week is a social, political and economic construct. Why shouldn't it change when almost

everything else in society has—the speed we communicate, the types of jobs we do, the technology available to us, the number of years we study, the structure of our families, the duration of our lives, our social interactions? I tried to redeem this "sin of omission" of economics with my book. I hope it can start a serious conversation.

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# Labor Market Institutions and Demographic Employment Patterns

*Giuseppe Bertola, Francine D. Blau, and Lawrence M. Kahn*

## 1 Introduction

This chapter studies the impact of collective bargaining on the employment and unemployment rates of youth, women, and older individuals relative to prime-age males. The labor market position of such groups is an important issue in its own right, in light of widespread concerns over youth employment problems, integration of women into the labor

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market, and the financial viability of retirement systems.[1] Our analysis, however, more broadly contributes theoretical and empirical insights to the large body of work that studies the aggregate labor market impact of unionization and other labor market institutions. Theoretically, we offer a novel perspective on reasons why labor markets where unions are more influential at the aggregate level should especially reduce employment of specific demographic groups. Empirically, we provide evidence that differences in OECD labor market outcomes are indeed concentrated on demographic groups other than prime-age males.

We proceed as follows. Section "A Model of Unionization and Disaggregate Employment" proposes a theoretical perspective that provides a simple and novel interpretation of institutional influences on relative employment. We show that right-to-manage collective bargaining models, where unions set wages and firms choose employment, generally imply larger wage increases and consequent disemployment when labor force participation is more wage-sensitive than when job loss would slide workers down steeply declining portions of their opportunity cost schedule. A more elastic labor supply implies that employment loss is less costly, since the value of alternative uses of time is closer to that of being employed. Thus, unions will choose higher wage increases, with resulting larger employment losses, for groups with more elastic labor supply. We illustrate the result in a simple model of union wage setting for different groups of workers, and discuss various extensions. While other realistic dimensions of demographic heterogeneity have very different implications, the model suggests that unions will indeed find it optimal to reduce employment more for population groups with such better and more uniform alternatives to paid employment as schooling (youth), home production (women, under a traditional division of labor), and retirement (older individuals). Since women and youths also tend to command lower wages in unregulated labor markets, the proposed theoretical perspective can rationalize wage-compression policies as well as a tendency for unionization to imply larger wage increases and employment losses for women, youth, and older workers, an outcome that appears empirically realistic in light of earlier empirical results and of our own analysis of a suitable data set.

[1] See Blanchflower and Freeman (2000b) on youth employment; Disney (1996) on older workers' employment; Ruhm (1998) or Blau and Kahn (2000) on women's employment.

Existing evidence of institutional effects on demographic employment patterns is weak relative to that of wage differential effects (Blau & Kahn, 2002). There is evidence from within-country studies of negative effects on low-skill employment from union intervention.[2] Blau and Kahn (1996) find for the 1980s that, among men, the employment-population ratio of low-skilled relative to middle-skilled workers (defined by age and education) was higher in the United States and the United Kingdom than in countries (Germany, Austria, Norway) with more highly unionized labor markets and more compressed wage structures. However, studies comparing two or three countries with different levels of unionization provide mixed results. [3] One reason may be that such studies can suffer from omitted variable biases that make it difficult to identify the less favorable employment opportunities for low-skill workers that might be expected to follow from wage compression.

In section "Empirical Evidence", we bring the model's relative employment implications to bear on a panel data set of 17 OECD countries over the 1960–1996 period. We find that more pervasive overall union activity does indeed lead to greater relative disemployment of secondary labor force groups. Our results are sharper and more comprehensive than those of previous related research, as we include an extensive set of controls (including individual country effects), and we offer comparative evidence across women, youth and older workers, whereas most previous work examines only one or two of these groups. In this and other respects our empirical work also makes some significant advances on some of the existing cross-sectional studies that pool data across a number of countries with different institutional arrangements. This literature has established well-known results at the aggregate level (see, e.g., Blanchard & Wolfers, 2000), but is much less well developed as regards demographic employment patterns. Neumark and Wascher (2004) use a time-series cross-section panel of OECD countries to find that minimum wages lower youth employment, other things equal. Jimeno and Rodríguez-Palenzuela (2002) specify and estimate demographically disaggregated labor market

[2] See, for example, Edin and Topel (1997) or Davis and Henrekson (2005) for studies of Sweden and Kahn (1998) for Norwegian evidence with this conclusion.

[3] See, for example, Card et al. (1999) (Canada, France, and the United States), Krueger and Pischke (1998) or Blau and Kahn (2000) (Germany and the United States) for studies that do not find that wage compression leads to relatively less employment for the low skilled; on the other hand, Freeman and Schettkat (2000) (Germany and the United States) do find such effects.

outcome regressions, but focus only on youth and prime-age relative unemployment rates, and, since they assume fixed institutions, cannot control, as we do below, for country-specific effects in estimating the impact of institutions on relative employment. And Kahn (2000), analyzing data from 15 OECD countries over a relatively short (1985–1994) period, finds cross-sectional evidence that collective bargaining and coordinated wage-setting are negatively associated with the relative employment of the young. These chapters' approach and results are closely related to ours but offer less comprehensive and often more mixed evidence; similarly, OECD (2004) implements a previous draft's version of our empirical perspective on a short span of annual data, with mixed results.

## 2 A Model of Unionization and Disaggregate Employment

In this section we build a model of union-management bargaining that predicts that unionization raises the relative pay and lowers the relative employment of groups with more elastic labor supply schedules. The available comparable cross-country data, which we analyze in the next section, are employment and unemployment rates. Accordingly, we model group-level employment and participation at the level of an entire labor market, without distinguishing between the hours and participation dimensions of labor supply.

Our basic model depicts an encompassing union implementing an economy-wide wage policy, a situation that might be approximated by the highly centralized wage-setting arrangements in Scandinavia or Austria. In that setting, a worker's alternative to employment in the bargaining unit is to be out of work. Below, we discuss the implications of less centralized institutions for our model.

Let the value of production $F(L, X)$ be a function of $L$, a column vector of the employment levels of $n$ worker groups, and other factors denoted $X$; we will assume that the function is homothetic in all its arguments.[4] And let $S(L)$, a (decreasing) function of various groups' employment levels, be the aggregate value of time spent out of formal employment. We denote with $f_i(L, X) \equiv \partial F(L, X)/\partial L_i$, $s_i(L) \equiv \partial S(L)/\partial L_i$ these functions'

[4] We abstract from possible general equilibrium effects of union policy. For example, if unions reduce female employment, the demand for childcare would presumably fall, possibly affecting the pattern of labor demand.

derivatives with respect to employment level, and collect them in row vectors $f(L,X)$ and $s(L)$.

In competitive equilibrium, employment levels $L^*$ are such that $f(L^*,X) = s(L^*)$, and this outcome maximizes the overall surplus $F(L,X) - S(L)$ generated by productive employment. Now suppose a union organizes and negotiates wages with the employers, and that firms are allowed to be on their labor demand curves.[5] This implies that the vector of wage rates for the various labor force groups coincides with the $f(L,X)$ vector of marginal productivities. Thus, a monopoly union that aims at maximizing the total income and out-of-work welfare of workers solves the problem

$$Max \;\; f(L,X)L - S(L). \tag{1}$$

Since all incomes (from employment and non-employment) enter the objective function linearly and with equal weight, distributional concerns within the group of workers are assumed away by this specification. Wages are the natural instrument for maximization of (1), and we will discuss the model's implications for wage outcomes. But since employment is on the demand curve, choosing wages is analytically the same thing as choosing employment levels. Since the latter approach better fits the chapter's purpose, we will characterize our results in terms of the first-order conditions of problem (1) with respect to employment (where the $\tilde{L}$ symbol signifies the union's optimal value of $L$):

$$\frac{\partial F(\cdot)}{\partial L_i} - \frac{\partial S(\cdot)}{\partial L_i} = \sum_{j=1}^{n} \frac{\partial^2 F(\cdot)}{\partial L_i \partial L_j} \tilde{L}_j, i = 1,\ldots,n. \tag{2}$$

### *Key Insight*

For our purposes, it is important to highlight how the employment impact of union wage setting depends on the shape of the various groups' non-employment options, which may in turn depend on the within-group distribution of non-labor income, partners' wages, and non-employment uses of time. This is most easily done under the assumptions of separability

[5] Below, we discuss the implications of relaxing this assumption. See Farber (1986) for further discussion of alternative models.

of the value-of-production and non-employment welfare functions. If all functions' derivatives and elasticities in each of the conditions in (2) only depend on group *i*'s employment, each group's employment is determined in isolation according to

$$s_i\left(\tilde{L}_i\right)=\left[1+\eta\left(\tilde{L}_i\right)\right]f\left(\tilde{L}_i,X\right), \tag{3}$$

where $\eta\left(\tilde{L}_i\right)<0$ denotes the (signed) elasticity of $f(.)$ with respect to employment, and we assume to begin with that all groups face identical labor demand functions. In (3), the monopoly union raises the wage above labor's opportunity costs, by a factor that depends on the elasticity of inverse labor demand. The markup's implications for the levels of the wage and of employment, however, also depend on the elasticity of labor supply. A log-linear approximation to (3) readily implies that the proportional change in employment relative to its competitive level is

$$\frac{\Delta L_i}{L*_i}=\frac{\eta}{\varepsilon_i-\eta}, \tag{4}$$

where $\varepsilon_i$ denotes the elasticity, in the relevant region, of $s_i(.)$, labor's marginal non-employment option.

Figure 1 illustrates this relationship for log-linear marginal schedules. The demand functions are similar in the two diagrams of the figure and so is the wedge (represented by curly brackets) introduced by the union's markup. In (4), for any given (negative) value of $\eta$ the disemployment effect is smaller in absolute value when $\varepsilon_i$ is larger (more positive). And in the right-hand diagram of Fig. 1, a flatter labor market participation function yields a larger negative impact on employment.[6] Intuitively, to increase labor's share of producer surplus some individuals are shut out of employment, and employment losses are less attractive when workers who lose jobs are on a steeply declining portion of their opportunity cost schedule

[6] Note that when flat-rate welfare benefits serve as a floor for market wages, the labor supply of low-wage workers is more elastic than that of high-wage workers. Koeniger et al. (2007) in their study of overall wage inequality make the related point that if unemployment insurance (UI) benefits are a higher fraction of wages for lower-wage workers, then an optimizing union will compress wages.

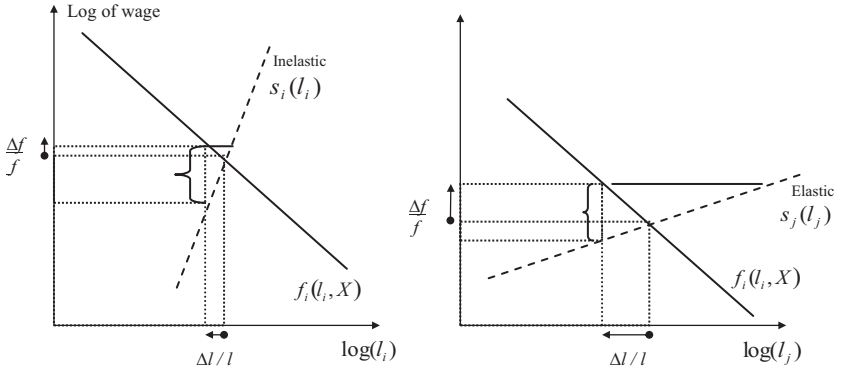


**Fig. 1** The different effects on wages and employment (relative to laissez-faire) of collective bargaining for groups with differently sloped non-employment payoffs

Thus, different elasticities of labor supply imply that different employment impacts should derive from uniform distortions away from equality of marginal employment and non-employment payoffs.[7] Female, young, and elderly workers have elastic labor supply relative to prime-age men (Blundell & MaCurdy, 1999): women are more likely to be making choices between home production and market work (in many cases both types of work), the elderly are more likely to be choosing between employment and retirement, and youth are more likely to be choosing between work and school.

### *Other Dimensions of Cross-Group Heterogeneity*

In Eq. (4) not only the supply but also the demand elasticity could of course differ across groups. In an earlier draft (Bertola et al., 2002), we showed that in the context of our model, a less elastic demand curve implied both a larger union wage effect and a larger disemployment effect: intuitively, a less elastic demand curve implies that the monopolist (the

[7] In Bertola et al. (2002) we show that the same employment outcomes can be achieved through an employment tax whose proceeds are distributed to workers. In addition to affecting employment by influencing relative wages, unions may directly affect relative employment by agreeing to downsize on the condition that older workers are separated first (Casey, 1992); moreover, the most recent (and younger) employees are usually laid off on a last-in-first-out basis.

union) gains more by lowering the supply. Hence, demographic groups facing more elastic demand are predicted to display smaller disemployment under unionization.

In what follows we argue that since prime-age males can be expected, on both theoretical and empirical grounds, to face less elastic demand than the other groups, demographic differences in labor demand elasticity tend to imply that unionization's employment impact should be stronger for prime-age males (the opposite of what we observe empirically).

To see this, it is useful to relax the assumption of additive separability of the derivatives in (2). Denoting with $\eta_j^i(\cdot)$ the (signed) elasticity of labor *i*'s marginal contribution to production with respect to labor *j*'s employment, the first order conditions can be written

$$\frac{\partial S(\cdot)}{\partial L_i} = \frac{\partial F(\cdot)}{\partial L_i}\left[1+\sum_{j=1}^{n}\eta_j^i(\cdot)\right],\ i=1,\ldots n.$$

We can then implicitly determine the employment levels of the $n$ worker types. If the function $F(\cdot)$ is homothetic of degree $\mu$ in the employment levels $L$ and the other factors of production, denoted $X$, the summation of elasticities in (2) adds up to $\mu-1-\eta_X^i$, and

$$\omega_j = \left[1-\sum_{j}^{n}\eta_j^i\right] = \left[1-\left(\mu-1-\eta_X^i\right)\right]:$$

marginal productivity is more elastic, and its proportionality factor to outside income is closer to unity, for factors that are more easily substitutable with non-labor inputs.[8] It is theoretically and empirically plausible for that substitutability to be weaker, and labor demand less elastic, in the case of qualified prime-age males.[9] If the demand for prime-age men is indeed less

[8] It may be interesting to note that non-separabilities may also play a role on the supply side, for example in that the non-employment opportunities of an individual may be larger when a spouse works: this channel can help rationalize polarization of institutional disemployment effects across demographic lines.

[9] Traditional production-function estimation exercises such as Berger (1983), and some of the work on US wage inequality reviewed by Topel (1997), find evidence of substitutability between female and youth, or unskilled, male employment. Skilled prime-age workers, however, are not close substitutes for youth, female, and older workers, while individuals within these groups are closely substitutable for each other (Disney, 1996).

elastic, then this reasoning predicts lower relative employment for prime-age men than for other groups: as we shall see, the opposite is true empirically.

Consider next the implications of union objective functions that differ from the simple monopoly case. We denote with $\beta$ the weight given to workers' welfare by the asymmetric bargaining that determines employment's position along the demand curve: maximization of $[F(L) - f(L)L] + \beta[f(L)L - S(L)]$ yields the competitive equilibrium if $\beta=1$, and the monopoly union outcome discussed above if $\beta \to \infty$ gives no weight to the firm in setting the wage. As in Jimeno and Rodríguez-Palenzuela's (2002) theoretical model, this index of "bargaining power" can vary across different types of workers.

Following and generalizing Rosen (1970), an uncoordinated (with other groups) bargain for group i maximizes

$$\left[F(L) - f_i(L)L_i\right] + \beta_i\left[f_i(L)L_i - S_i(L)\right], \tag{5}$$

by choice of $L_i$, taking as given the other employment levels in the vector $L$. Intermediate values index the worker's bargaining power relative to the firm's, and its first order condition is

$$\frac{\partial S_i(\tilde{L})}{\partial L_i} = \frac{\partial F(\tilde{L})}{\partial L_i} + \frac{\beta_i - 1}{\beta_i}\frac{\partial^2 F(\tilde{L})}{\partial L_i^2}, \tag{6}$$

which does not contain cross-derivative terms but is otherwise similar to (2).

Alternatively, coordinated maximization of the objective

$$\left[F(L) - f(L)L\right] + \sum_j \beta_j\left[f_j(L)L_j - S_j(L)\right], \tag{7}$$

which also weighs the surplus of different worker types differently, yields first order condition with respect to $L_i$ that can be straightforwardly rearranged to read

$$\frac{\partial F\left(\tilde{L}\right)}{\partial \tilde{L}_i} - \sum_j \frac{\beta_j}{\beta_i} \frac{\partial S_j\left(\tilde{L}\right)}{\partial L_i} = \sum_j \left( \frac{1-\beta_j}{\beta_i} \right) \frac{\partial^2 F\left(\tilde{L}\right)}{\partial L_i \partial L_j} \tilde{L}_j \tag{8}$$

Comparing this to the baseline expression (2), we see that the $S(\cdot)$ function is replaced by its weighted counterpart on the left-hand side, and that the right-hand side features a weighted sum of own and cross elasticities on the right-hand side. If the production function is separable, then the uncoordinated and coordinated outcomes are equivalent; if not, coordination increases or decreases employment, depending on functional forms.

In both cases, when the ability to extract producer surplus differs across groups, stronger bargaining power tends to increase disemployment. To the extent that prime-age males are likely to be better organized, and are therefore the group with the highest bargaining power, this extension predicts that unions should raise prime-age males' wages and lower their employment more than other groups, and cannot explain the basic empirical fact of smaller disemployment and smaller wage effects of unions on this group.[10]

### *Partial Unionization and Wage-Setting Differentiation*

The extensions reviewed above deserved to be discussed explicitly because, while theoretically plausible, they deliver implications that are different and empirically less realistic than those highlighted in section "Key Insight". We proceed to discuss other extensions that, in view of the empirical implementation below, serve the purpose of increasing the model's realism.

A first and most important element of realism concerns the extent of unionization. The basic model assumed that an all-encompassing union

[10] Note that it is possible that some workers, such as women, encounter labor market discrimination. Indeed, an extensive literature on the gender pay gap suggests that both gender differences in productivity and discrimination play a role in causing the observed gender wage differential. The possibility of discrimination can easily be accommodated in the model by adjusting "true" productivity by the discrimination coefficient. The same reasoning applies to other groups such as older or younger workers who may face discrimination. Since this issue is not central to our concerns here and leaves our basic reasoning unchanged, we do not explore it further theoretically but note that the adjusted productivity interpretation is most likely the relevant one for women. We do, however, explore the impact of controlling for antidiscrimination policies below.

set all wage and employment levels and that all displaced union workers would end up in non-employment. In the real-life labor markets we empirically analyze below, of course, not all wages are collectively bargained and, depending on the extent of unionization, more or less plentiful alternative employment opportunities are available for workers who would be willing to work, but cannot be employed, at the union wage.

When collective bargaining applies only to a portion of employment, the proportional employment effects characterized above are of course smaller in relation to the economy's total employment. Our empirical specifications will use several indicators of unions' involvement in wage setting and treat the direction and strength of such indicators' impact on the employment of different demographic groups as indications of our theoretical perspective's empirical relevance. Partial unionization also has less obvious effects, in that it affects the outside options available to workers disemployed by union wage setting. These higher-order effects, however, do not overturn the basic insight, and indeed tend to reinforce the mechanism we focus on.

To see this, consider first the limit case where a union sets the wage for a small number of jobs and takes as given the wage offered by employment opportunities in a much larger labor market: this may represent unionization of a single firm in an otherwise competitive labor market, or completely uncoordinated wage setting by one among a very large number of unions organizing small industries or regions. In this case, the union workers' opportunity cost is constant at the given wage, hence perfectly elastic. In the context of our model, then, there is no reason for the labor supply elasticity of different demographic groups to bear on the employment impact of unionization. Thus, economies with a very low level of unionization should see lower relative wages and higher relative employment of secondary workers compared to economies with complete unionization.

In the intermediate case of partial coverage of the economy by coordinated unions, the laid-off worker's alternatives include the possibility of union or nonunion employment as well as non-employment. This means that the disemployed union member's outside option is a weighted average of non-employment and nonunion employment. In addition, this worker can wait for a union job while unemployed, as in Mincer's (1976) minimum wage model, and the value of the worker's time out of work raises the utility of waiting for a union job. But the smaller the uncovered sector, the smaller weight nonunion wages will have in each worker's cost

of supplying labor to the union sector. To the extent that a higher level of coverage induces a coordinated union to place higher weight on out-of-employment alternatives when choosing the optimal wage, it implies larger wage increases and more pronounced disemployment for secondary workers.[11]

Consider next the realism of our model's implications for the extent of (contractual) wage differentiation. For simplicity, the derivations above represented a situation where employment, hence wages, are set independently for the various groups. In reality collective wage-setting agreements link workers' wages to their demographic characteristics only indirectly, in that the industries, occupations, and seniority level dimensions of wage agreements are to some extent correlated with workers' genders and ages. But unions, firms, and wages are not segregated by age and gender: a single contract usually specifies wages for very many different types of workers, and reducing wage differentials across such groups may have attractions of its own. In particular, wage compression may also serve the purpose of enhancing union solidarity among employed members; in addition, it may provide income insurance (Agell & Lommerud, 1992).[12] From such modeling perspectives, our emphasis on heterogeneous labor supply elasticities implies that a union policy of wage compression is less costly than otherwise if the same groups that have high labor supply elasticities also would have low wages in a competitive labor market (i.e., women and youth). Thus, even given the aforementioned alternative reasons for pursuing wage compression, our model helps explain why we observe it in practice. Put differently, if high wage workers also had high labor supply elasticities, our model predicts that unions would be less disposed to follow policies of wage compression.

### *An Alternative Framework*

Before proceeding to empirical assessment, we briefly discuss an alternative to our model's assumption that firms are on their labor demand curves. It is well known that the parties can do better by jointly setting

[11] Coverage can be different across groups (we discuss some of the empirical implications of this below), but to the extent that prime-age males are more covered, the implications of such differences are as counterfactual as those of different bargaining power above.

[12] While wage insurance may explain wage compression within similar groups, it is harder to use an insurance argument to explain wage compression between ex ante identifiable groups such as men and women.

wages and employment in an efficient bargain, which will in general be to the right of the demand curve (McDonald & Solow, 1981). However, there are also well-known enforcement problems associated with such bargains, caused by management's desire to move back to the demand curve, given the negotiated wages. The right to manage model is self-enforcing (as long as the firm pays the negotiated wage), since the employer chooses the quantity of labor demanded (Farber, 1986). Thus, whether we in fact have efficient contracts is an empirical question, and it is worthwhile to consider briefly the likely wage and employment outcomes for demographic groups under efficient contracts.

As discussed by McDonald and Solow (1981), efficient bargaining models yield contract curves—efficient combinations of wages and employment—and the actual position one arrives at on a contract curve is determined by relative bargaining power. McDonald and Solow (1981) study a variety of efficient bargaining models and conclude that the contract curve can be vertical (in the case of risk-neutral workers), upward sloping (in the case of risk-averse workers), or downward sloping (if the union pays unemployed workers a benefit that is less than wages by the money value of the disutility of employment). If, as is likely, prime-age males would have the highest bargaining power, then none of these three possible models can explain larger union wage and employment effects among the secondary labor force groups. First, if the contract curve is upward sloping, the effects of unionization should be positive on both wages and employment, and larger for prime-age males. This implication is empirically false. Second, if the contract curve is vertical, there should be no employment effect (and again prime-age males should have the largest wage effects). This is also rejected by the data. Third, in the event of a downward sloping contract curve, prime-age males should have larger wage effects but more negative employment effects than the other groups, the exact opposite outcome to what we observe.

## 3 Empirical Evidence

To test the employment implications of our theoretical perspective we build on the cross-country time-series data set that has become standard in the analysis of aggregate unemployment effects. We start from the version of that data set constructed and analyzed by Blanchard and Wolfers (2000). We draw from it variables pertaining to overall unemployment and some labor market institutions, and add data on labor force by age

groups, population by age groups, and unemployment rates by age groups for male and female workers separately. To smooth out short-run fluctuations, and in light of infrequent availability of institutional information, observations are arranged in five-year intervals (1960–1964 to 1990–1994) along the time dimension; the last observation refers to the shorter 1995–1996 interval. The countries included are Australia, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, New Zealand, Portugal, Spain, Sweden, the United Kingdom, and the United States.

Figure 2 illustrates some of what our model aims to explain, namely, different country-specific changes in employment rates of prime-age relative to young and older individuals (separately by sex) for the set of countries with complete observations in 1970–1974 and 1995–1996. The relative employment incidence of the prime-aged rose in virtually every case (the only exception is the Canadian comparison of prime-aged and young men). On average, employment gaps between the prime-aged and younger and older individuals rose by more in the other countries than in the United States, and in Continental European countries (such as Italy, France, and Spain) by more than in Anglo-Saxon countries. These contrasts are stronger for the youth-prime age than for the older-prime age comparisons.

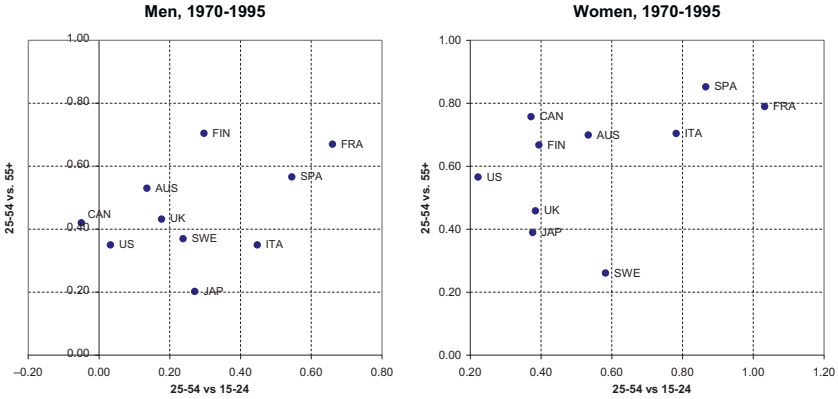


**Fig. 2** Changes over time in relative employment-to-population ratios across age groups. Country-specific changes, across the 1970–1974 and 1995–1996 periods, in the difference in the log of employment rates across the indicated age groups

### *The Data*

In order to estimate the impact of unions on the relative employment of different demographic groups, it is necessary to control for other labor market institutions. Some institutional aspects explicitly differentiate, not only across ages but also across genders: minimum wage exceptions are sometimes allowed for youth, retirement age typically is different for men and women, and the availability of paid parental leave is surely (if theoretically ambiguously) relevant to women's employment. It is impossible, of course, to obtain and include indicators of all potentially relevant institutions.[13] Further, the interpretation of some indicators requires particular care. If unions completely control the political process, then it is possible to view the choice of institutions such as taxes or employment protection similarly to union-management bargaining. If so, then one might expect the same effects of these institutions on wages and employment as collective bargaining itself, and omitted regulatory policies that bear on demographic employment outcomes may, to the extent that they are affected by collective bargaining, be subsumed in the reduced-form effects of the unionization variables. This reasoning suggests that it would not be appropriate to control for minimum wages, for example, since this is an institution that is strongly affected by the prevalence of unions both in collective bargaining and in their effect on government policy. When compared to those of Neumark and Wascher (2004), our findings for the impact of unionization can thus be interpreted as reduced forms, including possible impacts through mandated as well as negotiated minimum wage levels, including youth subminima. In fact, in highly unionized societies, the legislated value of these subminina may be affected by the same factors that influence union wage policy we have emphasized here.

To the extent that policies and institutions are shaped by more complex dynamics than those relevant to unions' objectives, however, their effects and those of collective bargaining are empirically distinct. We choose to control for a number of important institutions—including those that are standard in the literature—aiming at placing a sharper interpretation on the unionization variables. Tables 1 and 2 report cross-sectional and

[13] Christopher Ruhm kindly provided us with the data on weeks of paid parental leave that he used in Ruhm (1998) to find that they increase women's relative employment while also reducing their relative wages at extended durations. Unfortunately, however, there was too little overlap between his data and ours in countries and periods covered to allow us to control for parental leave policies.

time-series data on institutional arrangements for countries for which data are available in both 1970 and 1995 (see the Appendix for definitions and sources).

Theory indicates that union involvement in wage setting should concentrate employment losses on secondary workers. To assess the empirical relevance of this insight, we can exploit variation in several indicators of the extent and character of unions' involvement in wage setting: collective bargaining coverage, degree of coordination indicators, and union density measures. All three variables are available on a time-varying basis. While union density might appear to be redundant once we know what fraction of workers are actually covered by collective bargaining contracts, a higher fraction of workers who are union members may enable unions to pose a greater threat to management, all else equal. Indeed, earlier macroeconomic work on unemployment has controlled coverage and density, as well as coordination (Nickell & Layard, 1999; Blanchard & Wolfers, 2000). We also control for employment protection laws, unemployment insurance (UI) parameters, labor taxes, and retirement system characteristics. Each of these institutions may differentially affect the relative employment of secondary groups, so it is important to control for them in our regressions. Appendix Table 8 shows correlation coefficients among these institutions. Some are moderately high, and imply that controlling for them is important. For example, collective bargaining coverage has a correlation coefficient of 0.46–0.57 with employment protection, labor taxes, and some of the retirement system characteristics.

Summary statistics on other institutional indicators are also included in Tables 1 and 2. We will briefly comment on their theoretical role and empirical relevance when discussing the regression results below. Here we just mention that, on average, the institutions shown in Tables 1 and 2 appear to have become more interventionist in some countries relative to others between 1970 and 1995. The United States, the United Kingdom, and other countries displaying a lesser tendency to disemploy secondary labor force groups in Fig. 2 also tend to display the least tendency to increase unionization and decrease work incentives in Tables 1 and 2.

Our focus on the relative employment or unemployment of subgroups makes it possible in some cases to formulate and test sharper predictions of the effects of labor market institutions than is the case for aggregate labor market outcome indicators. Consider, for example, the impact of centralization of union wage setting. More centralized wage bargaining may or may not increase overall wages and unemployment, because the

**Table 1** Institutional patterns in selected countries, 1970–1995

| | *Collective Bargaining Coverage*[a] | | *Coordination* | | *Union Density* | | *Labor Tax Rate* | | *Employment Protection Index* | | *UI Replacement Rate: First Year* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1970* | *Change 70–95* | *1970* | *Change 70–95* | *1970* | *Change 70–95* | *1970* | *Change 70–95* | *1970* | *Change 70–95* | *1970* | *Change 70–95* |
| Australia | 85.0 | -5.00 | 2.25 | -0.75 | 43.37 | -8.17 | 32.18 | 7.82 | 1.00 | 0.00 | 0.12 | 0.09 |
| Canada | 40.0 | -4.00 | 1.00 | 0.00 | 30.62 | 6.78 | 42.44 | 9.56 | 0.60 | 0.00 | 0.49 | 0.09 |
| Finland | 95.0 | 0.00 | 2.25 | 0.00 | 51.30 | 28.30 | 51.69 | 12.31 | 2.40 | -0.30 | 0.29 | 0.35 |
| France | 85.0 | 11.00 | 1.75 | 0.25 | 21.70 | -11.80 | 57.91 | 10.09 | 1.97 | 1.13 | 0.47 | 0.08 |
| Italy | 85.0 | -3.00 | 1.50 | 1.00 | 37.00 | 1.70 | 55.71 | 15.29 | 4.00 | -0.60 | 0.04 | 0.11 |
| Japan | 28.0 | -7.00 | 3.00 | 0.00 | 31.74 | -7.94 | 25.88 | -1.88 | 2.80 | 0.00 | 0.41 | -0.12 |
| Spain | 68.0 | 10.00 | 2.00 | 0.00 | 9.00 | 9.20 | 25.91 | 20.09 | 4.00 | -0.90 | 0.38 | 0.27 |
| Sweden | 86.0 | 3.00 | 2.50 | -0.50 | 66.76 | 23.22 | 59.47 | 14.53 | 1.20 | 1.20 | 0.24 | 0.49 |
| UK | 70.0 | -32.00 | 1.50 | -0.50 | 49.80 | -13.10 | 43.19 | 3.81 | 0.58 | 0.12 | 0.31 | -0.13 |
| USA | 27.0 | -10.50 | 1.00 | 0.00 | 27.24 | -12.34 | 40.06 | 5.94 | 0.20 | 0.00 | 0.20 | 0.07 |

**Table 2** Further institutional patterns in selected countries, 1970–1995

| | *UI Replacement Rate: Fifth Year* | | *Retirement Benefits Wage Replacement Ratio* | | *Wage Replacement Ratio for Older Workers, Disability Schemes* | | *Wage Replacement Ratio for Older Workers, Unemployment Schemes* | | *10-Year Retirement Benefit Accrual Rate, Males Age 55*[b] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1970 | Change 70–95 | 1970 | Change 70–95 | 1970 | Change 70–95 | 1970 | Change 70–95 | 1970 | Change 70–95 |
| Australia | 0.12 | 0.10 | 0.30 | 0.11 | 0.20 | 0.08 | 0.21 | 0.06 | 0.00 | 0.00 |
| Canada | 0.10 | 0.00 | 0.42 | 0.09 | 0.22 | 0.11 | 0.16 | 0.01 | 0.19 | -0.19 |
| Finland | 0.10 | 0.06 | 0.54 | 0.06 | 0.46 | 0.14 | 0.30 | 0.34 | 0.09 | -0.05 |
| France | 0.07 | 0.06 | 0.60 | 0.05 | 0.50 | -0.25 | 0.38 | -0.15 | 0.24 | -0.07 |
| Italy | 0.00 | 0.00 | 0.62 | 0.18 | 0.48 | 0.12 | 0.25 | 0.49 | 0.22 | -0.12 |
| Japan | 0.00 | 0.00 | 0.48 | 0.04 | 0.16 | 0.09 | 0.04 | -0.01 | 0.05 | -0.02 |
| Spain | 0.00 | 0.00 | 0.50 | 0.50 | 0.55 | 0.16 | 0.42 | -0.05 | 0.00 | 0.00 |
| Sweden | 0.00 | 0.00 | 0.72 | 0.02 | 0.74 | 0.00 | 0.12 | 0.03 | 0.17 | -0.17 |
| UK | 0.16 | -0.03 | 0.34 | 0.16 | 0.33 | -0.05 | 0.19 | -0.02 | 0.02 | 0.08 |
| USA | 0.04 | 0.00 | 0.47 | 0.09 | 0.38 | 0.07 | 0.06 | 0.00 | 0.00 | 0.00 |

[a]Due to data availability, data shown for Sweden are 1990 data for 1970 and the average of 1990 and 1994 data for 1990. As explained in Appendix, for countries for which the first period we observe coverage is, say, $t_0$, we assign the $t_0$ value to all prior periods. Our basic results were the same when we included a dummy variable for these observations

[b]Increase in Retirement Benefit Replacement Rate for a 55-year-old male who works ten more years

greater bargaining power associated with more extensive union coverage may be offset by wage restraint resulting from the union's awareness of macro-level wage effects (Calmfors & Driffill, 1988). Centralized wage setting does, however, tend to cause some compression of the distribution of wages in practice (Blau & Kahn, 2002), and such compression should unambiguously decrease the *relative* employment of low-productivity worker groups regardless of whether it decreases or increases each group's employment level. In this and other instances, theory has ambiguous implications for aggregate employment and unemployment rates, but offers sharp predictions on group-relative effects of labor market institutions.

Studying relative employment is also attractive in that it reduces the potential biases in cross-sectional studies due to omitted country-specific variables to the extent that such variables affect the employment of different groups in a similar way. Of course, some omitted variables—such as youth training programs or the structure of skill supply—may affect relative employment more strongly than aggregate employment. But, in our empirical work, we use time-varying institutional indicators, and this makes it possible to control for country effects that affect relative outcomes by influencing the various subgroups differently. Lack of suitable instruments makes it impossible to control for the endogeneity of institutions along cross-sectional or time-series dimensions (e.g., the possibility that increasingly generous unemployment insurance is a response to high unemployment). However, such concerns may well be less important when one is examining relative employment or unemployment than their corresponding aggregates. Thus, for example, while labor market institutions may well be endogenous, studies of relative outcomes may suffer less from endogeneity biases than studies of absolute outcomes.

We also include, as controls, overall unemployment, demographic factors, country effects, and period effects. To the extent that the aggregate unemployment rate effectively controls for macroeconomic factors, this specification provides a sharp test of the relative employment hypotheses discussed earlier. Specifically, we expect overall unemployment to have a positive effect on the young-prime age employment-population ratio gap: due to downward wage rigidity, unemployment is likely to be concentrated on relatively low-productivity individuals, and the young are likely to be at the end of a queue of individuals looking for work. Moreover, the prime age-older employment gap is also likely to be positively affected by overall unemployment to the extent that retirement systems can be used

to reduce the employment of older workers in a recession. Overall unemployment is less likely to raise the male-female employment gap because women are less likely to be employed in cyclically sensitive sectors than men, although they are more likely than men to be discouraged workers. However, it could be argued that results controlling for overall unemployment do not fully capture the effects of institutions, since institutions can also affect overall unemployment which in turn influences relative employment. Moreover, a specific mechanism whereby unions could raise aggregate unemployment is by maintaining relatively high wages for low-productivity groups in the face of adverse economic shocks (see Blanchard & Wolfers, 2000). Such a mechanism is quite consistent with the implications of our theoretical model. Thus, we also estimated models with the overall unemployment rate excluded, in effect estimating the total impact of institutions on relative employment or relative unemployment rates.

As to demographic controls, we include births/population 15–24 years prior to the current observation as indicators of the relative supply of youth (see Korenman & Neumark, 2000, and Jimeno & Rodríguez-Palenzuela, 2002). At a given aggregate unemployment rate, a larger cohort of young people is expected to cause a deterioration in their labor market prospects and thus lower the employment-population ratio of the young relative to the prime-aged. We use prior births/population rather than current youth population share because the former is less likely to be affected by current labor market conditions through migration, and is therefore more likely to be exogenous with respect to current employment outcomes. It is not possible to control similarly for other groups' population shares because birth rate data 25–54 or 55+ years prior to the current observation are not available.

### *Regression Results*

To study the effect of unionization on relative employment, we estimate equations of the following general form separately by sex for each of three age groups—15–24, 25–54, and 55+ years old:

$$\ln\left(e_{gjt}\right) = B_g' X_{jt} + a_{gj} + b_{gt} + u_{gjt}, \tag{9}$$

where the age-sex groups are indexed by $g$, countries by $j$, and periods by $t$; $e$ is the employment-to-population ratio, $X$ is a vector of explanatory variables including the overall unemployment rate, births/population 15–24 years prior to the current observation, collective bargaining coverage, coordination of wage setting, union density, an index of employment protection mandates, the first and fifth year UI replacement rates, the retirement system indicators shown in Tables 1 and 2, and the average total labor tax rate (income plus payroll plus consumption taxes), $a$ is a country effect, $b$ is a period effect, and $u$ is a disturbance term. In all models, we correct for the heteroskedasticity due to correlation of errors across observations for a country and for country-specific autocorrelation using a generalized least-squares procedure.

Our theory suggests an impact of unionization on the relative employment of specific age-gender groups. This effect can be recovered from the parameter vectors $B_g$ by differencing, for example, the effects of unions on the log employment-population ratios of prime-age men and young men. Measuring relative employment effects in terms of differences in the log of employment-to-population ratios in effect standardizes for exogenous population differences between age/gender groups. Our estimating equations, however, allow each variable to have a separate effect on the employment-population ratio of each age-gender group.[14]

We are primarily interested in ascertaining whether labor market institutions affect relative employment-population ratios of particular groups. While unemployment is a natural result of wages set above the market-clearing level, its extent is ambiguously related to contract coverage and other indicators of union involvement. Since variation in the dependent variable of equations like (9) reflects the different incidence across groups not only of employment but also of out-of-the-labor-force status, we also estimate models of the form of Eq. (9) with the group-specific unemployment rate as the dependent variable. Freeman and Schettkat (2000) argue that in comparing unemployment rates over time and across groups, raw differences (rather than, for example, log differences) are the appropriate functional form.

[14] In Bertola et al. (2002), we estimated models with relative employment as the dependent variable, thus constraining the impact of the explanatory variables on the two comparison groups to be equal in absolute value. The results of those more restrictive models were very similar to those reported below.

Table 3 reports basic regression results for employment as the dependent variable, and Table 4 reports the results of similar regressions of unemployment.[15] Many of the institutional indicators are correlated with each other, potentially making it difficult to obtain significant findings. We will focus particularly on indicators of union involvement in wage setting. First, however, we discuss briefly estimation results for the other variables.

In each specification the effects of the overall unemployment rate on the dependent variable are larger in absolute value for youths than for adults, reflecting the greater cyclical sensitivity of youth employment. A larger potential youth cohort (prior births/population) raises youth unemployment rates and lowers youth employment-population ratios, although the latter effects are insignificant. The fact that the births variable has more negative effects for employment (and more positive effects for unemployment) for youths than for adults suggests cohort crowding and imperfect substitution between youth and adults (see also Korenman & Neumark, 2000). Employment protection is found to raise youth unemployment rates relative to those of adults. This is consistent with theoretical implications: more stringent employment protection (EPL) reduces employers' propensity to hire and terminate workers (Bertola, 1999) and should imply that young labor market entrants (and possibly women with intermittent participation spells) will be over-represented among the unemployed and underrepresented among the employed. Montenegro and Pagés's (2004) relative-employment regression on Chilean samples, controlling for time effects, finds that increases in EPL reduce the employment shares of youth and women relative to mature men. In addition, Autor et al. (2006) find similar results for states in the United States that have granted workers the right to sue for wrongful discharge. Specifically, the authors find that this type of wrongful discharge

[15] We implemented unit root tests for our panel using a method suggested by Maddala and Wu (1999). Because of our short panel, usually seven periods, we interpret these results very cautiously. To test for unit roots, we computed Dickey-Fuller statistics on the residuals for each country and their associated significance levels, using the approximations in MacKinnon (1994). We then implemented the suggestion of Maddala and Wu (1999) to aggregate these individual country tests using an exact Fisher test, under which –2 times the sum of the logs of the significance levels has a chi-squared distribution with degrees of freedom equal to two times the number of countries. When we used this method to analyze the residuals from each of the basic regression models, in each case we rejected the null hypothesis of no cointegration (albeit not taking into account the fact that the residuals are themselves estimated variables due to the short panels). Thus, under these tests, we reject the hypothesis of spurious regression across our time-averaged observations.

**Table 3** Generalized least-squares regression results for employment[a]

| *Explanatory Variables* | *log(epop men 15–24)* | | *log(epop men 25–54)* | | *log(epop men 55+)* | | *log(epop women 15–24)* | | *log(epop women 25–54)* | | *log(epop women 55+)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* |
| Overall unemployment rate | -2.2596 | 0.2417 | -0.7095 | 0.0521 | -1.1277 | 0.2329 | -3.1835 | 0.2784 | -1.1178 | 0.3753 | -0.6962 | 0.3938 |
| Prior births/ population | -3.4682 | 5.0407 | -0.7506 | 0.5000 | 2.5160 | 3.2927 | -3.0478 | 5.1643 | 1.0052 | 5.0063 | 8.9902 | 4.3159 |
| Coll barg coverage | -0.0026 | 0.0008 | 0.0004 | 0.0002 | -0.0032 | 0.0005 | -0.0018 | 0.0009 | 0.0017 | 0.0012 | -0.0043 | 0.0018 |
| Coordination | -0.0676 | 0.0454 | 0.0056 | 0.0069 | -0.0246 | 0.0298 | -0.1145 | 0.0494 | -0.0187 | 0.0427 | -0.1393 | 0.0477 |
| Union density | 0.0023 | 0.0010 | 0.0005 | 0.0002 | -0.0036 | 0.0009 | 0.0011 | 0.0013 | -0.0030 | 0.0015 | -0.0061 | 0.0018 |
| Employment protection | 0.0111 | 0.0170 | 0.0036 | 0.0029 | -0.0483 | 0.0142 | -0.0202 | 0.0167 | 0.0136 | 0.0192 | 0.0334 | 0.0260 |
| UI rep rate: year 1 | 0.0756 | 0.0612 | -0.0068 | 0.0099 | 0.0652 | 0.0362 | 0.2697 | 0.0679 | 0.2042 | 0.0657 | 0.4001 | 0.0789 |
| UI rep rate: year 5 | 0.0754 | 0.1189 | -0.0202 | 0.0234 | 0.1407 | 0.0751 | -0.0290 | 0.1163 | -0.1110 | 0.1091 | 0.2851 | 0.0899 |
| Labor tax rate | -0.3089 | 0.2233 | 0.0348 | 0.0261 | 0.3035 | 0.1437 | -0.4710 | 0.2033 | -0.0405 | 0.2110 | -0.2114 | 0.2193 |
| Public pension replacement rate | -0.0017 | 0.0017 | -0.0001 | 0.0003 | 0.0004 | 0.0012 | 0.0027 | 0.0020 | 0.0040 | 0.0019 | 0.0006 | 0.0019 |
| Accrual rate, 10 years, age 55 | 0.0015 | 0.0034 | 0.0008 | 0.0005 | -0.0129 | 0.0020 | -0.0021 | 0.0039 | -0.0071 | 0.0033 | -0.0155 | 0.0035 |
| UI rep rate: older workers | -0.1638 | 0.1000 | 0.0215 | 0.0143 | -0.2616 | 0.0669 | -0.1133 | 0.1199 | -0.0173 | 0.1406 | -0.1477 | 0.1213 |

(*continued*)

**Table 3** (continued)

| *Explanatory Variables* | *log(epop men 15–24)* | | *log(epop men 25–54)* | | *log(epop men 55+)* | | *log(epop women 15–24)* | | *log(epop women 25–54)* | | *log(epop women 55+)* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* | *Coeff* | *Std Err* |
| Disability rep rate: older workers | 0.0111 | 0.3656 | -0.0381 | 0.0498 | -0.1793 | 0.2351 | -0.1926 | 0.4236 | 0.2810 | 0.3282 | 0.0853 | 0.3851 |
| Female retirement age | 0.0308 | 0.0124 | 0.0075 | 0.0013 | 0.0333 | 0.0062 | 0.0186 | 0.0128 | 0.0020 | 0.0097 | 0.0106 | 0.0096 |
| Male retirement age | 0.0295 | 0.0189 | -0.0029 | 0.0024 | 0.0257 | 0.0089 | 0.0404 | 0.0216 | -0.0032 | 0.0183 | 0.0105 | 0.0186 |
| Country dummies | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Period effects | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Sample size | 101 | | 101 | | 101 | | 101 | | 101 | | 101 | |

[a] Standard errors are corrected for country-specific heteroskedasticity and country-specific first-order autocorrelation. Accrual rate is the change in the retirement replacement rate if a 55-year-old works an additional ten years

**Table 4** Generalized Least Squares Regression Results for Unemployment[a]

| *Explanatory Variables* | *u rate men 15–24* | | *u rate men 25–54* | | *u rate men 55+* | | *u rate women 15–24* | | *u rate women 25–54* | | *u rate women 55+* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Overall unemployment rate | 1.7910 | 0.1090 | 0.7071 | 0.0370 | 0.8223 | 0.0565 | 2.2229 | 0.1218 | 0.7648 | 0.0520 | 0.5290 | 0.0725 |
| Prior births/ population | 4.0658 | 1.2340 | -0.1448 | 0.3393 | -2.0662 | 0.5823 | 4.0812 | 1.7139 | 2.3198 | 0.4870 | -0.4205 | 0.5773 |
| Coll barg coverage | -0.0003 | 0.0002 | -0.0001 | 0.0001 | 0.0001 | 0.0001 | -0.0003 | 0.0003 | 0.0008 | 0.0002 | 0.0004 | 0.0002 |
| Coordination | 0.0140 | 0.0129 | -0.0025 | 0.0052 | -0.0195 | 0.0051 | 0.0253 | 0.0183 | -0.0024 | 0.0071 | -0.0082 | 0.0080 |
| Union density | -0.0012 | 0.0004 | -0.0003 | 0.0001 | 0.0000 | 0.0002 | -0.0007 | 0.0004 | 0.0002 | 0.0002 | 0.0006 | 0.0002 |
| Employment protection | 0.0176 | 0.0078 | 0.0009 | 0.0026 | 0.0005 | 0.0024 | 0.0224 | 0.0086 | 0.0065 | 0.0029 | 0.0026 | 0.0030 |
| UI rep rate: year 1 | -0.0299 | 0.0207 | 0.0027 | 0.0074 | -0.0101 | 0.0070 | -0.0303 | 0.0244 | -0.0330 | 0.0091 | -0.0298 | 0.0114 |
| UI rep rate: year 5 | 0.0319 | 0.0466 | -0.0101 | 0.0163 | -0.0104 | 0.0096 | -0.0372 | 0.0459 | -0.0792 | 0.0222 | -0.0369 | 0.0213 |
| Labor tax rate | -0.0640 | 0.0660 | -0.0140 | 0.0204 | 0.1347 | 0.0235 | -0.3609 | 0.0748 | -0.0945 | 0.0291 | 0.0257 | 0.0295 |
| Public pension replacement rate | -0.0020 | 0.0006 | -0.0003 | 0.0002 | -0.0021 | 0.0003 | 0.0018 | 0.0007 | 0.0022 | 0.0003 | -0.0005 | 0.0004 |
| Accrual rate, 10 years, age 55 | -0.0010 | 0.0011 | -0.0001 | 0.0003 | 0.0017 | 0.0004 | -0.0047 | 0.0015 | -0.0010 | 0.0004 | 0.0014 | 0.0006 |
| UI rep rate: older workers | -0.0046 | 0.0328 | -0.0033 | 0.0106 | 0.0109 | 0.0135 | 0.0790 | 0.0399 | 0.0525 | 0.0132 | 0.0608 | 0.0195 |
| Disability rep rate: older workers | 0.2840 | 0.1108 | 0.0404 | 0.0366 | 0.0867 | 0.0459 | 0.1469 | 0.1382 | -0.0062 | 0.0447 | 0.1175 | 0.0535 |

(*continued*)

**Table 4** (continued)

| *Explanatory Variables* | *u rate men 15–24* | | *u rate men 25–54* | | *u rate men 55+* | | *u rate women 15–24* | | *u rate women 25–54* | | *u rate women 55+* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Female retirement age | -0.0106 | 0.0030 | -0.0045 | 0.0009 | -0.0030 | 0.0011 | -0.0057 | 0.0040 | 0.0008 | 0.0011 | -0.0014 | 0.0015 |
| Male retirement age | 0.0024 | 0.0048 | 0.0009 | 0.0016 | -0.0010 | 0.0017 | -0.0068 | 0.0071 | -0.0040 | 0.0020 | -0.0090 | 0.0028 |
| Country dummies | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Period effects | Yes | | Yes | | Yes | | Yes | | Yes | | Yes | |
| Sample size | 101 | | 101 | | 101 | | 101 | | 101 | | 101 | |

[a]Standard errors are corrected for country-specific heteroskedasticity and country-specific first-order autocorrelation. Accrual rate is the change in the retirement replacement rate if a 55-year-old works an additional ten years

protection lowered employment rates in the short run for women, the young, and the less educated; however, in the long run, negative effects became larger for older and more-educated workers. Our data in principle make it possible to test for the same effects in a more encompassing data set.

We find positive effects of retirement ages and a negative effect of the older worker UI replacement rate on older male employment-population ratios.[16] The estimated coefficients, when significant, are consistent with the notion that retirement-related institutions should impact the relative employment of older workers.

Finally, we find some perverse or conflicting effects for taxes and UI parameters. For example, taxes appear to lower young women's employment and unemployment while having the opposite effects for older men. We note that the correlation between the large number of controls may make it difficult to estimate the impact of particular institutions. Fortunately, as shown in detail below, our conclusions about the impact of unionization are robust to the exclusion or inclusion of the other institutional variables.

### *The Empirical Impact of Unionization on Relative Employment Outcomes*

In the empirical specification, union involvement in wage setting is measured by collective bargaining coverage, coordination, and union density.[17] Inspection of Tables 3 and 4 shows that, in some cases, all three union variables have effects in the same direction (e.g., all negatively affect the employment-population ratio of older men), while in other cases, they

[16] Our results for the retirement variables are partially consistent with those of Blöndal and Scarpetta (1999), who examined the labor force participation rate of men 55–64 for 15 countries for the 1971–1995 period. Note that, of the explanatory variables in our analysis, the retirement variables are perhaps the most likely to suffer from reverse causation. We nonetheless present results including them in order to provide a sharper test of the impact of the collective bargaining variables, our primary focus. Results for these variables were similar when the retirement variables were excluded.

[17] As explained in the Appendix, for countries for which the first period we observe coverage is, say, $t_0$, we assign the $t_0$ value to all prior periods. Our basic results for the unionization variables' main effects were the same when we included a dummy variable for these observations and an interaction between collective bargaining coverage and this dummy variable. In this model, the only observations that contribute to the unionization main effects are ones with actual observations for collective bargaining coverage.

have conflicting signs (e.g., for young men, coverage and coordination have negative effects on the employment-population ratio, while union density has a positive coefficient). It is not surprising to find some perversely signed estimates for the coefficients on the union-power indicators. The three union variables offer admittedly imprecise measures of similar aspects of the institutional environment (from Table 8, we see that the correlation is 0.360 for union density and collective bargaining coverage; 0.210 for density and coordination; 0.360 for coverage and coordination).

In light of such multicollinearity, we evaluate the influence of these indicators of union power as a group, using the regression coefficients to predict the change in employment or unemployment which would occur if all the union-related variables were simultaneously changed by one-standard deviation within or between countries. Using within-country standard deviations produces a change that is in spirit similar to the regressions themselves, which include country dummies and therefore use within-country variation in the explanatory variables to test their impact. The within-country standard deviations in our sample are 5.28 percentage points for collective bargaining coverage, 7.24 percentage points for union density, and 0.157 for coordination. On the other hand, using between-country standard deviations of the unionization variables tells us the impact of long-run differences across countries in wage-setting institutions. These between-country differences are considerably larger than those within nations: 23.51 percentage points for coverage, 18.51 percentage points for density, and 0.599 for coordination. Across countries, then, differences in institutions are more dramatic than changes within countries over time.

Table 5 shows the impact of these one-standard deviation changes in the unionization measures on employment-population ratios and unemployment rates. Looking first at results that control for the overall unemployment rate, we see that, with the exception of prime-age men, unionization lowers employment-population ratios, with most of these effects being statistically significant. Effects on group-specific unemployment rates are mixed, however, with positive effects obtained for prime age and older women and negative effects for all groups of men and for younger women. Estimated effects are of course larger in absolute value for the between-country unionization simulation, due to the larger differences in standard deviations across (than within) countries.

**Table 5** Union effects on employment and unemployment: impact of simultaneous one standard deviation changes of collective bargaining coverage, coordination, and density within or between countries[a]

| *Dependent Variable* | *I. Overall Unemployment Rate in Model* | | | | *II. Overall Unemployment Rate Out of Model* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Std. Deviation Changes:* | | | | *Std. Deviation Changes:* | | | |
| | *Within Countries* | | *Between Countries* | | *Within Countries* | | *Between Countries* | |
| | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Log epop ratios: | | | | | | | | |
| Men 15–24 | -0.0075 | 0.0103 | -0.0582 * | 0.0349 | -0.0497 *** | 0.0125 | -0.1902 *** | 0.0440 |
| Men 25–54 | 0.0065 *** | 0.0017 | 0.0216 *** | 0.0059 | -0.0047 ** | 0.0022 | -0.0106 | 0.0073 |
| Men 55+ | -0.0467 *** | 0.0067 | -0.1562 *** | 0.0217 | -0.0592 *** | 0.0066 | -0.1889 *** | 0.0216 |
| Women 15–24 | -0.0195 * | 0.0117 | -0.0900 ** | 0.0384 | -0.0552 *** | 0.0150 | -0.1996 *** | 0.0499 |
| Women 25–54 | -0.0157 | 0.0127 | -0.0268 | 0.0380 | -0.0298 ** | 0.0120 | -0.0717 ** | 0.0356 |
| Women 55+ | -0.0884 *** | 0.0141 | -0.2965 *** | 0.0489 | -0.0837 *** | 0.0138 | -0.2852 *** | 0.0458 |
| Unemployment rates: | | | | | | | | |
| Men 15–24 | -0.0080 *** | 0.0030 | -0.0205 ** | 0.0099 | 0.0181 *** | 0.0052 | 0.0524 *** | 0.0174 |
| Men 25–54 | -0.0029 ** | 0.0012 | -0.0089 ** | 0.0042 | 0.0067 *** | 0.0019 | 0.0177 *** | 0.0059 |
| Men 55+ | -0.0026 | 0.0019 | -0.0097 * | 0.0054 | 0.0082 *** | 0.0019 | 0.0238 *** | 0.0062 |
| Women 15–24 | -0.0031 | 0.0040 | -0.0065 | 0.0135 | 0.0230 *** | 0.0053 | 0.0621 *** | 0.0193 |
| Women 25–54 | 0.0047 *** | 0.0018 | 0.0190 *** | 0.0060 | 0.0150 *** | 0.0026 | 0.0493 *** | 0.0084 |
| Women 55+ | 0.0048 ** | 0.0022 | 0.0146 ** | 0.0068 | 0.0116 *** | 0.0025 | 0.0352 *** | 0.0076 |

*, **, ***: significantly different from zero at the 10%, 5%, or 1% level (two-tailed tests)

[a] Sample size is 101. Control variables include births/population 15–24 years earlier; employment protection index; first- and fifth-year UI replacement rates; labor tax rate; public pension replacement rate; pension accrual rate for 10 years for a 55-year-old worker; UI replacement rate for older workers; disability replacement rate for older workers; and male and female retirement ages. One standard deviation changes within countries are 5.28 percentage points for collective bargaining coverage; 7.24 percentage points for union density; and 0.157 for coordination index. One standard deviation changes between countries are 23.51 percentage points for collective bargaining coverage; 18.51 percentage points for union density; and 0.599 for coordination. Standard errors are corrected for country-specific heteroskedasticity and country-specific first-order autocorrelation

For the reasons discussed above, we also present results excluding the overall unemployment rate. The employment effects in this specification are almost always more negative, and the unemployment effects are always more positive than in the model with the overall unemployment rate included. Moreover, the estimated union effects in the models excluding the unemployment rate are always in the expected direction (negative for employment and positive for unemployment) and are statistically significant in 23 of 24 cases.

Table 6 shows the implied effects of the parameter estimates presented in Table 5 on the key relative employment and unemployment concepts our theory emphasizes. Looking first at relative employment, the results indicate that, as our theory predicts, unionization raises the employment-population ratio gaps for each of our comparisons in every specification: prime-age versus young individuals, prime-age versus older people, and men versus women.[18] Moreover, the effects are statistically significant 15 out of 24 times, with especially strong effects in specifications excluding the unemployment rate. To provide an indication of the magnitudes of these estimates, Table 7 shows the impact on relative employment of these changes in unionization divided by the within- or between-country standard deviations of the group differences in the relative employment measures. The magnitudes of these effects range from modest to sizable, depending on the group, specification, and the size of the unionization changes at which the effects are evaluated. Specifically, larger effects are obtained for the age comparisons (i.e., youth and older individuals relative to the prime-aged), the specifications excluding the unemployment rate, and the evaluation of the unionization change using the between-country standard deviation. So, for example, in specification II, which does not control for unemployment, an increase of one between-country standard deviation in all the unionization variables raises the relative employment gaps by age by 65–123% of the relevant between-country standard deviation in relative employment. In contrast, when we control for unemployment in specification I and use within-country unionization changes, relative employment gaps by age rise by only 2–27% of the within-country standard deviations of relative employment. The impact of unionization

[18] In addition, using the estimates in Table 4, we can conclude that unionization significantly lowers the employment of young and older women relative to prime-age men using either within-country or between-country standard deviations of the union variables and whether or not we control for the unemployment rate.

**Table 6** Union effects on relative employment and unemployment: impact of simultaneous one-standard deviation changes of collective bargaining coverage, coordination, and density within or between countries[a]

| *Dependent Variable* | *I. Overall Unemployment Rate in Model* | | | | *II. Overall Unemployment Rate Out of Model* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Std. Deviation Changes:* | | | | *Std. Deviation Changes:* | | | |
| | *Within Countries* | | *Between Countries* | | *Within Countries* | | *Between Countries* | |
| | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Log epop ratios: | | | | | | | | |
| Men 25–54 vs. Men 15–24 | 0.0140 | 0.0104 | 0.0798 ** | 0.0354 | 0.0450 *** | 0.0127 | 0.1796 *** | 0.0446 |
| Men 25–54 vs. Men 55+ | 0.0532 *** | 0.0069 | 0.1778 *** | 0.0225 | 0.0545 *** | 0.0070 | 0.1783 *** | 0.0228 |
| Women 25–54 vs. Women 15–24 | 0.0038 | 0.0173 | 0.0632 | 0.0540 | 0.0254 | 0.0192 | 0.1279 ** | 0.0613 |
| Women 25–54 vs. Women 55+ | 0.0727 *** | 0.0190 | 0.2697 *** | 0.0619 | 0.0539 *** | 0.0183 | 0.2135 *** | 0.0580 |
| Men 25–54 vs. Women 25–54 | 0.0222 * | 0.0128 | 0.0484 | 0.0385 | 0.0251 ** | 0.0122 | 0.0611 * | 0.0363 |
| Unemployment rates: | | | | | | | | |
| Men 25–54 vs. Men 15–24 | 0.0051 | 0.0032 | 0.0116 | 0.0108 | -0.0114 ** | 0.0055 | -0.0347 * | 0.0184 |
| Men 25–54 vs. Men 55+ | -0.0003 | 0.0022 | 0.0008 | 0.0068 | -0.0015 | 0.0027 | -0.0061 | 0.0086 |
| Women 25–54 vs. Women 15–24 | 0.0078 * | 0.0044 | 0.0255 * | 0.0148 | -0.0080 | 0.0059 | -0.0128 | 0.0210 |

(*continued*)

**Table 6** (continued)

| *Dependent Variable* | *I. Overall Unemployment Rate in Model* | | | | *II. Overall Unemployment Rate Out of Model* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Std. Deviation Changes:* | | | | *Std. Deviation Changes:* | | | |
| | *Within Countries* | | *Between Countries* | | *Within Countries* | | *Between Countries* | |
| | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Women 25–54 vs. Women 55+ | -0.0001 | 0.0028 | 0.0044 | 0.0091 | 0.0034 | 0.0036 | 0.0141 | 0.0113 |
| Men 25–54 vs. Women 25–54 | -0.0076 *** | 0.0022 | -0.0279 *** | 0.0073 | -0.0083 ** | 0.0032 | -0.0316 *** | 0.0103 |

*, **, ***: significantly different from zero at the 10%, 5%, or 1% level (two-tailed tests)

[a] Entries are based on estimates in Tables 3 and 4. One standard deviation changes within countries are 5.28 percentage points for collective bargaining coverage; 7.24 percentage points for union density; and 0.157 for coordination index. One standard deviation changes between countries are 23.51 percentage points for collective bargaining coverage; 18.51 percentage points for union density; and 0.599 for coordination. Standard errors are corrected for country-specific heteroskedasticity and country-specific first-order autocorrelation

on male-female employment gaps is generally smaller than for the comparisons by age, ranging from 10% to 29% of the relevant standard deviation of the gender gap in employment.

From our theoretical perspective, more valuable alternative uses of time for non-employed youth, older individuals, and women than for prime-age men provide the rationale for the wage compression and employment displacement predictions of our model. To the extent that the non-employed take advantage of such opportunities and drop out of the labor force, and that different models of unemployment have different implications for its relationship to union coverage and other indicators, it is not surprising to see that the results for relative unemployment are not as clear-cut as those for relative employment. The one consistent unemployment finding is that unionization significantly lowers prime-age male versus prime-age female unemployment in every case, with effects ranging from 0.76 to 3.16 percentage points. These are sizable relative to the within- and between-country standard deviations of the male-female

**Table 7** Effects of one-standard deviation changes in unionization variables on relative employment divided by standard deviation of relative employment[a]

| *Dependent Variable* | *I. Overall Unemployment Rate in Model* | | | | *II. Overall Unemployment Rate Out of Model* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Std. Deviation Changes:* | | | | *Std. Deviation Changes:* | | | |
| | *Within Countries* | | *Between Countries* | | *Within Countries* | | *Between Countries* | |
| | *Absolute effect* | *Relative effect* | *Absolute effect* | *Relative effect* | *Absolute effect* | *Relative effect* | *Absolute effect* | *Relative effect* |
| Log epop ratios: | | | | | | | | |
| Men 25–54 vs. Men 15–24 | 0.0140 | 0.1007 | 0.0798 ** | 0.5466 | 0.0450 *** | 0.3237 | 0.1796 *** | 1.2301 |
| Men 25–54 vs. Men 55+ | 0.0532 *** | 0.2608 | 0.1778 *** | 0.8387 | 0.0545 *** | 0.2672 | 0.1783 *** | 0.8410 |
| Women 25–54 vs. Women 15–24 | 0.0038 | 0.0150 | 0.0632 | 0.3511 | 0.0254 | 0.1000 | 0.1279 ** | 0.7106 |
| Women 25–54 vs. Women 55+ | 0.0727 *** | 0.2653 | 0.2697 *** | 0.8148 | 0.0539 *** | 0.1967 | 0.2135 *** | 0.6450 |
| Men 25–54 vs. Women 25–54 | 0.0222 * | 0.0978 | 0.0484 | 0.2316 | 0.0251 ** | 0.1106 | 0.0611 * | 0.2923 |

*, **, ***: significantly different from zero at the 10%, 5%, or 1% level (two-tailed tests)

[a] Entries are based on the estimates in Table 4. One standard deviation changes within countries are 5.28 percentage points for collective bargaining coverage; 7.24 percentage points for union density; and 0.157 for coordination index. One standard deviation changes between countries are 23.51 percentage points for collective bargaining coverage; 18.51 percentage points for union density; and 0.599 for coordination. The "absolute effect" entries are reproduced from Table 4. The "relative effect" entries are the absolute effects divided by within- or between-country standard deviation of the corresponding relative employment measure

unemployment rate gap of 1.9 to 2.1 percentage points. An additional notable finding is that in models excluding the overall unemployment rate unionization significantly lowers the prime-age male versus the young male unemployment rate, by 1.1 to 3.5 percentage points. Again, these are sizable relative to the within-country and between-country standard

deviations for these variables of 3.6 to 4.0 percentage points. However, the unionization effects are positive and insignificant when the overall unemployment rate is included. Unions thus appear to raise young men's relative unemployment rate mainly through their effect on the overall unemployment rate.[19]

The models discussed so far have a simple linear structure in which, for reasons of parsimony, only main effects of each variable appear. However, we might expect recessionary overall macroeconomic conditions to have more severe negative relative employment effects on youth, for example, the more rigid relative wages are with respect to economic conditions. Blanchard and Wolfers (2000) use this logic to predict that rigid labor market institutions should have more negative overall employment effects during recessions than during expansions. To some extent, the interactions between shocks and institutions emphasized by Blanchard and Wolfers (2000) in their analysis of overall unemployment are already subsumed in the unemployment rate, which serves as a control here. Employment institutions such as seniority-based layoffs, however, may also produce larger prime age versus youth employment differentials when there is a recession than when there is an expansion. Hence, we ran all of our models with interactions between overall unemployment and the other variables in the equation other than the year and country dummies. These models place a considerable burden on the data, since there are 52 coefficients and only 101 observations.[20] Nonetheless, the interactions were jointly significant in each case, although there were many conflicting signs. Appendix Table 9 shows the interaction effects of unemployment and changing the unionization variables by one-standard deviation. Each entry is the change in the impact of a one-standard deviation increase in the unionization variables when the unemployment rate rises by one percentage point. The results are mixed. On the one hand, with between-country standard deviation changes in unionization (which are larger than the within-country changes), union effects on employment are usually

[19] In Bertola et al. (2002) we used a less flexible specification, constraining the impact of each institutional variable to be of equal magnitude and opposite sign. The results were qualitatively similar to those reported here. OECD (2004), running that specification on a much shorter time span of annual data and computing collinearity-robust statistics of the type devised in that earlier version of our work, obtains much weaker evidence.

[20] One might also speculate that cohort crowding effects would be larger with more rigid labor markets (Korenman & Neumark, 2000). However, we were unable to obtain easily interpretable results testing such a prediction, possibly due to insufficient degrees of freedom, since the models in question had 65 coefficients and 101 observations.

more negative and effects on unemployment are usually more positive when the overall unemployment rate is higher, as expected. Several of these effects are statistically significant. And unionization lowers the relative employment of younger and older workers relative to the prime-aged by more during recessions than during expansions, although these age comparisons are not statistically significant. On the other hand, the expected relative unemployment rate effects are generally not observed. Moreover, using within-country changes in unionization, only the relative employment effects for younger versus prime-age men go in the expected direction. Thus, there is some weak evidence that unionization has more negative employment effects on younger and older individuals during periods of higher unemployment.

This section's empirical implementation of the theoretical perspective of section "A Model of Unionization and Disaggregate Employment" is based on the plausible assumption that, in all countries and periods, labor supply is more elastic for secondary than for primary labor force groups. The relevant elasticities, of course, may in reality differ across demographic groups to different extents in different countries and periods. No direct information is available in our panel data set, but we have explored the possibility that institutional differences may themselves influence the shape of labor supply functions. For example, more generous retirement benefits may raise the labor supply elasticity of older individuals, and this would lead us to expect retirement policies to have negative interaction effects with collective bargaining on the relative employment of older individuals. We tested this reasoning by adding interactions between the retirement variables and the three unionization variables to the basic employment models. Because we have only 101 observations and there are many explanatory variables, we included these sets of three interactions one set at a time (with results available on request). For example, to our basic employment models, we added interactions between the basic pension replacement rate and collective bargaining coverage, coordination, and union density. We then estimated additional models where we replaced these three interactions with interactions between the unionization variables and the pension accrual rate, and so on, for each of the six retirement variables.

To evaluate the impact of these interactions, we simulated the effects of the one-standard deviation between-country unionization differentials as they interacted with the retirement policies. Following the same approach as in Tables 5 and 6, we estimated a separate employment model for each

group and used the coefficients to compute effects of unionization on relative employment, in this case that of older individuals. We found that greater unionization lowered older men's and older women's relative employment to a significantly larger extent in countries and periods with more generous disability programs for older workers. In addition, a higher UI replacement rate for older workers significantly increased the magnitude of the union effect in lowering older men's relative employment. In the context of our model, these results would support the view that benefits availability increases labor supply elasticity. The implications of benefits availability, however, are theoretically ambiguous for the elasticity (as opposed to the level) of aggregate labor supply. Empirical results for other demographic groups offer very mixed evidence as regards interactions between unionization and institutions in determining relative employment. For example, we found significantly negative interaction effects with collective bargaining for a higher pension accrual rate in the case of older women, and for higher female retirement age's effect on both older men's and older women's relative employment.

### *Robustness*

Appendix Table 10 shows selected results for relative employment and unemployment under alternative specifications of the basic model. The entries are based on separate employment or unemployment regressions for each group as was the case in Table 6. Table 10 shows relative employment effects by age and gender and reports relative unemployment effects for the one comparison that was consistently significant in the expected direction in Table 6 (i.e., prime-age men vs. prime-age women). We now briefly discuss the results of these specifications, which almost always give similar results to our basic model, whose findings are reproduced for comparison at the top of Table 10.

First, it is possible that the measured overall unemployment rate, one of our key control variables, is itself affected by the demographic composition of the population.[21] Thus, we replaced the raw unemployment rate with one that was corrected for demographic composition. For each country-period observation, we took a weighted average of the unemployment rates for the following demographic groups: men age 15–24, men

[21] Compositional effects are potentially important in interpreting aggregate movements in unemployment and wages (Blundell et al., 2003).

age 25–54, men age 55+, women age 15–24, women age 25–54, and women age 55+. We constructed a corrected unemployment rate by using the same weights for each demographic group for each country-period observation based on the average for the 16 country sample of 1980 observations. Table 10 shows that the results of this exercise are very similar to the baseline results.

Second, it is possible that our results for collective bargaining and relative female employment reflect the impact of antidiscrimination policies rather than the impact of unions. Controlling for international differences in such policies is a difficult matter, since, in addition to the presence of individual laws in various countries, organizations such as the European Union (EU) and the International Labour Organization (ILO) have issued directives or conventions on gender discrimination.[22] Thus, the presence of a national law may not fully describe the policy environment for women in a given country. Moreover, enforcement mechanisms vary across countries. For example, equal pay in the United States is primarily enforced by individual lawsuits, while Australia's policy was implemented through binding national wage tribunals, which presumably have much greater coverage than lawsuits (Blau & Kahn, 2002). Acknowledging these limitations on one's ability to control for antidiscrimination policy, we re-ran our models controlling for the presence of national equal pay and equal employment opportunity laws.[23] Again, Table 10 shows that our results for the collective bargaining effects were very similar to those presented earlier.

Third, we considered the role of school enrollment in affecting our results for youth. We interpret the stronger effects we find for youth

[22] The EU, for example, issued directives on equal pay in 1957 and 1975 and on equal employment opportunity in 1976; the ILO issued conventions 100 (equal pay for work of equal value) in 1951 and 111 (equal employment opportunity) in 1958, and all of the countries in our sample except the United States (ratifying neither) and Japan (ratifying only convention 100) had ratified both ILO conventions by 1999. Most of these ratifications occurred during the 1952–1970 period, or before most of the period we examine. For details on these policies, see the ILO and European Union websites: http://www.ilo.org/public/english/standards/norm/whatare/fundam/discrim.htm and http://www.europarl.eu.int/factsheets/4_8_7_en.htm

[23] Our main source for information on such policies was OECD (1988, pp. 167–168), which has data on equal pay and equal employment opportunity policies for all of our countries except the Netherlands and New Zealand. For these two countries, we obtained data from van der Sanden (with Waaldijk) (2001) and the New Zealand Human Rights Commission (http://www.hrc.co.nz/index.php?p=448).

employment than youth unemployment as suggesting that unions price young people out of work and thereby lower the opportunity cost of schooling, leading to labor force exits.[24] Alternatively, it may be that unmeasured propensities to be enrolled in school or national school policies are correlated with our unionization measures, leading to a potential spurious negative correlation between unionization and youth employment. We examined this question directly by using World Bank World Tables data on gross secondary and tertiary enrollment rates for our sample of countries and time periods, interpolating where necessary. These are defined as total secondary or tertiary school enrollments divided in each case by what the World Bank considers to be the target age group population and are thus indicators of relative enrollment rates. We estimated models similar to Eq. (9) for the determinants of these enrollment rates and, in each case, found positive although insignificant effects of unionization on enrollment. However, including these (admittedly endogenous) enrollment rates in our basic employment and unemployment equations did not affect the estimated union impacts, as shown in Table 10. Thus, our youth employment and unemployment effects are not accounted for by school attendance.[25]

Fourth, in light of the conflicting coefficients in Tables 3 and 4 for the individual unionization variables, we estimated a variety of specifications for them, as shown in Table 10. It shows, for example, that results were very similar when we added a dummy variable for missing collective bargaining coverage (recall that we assigned the earliest known value for this variable to all prior years). Moreover, when we included the union variables individually, coverage and coordination each gave very similar results

[24] A similar argument applies to the results for older individuals, with retirement being the alternative to employment in their case, and motivates inclusion of retirement-system characteristics alongside unionization indicators in our employment and unemployment equation.

[25] These results are consistent with Kahn's (2000) findings for a cross-section of 15 OECD countries. He found that collective bargaining coverage had a negative effect on youth relative employment and was positively associated with school attendance among young adults, but that enrollment did not fully account for the negative effect of union coverage on the relative employment of youth. Taking Kahn's findings in conjunction with those reported above suggests that unions may increase the share of out-of-the-labor-force youth who are neither at work nor at school. We should point out that different policies toward apprentice training policies may be an omitted factor in our regressions that could help explain the youth employment results. However, to the extent that national training systems don't change dramatically, we have accounted for these using the country dummy variables. For some discussion of cross-country differences in these policies, see Steedman (2001).

to our baseline estimates. But union density gave perverse results for youth-prime age employment differentials, as it did in the baseline model (Table 3). This may not be surprising in light of the large difference in some countries between membership and coverage (Tables 1 and 2). Table 10 also shows that excluding union density from the model gave very similar results to the baseline. And including only the three unionization variables while excluding the other institutions also gave very similar results. Thus, our baseline findings are not affected by the inclusion or exclusion of the other institutions.

Fifth, there are potential endogeneity concerns regarding the key unionization variables, which are measured at the national level and may reflect different levels of coverage across demographic groups. If prime-age males are more likely than other groups to have centralized wage setting, be covered by collective bargaining, and be union members, then our findings may reflect reverse causality from the composition of employment to the institutional variables: under this scenario, when younger or older individuals or women increase their employment share, the values of the union-related variables will decrease. It is perhaps equally plausible, however, that the higher employment of secondary groups might raise demand for unionization (due to its wage compression effects), imparting a positive bias on the unionization coefficients in our models of these groups' relative employment. If so, then any negative effects we estimate may be underestimates of the magnitude of the true effects of unions.

In any case, since we control for country effects, these endogeneity arguments must refer to within-country changes in the institutions and in relative employment in order to be valid, and should be discounted since the major changes in coordination and collective bargaining coverage in many cases reflect overall government decisions or union strategies regarding wage setting rather than compositional changes in the labor force. These include episodes such as the Thatcher program in the United Kingdom, the Employment Contracts Act in New Zealand, and the solidarity wage period and subsequent decentralization in Sweden, while the decline in unionization in the United States has occurred within industries and within demographic groups (Blau & Kahn, 2002; Farber & Krueger, 1993). As a robustness check, we investigated changes in union density in the countries included in this chapter for which microdata from the 1985–1998 International Social Survey Programme (ISSP) were available. (This resulted in an unbalanced panel containing all 17 countries except Belgium and Finland.) We found that within-country trends in overall

union density were virtually perfectly correlated with trends in union density controlling for the demographic composition of employment. While the data are not available to construct a demographically adjusted measure of union density for our full sample period, this analysis of the ISSP data suggests that had we been able to employ a demographically adjusted measure of union density in our analyses above, the results would have been quite similar.

Finally, we investigated the sensitivity of our results to excluding the country dummies, or excluding Scandinavia, North America, or observations before 1975. The results for all of these specifications are generally qualitatively similar to the baseline findings, although the effects on youth versus prime-age employment are weaker excluding country dummies, the North American observations, or observations before 1980. These results indicate that we do obtain useful variation in the explanatory variable by using data from the 1960s and 1970s and from North America. In addition, excluding country dummies may lead to biases to the extent that national-level factors other than unions affect both the level of unionization and youth employment.

### *Demographic Wage Differentials*

While our employment results are largely consistent with the theoretical model outlined above, is there corresponding evidence on the relative wage effects also implied by the mechanism illustrated in Fig. 1? We explored the possibility of using summary wage distribution statistics from the OECD, but the short time span, limited availability, and dubious comparability (especially as regards productivity) of demographically disaggregated data make it impossible to replicate our broad study along the wage dimension. What evidence is available, however, is nicely consistent with our theoretical perspective. Although typically based on smaller samples of countries and shorter time periods than our analysis, studies have consistently found that unions raise the relative wages of young people and women, with some evidence too of higher union wage effects for older individuals—exactly the effects that are predicted by our theory. [26]

[26] An additional reason for unions to raise the relative wages of youth is suggested by Lazear (1983), who argues that prime-age union members wish to reduce competition from younger workers.

First, on the effect of unions by age, Lewis (1986b) surveys a large number of microdata-based studies of union impact in the United States and concludes that, controlling for worker and workplace characteristics, for 27 of 30 studies the union wage effect is larger for young than for prime-age workers. Lewis's (1986a) survey further indicates that the union wage gap tends to be U-shaped by age, with a minimum at about 45 years, hence suggesting larger union wage effects for older workers as well. Unfortunately, we are not aware of further detailed evidence on the impact of unions on wage differentials between older and prime-age individuals. However, other studies support the US findings for younger people. Blanchflower and Freeman (2000a) use microdata to compute youth wage discounts controlling for gender separately for 11 countries and note that the discount is largest in magnitude for those countries with the least centralized wage-setting arrangements. Moreover, Kahn (2000) used microdata for 1985–1994 to estimate the impact of collective bargaining coverage or union density across 15 countries on the youth-prime age wage gap and found a strong negative effect for men with some indications of a negative effect for women as well. Finally, Blau and Kahn (2000) and Erickson and Ichino (1995) each used micro data to find that youth relative wages were lower in the United States than in Germany (Blau & Kahn, 2000) or Italy (Erickson & Ichino, 1995); in each case, the authors attributed some of this difference to the less coordinated wage-setting institutions in the United States.

Second, several studies, mostly using microdata, find that more coordinated wage setting or higher national coverage by collective bargaining lowers the gender pay gap. For example, Blau and Kahn (2003) and Polachek and Xiang (2006) use micro data from a variety of OECD countries and obtain this finding. Rowthorn (1992) notes using aggregate cross-country data that the gender pay gap is lower in countries where wage setting is more centralized. And Edin and Richardson (2002) attribute some of the declining gender pay gap in Sweden after 1968 to solidarity wage policies in which unions engaged in coordinated collective bargaining consciously attempted to bring up the bottom of the wage distribution.

## 4 Conclusion

In this chapter we have investigated the impact of labor market institutions on the relative employment of labor market subgroups from a labor-supply perspective that offers a simple and novel reason why unions should lower the relative employment of secondary labor force groups. That outcome is realistic in light of empirical evidence, cannot be easily rationalized by other theoretical mechanisms, and is consistent with evidence on wage-compression patterns.

Our empirical results suggest that countries where unions exert a more pervasive influence on labor market outcomes tend to feature relatively low employment levels among the young, older individuals, and women, and relatively high unemployment rates among prime-age women and young men. The lack of evidence of union effects on unemployment for young women and older individuals suggests that disemployed individuals in these groups move predominantly into non-labor-force (education, home production, or retirement) states.

These patterns are much less consistent with the alternative models of union behavior that we have briefly reviewed than with the theoretical perspective we put forward—that views organized labor as accepting the largest employment declines (in exchange for higher marginal and average compensation) for groups with the most elastic labor supply, because employment losses are less costly for those with alternatives that are nearly as good as paid employment. The resulting demographic bias of negative employment effects is likely to be economically as well as socially more acceptable than employment losses among prime-age males would be.

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## Appendix

This chapter's data set builds on that constructed by Blanchard and Wolfers (2000), documented at http://econ-wp.mit.edu/RePEc/2000/blanchar/harry_data/. The data set contains macroeconomic and institutional data on 26 OECD countries for 8 five-year periods covering the time span 1960–1999. We have added data on labor force by age groups, population by age groups, and unemployment rates by age groups for male and female workers separately, as well as time-varying data on a number of institutions.

### *Demographic Disaggregation of Employment and Unemployment*

The labor force and population data are taken directly from the ILO database "Economically Active Population 1950–2010". The data on unemployment rates by age group were constructed from data found in the OECD publication *Labour Force Statistics* (n.d., various issues). These are country-source data, and we did not attempt to harmonize their definition. To compute the average unemployment rate for each five-year period, we calculate the arithmetic mean of the yearly unemployment rates within the period. To obtain similar data on as many countries as possible, we also aggregate the data to broad age groups by computing the labor force weighted average of the time-averaged unemployment rate of the relevant age groups. The labor force weights themselves are constructed as linearly interpolated weights from the labor force data used above.

### *Institutional Indicators*

Time-varying employment protection legislation indicators are from the Blanchard and Wolfers (2000) dataset.

Union density, collective bargaining coverage and coordination, labor tax rates are from the data appendix to Nickell et al. (2003), kindly attached by the authors to the Discussion Paper version of their study at http://cep.lse.ac.uk/papers/. Collective bargaining coverage was available for some countries from 1960 to 1999 and for other countries from 1980 to 1994. We used interpolation and assigned the authors' earliest figure to all dates before its date.

The UI year 1 and year 5 replacement rates were taken from an OECD database and were available for the entire 1960–1996 period.

**Table 8** Correlation matrix for the institutional variables

| | *cb* | *co* | *den* | *epl* | *rr1* | *rr5* | *tax* | *penrr* | *acc* | *disold* |
|---|---|---|---|---|---|---|---|---|---|---|
| Coll barg coverage (cb) | 1.000 | | | | | | | | | |
| Coordination (co) | 0.360 | 1.000 | | | | | | | | |
| Union density (den) | 0.360 | 0.210 | 1.000 | | | | | | | |
| Employment protection (epl) | 0.463 | 0.530 | 0.016 | 1.000 | | | | | | |
| UI rep rate: year 1 (rr1) | 0.175 | 0.166 | 0.072 | 0.229 | 1.000 | | | | | |
| UI rep rate: year 5 (rr5) | 0.268 | 0.036 | 0.193 | -0.231 | 0.090 | 1.000 | | | | |
| Labor tax rate (tax) | 0.517 | 0.103 | 0.416 | 0.196 | 0.418 | 0.079 | 1.000 | | | |
| Public pension replacement rate (penrr) | 0.292 | 0.133 | 0.108 | 0.625 | 0.268 | -0.323 | 0.343 | 1.000 | | |
| Accrual rate, 10 yrs, age 55 (acc) | 0.344 | 0.038 | 0.002 | 0.274 | -0.082 | -0.105 | 0.293 | 0.316 | 1.000 | |
| UI rep rate: older workers (uiold) | 0.573 | 0.153 | 0.108 | 0.380 | 0.274 | 0.442 | 0.326 | 0.257 | 0.034 | 1.000 |
| Disability rep rate: older workers (disold) | 0.476 | 0.151 | 0.290 | 0.520 | 0.385 | -0.178 | 0.424 | 0.702 | 0.132 | 0.345 |
| Female retirement age (femret) | 0.046 | -0.092 | 0.184 | -0.195 | 0.537 | 0.134 | 0.279 | 0.087 | -0.073 | 0.049 |
| Male retirement age (maleret) | 0.181 | -0.094 | 0.402 | -0.307 | 0.351 | 0.279 | 0.224 | -0.041 | -0.095 | 0.107 |
| | disold | femret | maleret | | | | | | | |
| Disability rep rate: older workers (disold) | 1.000 | | | | | | | | | |
| Female retirement age (femret) | 0.359 | 1.000 | | | | | | | | |
| Male retirement age (maleret) | 0.346 | 0.816 | 1.000 | | | | | | | |

**Table 9** Interaction effect between overall unemployment and simultaneous one-standard deviation changes of collective bargaining coverage, coordination, and density within or between countries[a]

| *Dependent Variable* | *I. Overall Unemployment Rate in Model* | | | |
|---|---|---|---|---|
| | *Std. Deviation Changes:* | | | |
| | *Within Countries* | | *Between Countries* | |
| | *Coeff* | *Std err* | *Coeff* | *Std err* |
| Log epop ratios: | | | | |
| Men 15–24 | -0.0851 | 0.0848 | -0.5796 * | 0.3021 |
| Men 25–54 | -0.0308 * | 0.0160 | -0.1050 * | 0.0662 |
| Men 55+ | 0.0853 | 0.0813 | -0.4435 | 0.2788 |
| Women 15–24 | 0.0122 | 0.0947 | -0.4104 | 0.3445 |
| Women 25–54 | -0.1132 | 0.0971 | 0.1993 | 0.3353 |
| Women 55+ | 0.2164 * | 0.1144 | -0.3470 | 0.4183 |
| Unemployment rates: | | | | |
| Men 15–24 | 0.0244 | 0.0337 | 0.1189 | 0.1282 |
| Men 25–54 | 0.0404 *** | 0.0116 | 0.1428 *** | 0.0423 |
| Men 55+ | 0.1082 *** | 0.0166 | 0.3486 *** | 0.0596 |
| Women 15–24 | -0.0918 *** | 0.0246 | -0.2089 *** | 0.0867 |
| Women 25–54 | 0.0193 | 0.0211 | 0.0207 | 0.0702 |
| Women 55+ | 0.0306 | 0.0189 | 0.1134 * | 0.0687 |

*, **, ***: significantly different from zero at the 10%, 5%, or 1% level (two-tailed tests)

[a]Sample size is 101. Control variables include births/population 15–24 years earlier; employment protection index; unemployment rate; collective bargaining coverage; union density; coordination index; first- and fifth-year UI replacement rates; labor tax rate; public pension replacement rate; pension accrual rate for 10 years for a 55-year-old worker; UI replacement rate for older workers; disability replacement rate for older workers; male and female retirement ages; and interactions between the unemployment rate and these variables. One standard deviation changes within countries are 5.28 percentage points for collective bargaining coverage; 7.24 percentage points for union density; and 0.157 for coordination index. One standard deviation changes between countries are 23.51 percentage points for collective bargaining coverage; 18.51 percentage points for union density; and 0.599 for coordination. Standard errors are corrected for country-specific heteroskedasticity and country-specific first-order autocorrelation

**Table 10** Selected results for relative employment and unemployment, alternative specifications (effects of one between country standard deviation difference in unionization variables)

| *Specification* | *Relative employment* | | | | | *Relative unemployment* |
|---|---|---|---|---|---|---|
| | *Men 25–54 vs. Men 15–24* | *Men 25–54 vs. Men 55+* | *Women 25–54 vs. Women 15–24* | *Women 25–54 vs. Women 55+* | *Men 25–54 vs. Women 25–54* | *Men 25–54 vs. Women 25–54* |
| *Baseline model* | *0.0798*** | *0.1778*** | *0.0632* | *0.2697*** | *0.0484* | *-0.0279*** |
| | *(0.0354)* | *(0.0225)* | *(0.0540)* | *(0.0619)* | *(0.0385)* | *(0.0073)* |
| Demographically corrected unemployment rate | 0.0761** | 0.1919*** | 0.1038* | 0.2840*** | 0.0280 | -0.0280*** |
| | (0.0301) | (0.0230) | (0.0541) | (0.0618) | (0.0408) | (0.0069) |
| EEO policies in model | 0.0841** | 0.1800*** | 0.0599 | 0.2658*** | 0.0510 | -0.0291*** |
| | (0.0360) | (0.0225) | (0.0548) | (0.0624) | (0.0388) | (0.0075) |
| Enrollment variables in model | 0.0878** | 0.1703*** | 0.0670 | 0.2822*** | 0.0411 | -0.0282*** |
| | (0.0356) | (0.0229) | (0.0579) | (0.0680) | (0.0434) | (0.0074) |
| Government employment share in model | 0.0555 | 0.1830*** | 0.1090 | 0.3877*** | -0.0624 | -0.0326*** |
| | (0.0436) | (0.0271) | (0.0770) | (0.0876) | (0.0601) | (0.0098) |
| Country dummies excluded | 0.0047 | 0.0260 | 0.0241 | 0.0547 | -0.0888*** | -0.0151*** |
| | (0.0178) | (0.0184) | (0.0344) | (0.0473) | (0.0254) | (0.0039) |
| North America excluded | 0.0246 | 0.1758*** | 0.0682 | 0.3243*** | -0.0186 | -0.0233*** |
| | (0.0314) | (0.0245) | (0.0589) | (0.0714) | (0.0469) | (0.0086) |
| Scandinavia excluded | 0.0980** | 0.1246*** | -0.0311 | 0.1758*** | 0.0675 | -0.0448*** |
| | (0.0492) | (0.0286) | (0.0698) | (0.0681) | (0.0469) | (0.0078) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Missing coll. barg. coverage dummy included | 0.1162*** | 0.1761*** | 0.0582 | 0.2389*** | 0.0677* | -0.0242*** |
| | (0.0308) | (0.0201) | (0.0565) | (0.0623) | (0.0393) | (0.0070) |
| Coll. barg. coverage is the only union variable in model | 0.0752*** | 0.0776*** | 0.0729*** | 0.1622*** | -0.0306 | -0.0202*** |
| | (0.0217) | (0.0149) | (0.0320) | (0.0456) | (0.0263) | (0.0049) |
| Coordination is the only union variable in model | 0.0510* | 0.0461*** | 0.0670 | 0.1158*** | 0.0146 | -0.0063 |
| | (0.0289) | (0.0162) | (0.0408) | (0.0401) | (0.0285) | (0.0055) |
| Union density is the only union variable in model | -0.0444** | 0.0666*** | -0.0642* | 0.1055** | 0.0685** | -0.0083* |
| | (0.0207) | (0.0171) | (0.0367) | (0.0434) | (0.0280) | (0.0045) |
| Union density excluded from model | 0.1206*** | 0.1131*** | 0.1304*** | 0.2552*** | -0.0147 | -0.0209*** |
| | (0.0305) | (0.0199) | (0.0470) | (0.0571) | (0.0337) | (0.0060) |
| Post 1975 data only | 0.0085 | 0.1024*** | 0.0314 | 0.1540*** | 0.0244 | -0.0228*** |
| | (0.0300) | (0.0234) | (0.0403) | (0.0574) | (0.0335) | (0.0079) |
| Coll. barg. coverage, coordination and union density are the only institutions in model | 0.0943*** | 0.0794*** | 0.0273 | 0.1073* | 0.0446 | -0.0220*** |
| | (0.0280) | (0.0229) | (0.0477) | (0.0555) | (0.0382) | (0.0070) |

Notes: Baseline model includes union density, coll. barg. coverage, coordination, unemployment rate, prior birth rate, country dummies, all of the institutions listed in Table 3, and period dummies (baseline estimates taken from Table 6, Panel I). Relative employment or unemployment is inferred from absolute coefficients

*, **, *** denote significantly different from zero at the 10%, 5%, and 1% level on two tailed tests, respectively

Data on retirement system characteristics were interpolated from those available from Blöndal and Scarpetta (1999): Male and Female retirement ages in 1961, 1975, 1995 from Table III.1; 10 Year pension accrual rate in 1967 and 1995 from Table III.4; Pension Replacement Rates for 1961, 1975, and 1995 from Table III.3; Disability and Unemployment Special Scheme Replacement Rates for 1961, 1975, and 1995 from Table IV.3.

Individual union membership data were taken from the International Social Survey Programme (ISSP) for 1985–1998.

Data on enrollment in education were taken from the World Bank's 1995 CD edition of the World Tables (Tables 8, 9 and 10).

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# Equilibrium Unemployment and the Duration of Unemployment Benefits

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## 1 Introduction

According to standard job search theory, more generous unemployment benefits increase the unemployment rate by reducing the search effort of workers, thereby reducing the unemployment outflow rate. This prediction has been studied extensively in theoretical and empirical work and has proved to be empirically relevant and quantitatively important. The general finding from the empirical literature which will be discussed in more detail below is that it takes about 14 weeks of benefit duration to increase unemployment duration by 1 week.

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The benefit system may affect unemployment not only via a reduced outflow from unemployment but also via a higher inflow into unemployment. One prominent argument, due to Mortensen and Pissarides (1999), holds that idiosyncratic shocks to workers' productivities let firms' optimal layoff rule depend on the wage rate—which in turn is affected by the prevailing unemployment benefit system. If the benefit system becomes more generous, newly established jobs become unprofitable more quickly. As a result, a more generous benefit system will lead to an increase in the steady state flow from employment to unemployment. Alternatively, when workers' preferences (rather than their productivity) change randomly over time, a sufficiently negative shock may induce an employed worker to "quit" and collect benefits. More generous benefits will induce individuals to quit more easily, raising the inflow into unemployment. As we discuss below, and in contrast to outflow effects, empirical evidence on the effects of benefit generosity on the unemployment inflow is much more scarce and far from conclusive.

The aim of this chapter is to assess how the potential duration of unemployment benefits affects the equilibrium unemployment rate. Our main contribution is the analysis of the joint effects of benefit duration on the outflow from *and* the inflow into unemployment. This is different from the literature which has studied one of the two effects in isolation. The majority of previous studies have concentrated on the effects of the generosity of the benefit system on the probability that unemployed workers find regular jobs while a smaller literature has looked at the role of benefit rules on the probability to enter unemployment.

Understanding the inflow and outflow effects of the unemployment benefit system is crucial for labor market policy. First, the overall effect of a policy change remains unclear without a comprehensive understanding of both the inflow and the outflow channel. The risk is that policy makers may underestimate the implications of extended benefits for steady state labor market outcomes. Second, it is also crucial to understand the relative importance of the inflow and the outflow channel from a welfare point of view. Generous benefits that prolong unemployment spells can be problematic because long-term unemployment can cause skill depreciation. Skill depreciation is less of a concern when generous benefits mainly reduce job duration. As previous studies were typically concerned either with the inflow effect or with the outflow effect, the relative size of these two effects remains unclear. The current study aims to shed light on their relative importance. As far as we know, this is the first paper that

investigates the implications of the unemployment benefit system from a comprehensive perspective.[1]

Our analysis is based on a change in the Austrian unemployment insurance system that lead to a quasi-experimental situation allowing us to estimate benefit-duration effects on flows in and out of unemployment. In August 1989, the Austrian government made unemployment insurance more generous by increasing the maximum duration of unemployment benefits for certain groups of workers. Depending on age and previous work experience, the potential duration of regular benefits was raised from 30 to 52 weeks for one group, from 30 to 39 for a second group, and remained unchanged for a further group. We exploit this policy change and its differential treatment of these various groups of workers to assess the impact of benefit duration on unemployment inflows and outflows.

A particular advantage of our analysis is a very large and informative data drawn from two sources: the Austrian unemployment register and the Austrian Social Security Data (ASSD). These data sources contain the universe of all employed and unemployed Austrian workers. We observe these workers over a period of four years, two years before the policy change, that is, from August 1987 to July 1989; and two years after this policy change, from August 1989 to July 1991. A further advantage of our study concerns the fact that the period during which the policy change took place was quite stable from a macroeconomic perspective. This implies that our study is not subject to endogenous policy bias which arises when more generous unemployment insurance rules are implemented in anticipation of a deteriorating labor market. Such a policy bias has been found important in several recent studies (Card & Levine, 2000; Lalive & Zweimüller, 2004a). The absence of an endogenous policy bias, the large size, and the low measurement error in our data set allow us to estimate the relevant policy parameters quite precisely.

Although we study both inflow and outflow effects of extended unemployment benefits, the novelty of our study is in the inflow analysis and above all in the comprehensive perspective. In previous work we analyzed outflow effects of the Austrian benefit system in detail. In Lalive et al. (2006) we show that the duration of unemployment is affected by two key

[1] There are cross-country studies that relate aggregate parameters of the unemployment insurance system—that is, average replacement rate and average benefit duration—and other labor market institutions in various countries to the aggregate unemployment rates in these countries. See for an overview Nickell and Layard (1999).

parameters of unemployment insurance, the benefit replacement rate and the potential benefit duration. While the current study also addresses benefit duration effects, the overlap is limited. It is restricted to the relationship between potential benefit duration and outflow from unemployment.[2] In Lalive et al. (2006) we analyze the joint effect of potential benefit duration and changes in the replacement ratio. (In the present analysis we focus only on those workers for whom the replacement ratio remained unchanged.) Moreover, the analysis is based on a more sophisticated methodology, a proportional hazard approach that allows us to investigate in detail the effect of observables on the exit rate from unemployment and the evolution of the exit rate over the elapsed duration. Because here we follow a more comprehensive approach in which we want to analyze inflow to and outflow from unemployment in a similar way we do not analyze the outflow processes in as much detail. In fact, as discussed in more detail below, we use straightforward logit analysis focusing on the probability to leave unemployment within a particular interval. The logit analysis is not as rich as the proportional hazard analysis but by and large generates similar results in terms of the way the extended potential benefit duration (PBD) influence the overall outflow from unemployment. By performing a similar logit analysis for the probability to lose a job within a particular calendar time interval, we are able to capture equilibrium unemployment as derived from dynamics concerning both inflow and outflow.

Our findings with respect to the effect of the potential benefit duration (PBD) on the outflow from unemployment are in line with Lalive et al. (2006). The increase in PBD reduces the outflow a lot. The novel findings are twofold. First, the extension of the PBD also increases the inflow into unemployment. Our second finding is that the effect on the equilibrium unemployment rate due to increase in the inflow into unemployment is more important than the effect due to the decrease in the outflow from unemployment. Although the PBD extension makes it only a little bit more attractive for employed workers to become unemployed, there are

[2] Note that Lalive and Zweimüller (2004a, 2004b) also use Austrian data to analyze how unemployment benefits affect the outflow from unemployment, but these studies are based on information from Austrian regions with a dominant steel industry. In these regions, in 1988 an extended benefit program was introduced for workers aged 50 or older. The focus of both studies is on policy endogeneity, which indeed turns out to introduce a substantial bias in the parameter estimates. In Lalive et al. (2006) and the current paper to avoid policy endogeneity problems, the analysis excludes the steel-dominated regions.

many more employed workers than unemployed workers. This difference in the size of the two groups of workers causes the inflow effect to be larger.

The set-up of the chapter is as follows. In Sect. 2 we review the relevant theoretical and empirical literature. Section 3 discusses the characteristics of the Austrian unemployment insurance system and briefly describes the Austrian labor market during the period when the change in maximum unemployment benefits was implemented. Section 4 presents the data we use in our analysis and discusses our empirical strategy. Section 5 presents parameter estimates and Sect. 6 uses our estimates to simulate the implied effects for the steady-state unemployment rate. Section 7 concludes the study.

## 2 How Potential Benefit Duration Affects Unemployment

### *Theory*

Denote by $\theta_{u,t}(x|T)$ the probability that an unemployed worker with personal characteristics $x$ finds a job in calendar time interval $t$ when $T$ is the maximum benefit duration (or potential benefit duration—PBD), and by $\theta_{e,t}(x|T)$ the probability that an employed worker with these characteristics loses his/her job in calendar time interval $t$. The steady state unemployment rate of the group of workers with characteristics $x$ is then

$$u^*(x\,|\,T) = \frac{\theta_e(x\,|\,T)}{\theta_e(x\,|\,T) + \theta_u(x\,|\,T)}. \tag{1}$$

Consider the effects of a change in the maximum benefit duration $T$ from the perspective of search theory. According to Mortensen (1977), expanding the duration of benefits has two opposite effects on the exit rate out of unemployment. First, the value of being unemployed increases so there is a disincentive effect that leads an unemployed worker to search less intensively. Second, the value of being employed also increases (because the value of being unemployed in the future has increased) which has a positive effect on the exit rate. For short-term unemployed, the disincentive effect dominates; for unemployed near the point of benefit exhaustion (and beyond), the incentive effect dominates. Therefore, if there is an extension of benefit duration, this will have a negative effect on

the exit rate out of unemployment for short-term unemployed, but it will have a positive effect on the exit rate for long-term unemployed. While the first effect has been found often in empirical research, evidence for the second effect is scarce (Fredriksson, 2006).

The increase in the value of being unemployed through the extension of the potential benefit duration may also induce an increase in the inflow into unemployment. There are various reasons why this could be the case. For instance, the standard search and matching model with endogenous job destruction (Mortensen & Pissarides, 1999; Pissarides 2000, chapter 2) assumes that a worker's productivity on the job is subject to idiosyncratic shocks and firms require a minimum productivity level that prevents them from firing the worker and destroying the job. The firms' reservation productivity increases with more generous unemployment benefits because more generous benefits push up wages requiring a higher average productivity on the job. Alternatively, assume a worker's disutility of labor (rather than his/her productivity) is subject to idiosyncratic shocks. In that case, more generous benefits will induce a worker to quit his/her job more easily. More generous unemployment benefits may also increase the take-up of unemployment benefits. Conditional on losing his/her job, a worker may be more inclined to apply for benefits. Finally, it may be that the separation rate increases because a worker reduces his/her effort on the job and is more likely to be dismissed because he/she is less likely to take actions to prevent job loss.[3]

In conclusion, from a theoretical point of view, it is likely that $\partial\theta_u(x|T)/\partial T<0$ and $\partial\theta_e(x|T)/\partial T>0$. Therefore, an extension of the maximum benefit duration will increase the equilibrium unemployment rate:

$$\frac{\partial u^*(x\,|\,T)}{\partial T}>0. \tag{2}$$

### *Empirical Literature*

Several US studies estimate the effects on the unemployment exit rate of variations in PBD that take place during recessions.[4] Early studies,

[3] Note, however, that according to Fredriksson (2006) there is not much empirical evidence in support of such an effect.

[4] Fredriksson (2006) give a recent overview of empirical research related to incentives in unemployment insurance. See Green and Riddell (1993), Green and Riddell (1997) and Ham and Rea (1987) for studies that focus on Canada.

including Moffitt and Nicholson (1982), Moffitt (1985), and Grossman (1989), find significantly negative incentive effects. Meyer (1990) and Katz and Meyer (1990) show that the exit rate from unemployment rises sharply just before benefits are exhausted. Such spikes are absent for non-recipients. More recent work by Addison and Portugal (2004) confirms these findings.[5]

A common objection against these studies is policy endogeneity. Benefits are typically extended in anticipation of a worse labor market for the eligible workers. Card and Levine (2000) exploit a variation in benefit duration in New Jersey that occurred independently of labor market condition and show that policy bias is substantial. Lalive and Zweimüller (2004b) find similar evidence for Austria.

Evidence on the effect of PBD in European studies is mixed. Hunt (1995) finds substantial disincentive effects of extended benefit entitlement periods for Germany. Carling et al. (1996) find a big increase in the outflow from unemployment to labor market programs, whereas the increase in the exit rate to employment is substantially smaller. Puhani (2000) finds that reductions in PBD in Poland did not have a significant effect on the duration of unemployment, whereas Adamchik (1999) finds a strong increase in re-employment probabilities around benefit expiration. Roed and Zhang (2003) find for Norwegian unemployed that the exit rate out of unemployment increases sharply in the months just prior to benefit exhaustion where the effect is larger for females than for males. Winter-Ebmer (1998) and Lalive and Zweimüller (2004b) show that extending the potential duration of benefits had significant disincentive effects in Austria. Van Ours and Vodopivec (2006) studying PBD reductions in Slovenia find both strong effects on the exit rate out of unemployment and substantial spikes around benefit exhaustion.

Empirical studies on the unemployment inflow effect of a lengthening of the maximum benefit duration are more rare. Most of these studies focus on requirements concerning entrance into unemployment insurance. Christofides and McKenna (1995, 1996), for example, find a clear

[5] Note that there is no theoretical explanation for the existence of end-of-benefit spikes. It could be that the spikes have to do with strategic timing of the job starting date, that is, workers have already found a job, but they postpone starting to work until their benefits are close to expiration. Card and Levine (2000) point at the possibility that there is an implicit contract between the unemployed worker and his previous employer to be rehired just before benefits expire.

relationship between entrance requirements of Canadian unemployment insurance and employment durations. The exit rate from employment to unemployment increases substantially as soon as the workers satisfy the number of weeks worked in order to qualify for UI benefits. Anderson and Meyer (1997) investigate the take-up rate of unemployment benefit insurance of workers separating from their employers. They find that both the level and the maximum duration of benefits have a significant positive effect. Green and Riddell (1997) study the effect of changes in entrance requirements on the inflow into Canadian unemployment finding that changes in these requirements have a significant impact on employment durations. They also find that many employment spells that just qualify under the old system are extended to just qualify under the new system. And they find that all of the response is in layoffs, not quits, which suggests that employers play an important role in the adjustment of employment durations. Green and Sargent (1998) analyze Canadian data and also find evidence of concentrations of job spell durations at the entrance requirement point and at the point at which individuals have qualified for the maximum possible weeks of benefit receipts. Winter-Ebmer (2002) finds strong inflow effects of the Austrian regional extended benefit program which granted very long benefits for older workers in certain regions.[6] These results are in line with those of Lalive and Zweimüller (2004a) who also find significant inflow effects which were particularly strong immediately before this program was abolished.

## 3 Institutional Background

Like in a number of other countries, the Austrian unemployment insurance system is characterized by a limited period over which unemployed individuals can draw "regular" unemployment benefits. Unemployment benefits depend on previous earnings and, compared to other European countries, the replacement ratio (benefits relative to *gross* monthly earnings) is rather low. In 1990, the replacement ratio was 40.4% for the median income earner; 48.2% for a low-wage worker who earned half the median; and 29.6% for a high-wage worker earning twice the median. On

[6] The regional extended benefit program was implemented in 1987 and ended in 1993 and was directed to a subset of Austrian regions. (See Winter-Ebmer, 1998, 2002 and Lalive and Zweimüller, 2004a, 2004b). The policy change analyzed here applies to workers in all other regions and excludes regions that were subject to the regional extended benefit program.

top, family allowances are paid. Unemployment benefit payments are not taxed and not means-tested. Voluntary quitters and workers discharged for misconduct cannot claim benefits until a waiting period of four weeks has passed. Unemployment benefit recipients are expected to search actively for a new job that should be within the scope of the claimant's qualifications, at least during the first months of the unemployment spell. Non-compliance with the eligibility rules is subject to benefit sanctions that can lead to the withdrawal of benefits for up to four weeks.

Once the period of regular unemployment benefits has expired, individuals can apply for "transfer payments for those in need". [7] As the name indicates, these transfers are means-tested and the job seeker is considered eligible only if she or he is in trouble. These payments depend on the income and wealth situation of other family members and close relatives and may, in principle, last for an indefinite time period. These transfers are granted for successive periods of 39 weeks after which eligibility requirements are recurrently checked. The post-unemployment benefits transfers are lower than unemployment benefits and can at most be 92% of unemployment benefits. In 1990, the median post-unemployment benefits transfer payment was about 70% of the median unemployment benefits. Note, however, that individuals who are eligible for such transfers may not be comparable to individuals who collect unemployment benefits because not all individuals who exhaust unemployment benefits pass the means test. The majority of the unemployed (59%) received unemployment benefits, whereas 26% received post-unemployment benefit transfers. In sum, the Austrian unemployment insurance system is less generous than many other continental European systems and closer to the U.S. system.[8]

Before August 1989, an unemployed person could draw regular unemployment benefits for a maximum period of 30 weeks, provided that he or she had paid unemployment insurance contributions for at least 156 weeks within the last 5 years.[9] In August 1989 the potential duration of

[7] This so-called Notstandshilfe implies that job seekers who do not meet benefit eligibility criteria can apply at the beginning of their spell.

[8] See Nickell and Layard (1999). It is interesting to note that the incidence of long-term unemployment in Austria is closer to U.S. figures than to those of other European countries. In 1995, when our sample period ends, 17.4% of the unemployment stock were spells with an elapsed duration of 12 months or more. This compares to 9.7% for the U.S. and to 45.6% for France, 48.3% for Germany, and 62.7% for Italy (OECD, 1999).

[9] UB duration was 20 weeks for job seekers who did not meet this requirement. This chapter focuses on individuals who were entitled to at least 30 weeks of benefits.

unemployment benefit payments became dependent not only on previous experience but also on age at the beginning of the unemployment spell. Benefit duration for the age group 40–49 was increased to 39 weeks if the unemployed had 312 weeks of employment within the last 10 years prior to the current spell. For the age group 50 and older, unemployment benefit duration was increased to 52 weeks if the unemployed had been employed for at least 468 weeks within the last 15 years. Austrian policy makers introduced age delineation for two reasons. First, as age is the strongest predictor of long-term unemployment, policy makers wanted to improve protection for older workers by granting payment of regular unemployment benefits for a longer time period. Second, about one year prior to the August 1989 policy change, the *Krisenregionsregelung* introduced very strong age delineation at age 50 years. Age delineation was therefore adopted in August 1989 to be consistent with earlier modification of unemployment benefit rules.

## 4 Data and Empirical Strategy

To assess the impact of increasing benefit duration on unemployment outflow and inflow rates, we use longitudinal individual data from two different sources: (i) the *Austrian Social Security Database* (ASSD), which contains detailed information on the individuals' employment, unemployment, and earnings history since the year 1972, and some information on the employer, like region and industry affiliation; and (ii) the *Austrian unemployment register*, from which we get information on the relevant socioeconomic characteristics.

From these data we drew two samples, a "before-policy" sample and an "after-policy" sample. The sample was constructed such that all individuals fulfilled the experience requirement required for extended eligibility and that control individuals not too different in age from the treatment group. Thus, for both samples we selected individuals who were at least 35 years and at most 54 years old. Furthermore, we included only individuals with a continuous work history. To be included in the sample, an individual had to have a job for at least 6 out of the last 10 years and for at least 9 out of the last 15 years. Hence all individuals in our sample satisfy the work experience criteria for eligibility to extended benefit duration (see above). Our additional sample restrictions were motivated by concerns with events that may confound the estimates of the effects of PBD on inflow and outflow. We excluded all individuals living in regions subject to

the regional extended benefit program because these regions were covered by different extended benefit rules for workers older than 50 years.[10] Furthermore, we considered only workers with previous income above Austrian Shilling 12,610 (Euros 916) because workers below this threshold experienced an increase in benefits levels in 1989, a policy change that is beyond the scope of this study. The sample also excludes workers previously employed in the construction and tourism industries as unemployment durations in these groups are mainly driven by seasonal factors.

To make the sample as clean as possible we concentrate our analysis on "attached workers", that is, workers who are either employed or unemployed during the first observation year. The reason is that our focus is on flows between employment and unemployment rather than on flow between employment (unemployment) and out-of-labor force. While this is potentially interesting, our data set is not informative whether individuals have access to programs other than unemployment insurance in case they drop out of the workforce. Concentrating on attached workers has the advantage that flow in and out of non-employment are less important. Our empirical analysis is based on a comparison of two samples. The "before-policy" sample contains individuals who were either (i) employed as white- or blue-collar workers or (ii) unemployed at one of the four mid-quarter baseline dates (10 February, 10 May, 10 August, and 10 October) in the year 1986. We then follow these individuals up until quarter IV 1988. The "after-policy" sample contains all individuals who were either unemployed or employed as blue- or white-collar workers at each mid-quarter baseline date in the year 1990. We then follow these individuals up until quarter IV 1992. Note that this design allows individuals in the before-policy (after-policy) sample to be *out of labor force* only in the years 1987 and 1988 (1991 and 1992). Hence this restriction reinforces our focus on attached workers whose unemployment rates are below the actual unemployment rates which include workers with some distance from the labor market. Note further that we did not consider observations for the year 1989. This procedure minimizes potential biases resulting from anticipation effects that may arise due to behavioral changes of individuals that

[10] This so-called *Krisenregionsregelung* applied to about 15% of all observations. In these crisis-ridden regions even more generous unemployed insurance policies were implemented between 1988 and 1993. For empirical analyses of these programs, see Winter-Ebmer (1998, 2002) and Lalive and Zweimüller (2002, 2004).

were unemployed under initial policy rules but were anticipating that rules will become more generous.

Table 1 compares the characteristics of the two groups. There are basically two major differences between the two groups. First, we see that after the policy change, somewhat more than a quarter (half) of the sample is eligible to additional 22 (9) weeks of potential benefits duration. While average age in the before-policy sample is only slightly younger (by 0.4 years) than the after-policy sample, the distribution across relevant age

**Table 1** Descriptive statistics

| | *Unemployment outflow* | | | | *Unemployment inflow* | | | |
|---|---|---|---|---|---|---|---|---|
| | *Before-policy sample* | | *After-policy sample* | | *Before-policy sample* | | *After-policy sample* | |
| | *Mean* | *Std. dev.* | *Mean* | *Std. dev.* | *Mean* | *Std. dev.* | *Mean* | *Std. dev.* |
| Eligible for 52 weeks | 0.000 | 0.000 | 0.382 | 0.486 | 0.000 | 0.000 | 0.308 | 0.462 |
| Eligible for 39 weeks | 0.000 | 0.000 | 0.492 | 0.500 | 0.000 | 0.000 | 0.539 | 0.498 |
| Eligible for 30 weeks | 1.000 | 0.000 | 0.126 | 0.332 | 1.000 | 0.000 | 0.153 | 0.360 |
| Duration of unemployment (weeks) | 41.630 | 63.845 | 48.977 | 76.780 | 0.000 | 0.000 | 0.000 | 0.000 |
| Age 35–39 | 0.181 | 0.385 | 0.126 | 0.332 | 0.173 | 0.378 | 0.153 | 0.360 |
| Age 40–49 | 0.562 | 0.496 | 0.492 | 0.500 | 0.580 | 0.494 | 0.539 | 0.498 |
| Age 50+ | 0.257 | 0.437 | 0.382 | 0.486 | 0.247 | 0.431 | 0.308 | 0.462 |
| Age | 45.383 | 5.500 | 46.768 | 5.526 | 45.474 | 5.457 | 45.941 | 5.416 |
| After-policy | 0.000 | 0.000 | 1.000 | 0.000 | 0.000 | 0.000 | 1.000 | 0.000 |
| 1st quarter | 0.351 | 0.477 | 0.301 | 0.459 | 0.250 | 0.433 | 0.250 | 0.433 |
| 2nd quarter | 0.220 | 0.414 | 0.219 | 0.414 | 0.251 | 0.434 | 0.251 | 0.434 |
| 3rd quarter | 0.212 | 0.408 | 0.229 | 0.420 | 0.250 | 0.433 | 0.250 | 0.433 |
| 4th quarter | 0.218 | 0.413 | 0.251 | 0.434 | 0.248 | 0.432 | 0.248 | 0.432 |
| (log) wage | 6.425 | 0.276 | 6.440 | 0.316 | 6.573 | 0.280 | 6.598 | 0.300 |
| Experience[a] (years) | 13.143 | 1.487 | 13.102 | 1.520 | 14.293 | 1.241 | 14.252 | 1.293 |
| Tenure (years) | 5.209 | 5.514 | 6.062 | 6.635 | 10.267 | 5.522 | 11.062 | 6.954 |
| White collar | 0.151 | 0.358 | 0.158 | 0.364 | 0.596 | 0.491 | 0.606 | 0.489 |
| Manufacturing | 0.449 | 0.497 | 0.423 | 0.494 | 0.415 | 0.493 | 0.384 | 0.486 |
| Women | 0.349 | 0.477 | 0.436 | 0.496 | 0.333 | 0.471 | 0.378 | 0.485 |

[a]Work experience during last 15 years

groups is more strongly affected. Second, we see that the after-policy sample has a higher fraction of females.[11] Otherwise, the differences between samples are minor. Real earnings are slightly higher in the after-policy sample. Years of work experience within the last 15 years ("Experience") and the duration of the current job ("Tenure"; for the non-employed: tenure in the last job) are slightly higher in the after-policy sample. Moreover, the number of white-collar workers and the industry distributions of the two samples are very similar.

Our analysis of the impact of the maximum duration of benefits on the steady-state unemployment rate is based on an analysis of individual transition probabilities to and from unemployment. To assess the effect of the maximum benefit duration on these transition probabilities, we use a simple difference-in-differences estimator in the context of a logit model for quarterly transition probabilities for observation $i$ in quarter $t$

$$\theta^*_{yit} = \delta_{y1} ELIG52_{it} + \delta_{y2} ELIG39_{it} + \gamma_y A_{it} + x_{it}\beta_y + \varepsilon_{yit} \tag{3}$$
$$\theta^*_{yit} \geq 0 \text{ if } \theta_{yit} = 1 \text{ and } \theta^*_{yit} < 0 \text{ if } \theta_{yit} = 0$$

where $y$ is a subscript indicating whether the transition concerns outflow from unemployment ($y = u$) or inflow into unemployment ($y = e$). The variables $ELIG52_{it}$ and $ELIG39_{it}$ are indicator variables that take value 1 when observation $i$ is eligible for at most 52 or at most 39 benefit weeks, respectively.[12] Furthermore, $\delta_{y1}$ and $\delta_{y2}$ are the corresponding difference-in-differences estimators, the dummy variable $A_{it}$ indicates the after-policy period and $\gamma_y$ measures the calender time effect on transition $y$ that is irrespective of observation $i$'s eligibility status. Finally, $x_{it}$ is a vector in individual characteristics, $\beta_y$ is a vector of parameters that estimate the impact

[11] The higher fraction of ages 50+ is because the big birth cohorts of 1940–1942 are in the age group 40–49 in the before-policy sample whereas they are in the age group 50+ in the after-policy sample. The higher fraction of females in the after-policy sample is most likely due to the fact that the cohorts that are in the after-policy but not in the before-policy sample have a high labor force participation and are relatively large (vintages in the mid-1950s). In contrast, the cohorts that are in the before-policy sample but not in the after-policy sample (vintages of the early 1930s) do have a low labor force participation and are comparably small.

[12] All observations in our samples for which both $T39_i = 0$ and $T52_i = 0$ are eligible for at most 30 weeks of benefits.

of these characteristics on transition $y$,[13] and the error term $\varepsilon_{yit}$, capturing unobservable heterogeneity, are assumed to be standard normally distributed.[14]

Obviously, whether the difference-in-differences estimator identifies the causal effect of the increase in benefit duration on the unemployment risk hinges upon whether or not the policy change was exogenous.[15] There are two reasons why policy endogeneity is most likely of minor importance in the present context. The first reason is that the economy was doing badly before the policy change (in the years 1987 and 1988). After the policy change (in the years 1989, 1990, and 1991) the economy was in a boom. To the extent that all age groups were benefitting from this situation, policy endogeneity is not an issue. Second, one reason for the implementation of the policy may have been equity concerns. In 1988, the Austrian government implemented a very generous program that was targeted toward older steel workers in crisis-ridden steel regions. This "Austrian regional extended benefit program" granted four years of unemployment benefits to eligible older workers in crisis-ridden steel regions. Hence political pressure to treat older unemployed workers in non-eligible regions more generously was one reason for changing the benefit rules. To the extent that such equity concerns were the reason for the policy change, the increase in benefit duration can be regarded as exogenous with respect to labor market outcomes of the eligible individuals in our sample.

An important assumption of the difference-in-differences strategy is that there are no differential trends in unemployment between treated and control groups. In our analysis below we will use the age group 35–39 as the benchmark for changes in unemployment inflows and outflows in the absence of the PBD extension. To check whether this age group is a good benchmark for the changes in unemployment Fig. 1 provides information on trends in unemployment during the pre-reform period. Note that Fig. 1 is based on the official unemployment rate, thus covering both

[13] The vector of individual characteristics includes the individual's age, age dummies, dummies for the inflow quarter, log daily wage, experience, tenure, broad occupation (blue/white collar), sex, and industry (manufacturing, construction/tourism, other industries).

[14] The analysis below will be undertaken also for more flexible specifications of age and calendar time and will be estimated for various subgroups to assess the robustness of the results.

[15] If policy was implemented because policy makers became concerned with worse labor market prospects for older individuals, there would be policy endogeneity.

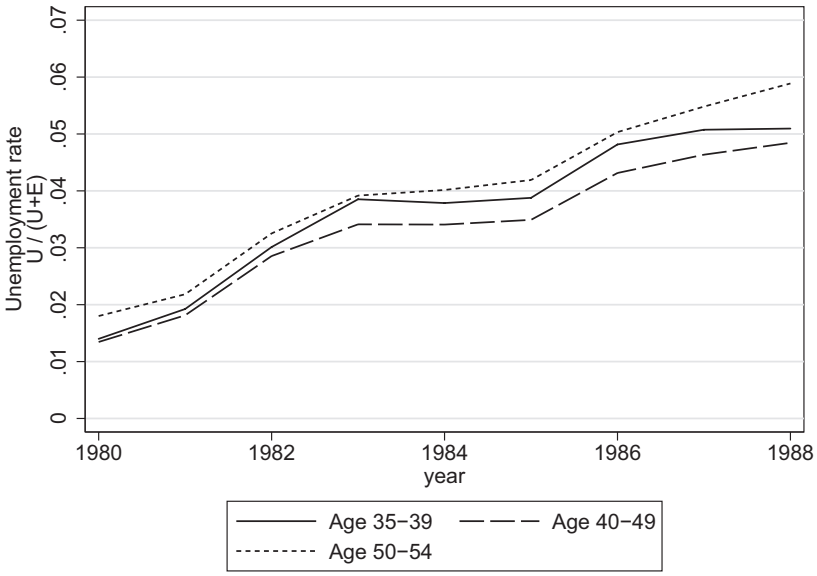


**Fig. 1** Pre-reform trends in unemployment rates, by age groups

attached workers (as our sample does) and unattached workers leading to higher unemployment rates than in our sample. As Fig. 1 shows clearly that the unemployment rates of the age groups 35–39, 40–49, and 50–54 are similar and do not show any substantial differences in the trend over the pre-reform period.

Our analysis concentrates on the period 1987–1992. In 1987 the economy was at the end of a recession and started to improve. Real GDP growth was 1.7% in 1987 and then started to grow to as much as 4.7% in 1990. The favorable situation of the business cycle led to strong employment growth throughout the period under consideration. The unemployment rate was rather stable due to an increase in labor supply (immigration and rising female labor force participation). Aggregate flows into and out of unemployment did not dramatically change during the period under consideration. The aggregate quarterly unemployment inflow rate (new unemployment spells that started in given quarter relative to the total stock of employment and out-of-labor-force) was fluctuating around 2.75% and the average duration of unemployment (spells completed during respective year) was roughly stable at somewhat less than four months.

The average unemployment rate during the post-treatment period 1989–1991 was as high as during the pre-treatment period 1987–1988. Furthermore, employment growth during the treatment period was even somewhat stronger than before.

It is worth noting that the improving labor market is favorable in terms of our empirical strategy. This is because it is unlikely that comparing labor market experiences of older workers before and after the policy change are driven by a deteriorating labor market. Notice, however, that workers aged 35–39 could be affected by business-cycle fluctuations in a different way than older workers aged 40–49 or 50–54 invalidating the assumption of difference-in-differences analysis. As a crude check whether this concern is relevant we ran separate ordinary least squares (OLS) regression with the age-specific unemployment rate as the dependent variable and the aggregate unemployment rate as a regressor. For all three age groups, the coefficients are not significantly different from unity and point estimates are almost identical in these regressions. Hence business-cycle reactions do not seem to differ strongly across age groups.

## 5 Empirical Estimates

We proceed in two steps. We first show the regression results of our basic statistical model for the unemployment flows, separately for the unemployment outflow and the unemployment inflow. We next check (i) whether our estimated effects of benefit duration extension are robust to a more flexible specification of the age and calendar time variables; (ii) how the estimated effects of benefit duration are robust once the duration of the current state (elapsed duration of unemployment in the outflow equation; and tenure on the current job in the inflow equation); and (iii) how the estimated effects differ across various population subgroups. Using our outflow and inflow estimates, we can then discuss the question of interest: How do the changes in maximum benefit duration affect the steady-state unemployment rate?

### *Unemployment Outflow and Inflow*

Table 2 shows the results of Eq. (3) both for the unemployment outflow (columns 1 and 2) and for the unemployment inflow (columns 3 and 4). (Notice that the coefficients displayed in the table are marginal effects evaluated at the sample means of the right-hand-side variables.) The logit

**Table 2** Logit results on unemployment flows

| *Dependent variable* | *Unemployment outflow* | | *Unemployment inflow* | |
|---|---|---|---|---|
| *Mean of dep. variable* | *0.445* | | *0.011* | |
| | *(1)* | *(2)* | *(3)* | *(4)* |
| Eligible for 52 weeks | -0.090 | -0.041 | 0.002 | 0.003 |
| | (4.30)** | (2.43)* | (4.19)** | (5.77)** |
| Eligible for 39 weeks | -0.024 | -0.018 | 0.001 | 0.001 |
| | (1.22) | (1.15) | (2.25)* | (3.78)** |
| Duration of unemployment (weeks) | | -0.008 | | |
| | | (24.30)** | | |
| Tenure (years) | | | | -0.001 |
| | | | | (74.23)** |
| After-policy | -0.208 | -0.141 | -0.000 | -0.001 |
| | (9.23)** | (6.80)** | (0.64) | (2.57)* |
| (log) wage | -0.150 | -0.054 | -0.008 | -0.004 |
| | (11.37)** | (5.17)** | (23.60)** | (13.38)** |
| Experience (years) | -0.013 | -0.024 | -0.003 | -0.001 |
| | (5.13)** | (12.06)** | (59.81)** | (36.37)** |
| White collar | 0.089 | 0.044 | -0.004 | -0.002 |
| | (9.63)** | (4.95)** | (16.06)** | (13.16)** |
| Manufacturing | -0.022 | -0.016 | 0.001 | 0.001 |
| | (3.03)** | (2.85)** | (3.36)** | (5.74)** |
| Women | -0.096 | -0.084 | -0.003 | -0.001 |
| | (12.59)** | (13.87)** | (16.61)** | (5.07)** |
| Calendar time dummies (for each quarter) | Yes | Yes | Yes | Yes |
| Age dummies (for each year) | Yes | Yes | Yes | Yes |
| Observations | 29,786 | 29,786 | 1,245,337 | 1,245,337 |

Note: Marginal effects, absolute value of robust z statistics in parentheses, clustered at the individual level
* significant at 5%; ** significant at 1%

estimation of column 1 includes all 29,786 unemployment cases observed in one of the eight quarterly baseline dates. Similarly, the estimation of column 2 is based on the 1,245,337 employment cases observed in our sample.

The difference-in-differences estimators are in line with the theoretical predictions. Eligibility to longer benefits reduces the outflow rate from unemployment (column 1) and increases the inflow probability into unemployment (column 2). All coefficients have the expected sign. The

effect of increasing PBD by 22 weeks is particularly strong, both in the outflow and in the inflow equation. The effect of increasing PBD by nine weeks is weaker and statistically significant only in the inflow equation.

The coefficient of column 1 in Table 2 indicates that the probability that an individual leaves the unemployment register within the next quarter is reduced by 9 percentage points for individuals that become eligible to a maximum of 52 benefit weeks instead of the 30 weeks before the policy change. Similarly, the point estimate of the increase from 30 to 39 weeks of maximum benefit duration indicates a (statistically insignificant) reduction of 2.4 percentage points. Column 2 in Table 2 checks how these effects change once we control for the elapsed duration of the individual's current unemployment spell. It turns out that the effects still significantly negative when becoming eligible to 52 benefit weeks albeit the estimated impact reduces to 4.1 percentage points whereas becoming eligible to 39 weeks leads only to a marginal change in the point estimate.

We find a strong impact of extending the maximum benefit duration on the unemployment inflow. The effects are not only highly significant, they are also quantitatively substantial. Column 3 of Table 2 suggests that as a result of an increase in maximum benefit duration from 30 to 52 weeks, the quarterly inflow rate increases by 0.2 percentage points. While this looks like a small number, we have to keep in mind that the average quarterly unemployment inflow rate is also a small number which amounts to roughly 1% per quarter. Taken together, this results in a quantitatively substantial increase in the inflow rate of 10%. Similarly, the extension of maximum benefit duration from 30 to 39 weeks leads to an increase associated with a 0.1 percentage point increase or a 10% increase in the unemployment inflow rate. Column 4 includes the duration of the current job ("tenure") as an additional regressor in the estimated equation. It turns out that controlling for tenure increases the estimated point effects for workers who become eligible for 52 benefit weeks, the inflow rate increases by 0.3 percentage points, and the estimated effect for workers with 39 weeks remains roughly constant. [16]

[16] With respect to the effect of PBD on the unemployment outflow, our results are in line with the estimates by Lalive et al. (2006) who find that the increase in PBD from 30 to 52 weeks leads to an increase in the expected duration of unemployment of 12.3% and who find a very small effect of the increase in PBD from 30 to 39 weeks. Our results are also similar to the previous estimate by Winter-Ebmer (2002) who finds substantial effects of PBD on the unemployment inflow for a different policy change in Austria, which extended PBD for older workers in certain regions.

Table 2 also displays the coefficient for the remaining control variables included in the regressions. We find that *high-wage* workers have substantially lower turnover: they do not have a lower risk of unemployment, but high-wage workers have also lower chances to exit unemployment. Similar effects are found with respect to previous *work experience*. In contrast, *white-collar* workers have a higher unemployment exit rate and a lower unemployment entry rate. Results also show significant differences between *industries* with manufacturing workers showing lower turnover than other industries (mostly services). Finally, we find that *women* have significantly worse chances than men to exit unemployment. Furthermore, there are significant gender differences in the risk of unemployment.

To investigate further to which extent the duration in the current state may have an impact on the above results, Table 3 performs a number of further robustness checks. The upper and lower panels of this table refer to outflow and inflow regressions, respectively. For ease of comparison, column 1 in Table 3 repeats the baseline results obtained in columns 2 and 4 of Table 2. In column 2, we allow for interaction effects of duration with both calendar time and age dummies. This does not have any major impact on the estimated benefit duration effects. For individuals eligible to the extension to 52 weeks, we find a slightly larger negative impact on the outflow and a somewhat lower impact on the unemployment inflow. For individuals eligible to the extension to 39 weeks, the coefficients remain basically unchanged. In the last two columns of Table 3 we split the sample into short and long durations (below and above 15 weeks of elapsed unemployment duration in the outflow sample; below and above 10 years of tenure in the inflow sample). It turns out that outflow effects show predominantly longer unemployment spells when benefits are extended to 52 weeks. While the remaining coefficients show the expected negative sign, they turn out statistically insignificant. In contrast, unemployment inflow effects are somewhat stronger for workers with low tenure and become insignificant for long-tenured workers eligible to 39 benefit weeks. In sum, while we find differential impacts of workers with different durations in their current state, the basic picture of Table 2 remains. In general inflow effects seem to be stronger than outflow effects.

As a further test for the robustness of our results, we look at the effects of the change in maximum benefit duration once we split our sample into various subgroups (Table 4). All regressions are based on the specification we used in Table 2, column 2 (outflow) and column 4 (inflow). The basic message of Table 4 is that increasing the maximum benefit duration both

**Table 3** Splitting the sample by duration of current state, logit estimates

| *Unemployment outflow* | *Whole sample* | *Whole sample* | *Duration ≤15w* | *Duration >15w* |
|---|---|---|---|---|
| | *(1)* | *(2)* | *(3)* | *(4)* |
| Eligible for 52 weeks | -0.041 | -0.055 | -0.027 | -0.043 |
| | (2.43)* | (3.27)** | (0.85) | (3.01)** |
| Eligible for 39 weeks | -0.018 | -0.016 | -0.027 | -0.021 |
| | (1.15) | (1.03) | (0.96) | (1.54) |
| Duration of unemployment (weeks) | -0.008 | -0.005 | 0.008 | -0.004 |
| | (24.30)** | (2.95)** | (6.31)** | (17.28)** |
| Calendar time dummies (for each quarter) | Yes | Yes | Yes | Yes |
| Age dummies (for each year) | Yes | Yes | Yes | Yes |
| Interaction of duration with age and calendar time dummies | No | Yes | No | No |
| *Unemployment inflow* | Whole sample | Whole sample | Tenure ≤10y | Tenure >10y |
| | (1) | (2) | (3) | (4) |
| Eligible for 52 weeks | 0.003 | 0.002 | 0.003 | 0.002 |
| | (5.77)** | (4.66)** | (3.31)** | (3.39)** |
| Eligible for 39 weeks | 0.001 | 0.001 | 0.002 | 0.000 |
| | (3.78)** | (3.47)** | (3.73)** | (0.26) |
| Tenure (years) | -0.001 | -0.001 | -0.003 | -0.000 |
| | (74.23)** | (5.90)** | (67.76)** | (4.71)** |
| Calendar time dummies (for each quarter) | Yes | Yes | Yes | Yes |
| Age dummies (for each year) | Yes | Yes | Yes | Yes |
| Interaction of tenure with age and calendar time dummies | No | Yes | No | No |

Note: Marginal effects, absolute value of robust z statistics in parentheses, clustered at the individual level

* significant at 5%; ** significant at 1%

from 30 to 52 weeks and from 30 to 39 weeks has a significant and quantitatively important impact on the unemployment inflow. In contrast, the unemployment outflow coefficients are less important and the point estimates mostly insignificant.

**Table 4** Difference-in-differences logit marginal effects of PBD effects: various subgroups

| | *Unemployment outflow* | | | *Unemployment inflow* | | |
|---|---|---|---|---|---|---|
| | *Eligible for 52 weeks* | *Eligible for 39 weeks* | *Duration (weeks)* | *Eligible for 52 weeks* | *Eligible for 39 weeks* | *Tenure (years)* |
| Whole sample | -0.041 | -0.018 | -0.008 | 0.003 | 0.001 | -0.001 |
| | (2.426)* | (1.150) | (24.299)** | (5.768)** | (3.780)** | (74.230)** |
| Women | -0.025 | 0.007 | -0.006 | 0.005 | 0.001 | -0.001 |
| | (0.896) | (0.285) | (10.760)** | (4.014)** | (1.725) | (35.070)** |
| Men | 0.020 | 0.025 | -0.010 | 0.002 | 0.001 | -0.001 |
| | (0.760) | (1.103) | (17.694)** | (3.880)** | (3.744)** | (57.779)** |
| Blue collar | -0.006 | 0.012 | -0.010 | 0.004 | 0.002 | -0.001 |
| | (0.185) | (0.418) | (12.194)** | (4.630)** | (3.394)** | (45.717)** |
| White collar | 0.019 | 0.011 | -0.006 | 0.003 | 0.001 | -0.001 |
| | (0.838) | (0.537) | (16.854)** | (4.595)** | (1.954) | (42.286)** |
| Low wage | -0.015 | 0.019 | -0.009 | 0.005 | 0.002 | -0.001 |
| | (0.604) | (0.847) | (16.364)** | (4.611)** | (2.705)** | (55.275)** |
| High wage | -0.002 | -0.018 | -0.008 | 0.002 | 0.001 | -0.001 |
| | (0.068) | (0.807) | (16.245)** | (3.871)** | (2.403)* | (52.639)** |

Note: Marginal effects, absolute value of robust z statistics in parentheses, clustered at the individual level

* significant at 5%; ** significant at 1%

## 6 Benefit Duration and Equilibrium Unemployment

Using the parameter estimates of the inflow and outflow probabilities, we consider how the maximum benefit duration affects equilibrium unemployment. Our thought experiment is the following. Let us take our estimates of the increase in PBD at face value and consider a steady-state situation in which the inflow into and the outflow from unemployment are identical. Which unemployment rate is implied by the system before the policy change as compared to the system after the change. Ignoring effects of personal characteristics $x$ we have

$$u^*(T) = \frac{\hat{\theta}_e(T)}{\hat{\theta}_e(T) + \hat{\theta}_u(T)} \tag{4}$$

The policy changes we are analyzing are discrete and amount to a substantial increase in maximum benefit duration for the concerned groups. In order to assess the effect of the change in benefit duration on equilibrium unemployment, we perform a comparative static analysis. If $T_1$ and $T_2$ are the maximum benefit durations before and after the policy change, the change in equilibrium unemployment equals

$$\Delta u^* = u^*(T_2) - u^*(T_1) \tag{5}$$

Furthermore, it is straightforward to decompose this change into (i) a change due to a lower outflow from unemployment, (ii) a change due to a higher inflow into unemployment, and (iii) an interaction effect involving higher-order terms

$$\Delta u^* = \Delta u^*(out) + \Delta u^*(in) + \text{interaction effect}$$

where the inflow and outflow effects are given by

$$\Delta u^*(out) = \frac{\hat{\theta}_e(T_1)}{\hat{\theta}_e(T_1) + \hat{\theta}_e(T_2)} - \frac{\hat{\theta}_e(T_1)}{\hat{\theta}_e(T_1) + \hat{\theta}_u(T_1)}$$

$$\Delta u^*(in) = \frac{\hat{\theta}_e(T_2)}{\hat{\theta}_e(T_2) + \hat{\theta}_u(T_1)} - \frac{\hat{\theta}_e(T_1)}{\hat{\theta}_e(T_1) + \hat{\theta}_u(T_1)}$$

Notice that, just like in any other decomposition analysis, there is an "interaction effect" (or unexplained residual). When we calculate $\Delta u^*(out)$, we change the outflow rate from the pre-policy level $\hat{\theta}_u(T_1)$ to the post-policy level $\hat{\theta}_u(T_2)$, keeping the inflow rate $\hat{\theta}_e(T_1)$ at its pre-policy level. Similarly, $\Delta u^*(in)$ calculates the hypothetical effect on equilibrium unemployment of an isolated change in the inflow rate, keeping the outflow rate at its pre-policy level. Since equilibrium unemployment is non-linearly related to inflow and outflow rates, $\Delta u^*(in)$ and $\Delta u^*(out)$ do not sum up to $\Delta u^*$. The residual is captured by the interaction effect.

**Table 5** Effects of PBD increase in inflow, outflow, and unemployment population ratio

| | *Quarterly outflow* | *Quarterly inflow* | *Interaction* | *Implied steady-state unemployment ratio (%)* |
|---|---|---|---|---|
| *PBD change from 30 to 52 weeks* | | | | |
| Before policy-change | 0.4012 | 0.0098 | | 2.38 |
| After policy-change | 0.3680 | 0.0142 | | 3.72 |
| Implied increase in u* (p.p.) | 0.21 | 1.04 | 0.09 | 1.34 |
| (Percentage due to ...) | (15.6%) | (77.8%) | (6.6%) | 100.0%) |
| Implied increase in u* per additional PBD week (p.p.) | 0.010 | 0.047 | 0.004 | 0.061 |
| *PBD change from 30 to 39 weeks* | | | | |
| Before policy-change | 0.4649 | 0.0098 | | 2.07 |
| After policy-change | 0.4491 | 0.0121 | | 2.62 |
| Implied increase in u* (p.p.) | 0.07 | 0.46 | 0.02 | 0.55 |
| (Percentage due to ...) | (13.1%) | (84.1%) | (2.8%) | (100.0%) |
| Implied increase in u* per additional PBD week | 0.008 | 0.051 | 0.002 | 0.061 |

Note: Calculated from Table 2

We are now ready to present our simulation results that show how the more generous potential benefit duration affects the steady-state unemployment rate (Table 5). We proceed as follows. To get the effect of the benefit duration increase from 30 to 52 weeks, we utilize the entire sample (all age groups, both before- and after-policy sample). Using our regression results of Table 2 (columns 2 and 4), we estimate, for each observation, the inflow- and outflow-probability with and without benefit duration extended to 52 weeks. With these estimates, we can calculate the implied steady-state unemployment rate with and without extended benefit duration. Moreover, using these estimates, we can decompose the estimated increase in the steady-state unemployment rate into an inflow- and an outflow-component applying the procedure described. For the PBD extension from 30 to 39 weeks, we proceed in an analogous way.

Table 5 reports the result from this simulation exercise. In the upper panel of Table 5 we show the effects of the PBD extension from 30 to 52

weeks. The exit rate from unemployment (first column) falls from 0.4012 before the policy change and to 0.3680 after the change, implying a 8.3% reduction in the unemployment outflow probability.[17] Similarly, the entry rate into unemployment (second column) increases from 0.0098 to 0.0142, which amounts to a 44.9% increase in the unemployment inflow probability. Taken together, these estimates imply an increase in the steady-state unemployment-population ratio from 2.38% before the policy change to 3.72% after the policy change.[18] In other words, the unemployment rate increases by 1.34 percentage points or by about 56%.

The lower panel of Table 5 applies the same procedure to estimate the effects of the PBD extension from 30 to 39 weeks. While qualitatively all effects go in the same direction, they are quantitatively much smaller. The outflow probability decreases from 0.4649 to 0.4491 (a 3.4% reduction); and the inflow probability increases from 0.0098 to 0.0121 (a 23.5% increase).[19] These effects imply an increase in the equilibrium unemployment population ratio of 0.55 percentage points (or 26.6%), from 2.07% before the change to 2.62% after the change.

Table 5 shows a further interesting result. Decomposing the increase in the unemployment ratio into an inflow- and an outflow-component reveals that the bulk of the increase is due to the larger unemployment inflow rate. The effect of extended PBD on the unemployment outflow is much smaller. For the PBD increase to 52 weeks, 77.8% of the increase in the unemployment ratio can be attributed to an increase in the entry rate, whereas only 15.6% is due to a lower exit rate from unemployment. For the PBD increase from 30 to 39 weeks, an even larger fraction of the increase in the unemployment ratio (84.1%) is due to the increase in the inflow rate, whereas only 13.1% can be assigned to the lower unemployment exit probability.

[17] Note that this result is very much in line with our earlier results on the effects of PBD extensions in Austria (Lalive et al., 2006) suggesting that extending PBD from 30 to 52 weeks increases unemployment duration by 2.27 weeks which is about 12% of average unemployment duration.

[18] As indicated before, our sample contains attached workers for which the unemployment rate is rather low. For example, in the third quarter of 1988 the average unemployment rate in our sample was 2.04%.

[19] Note that the outflow result is, again, very much in line with our earlier result for Austria (Lalive et al., 2006) suggesting that extending PBD from 30 to 39 weeks increases unemployment duration by 0.45 weeks which is about 2% of average unemployment duration.

A further interesting indicator shows that the increase in PBD raises the unemployment ratio by 0.061 percentage points per additional PBD week for the extension from 30 to 52 weeks and by 0.061 percentage points for the extension from 30 to 39 weeks. Interestingly, for both policy changes, the estimated effect per additional PBD week attributable to the unemployment inflow, is similar for the short (from 30 to 39) and the long (from 30 to 52) PBD increase. The isolated effect of one additional PBD week on the unemployment inflow indicates an increase in the unemployment ratio by 0.047 percentage points (an increase from 30 to 52 weeks) and by 0.051 percentage points (an increase from 30 to 39 weeks). The effects on the unemployment outflow are much smaller. We find that one additional PBD-week increases the equilibrium unemployment ratio by 0.010 percentage points for the policy change from 30 to 52 weeks, whereas the corresponding estimate for the policy change from 30 to 39 weeks amounts to only 0.008 percentage points.

### *Simulations for Subgroups*

We find that the increase in maximum benefit duration increases equilibrium unemployment to some extent because the outflow from unemployment goes down but mainly through an increase in the inflow into unemployment. To investigate whether this result also holds for subgroups, we use the parameter estimates presented in Table 4 to perform similar simulations as before, but now separately for each subgroup. Table 6 presents the simulation results. The upper part presents the results for the PBD change from 30 to 52 weeks, and the lower part gives the simulation results for the PBD change from 30 to 39 weeks. For reasons of comparison the first rows of each part of the table replicate the main results of Table 5.[20]

As shown the PBD change from 30 to 52 weeks increases equilibrium unemployment for every subgroup with the increase for women, low wage workers, and non-seasonal workers being larger than for their counterparts. There is hardly any difference between blue-collar and white-collar workers and between workers with low tenure and high tenure. For every

[20] Note that in the simulations we use all estimated parameters of Table 6 irrespective of whether or not they are significantly different from zero at conventional levels of significance.

**Table 6** Decomposing the increase in the unemployment population ratio, various subsamples

| *Subsample* | *u* | *Change in u* | *Due to outflow* | | *Due to inflow* | | *Due to interaction* | |
|---|---|---|---|---|---|---|---|---|
| | | | *Absolute* | *%* | *Absolute* | *%* | *Absolute* | *%* |
| PBD from 30 to 52 | | | | | | | | |
| Full sample | 0.0238 | 0.0134 | 0.0021 | 15.6% | 0.0104 | 77.8% | 0.0009 | 6.6% |
| Females | 0.0293 | 0.0198 | 0.0019 | 9.5% | 0.0169 | 85.3% | 0.0010 | 5.2% |
| Males | 0.0202 | 0.0062 | -0.0006 | -8.9% | 0.0069 | 111.8% | -0.0002 | -3.0% |
| Blue collar | 0.0234 | 0.0138 | 0.0002 | 1.7% | 0.0135 | 97.4% | 0.0001 | 0.9% |
| White collar | 0.0196 | 0.0111 | -0.0010 | -9.2% | 0.0128 | 115.1% | -0.0006 | -5.8% |
| Low wage | 0.0351 | 0.0170 | 0.0009 | 5.4% | 0.0157 | 92.3% | 0.0004 | 2.3% |
| High wage | 0.0168 | 0.0076 | 0.0001 | 0.8% | 0.0075 | 98.9% | 0.0000 | 0.3% |
| *PBD 30 to 39* | | | | | | | | |
| Full sample | 0.0207 | 0.0055 | 0.0007 | 13.1% | 0.0046 | 84.1% | 0.0002 | 2.8% |
| Females | 0.0218 | 0.0034 | -0.0003 | -10.0% | 0.0038 | 111.8% | -0.0001 | -1.7% |
| Males | 0.0186 | 0.0044 | -0.0006 | -14.2% | 0.0052 | 118.1% | -0.0002 | -3.9% |
| Blue collar | 0.0210 | 0.0061 | -0.0004 | -6.0% | 0.0066 | 107.9% | -0.0001 | -1.8% |
| White collar | 0.0171 | 0.0025 | -0.0004 | -17.8% | 0.0030 | 120.9% | -0.0001 | -3.1% |
| Low wage | 0.0304 | 0.0050 | -0.0009 | -18.5% | 0.0061 | 122.0% | -0.0002 | -3.6% |
| High wage | 0.0148 | 0.0036 | 0.0005 | 13.6% | 0.0030 | 83.6% | 0.0001 | 2.7% |

Note: Calculated from Table 4

subgroup the contribution to the change in equilibrium unemployment of the change in inflow is larger than that of the change in outflow.

Also for the PBD change from 30 to 39 weeks, we find that the increase in equilibrium unemployment is mostly due to the increase in the inflow into unemployment and to a much smaller extent due to the decrease in the outflow from unemployment.

## 7 Conclusion

According to job search theory, an increase in the maximum unemployment benefit duration affects the unemployment rate both through a decrease in the outflow from unemployment and through an increase in the inflow to unemployment. These theoretical predictions are confirmed

by empirical research. However, empirical research has been on either the outflow from unemployment or the inflow into unemployment. There are no studies that investigate both effects simultaneously. So, it is not clear to what extent effects on inflow and outflow affect the unemployment rate.

This chapter uses microdata to evaluate the impact of an increase in maximum benefit duration on the steady-state unemployment rate distinguishing between these two effects. We draw on policy changes in Austria that extended maximum benefit duration from 30 to 52 (from 30 to 39) weeks for individuals above age 50 (between ages 40 and 49) with a continuous work history. We find that this policy change lead to 56% increase in the steady-state unemployment rate for the older age group and a 26% increase in the steady-state unemployment rate for the younger age group. Surprisingly, most of the increase in equilibrium unemployment is due to an increase in the inflow into unemployment, whereas the effect of the decrease in the outflow from unemployment is modest. We also find that the effects are stronger for women than for men. There may be institutional reasons for this as conditional on age women are closer to (early) retirement, and it is in line with the general notion that women react more strongly to incentives—wage elasticities of labor supply are larger for women than for men. Otherwise, our results are rather robust across population subgroups.

In Lalive et al. (2006) we showed that the increase in PBD reduced the outflow from unemployment a lot. The PBD extension made it a lot more attractive for unemployed workers to reduce the search activities and thus lower their job finding rate. The novel findings in this chapter are twofold. First, the extension of the PBD also increases the inflow into unemployment. The PBD extension made it only a little bit more attractive for employed workers to become unemployed. Our second finding is that the effect on the equilibrium unemployment rate due to increase in the inflow into unemployment is more important than the effect due to the decrease in the outflow from unemployment. Although the PBD extension makes it only a little bit more attractive for employed workers to become unemployed, there are many more employed workers than unemployed workers. It is the sheer mass of employed workers that causes the inflow effect to be larger.

From a policy point of view, it is important to know that the inflow effect is larger than the outflow effect. Should this not be taken into account the effects of a change in PBD will be seriously underestimated. The fact that changes in PBD have quite a large—aggregate—inflow effect

also means that PBD could be an instrument to increase the employment rate. If the PBD is shortened, firms may become more reluctant to destroy jobs and it may also be less attractive for workers to "quit" into unemployment. We also note that our results are partly based on older (50+) workers that have low employment rates in many countries. Taking into account inflow effects for these groups seems highly relevant from a policy perspective. With respect to 50+ workers, it should be emphasized that our analysis has focused on flows between employment and unemployment only. However, often older workers who lost their job might consider entering other programs (such as disability and early retirement) and changing unemployment insurance rules may affect flows into other programs. While this issue is beyond the scope of the this study, future research should consider how changing incentives in one program may affect flows in and out of other programs.

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# Social Protection Schemes in Ethiopia: The Productive Safety Net Program and the Community Based Health Insurance Scheme

*Zemzem Shigute, Anagaw D. Mebratie, and Arjun Singh Bedi*

## 1 Introduction

Notwithstanding the recent turmoil in Ethiopia, with an annual average growth rate of about 9.4% per annum in the years between 2010 and 2019, Ethiopia has been lauded for its strong and broad-based growth making it one of the fastest-growing economies in the world (World Bank,

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2021a). This growth may be attributed to large-scale investments in infrastructure, construction, and the links created between agriculture and manufacturing. These developments have contributed to reduction in poverty with the national headcount poverty declining from 30% in 2011 to 24% in 2016 (World Bank, 2021b). Most importantly, these developments have helped alter the image of a country known for "famines" to an example of a "developmental state".

Throughout this period of rapid economic growth, the Ethiopian government has continued to develop and implement policies and strategies to reduce poverty, enhance social protection, and sustain growth (Ministry of Agriculture, 2021). These interventions include a Social Insurance (Pension) Program, Food Security Programs, and most notably the implementation and expansion of public works programs to enhance food security, namely the Productive Safety Net Program (PSNP) and the introduction of a Community Based Health Insurance (CBHI) scheme for rural areas (Ministry of Labor and Social Affairs, 2016). This entry focuses on these two schemes.

## 2 Productive Safety Net Program (PSNP)

Since the mass famine in 1983–1984, Ethiopia has tried different measures to tackle deep-rooted poverty. These range from regular annual food aid to emergency food assistance. Though these measures have been successful in averting mass starvation, they have not yet banished the threat of further food insecurity. Keeping this in mind, recent efforts have focused on the promotion of rural livelihoods by building local infrastructure assets through different food security programs.

In 2003, the government initiated a consultation with development partners for an alternative to the existing emergency response of channeling food aid to fill consumption gaps. This alternative was aimed at

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supporting the needs of chronically food insecure households while at the same time developing long-term solutions to tackle the root causes of food insecurity. The process ended by proposing a Food Security Program (FSP) which encompassed a shift from an emergency relief system to sustainable food security. This program was formally launched in January 2005 with the name Productive Safety Net Program or PSNP (Gilligan et al., 2009). The PSNP has three interconnected objectives. First, to protect beneficiaries against hunger by providing cash and/or food in exchange for labor; second, to prevent further impoverishment by protecting the sale of household assets; and the third, a longer-term objective, to promote sustainable livelihoods by building local infrastructure assets.

Unlike preceding interventions, the PSNP program has several distinguishing features. First, there is a distinction between direct support and public work beneficiaries. The former include vulnerable but labor constrained households who receive support from the program but are not expected to provide any labor contribution, while the latter are expected to provide time and help build community assets. Second, soil erosion and drying up of water sources have been identified as the root causes behind declining agricultural production which eventually leads to poverty and food insecurity. Consistent with this analysis, soil conservation and flood control structures, together with water harvesting and water conservation projects, are the most important components of the public works projects implemented under PSNP. Finally, in order to achieve its long-term objectives of creating and maintaining quality local rural infrastructure assets, the program has adopted a so-called Community Based Participatory Watershed Development (CBPWD) approach which requires active participation of the community in the overall program cycle including selection of program participants, project selection, design, and management.

Since its inception, the PSNP has attracted a large body of empirical work. A number of these studies have evaluated the targeting efficacy of the PSNP (Nigussa & Mberengwa, 2009); its impact on assets, food security and consumption, diversification (Mohamed, 2017; Hoddinott et al., 2012; Andersson et al., 2011; Gilligan et al., 2009), and its unintended but positive impact on emission of greenhouse gases (Woolf et al., 2018). While the results vary across studies, depending on the district and the region under scrutiny, the literature tends to suggest that the PSNP has had a positive effect on a range of outcomes, including enhancing household resilience to covariate shocks and asset accumulation. A recent paper also suggests that the PSNP and its community-based approach have been successful in creating sustainable local infrastructure (Shigute, 2021).

Currently, the program is operating in its fifth phase and covers about 408 food-insecure districts located in 8 regions of the country and has about 7.9 million beneficiaries (Ministry of Agriculture, 2021). The most recent innovation, recognizing the food insecure conditions of the urban poor and the success of the PSNP, has been the extension of the PSNP to urban areas. In 2015, the Ethiopian government launched the Urban Productive Safety Net Program (UPSNP). As of September 2021, the program operates in 11 cities and includes almost 600,000 beneficiaries.[1]

## 3 Community Based Health Insurance (CBHI)

As a consequence of the negative effects of introducing user fees, international bodies have advocated health insurance as an approach that may be used to achieve universal access to healthcare. In the wake of such advocacy, several developing countries, including Ethiopia, have introduced, either or both, mandatory social health insurance and voluntary community-based health insurance schemes.

In 2011, following substantial supply-side investments which led to a rapid expansion of the country's health care infrastructure (Mebratie et al., 2015a), the Government of Ethiopia introduced a pilot voluntary CBHI scheme. The scheme, which caters to rural households and urban informal sector workers, was rolled out in 13 districts located in 4 main regions (Tigray, Amhara, Oromiya, and SNNPR) of the country. The main objectives of the scheme are to promote the use of modern health care services, enhance financial protection, and generate (domestic) revenues, which are to be retained by health facilities and expected to be plowed into improving quality of care.

The basic design of the scheme in terms of benefit packages, registration fees, premium payments, and co-payments was determined on the basis of feasibility studies and in collaboration with regional governments. While the scheme has been introduced by the government, it is "community based" in the sense that the community determines whether or not to join the scheme and is subsequently involved in scheme management and supervision. In order to reduce the possibility of adverse selection the unit of membership is the household rather than the individual.

[1] The program is implemented in 11 cities of the country. These are Adama, Addis Ababa, Assayita, Assosa, Dessie, Dire Dawa, Gambella, Hawassa, Harari, Jigjiga, and Mekelle (World Bank, 2015).

The scheme covers both outpatient and inpatient health care services in public facilities. There are no co-payments as long as members follow the scheme's referral procedure. When they seek care, scheme members are first expected to visit a health center and can subsequently access higher-level care at district or regional hospitals as long as they have referral letters from the health center. Although there have been changes since then, at inception, the insurance premiums amounted to less than 1% of household monthly income and to enhance affordability the central government subsidized a quarter of the premium and district and regional governments were expected to cover the costs of providing a fee waiver to the poorest 10% of the population or so-called indigent groups.

A series of papers have examined various aspects of the CBHI pilot including scheme enrolment (Mebratie et al., 2015a), dropout (Mebratie et al., 2015b), the impact of the scheme on health care utilization and financial protection (Ethiopian Health Insurance Agency, 2015; Mebratie et al., 2019), sustainability (Mebratie, 2015), and on enhancing the quality of care (Shigute et al., 2020b). For the most part the voluntary CBHI scheme has been associated with positive outcomes—enrolment rates in the pilot areas have been close to 50% while the dropout rate is relatively low. Membership in other social protection schemes, chiefly the PSNP, has been leveraged to enhance CBHI uptake (Shigute et al., 2017) and over time the scheme has drawn widespread support from beneficiaries who were initially skeptical (Shigute et al., 2020a).

As a result of these encouraging achievements, the scheme has been scaled up and as of 2020 (see Ethiopian Health Insurance Agency, 2020), the scheme is being implemented in 820 districts of a total of 1100 districts in the country and covers close to 32 million individuals or about 34% of the country's population.

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# How Impact Evaluation Is Shaping the Design of Labour Market Policies

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Support for evidence-based policy making and the microeconometric evaluation methods necessary to uncover causal effects has grown during the last two decades. Today, there is a growing appetite for credible and transparent evidence on whether a policy intervention achieves its expected outcomes. This concern is even more pressing as governments are increasingly held accountable for their decisions, and as the resources available for the implementation of policies are continuously scrutinized.

There has been an intense debate in Economics as to what methods are appropriate to ascertain causal effects and how much evidence is needed to assess credibly the effects of policies. The credibility crisis of the

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1980s–1990s (Angrist & Pischke, 2010) pushed empirical economics in a spiral of ever-increasing rigour, settling the question of what econometric evaluation methods achieve better identification (Angrist & Pischke, 2014). This transformation also set the course for the upsurge in sophistication and diversity of the last decade (Abadie & Cattaneo, 2018).

However, no agreement has yet been reached (particularly among policy makers and practitioners), as to whether high standards of rigour in impact evaluation are needed, or appropriate, in all situations (Clemens & Demombynes, 2011). This is in part why the support for evidence-based policy making is not equally widespread in policy settings as in academic circles. Indeed, while the number of impact evaluation studies has rocketed during the last decade, a great number of labour market policies not based on evidence is still implemented today. How can impact evaluation be used further in the future to exploit its full potential?

This short article discusses this question. First, it reviews the progress achieved thus far. Then, it examines the obstacles that the impact evaluation profession needs to overcome to achieve an even wider use of evaluation techniques that continues shaping the design of labour market policies.

## 1 Progress Made in Labour Economics Towards the Use of Causal Inference for Policy Analysis

Labour economics has been traditionally a space for methodological innovation. The influential *Handbook of Labor Economics* (Ashenfelter et al., 1986, 1999, 2011) explains that since the 1970s, many of the innovations in econometric and statistical methods were developed with labour applications in mind (Angrist & Krueger, 1999; Moffitt, 1999; List & Rasul, 2011). Examples of this include sample selection models, non-parametric methods for censored data and survival analysis, quantile regression and panel data models, and so on.

Causal inference, the type of empirical research that "seeks to determine the effects of particular interventions or policies, or to estimate features of the behavioral relationships suggested by economic theory" (Angrist & Krueger, 1999, p. 1280) has also been at the heart of research in labour economics for various decades. In fact, the renewed interest in identification problems related to instrumental variables estimators and quasi-experimental methods of the 1970s took place in labour economics

(Angrist & Krueger, 1999). Already from the beginning of the 1990s, there was an explosion in the number of economics articles using quasi-experimental methods, including those based on fixed effects, matching methods, difference-in-differences, regression discontinuities, instrumental variables, and natural experiments—from 27 in the 1980s to close to 250 in the 1990s, peaking at over 660 in the 2000s and staying around that level in the following decade.[1] By 2000, these methods were considered part of the mainstream empirical research toolbox to measure causal effects.

Field experiments (i.e., which use randomization to define treatment and control groups) were added last to the labour economist toolkit. But some of the first analyses using experimental design in economics were also implemented to answer labour-related questions, already a century ago.[2] Today, although the use of experimental design is less common in economics than in other fields (such as medical research), and it might also be less common in labour economics than in other economics fields (such as development economics), its application has grown. Indeed, this method carries advantages, such as the possibility of using economic theory to craft the research hypotheses, engineering exogenous variations in local labour market settings, as well as using primary data which is key when no other data is available (Angrist & Krueger, 1999; List & Rasul, 2011). As these insights have gained support, field experiments have become more common in labour economics.

Reaching an understanding of the methods capable of telling apart true causal relationships from correlations has not been a smooth process. Empirical economics underwent a serious credibility crisis in the 1980s and 1990s, due to the lack of attention given in research design to identification of the causal effect of interest and robustness to changing assumptions (Angrist & Pischke, 2010; Stock, 2010). Edward Leamer observed in 1983, as he reflected on the state of the empirical economics

[1] Own calculations based on the data presented in Panhans and Singleton (2017), which was kindly provided by the authors. Data includes articles published in 11 all-field journals plus the top four economic journals.

[2] List and Rasul (2011) trace the first use of field experiments in labour economics to two historical examples: first, the Hawthorne plant experiment in the 1920s, that varied the amount of light for different groups in the workplace to assess the effect on productivity of female assemblers. Second, the large-scale social experiment carried out by the US government (and led by Heather Ross) starting in 1968, which explored the behavioural effects of negative income taxation.

profession, "Hardly anyone takes data analysis seriously. Or perhaps more accurately, hardly anyone takes anyone else's data analysis seriously" (Leamer, 1983, p. 37). This prompted a push in the 1990s towards an increase in rigour, based on a greater emphasis on identification in econometric models (Abadie & Cattaneo, 2018). Improvements in empirical work were facilitated by more and better data and advances in computational power and estimation methods, but the driving force was an impetus for more robust research design.[3] The change in the nature of empirical economics was so profound that some scholars called this time the "credibility revolution" (Angrist & Pischke, 2010, p. 4). It increased not only the rigour of research but also its scientific impact and policy relevance.

As a result, the past two decades have seen an explosion in the number of impact evaluation studies, using experimental or quasi-experimental methods. Counting them all would be burdensome, but to give an idea of the progress achieved to date, we can look at the increase in impact evaluations of active labour market policies (ALMPs) included in the systematic reviews. In their seminal review two decades ago, Heckman et al. (1999) summarized approximately 75 microeconometric evaluation studies of ALMPs from advanced countries. In a more recent review, Kluve (2010) included nearly 100 separate studies from Europe alone, while Vooren et al. (2019) reviewed 57 experimental and quasi-experimental studies in only 12 advanced countries. In addition, Escudero et al. (2019) compiled and assessed 51 programme evaluations in Latin America and the Caribbean. On a geographically larger scale, the seminal review by Card et al. (2018) included 200 separate studies of ALMPs around the world. There are also a number of impact analyses of labour market programmes targeted to specific groups. Greenberg et al. (2003) surveyed 31 evaluations of government-funded programmes for the disadvantaged in the US. Meanwhile, Kluve et al. (2019) compiled 107 separate interventions that primarily targeted youth.

In addition to these studies that directly apply experimental and quasi-experimental methods, a great deal of research during the last decade was devoted to refining and expanding these methods, as well as developing solutions to address their constraints—for example, synthetic controls, variable selection methods such as machine learning methods and LASSO

[3] Landmark studies underlying this transformation include: Ashenfelter and Card (1985), Solon (1985), LaLonde (1986), Ashenfelter (1987), Angrist (1990), Angrist and Krueger (1991), Gruber (1994), Meyer (1995).

methods, design of high-dimensional experiments (Athey & Imbens, 2017; Cattaneo et al., 2018; Fougère & Jacquemet, 2020). It is safe to say that econometric evaluation methods have gotten more sophisticated and diverse with time.

## 2 The Future of Impact Evaluation for Labour Market Policy Analysis: Exploiting Its Full Potential

Data and methodological innovations have driven progress in the field of impact evaluation, but progress has also been facilitated by a mounting commitment to evaluation by governments and other institutions in many countries. Despite this progress, many labour market policies are implemented today, without regard to the available evidence on the effectiveness of these policies. The large support that exists today among academics for the use of impact evaluation methods has, therefore, not permeated equally into the policy making arena.

On reflection, this is not surprising. Impact evaluation is hard to implement—data and techniques are not accessible to everyone (often promoting scepticism about their validity or appropriateness), and their implementation is time-consuming and often costly. More importantly, it is not always clear to policy makers how to use the results of impact evaluations, making their benefits less evident.

With hindsight, we know the benefits of impact evaluation are extensive. First, impact evaluation increases the rigour of the findings generated—we can produce more credible causal evidence, but also understand better its implications. Second, impact evaluation has a disciplinary effect on policy makers, developing agencies and policy practitioners, as it increases transparency and ensures that scarce resources are not lost on ineffective programmes that look attractive on paper (Clemens & Demombynes, 2011). Third, impact evaluation offers a special opportunity to test innovations before adapting labour policy at a bigger scale.

However, there remain serious challenges that the social sciences professions need to overcome to leverage further the advantages of evidence-based policy. First, there are those who resist the implementation of impact evaluations on the basis of ethical or political concerns. Ethical concerns include questions such as: who benefits or not from an intervention, how to address potential negative unintended consequences or the methods

used to study subjects (Gertler et al., 2016). Taking into account ethical considerations in the implementation of an evaluation is indeed essential and should be an integral part of the evaluation plan. This is, however, different from questioning whether, in and of itself, impact evaluation is ethical, which is another point sometimes raised by detractors. This is also linked to the political concerns often raised, including the need to maintain positive narratives about programmes, because modifying or closing a popular policy or programme may cause social unrest or change the course of an election. I believe the useful starting point for this debate is to consider the ethics of implementing programmes (or continuing them), investing large amounts of public resources, without considering their effectiveness. It is the lack of evaluation that would be unethical in this context.

Second, despite the progress made in improving the rigour of impact evaluation methods and establishing standards for their appropriate use, there are many studies today that fail to abide by these norms. Investigator, publication, and political biases continue to taint the credibility of results today (Miguel, 2021). This is why a relatively new scholarly movement has emerged to advance the agenda of transparency and reproducibility of research findings (Christensen & Miguel, 2018; Christensen et al., 2019; Hoces de la Guardia et al., 2021; Miguel, 2021). This movement seeks to open the data and research practices to the wider community, so research objectives and strategies, as well as their findings, can be inspected, understood, and replicated. This would ensure the precision of estimated effects, contributing also to the credibility and applicability of impact evaluation (Clemens, 2017).

Third, with the increase in impact evaluations, policy makers around the world have a tremendous amount of evidence about "what works". How to reconcile the various findings, especially since, as we know, this evidence is context-specific? The move towards openness can be a first key. It will make transparent how estimates are produced, how precise they are, and what are assumptions withholding the stability of results (Hoces de la Guardia et al., 2021). Moreover, improving the precision of estimates and making data and methodologies available to other researchers, would allow a broader production of research studies that aim to reconcile findings across individual studies. This is the case of meta-analyses and systematic reviews that use impact estimates from individual impact evaluations to determine overall trends and test the consistency of treatment effects across studies. Meanwhile, cost-effectiveness analyses are an important complementary tool to impact evaluations, in order to compare between programme alternatives (Gertler et al., 2016). Meta-analysis and

systematic reviews can improve the applicability of research findings; while cost-effectiveness analyses can help policy makers and practitioners differentiate among policies evaluated.

Finally, an effort to broaden the use of evidence-based policy will not be complete without a coordinated effort to foster closer collaborations between policy makers and policy practitioners, and researchers. Efforts should aim to agree on a research design that is robust but also applicable on the ground, collect the necessary data, and discuss the appropriate solutions to adjust the labour policies evaluated on the basis of the evaluation results. These closer collaborations would also ensure that the questions asked by impact evaluations are directly relevant to the issues that matter to policy makers and practitioners.

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# Data Gap Analysis, Indicator Selection and Index Development: A Case for Developing Economies

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## 1 Introduction

Since the establishment of the United Nations in 1948, the crux of development agendas has been the assessment of progress not just at the global level but also at the regional, national and sub-national levels (Jain et al., 2018).

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In 1987, the development movement got a major boost mainstreaming the concept of sustainable development. Unclear policies and inability to protect the welfare of the people during the Industrial Revolution (Khalid et al., 2018) resulted in problems and issues that intervened with the development agendas of the countries, compelling them to focus on sustainable development pathways (Stanton & Ackerman, 2009).

Indicators and indices are increasingly used as popular tools to measure sustainable development (SD) progress and as an aid for sound policymaking and public communication (Parris & Kates, 2003; Singh et al., 2009; Campagnolo et al., 2017). The monitoring and measurement rely on three crucial elements or dimensions of sustainable development: social, environmental and economic. Ensuring resonance among these dimensions is often difficult. For instance, achieving economic development while ensuring environmental protection is one of the most critical problems for the policymakers around the world (Barbier, 2011). There is also an increasing concern among researchers over developing sound SD benchmarking and performance evaluation methods (Yu, 2019).

To meet the needs of the world's poorest, the Millennium Development Goals[1] (MDGs) were launched as part of UN Millennium Declaration in 2000. Under the MDGs, 189 countries globally pledged to eradicate poverty and improve well-being by 2015 (Alkire et al., 2015). The MDGs ended in 2015 and its global performance was mixed. Several countries in the developing world, particularly Africa and Asia, failed to achieve their targets. The MDGs were also criticized by research fraternity for being limited in scope, focus and lacking inclusive stakeholder consultation (Fukuda-parr, 2016; Kumar et al., 2016; Pink et al., 2014).

In 2015, the Sustainable Development Goals[2] (SDGs) were launched as a part of the UN Agenda 2030. The SDGs comprise 17 goals, 169 targets and 232 indicators. The SDGs build on the limited success of the MDGs (McArthur, 2013), ensuring better coverage and resonance among the three dimensions of sustainable development (Costanza et al., 2016). They are also better equipped to handle insufficient improvements made on international environmental agreements (Tollefson & Gilbert, 2012). The SDGs are to be accomplished by 2030, with countries free to identify their priority area including selection of the SDG indicators. According to Allen et al.

[1] https://www.un.org/millenniumgoals/

[2] The details about the 17 SDGs can be referred to at: https://www.undp.org/content/undp/en/home/sustainable-development-goals.html

(2018), "[M]oving from MDGs to SDGs requires a systemic shift, from addressing critical issues in developing countries, adopting science and evidence-based approaches for SDG implementation, to identifying action for all countries equally". To prioritize appropriate set of national targets, a newer approach of systems thinking has also been suggested by researchers (Weitz et al., 2018; Nilsson et al., 2016). Further, developing countries require support, both technical and financial, from the developed world, ranging from capacity building, SDG implementation and data handling (Lu et al., 2015; Osborn et al., 2015; Espey et al., 2015).

Data availability and data quality are crucial for effective implementation and monitoring of the Agenda 2030. It aids governments, international organizations, civil societies and firms for making informed decision and accurately reviewing national SDG implementation plans (UN, 2018). As data is highly disaggregated with details such as income, gender, race, geographical location; proper utilization of such micro information is crucial for policymaking at the local government level such as in municipalities, wards and villages including specific sectors. In a way, it throws light on the real problems faced by people, communities and organizations on ground. The state of data availability for SDG indicators is poor globally. Data gaps for some of the regions in the world are presented in Table 1.

It is evident from Table 1 that the African region has one of the highest gaps in SDG indicator data availability. This may be attributed to lack of statistical capacities in several African countries. It is reported that only 12 countries in the African Union have an official operating statistical organization (UNECA, 2017). The OECD, comprising mostly the developed economies, is better than the rest in terms of data availability and statistical capacities. The recent review of the Voluntary National Reviews (VNRs) 2018 reflects that almost half of the countries do not have adequate data

**Table 1** SDG indicator data availability across the regions

| *Region* | *SDG indicator data availability status* | *Source* |
|---|---|---|
| Africa | 91 indicators (37.8%) have some data, 62% not trackable | UNECA (2017) |
| Asia Pacific | 114 indicators (~ 50%) presently trackable | UNESCAP (2017) |
| OECD | 131 indicators (57%) have some data, 43% not trackable | OECD (2017) |
| Global | 88 indicators (~ 39%) presently tracked, 37 countries not covered due to insufficient data | Sachs et al. (2018) |
| | Majority countries: 40–50% available as per 2018 VNR assessment | Szeker and Heisig (2018) |

for SDG monitoring (Szeker & Heisig, 2018). The VNRs[3] serve as a preliminary analysis and reflection of SDG implementation progress, gaps and challenges by countries and various international organizations (Allen et al., 2018).

As data availability continues to remain a critical factor towards the global SDG progress, there is an increasing need for the national statistical systems and organizations to do a thorough assessment of their statistical capacities. It is also necessary to perform an SDG indicator's data gap analysis to get an overview of the existing state of national data and identify the gaps. Some good practices and efforts in this direction include data gap or availability analysis and SDG indicator status exercises undertaken by countries such as Bangladesh (GED, 2017), Colombia (CEPEI, 2016) and Sri Lanka (DCS, 2017). Further, such exercises would also help governments to redesign or modify their existing census and socio-economic or demographic surveys to properly align data collection and reporting with the SDGs.

This study has selected India as its case subject because of its unique characteristics: seventh largest in terms of area, second most populous country in the world, country facing data challenges, one of the fastest growing economies and one of the nations with the highest share of global burden and challenges (see Fig. 1). "India's SDG success isn't crucial just

| | Absolute Indicators | | | | | | | | | | | | | | Relative Indicators | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Extreme Poverty | Under-nourishment | Children Overweight | Stunting | Wasting | Maternal Mortality | Family Planning | Pre-primary school | Violence against women | Gender Inequality in leadership (P) | Water | Sanitation | Electricity | Birth registration | HIV | Hepatitis B (P) | Malaria | Tuberculosis | Non-communicable disease | Suicide | Traffic deaths | Air Pollution (P) | Homicide (P) |
| Bangladesh | ✓ | 3% | <1% | 2% | 3% | ✓ | 2% | 2% | 3% | 2% | <1% | 3% | ✓ | 7% | ✓ | 6% | ✓ | 4% | 2% | <1% | 1% | 2% | 1% |
| Brazil | ✓ | ✓ | 4% | <1% | <1% | ✓ | 1% | ✓ | 2% | 4% | ✓ | <1% | ✓ | ✓ | 3% | 2% | ✓ | <1% | <1% | 3% | 4% | 3% | 23% |
| China | ✓ | 6% | 12% | 5% | 3% | ✓ | 3% | ✓ | 12% | 15% | ✓ | 8% | ✓ | -- | 2% | 12% | ✓ | 6% | 19% | 23% | 17% | 17% | ✓ |
| India | ✓ | 26% | 15% | 33% | 21% | 3% | 20% | 41% | 23% | 25% | 14% | 26% | ✓ | ✓ | 8% | 1% | ✓ | 22% | 22% | 11% | 24% | 18% | 7% |
| Mexico | ✓ | <1% | 2% | <1% | <1% | ✓ | 2% | 3% | 1% | ✓ | ✓ | ✓ | ✓ | <1% | 2% | <1% | ✓ | <1% | 1% | 3% | <1% | 2% | 17% |
| Nigeria | 25% | 5% | 5% | ✓ | 10% | 34% | 8% | NA | 3% | 6% | 6% | 10% | 7% | 25% | 6% | 8% | 46% | 6% | 4% | 4% | 2% | 3% | 2% |
| Pakistan | ✓ | 6% | <1% | 6% | 8% | 1% | 5% | 2% | 4% | 4% | 5% | 2% | ✓ | 10% | 1% | 6% | ✓ | 6% | 3% | <1% | 2% | 3% | 9% |
| India as % of Top 5 | NA | 53% | 38% | 60% | 43% | 6% | 51% | 71% | 51% | 46% | 31% | 47% | NA | NA | 25% | 3% | NA | 42% | 37% | 20% | 47% | 39% | 11% |

Legend: ✓ Country on track to SDG | -- No Data | NA No Applicable | (P) Proxy Data

**Fig. 1** Select developing country's contribution to global challenges in 2030. (Source: Adapted from Kharas et al. (2018))

[3] The VNR database and official country VNR reports can be accessed at https://sustainabledevelopment.un.org/vnrs/

for its own development but also for the world because of its extreme inequalities with regards to socio-economic and demographic indicators" (Saikia & Kulkarni, 2017). It has great influence on the global development growth rates. According to von Hauff et al. (2013), India's current sustainability strategy seems weak and demands more consideration towards environmental and social concerns. "People" constitute one of the core elements or the "Five Ps" of the SDG and it aims at removing hunger and poverty and ensuring dignity and equality for all. Discussion on India with its huge population in a way strengthens the "Leave no one behind" agenda of the SDGs.

Figure 1 represents select country's contribution to global challenges—lives and needs at stake by 2030 in terms of absolute and relative indicator. India has done well on some of the indicators such as extreme poverty, electricity, birth registration, malaria and primary schooling and is on track to achieve them by 2030. For the remaining indicators, India has the highest global burdens individually and among the developing countries except for maternal mortality (Nigeria—34%), Hepatitis B (China—12%), Suicide (China—23%) and Homicide (Brazil—23%). Apart from this, fast urbanization and climate change impacts such as regular droughts and floods in different parts of the country pose a serious threat to its planning and development activities. India is one of the 20 countries having the highest climate change risk which in turn exacerbates other risks such as poverty (Jain et al., 2018), high expected rate of exposure to sea-level rise (Edenhofer et al., 2014) and cases of suicides among marginal farmers (Leal Filho et al., 2018). Government of India is highly concerned towards these issues and is an active stakeholder in the global sustainable development movement as SDGs encompass India's overall development agenda. Several SDG targets directly or indirectly are closely related to India's ambitious Intended Nationally Determined Contributions (INDCs) aimed at boosting clean energy and achieving a low carbon emission pathway (Khalid et al., 2018).

Another important reason to focus on India is to look at its different regions and sub-national territories comprising 29 states and 7 union territories[4] (UTs). These regions face a diverse set of socio-economic, cultural and ecological issues, simultaneously also offering good practices and local solutions for global challenges and objectives such as achieving the SDGs. For example, state of Kerala performs exceptionally well on health

[4] Union Territories (UTs) are administrative divisions in India, which like states do not have their own elected governments and are in the direct control of the central government.

and education than the rest of the country and has the highest Human Development Index (HDI) scores among the Indian states and UTs. At the same time, it is also the state with one of the highest crime rates in the country, placed third after the states of Uttar Pradesh and Assam (NCRB, 2016).

The sub-national or the state governments, cities and municipalities play a pivotal role in the achievement, implementation and ownership of the SDGs, ensuring territorial cohesion (UCLG, 2018). The localization of SDGs is at the core of "no one is left behind" principle of the Agenda 2030. Several studies such as Marks et al. (2008) and Happaerts et al. (2010) point out that research fraternity has put inadequate attention and efforts for the progress of sub-national governments despite their diverse characteristics in specific areas such as agriculture, transport, energy and environment. Thus, it is important for the experts and planning institutions to review local sustainability studies and efforts of sub-national governments while selecting national indicators for the SDGs (Khalid et al., 2018).

Only few studies are available in the literature that deal with sub-national SDG performance and SDG indicator identification for India such as those by NITI (2018) and Jain et al. (2018). NITI's SDG Index India Report 2018 serves as the first baseline assessment report for India to look at the sub-national SDG performance. The report however suffers from unclear methodology and perspective. For example, indicator identification has been limited to specific processes and scheme-level indicators related to Government of India and not India as a whole. Also, SDGs 12–14 which are crucial components of the environmental dimensions were left out in the index process, citing data gap issues. This creates a doubt whether it can be called an SDG Index in true sense. Another study by Jain et al. (2018) looks at SDG Index and the states in India with a focus on the urban context only. Some background and review work on sustainable development evolution, indicator identification for SD, sub-national context, studies addressing different dimensions of SD in India and government acts and policies concerning sustainable development movement in India has been covered by Khalid et al. (2018). Several studies exist which suggest indexes as a popular performance measurement tool to access unique dimensions of SD in India such as environmental performance (Chandrasekharan et al., 2013), governance performance (Mundle et al., 2016), equality-adjusted human development (Suryanarayana et al., 2011) and sub-national

competitiveness (Tan & Rao, 2015), among others. Authors, however, could not find any study which has performed an SDG indicator data gap analysis for India. This study intends to add to the limited literature on SDG implementation in a developing country (India) and perform a data gap and availability exercise by taking crucial inputs from the existing studies. Further, this study can also have implications for countries that have performed such or similar exercise. This study has primarily set the following objectives:

(a) To perform a preliminary assessment on global SDG indicator's data gap analysis for India based on secondary sources.
(b) To develop a sub-national SDG Index considering the major states in India using the finalized indicator set obtained from objective (a) and analyse their SDG performance.
(c) To propose a simple approach to set national targets for global SDG indicators.
(d) To suggest a simple benchmarking approach for the states or local governments to move on a path of continual progress towards the SDGs

### *Institutional Structure for SDG Implementation in India*

The supervising agency looking at SDG implementation in India is NITI Aayog. It serves as a policy think tank for the Government of India and replaces the erstwhile Planning Commission. NITI Aayog works in close coordination with Ministry of Statistics and Plan Implementation (MoSPI), the Union Ministries and the Directorate of Economics and Statistics in the state or union territories (UT), academia, civil society organizations and businesses to achieve India's SDG target. Information on national strategy for SDG implementation in India; mapping of SDGs, targets and indicators with ministries and government schemes; and implementation status of SDGs in states and UTs have been discussed in detail in NITI (2018).

The remaining chapter has been organized in the following manner. Section 2 describes the methodology of the study. Some observations and insights regarding SDG implementation and data analysis have been covered in Sect. 3. The results from data analysis and index creation have been presented in Sect. 4. The last section (Sect. 5) concludes the chapter.

## 2 Methodology

In performing the data gap and availability analysis for SDG indicators in India and developing an SDG Index from the Most Representative Indicator (MRI) set resulting from the previous exercise, this study follows a stepwise procedure to accomplish this task (see Fig. 2).

In stage 1, the SDGs have been classified according to UN TIER Classification. Stage 2 deals with selection of indicators based on national priorities along with expert input and performing a data gap and availability exercise. Stage 3 deals with an SDG Index creation to present a case for the sub-national SDG performance of the major states in India based on the MRI set. The detailed methodologies covering description, assumption and justification within each stage and its components have been described in the following sub-sections.

### *SDGs and Their Global TIER Classification*

The process starts with SDGs 1–16 and categorizing the global indicators according to their latest tier classification. The SDGs 1–16 comprise a total of 219 global indicators. The study uses the UN Inter-Agency Expert

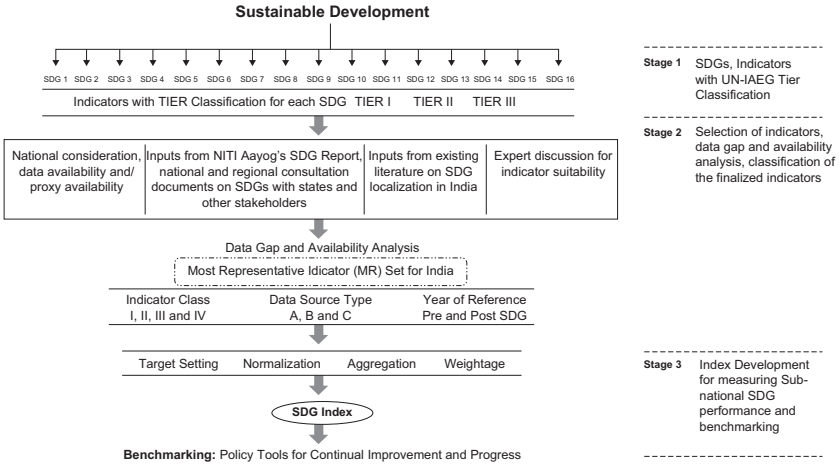


**Fig. 2** Methodology for conducting data gap and availability analysis in India and developing a SDG Index for sub-national performance assessment. (Source: Authors' compilation)

Group (UN-IAEG) Tier classification as on 31 December 2018 (UNSTATS, 2018). SDG 17 which refers to "Partnership for Goals" has not been considered in the study as a separate goal as it is a facilitation mechanism which cuts across all the SDGs and targets.

The Tier classification differentiates the indicators into three Tiers depending on their robustness of methodology and data availability status. TIER I comprises indicators which are conceptually sound, have established methodology and standards and have the best data availability. TIER II indicators have all the features of TIER I indicators but have irregular data availability. The last category, that is TIER III indicators, has no established methodology or standard and is still under development and expert inspection.

### *Indicator Selection, Data Gap and Availability Analysis*

Indicators have been selected based on national preferences, data availability, possible proxies and their relevance at the sub-national level. Inputs from official documents such as NITI (2018) and its national and regional consultation documents on SDGs with the state governments and other stakeholders have been included. Existing literature on SDG implementation, indicator selection, index creation and localization efforts (such as those by Jain et al., 2018) has also been reviewed. While analysing available data, care was taken to ensure that indicators are simple, conceptually sound, national in scope and measurable (Nardo et al., 2005; Moldan et al., 2012; Singh et al., 2009; Greco et al., 2019).

To make the indicator selection process even more robust, experts were consulted and several discussions were held with individual experts in person and through e-mail to validate and ensure the appropriateness and suitability of different indicators selected. A group of 15 experts from academia, government, think tanks and private practitioners were consulted in person from the National Capital Region (NCR) in Delhi. This provided more flexibility to discuss the issues holistically and in depth. E-mails were also circulated to experts across India in specific domains. Approximately 8% of the experts responded via e-mail. These responses were used as an additional reinforcement mechanism to substantiate inferences drawn from the interaction with experts. The selection criteria for the experts included both education and experience—that is a PhD degree or a Masters' degree and a minimum of 10 years in academic research or industry in the concerned domain. The data collection from secondary

sources and discussions with experts in person and through e-mail were undertaken simultaneously between February 2018 and January 2019. Once data gap and availability exercises were performed, the outcome was the Most Representative Indicator (MRI) set. Indicators under the MRI set were further classified in terms of their "Class", "Type of Data Source" and their "Year of Reference".

*MRI Indicator Classification by Class*

The MRI has been divided into four classes of indicators as per their availability and relevance to the sub-national context in India. Class I indicators are the one which are exact match or same as global indicators. Class II indicators are closely related or "Proxy" indicators related to the spirit of the SDG target but do not match the target's actual indicator. Class III indicators have no data availability at the sub-national level. Lastly, Class IV indicators such as "agricultural export subsidies", "number of countries that have implemented well-managed migration policies" and "aid for trade commitments and disbursements" make more sense for country-level comparison as compared to a state-level analysis.

*MRI Indicator Classification by Type of Data Source*

The data available and selected for the indicators comprise multiple secondary sources which are publicly available. These comprise different social, economic and environmental parameters reported regularly by the Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation (MoSPI) and national surveys such as the census exercise, National Sample Survey (NSS) and the National Family Health Survey (NFHS). In addition, it also includes the statistics, reports or databases for states and UTs released by the Reserve Bank of India (RBI), NITI Aayog and various ministries such as Ministry of Environment and Forest (MoEF) and Ministry of Health and Family Welfare (MoHFW), among several others. Some of the reported indicators were used as such and several others required some calculation to get the usable form.

To make this process easier to understand, all the indicators were classified into three types: A, B and C. Type A data were publicly available data used in the original form. For example, under-5 mortality rate and neonatal mortality rate are reported by the Sample Registration System (SRS) regularly and were used in this study in their original form. Type B data on the other hand were also publicly available but were used with some modification to get the actual indicator form. For example, one of the global

indicators is "No. of Commercial Bank Branches per 100,000 Adults". The number of commercial bank branches in a State or UT is reported by RBI. The data for adult population (15–34 years) was obtained using the population estimation given by RGI (2006). Using the above two sources actual indicator was calculated. Finally, there is the last category or Type C data which is not publicly available. These are private data which were used as such or with some modification. For example, average wildlife cases reported between 2010 and 2017, a proxy indicator used in SDG 15 isn't publicly available and has been obtained from Wildlife Protection Society of India (WPSI) with permission.

*MRI Indicator Classification by Year of Reference*

The study has further classified the year of reference of the MRI set indicators into three categories: Pre-SDG period, Post-SDG period (2016, 2017, 2018) and others. Indicator data in fiscal years formats like 2016–2017 and 2017–2018 has been treated as year 2016 and year 2017 respectively. The "Others" category of reference data involves indicators which use mixed data from both the Pre-SDG period and the Post-SDG period. For example, one of the proxy indicators used in SDG 16 is "States which have notified/enacted public service guarantee act". One could easily find that the official notification documents on the above act from different states fall both in the Pre- and in the Post-SDG periods. "Appendix 1" provides the full list of indicators with their indicator class, type and reference year.

### *State/UT Coverage and Regional Classification*

Twenty-two major states[5] in India including union territory Delhi have been considered in this study as compared to all the 36 states and 7 UTs as this option provided the convenience of getting the largest number of proposed indicators with available data. Care was taken to ensure that the states are representative of India's geographical spread. In terms of coverage, these 22 states constitute ~ 98% of India's total population as per

[5]The states included in this study are Andhra Pradesh (AP), Assam (AS), Bihar (BR), Chhattisgarh (CT), Delhi (DL), Gujarat (GJ), Haryana (HY), Himachal Pradesh (HP), Jammu and Kashmir (J&K), Jharkhand (JH), Karnataka (KA), Kerala, Madhya Pradesh (MP), Maharashtra (MH), Odisha (OD), Punjab (PB), Rajasthan (RJ), Tamil Nadu (TN), Telangana (TL), Uttar Pradesh (UP), Uttarakhand (UK) and West Bengal (WB).

Census 2011 figures and contribute to ~ 96% of India's GDP based on Central Statistics Organization's estimated gross state domestic product (GSDP) figures for the year 2016–2017.

In case of UTs, only Delhi has been included because of its economic strengths, better data availability and being the national capital of India. Throughout the study Delhi has been treated as a state and the terms "State" and "Sub-national" have been interchangeably used for ease of conversation. The regional classification of states is based on the NFHS survey design (IIPS, 2017).

### *Handling the Missing Data*

The study uses a simple stepwise method to handle the missing data for the major states if it is not available in the official or national documents. There is no simple rule reported in literature and there is possibility of multiple imputation methods to handle such instances. Studies such as NITI (2018) and Sachs et al. (2018) have either assigned NIL value or dropped the entity for missing data. The current study, however, used imputation method to fill missing data rather than missing out information. This notion is also in tune with works by Campagnolo et al. (2018) and Kapoor et al. (2017). The authors agree that such imputations in instances can distort the results but losing out data completely might prove costlier to some states as compared to others. Following stepwise method has been used in imputing the missing values.

1. Initially, for states with missing data, state or UT's official documents such as ministry reports, planning department releases, budget documents, state at a glance and socio-economic profiles have been referred. For example, maternal mortality ratio (2014–2016) is not reported for Himachal Pradesh, Jammu and Kashmir and Delhi in the NITI Aayog's state statistics. The study has obtained data for Himachal Pradesh and Jammu and Kashmir from Health Management Information System document titled "Causes of Maternal Deaths, 2015–16". The data for Delhi has been imputed with the help of Delhi government's Vision Delhi 2030 report.
2. If data for an indicator is not reported in a state or UT's official documents as well as any other special national-level study, then average imputation techniques such as all-India average or regional average were used. This chapter has preferred to use regional

averages for the indicators as compared to all-India averages as these give better representative picture for the states within a given region because of similar demographic, social, physical or cultural attributes. For example, unemployment rate of youth in the age group 15–29 years is one of the indicators used in the study. The labour bureau provides the age group data in two categories: 15–17 years and 17–29 years. Data for the age group 15–17 years isn't reported for the state of Uttarakhand for 2015–2016. The study has used northern regional average to impute the missing data for Uttarakhand.

3. Another way to look at states in India is in terms of parent states and separated or newly formed states. Examples include Andhra Pradesh and Telangana, Bihar and Jharkhand. In general, most of the missing indicator values pertain to the newly formed states. For such cases, value of indicator of the parent state has been used to supplement the gap. For example, under-5 mortality rate is not reported for Telangana in the Sample Registration System (SRS), GOI. The indicator value for Andhra Pradesh has been used as a proxy for the state of Telangana. There are also instances where value of parent state was not reported, and the authors were bound to use the data for newly formed state as a proxy for parent state. For example, Regional Satellite Tourism Accounts (2009–2010) does not report tourism-directed gross value addition to state GDP for state of Madhya Pradesh (parent state) but reports for Chhattisgarh, the newly formed state. Thus, figures for Chhattisgarh have been used in case of Madhya Pradesh.

### *SDG Measurement: Index Development*

The most popular method adopted for SD measurement is the index approach. Some of the popular indices currently being used globally include Human Development Index (HDI) by UN, Environmental Performance Index (EPI) by Yale-Columbia-World Economic Forum, Sustainable Society Index (Van de Kerk & Manuel, 2008) and Gender Empowerment Measure (Santos & Santos, 2014). Such metrics are increasingly used by the international community as these allow easy comparison within and among nations across time and scale (country, region, state, municipality etc.), making them one of the most effective and simplistic tools for policy intervention. According to Pintér et al. (2005), the

compendium of sustainable development indicator initiative reported more than 669 index creations around the world in 2005.

This stage deals with the SDG Index development for sub-national comparison based on the MRI set resulting from the data gap and availability analysis. Index development exercise has excluded SDG 14 which focuses on coastal states to make a fair comparison among the states under study.

*Normalization*

Normalization is usually performed on indicators to rule out any effect(s) of units and to facilitate comparison. There are several normalization techniques existing in sustainability literature: ranking, distance to target, Z-Score and min–max (Nardo et al., 2005; OECD 2008; Pollesch & Dale, 2016). Among these, min–max and Z-score and normalization are more popular. This study has used min–max normalization technique which is simple and is used across several development indices such as the Human Development Index (HDI) by UN, SDG Indexes by Bertelsmann Stiftung, Germany, and the Sustainable Development Solutions Network (SDSN) for the years 2016, 2017 and 2018, respectively; and SDG Indexes by NITI (2018) and Jain et al. (2018). In this technique, the indicators are divided into two classes. Some authors, such as Krajnc and Glavič (2005), use the terms "positive impact" or "negative impact", and Pollesch and Dale (2016) use the nomenclatures larger the better (LTB) and smaller the better (STB) for the two classes of indicators. This study has used the terms *positive indicators* and *obstructive indicators*. Positive indicators are those whose increasing values signify better performance (e.g. ratio of forest cover to total geographic area) and obstructive indicators are the ones whose lower values signify better performance (e.g. infant or maternal mortality rates). Targets can also be incorporated within the normalization process. Ways to define and set targets have been discussed in Section "Setting Indicator Targets". One of the advantages of normalization using targets is its use in further analysis, for example geometric aggregation as the technique does not generate zero and negative values for the variables.

It is also worth mentioning that, in this study, the use of Z-Score normalization would not be appropriate as the sample size is small and only few instances of extreme values have been found in the dataset (Nardo et al., 2005; Talukder et al., 2017) and the same have been retained to avoid loss of information. Further, the negative values of some of the

normalized indicators make geometric aggregation invalid either at the indicator or at the goal level.

The min–max normalization formula for the positive indicators $X^I$ and obstructive indicators $X^{II}$ can be expressed as

$$X^I = \frac{X - \min(X)}{T(X) - \min(X)} \tag{1}$$

$$X^{II} = \frac{\max(X) - \mathrm{X}}{\max(X) - T(X)} \tag{2}$$

where $X$ represents the raw data value, $\min(X)$ the minimum observed value of the indicator, $\max(X)$ the maximum observed value of the indicator, $T(X)$ the target value for the indicator, $X^I$ the normalized value for the positive indicators and $X^{II}$ the normalized value for the obstructive indicators.

*Setting Indicator Targets*

Target normalization is an effective way to link sustainability outcomes to target or ideal values (Smeets & Weterings, 1999; OECD, 2008; UN, 2010; Moldan et al., 2012; Pollesch & Dale, 2016; Lafortune et al., 2018, Sachs et al., 2018). This study has used inputs from studies that focus on SDGs (Sachs et al., 2018; Lafortune et al., 2018; NITI, 2018) for setting 2030 targets of indicators. In addition, this study proposes choosing a more ambitious target level for SDG indicators. This study has adopted the following ways of target setting as applicable to the specific indicators:

1. Targets Available
   (a) Clear quantifiable targets given by the SDGs such as zero poverty, full gender equality, ending epidemic of communicable diseases and reducing the number of deaths and injuries from road and traffic accidents to half.
   (b) Clear quantifiable targets given by the Government of India such as zero disposal of hazardous wastes, 33% of geographical area under the forest or tree cover, reduction in prevalence of tobacco use by 5% and HIV or AIDS incidence to zero.
2. Targets Not Available or Absolute Figures Not Given

For cases where SDG or national government targets do not exist, attempt was made in this study to verify existence of any global benchmark or target suggested by organizations such as UNESCO, WHO, UNICEF or some reference studies done by institutions such as World Bank, Asian Development Bank, SAARC and OECD, among others. For example, government spending on social sector expenditure with respect to GDP has no defined target by the national government. Here, the study followed OECD benchmark,[6] where countries on an average spent ~ 20% of their GDP on social sector expenditure since 2010. India currently spends nearly 8%. Thus, double the existing rate (16%) was set as a suitable target for India.

In remaining all other cases, average value of the top three performing states/UTs has been used as the target value for 2030.

3. Special Case

This study found few special cases while setting the indicator targets for 2030. These two cases are described below.

There may be instances where the average of the top three performing states or UTs as targets is less or more ambitious than the internationally agreed targets or recommended levels by global institutions. There may be another possibility where the national target is less ambitious than the internationally recommended levels. In such cases, the principle of "Leave no one behind" should be followed and more ambitious target levels should be preferred as illustrated in Table 2.

Further, the rationale for defining targets has been classified into five categories: national targets, average of top three performing states, SDG targets, internationally agreed targets and others. "Other target" specifies justification by the authors based on secondary sources or scientific evidences. For example, "level of change in natural capital during 2005–2015" is one of the proxy indicators used for SDG indicator 12.2.2 which refers to domestic material consumption. This indicator is based on the information given in Envi-Stat Report 2018 (MoSPI, 2018). According to this report, the states were classified into three categories depending on whether the level of change in natural capital between 2005 and 2015 (1) saw an increase of greater than 5% or (2) increase between 0 and 5% or (3) a decrease or negative change. As only four states in India could meet

[6] https://stats.oecd.org/Index.aspx?DataSetCode=SOCX_AGG

**Table 2** Choosing a more ambitious target level for 2030

| *S no.* | *Global indicator* | *Internationally recommended/agreed target* | *National target/ average of top three states or UTs* | *Target decision* |
|---|---|---|---|---|
| 1 | 2.2.1 Children under 5 years who are stunted (%) | WHO recommends 40% reduction by the year 2025[a]. This translates to a target of 23.4% as per NFHS 2015–2016 figures for India | Average of top three states/UTs stands at 21.03% as per NFHS 2015–2016 for India | Average of top three states/ UTs preferred as more ambitious than WHO target |
| 2 | 2.2.2 Children under 5 years who are wasted (%) | WHO Global Target is to reduce and maintain childhood wasting < 5% by 2025[a]. So, 5% as the minimum cut-off value assumed | Average of top three states/UTs stands at 7.93% as per NFHS 2015–2016 figures for India | WHO target preferred as more ambitious than the average of top three states/UTs |
| 3 | 11.6.2 Annual mean levels of PM 10 | WHO-guided annual mean values for ambient outdoor air is 20 µg/$m^3$[b] | As per GOI 2013 notification for regulated pollutants, recommended level for PM 10 in ambient air is 60 µg/$m^3$[c] | WHO target preferred as more ambitious than the national target |

Source: Authors' compilation

[a] WHO (2017)

[b]WHO (2006)

[c]CPCB (2013)

category one, achieving this minimum level was assumed to be a good target for all the states. To give it a quantitative number, the study chose 6% as the target value which was also the next absolute figure. The details on target for all the selected indicators used in this study along with their rationale are presented in "Appendix 1".

*Weighting of Indicators and Goals*

Universally, there is no agreed weighting technique (Booysen, 2002) and the method adopted for weighting as well as aggregating several variables into a single index can have significant impact on a country's overall ranking (Booysen, 2002; Rickels et al., 2016; Greco et al., 2019). Some of the popular weighing techniques reported in the literature include equal weights—EW, principal component analysis—PCA, factor analysis—FA

and expert weights—EW (Nardo et al., 2005; OECD, 2008; Lafortune et al., 2018). These techniques have their own limitations in the SDG context. For example, PCA and FA can only estimate weights if correlation exists between indicators (OECD, 2008). While performing PCA and FA on the SDGs, Sachs et al. (2018) report instances of factors within SDGs (e.g. SDG 2) containing different factors which are uncorrelated among each other. The Joint Research Centre (JRC) audit of the SDG Index and dashboard also showcased four such instances: two in SDG 2 and one each in SDG 6 and SDG 8 (Papadimitriou et al., 2019).

Expert weights are highly subjective and can also encourage countries to pick SDGs easy to achieve and pay less or insufficient focus on SDG requiring serious efforts (Lafortune et al., 2018). Further, large number of indicators or variables can cause serious psychological stress in the experts while assigning weights. An optimal suggested number should be in the range of 10–12 indicators (OECD, 2008). The global SDGs on the other hand contain 17 goals and nearly 230 indicators. Analytic hierarchy processes (AHP) and conjoint analysis (CA) are two other weighting techniques reported in literature (Nardo et al., 2005; OECD, 2008; Talukder et al., 2017).

In this study equal weighing scheme within and among the goals has been used. It must be noted that equal weighting doesn't mean "no weights" (Nardo et al., 2005; OECD, 2008). In case of SDGs, equal weighting is more sensible and suitable as all the SDGs have equal status as part of Agenda 2030 (Papadimitriou et al., 2019; Sachs et al., 2018). However, researchers such as Nardo et al. (2005) and Becker et al. (2017) acknowledge that assigning equal weights to indicators and goals does not guarantee equal contribution of the indicators or goals to the SDG Index. For example, in the current study, the nine selected indicators under SDG 16 are effectively weighted less in overall aggregation as compared to the two indicators used to measure SDG 10. Similar is the case with other indicators within each global SDG (Sachs et al., 2018). While auditing the SDGs Index and Dashboards Report (Sachs et al., 2018), the Joint Research Centre (JRC) agrees that equal weighting scheme offers easy interpretation in the SDG context (Papadimitriou et al., 2019). However, as an alternative, the audit suggests option of exploring modest changes in the importance of the SDG goals. For example, varying the goal level weights by ± 25% from the nominal values.

*Aggregation of Indicators and Goals*

Arithmetic aggregation is one of the most common aggregation techniques reported in sustainability literature. Arithmetic averages allow perfect compensability, offsetting deficit on one variable by a surplus on another variable (OECD, 2008; Moldan et al., 2012; Talukder et al., 2017; Lafortune et al., 2018; Sachs et al., 2018). However, this notion may interfere with the concept of sustainable development where high economic development is coming at the cost of low environmental or social sustainability (Nardo et al., 2005; Papadimitriou et al., 2019). Another popular aggregation method is geometric aggregation which is a multiplicative process, allows low substitutability and is used in cases where focus is on percentage changes and growth rates (OECD, 2008; Talukder et al., 2017; Lafortune et al., 2018). Geometric mean aggregation rewards high scores more as compared to low scores, becomes invalid with negative and zero values and is often difficult to justify (OECD, 2008; Sachs et al., 2018). Current study has used arithmetic aggregation within and between the goals because of its simplicity. Further, as few normalized indicators have zero values, geometric aggregation will not be possible (e.g. SDG 6 and SDG 13).

*SDG Index Formula*

The overall SDG Index score at the sub-national level was calculated using the following equation:

$$X_i = \frac{1}{N}\sum_{k=1}^{n_{jk}} \frac{1}{n_{jk}} I_{ijk} \tag{3}$$

where $X_i$ is the SDG Index for the *ith* state or UT, $I_{ijk}$ is the value of indicator $k$ within SDG $j$ for *ith* state or UT and $N$ is the total number of SDGs considered in this study. Indicators within each SDG are given by $n_{jk}$.

The SDG Index scores so calculated for all the states are further divided into four categories: leaders, front runners, achievers and aspirants based on their relative performance (see Table 3).

## *Benchmarking Strategy*

Benchmarking has been used by researchers and institutions for varying purposes such as measuring sub-national service delivery (Sterck, 2006),

**Table 3** MRI SDG Index category

| *State category* | *SDG Index score* |
|---|---|
| Leaders | > 75 |
| Front runner | 61–74 |
| Achiever | 50–60 |
| Aspirant | < 50 |

Source: Adapted from AEEE (2018)

evaluating local governance (Wilde et al., 2009) and policymaking (OECD, 2012), among others. This study suggests benchmarking and comparison of state's existing SDG position with respect to country's average scores for each SDG as a simple and competitive policy tool. These can help states to gauge their incremental progress, device better strategies to use their limited resources while ensuring a smooth pathway to achieve the national SDG targets. Another alternative approach which might be of practical use in situations involving comparison and evaluation of country or state rankings and indexes is based on partial order theory (Annoni & Brüggemann, 2009; Carlsen & Brüggemann, 2014; Boccuzzo & Caperna, 2017; Fattore & Arcagni, 2018; Arcagni et al., 2019; Beycan et al., 2019).

*Regional Benchmarks*

One way for the states to improve their SDG performances against their peers is to target the best states in their region or the regional benchmark. The aim should be to achieve regional benchmark's level of development in areas where it is the front runner and then set even better targets within a specified time. Similarly, states with already an above-average rank should aspire to break into the top five or the top three positions, ultimately targeting for the leader's spot.

*Comparison with Country Average Scores*

Here the state's performance score for each SDG is compared with the India Average Score (IAS) for a particular SDG. The purpose is to highlight the SDGs and the states which need immediate focus and attention by the national and sub-national policymakers and the governments.

## 3 Some Observations and Insights: SDG Implementation and Data Analysis

### *SDG Indicator Selection, Statistical Capacity, Survey and Census Exercises*

The approach of classifying indicators into different categories gives governments and statistical departments the current status of data availability in the country. This makes their task easier, enabling them to align existing national surveys and census exercises better with the SDG implementation. For example, closely related or proxy indicators indicate that some data are already in place, in some form and being monitored. This gives statistical institutes opportunity to slightly modify or add in the existing surveys in the new round. If there are indicators for which presently there is no suitable data at all, it reflects a need to initiate new surveys and studies in the country. For example, Bangladesh's SDG Data Gap Analysis (GED, 2017) exercise showed that almost 44% of the SDG indicators can be monitored by modifying the existing national census exercise and surveys. On the other hand, nearly 30% indicators require fresh surveys and studies for monitoring. Similarly, for India, based on the findings of this study 28.77% of the SDG indicators which fall in closely related or proxy category can be monitored by modifying the existing surveys and 44% indicators which have no data at all require fresh surveys and studies (see Sect. 4).

Census exercises are done at national level once in 10 years in India. These have the largest coverage, disaggregation and are typically the most reliable data sets for any country. Though, it doesn't underestimate other important surveys conducted regularly in the country such as NFHS every three years and National Sample Survey Organization (NSSO) (non-periodic), forest cover surveys every two years. It is required that there is greater alignment among these surveys and there is no repetition as these exercises have large budget, time and human resource constraints. For cases where there is need to start new surveys and studies, role and support of sub-national or local governments, private entities and civil society will be crucial. There may be cases where some of the indicators through specific studies have already been monitored and their data is maintained by one of the above stakeholders. This can serve as great inputs in the design of the new studies and surveys or could be directly adopted for national or sub-national statistical monitoring, given it matches

international benchmarks and standards. For example, Columbia's National Administrative Department of Statistics (DANE) is using private sector data to fill some of the data gaps in the national SDG indicator set (Rodriguez & Schonrock, 2018). This study has also used private data compiled by Wildlife Protection Society of India on wildlife poaching and illicit trafficking to fill the data gap for the Indian case.

There is also a need for developing the country's metadata specifically pertaining to SDGs which align closely with India's national priorities and set a balanced pathway towards the SDGs. For example, Germany and Norway maintain a national indicator metadata in addition to indicator sets they report on UN SDGs (Mulholland et al., 2018). There are cases pertaining to regions within the country which are neglected because of political reasons, inadequate infrastructure and statistical capacities within the local governments. For example, there are large data gaps pertaining to the northeastern region and the union territories in India. It is suggested that India should establish a special data centre or repository monitoring real-time data (may be in the form of dashboards) and focussing on such regions and are connected to the national monitoring system. Colombia's National Development Plan Dashboard which has a tiered planning system combining national, departmental, metropolitan and municipal development plans is one such powerful tool which aligns local developmental needs with national SDG priorities (Boza et al., 2017).

### *National and Local Government Relationship*

A sound relationship between the national and local governments is crucial for the national SDG implementation and localization efforts. The national governments play the unique role of mentors while supporting the local governments in various capacities on aspects such as infrastructure, administration, fund allocation, training, monitoring and programme implementation, among others. The role of local governments such as states, municipalities and wards is important as they implement all the agendas, programmes and policies of the national government at the local level. Also, the national governments, in general, are directly or indirectly dependent on the local governments (specially the state governments) while preparing the national statistics pertaining to different sectors or regions in the country. For example, the Statistical Year Book of India which is compiled annually by MoSPI is purely based on the data supplied by various ministries (national and provincial) as well as the different state

planning and statistical departments. Further, on certain aspects the state governments have even more control and power than the national government. For example, in India matters belonging to agriculture, fisheries, public health, land and building taxes among others comes under the direct control of the state governments (KKHSOU, 2011).

### *Data Revolution and International Partnerships*

To meet the new challenges pertaining to global problems, the official statistics and survey data need to harness the power of new advancements in computing and data science such as big data and artificial intelligence (AI). AI can be used in multiple ways to strengthen and support the SDG implementation process in the developing countries. For example, the use of AI-enabled ICT can fasten the process of identifying the poor households via the census and household surveys, fill up the shortage of medical professionals, enhance the capabilities of disease detection techniques and narrow down the gender gap by training and educating women and girls (Wong & Wang, 2018). India with a high global burden of diseases, poverty and gender inequality can utilize these technologies to efficiently handle its developmental problems. Studies such as Basu et al. (2018) and Paul et al. (2018) have provided detailed discussion on present state and prospects for AI in India in the governance and the healthcare sector, respectively. This includes successful case studies showcasing reduced cost, improvement in system efficiency and potential application areas. It also covers areas of concern such as data privacy, regulation and benchmarking. It is important that governments initiate holistic policies with proper ethical, regulatory and data handling guidelines to take advantage of advanced technologies in solving the developmental needs of the country. NITI Aayog's recent "National Strategy for Artificial Intelligence for India" is one such initial step in this direction.

The UN is spearheading the global data revolution to make SDG data accessible to everyone through various international collaborations and platforms. India along with other developing countries needs to take advantage of some of these existing UN initiatives such as Secretary-General's Independent Expert Advisory Group on Data Revolution[7] for Sustainable Development, Global Partnership for Sustainable Development

[7] http://www.undatarevolution.org/

Data,[8] Expert Group on the Integration of Statistical and Geospatial Information,[9] Global Pulse Programme[10] and UN Data Innovation Labs.[11] These initiatives and collaborative platforms are helping countries achieve the SDGs using better data, leading to informed decision and making a better life. For example, under the Global Pulse Programme, one of the projects is using machine learning to analyse radio content in Uganda and use the information for sustainable development and humanitarian action such as healthcare delivery, awareness raising campaigns and understanding spread of infectious diseases, among others. Another project in Indonesia (Pulse Lab Jakarta) is focusing on economic well-being and is using data related to demographics and financial transactions for inferring income levels which are required for effective targeting of social protection plans and policies (Fig. 3).

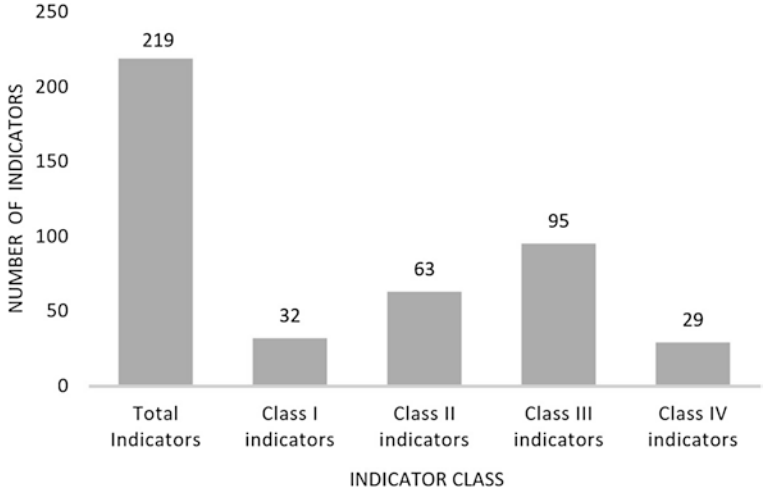


**Fig. 3** Indicator classification by class for sub-national analysis in India. (Source: Authors' compilation)

[8] http://www.data4sdgs.org/
[9] http://ggim.un.org/
[10] https://www.unglobalpulse.org/
[11] https://data-innovation.unsystem.org/

### *Voluntary National Reviews*

The Voluntary National Reviews (VNRs) are voluntary in nature and countries are free to decide what and how to report. The number of countries presenting VNRs has increased over time: 2016 (22), 2017 (43) and 2018 (46), indicating the importance of the platform in providing knowledge sharing and best practices on SDG implementation. Presently, only few countries have presented the VNRs twice (Benin, Columbia, Egypt) or thrice (Togo). The VNR review of 2018 indicates that only 11 out of 43 countries reported on all the SDGs and majority (32) reported on the thematic focus of that year or a priority set of SDGs (Szeker & Heisig, 2018). Some of the major developing countries which play a crucial role in global SDG success such as China and India have not reported on all the SDGs in their VNRs and have presented only one VNR. For example, India presented its progress towards achieving SDGs 1, 2, 3, 5, 9, 14 and 17 in 2017 (NITI Aayog, 2017). It is suggested that these countries should present their next VNR with coverage on all the SDGs. This should include aspects such as issues and challenges faced during first VNR, including better stakeholder engagement at local level, using improved data quality and discussing aspects which do not apply to them or it is not the focus of their current VNR. Such innovation and creativity in VNR is essential. This will make nations a front runner and an example in responsible SDG reporting rather than presenting just a summary.

## 4 Data Analysis and SDG Index Creation: Results

### *Data Gap and Availability Analysis*

The results of the preliminary SDG data gap and availability analysis about the major states in India in terms of indicator class, by data type, year of reference and rationale for targets have been presented below.

*Classification by Indicator Class*

It is evident from Fig. 3 that the present data is available only for 95 unique indicators (~ 44%) which include Class I and Class II indicators. Among these, exact matches or same indicators as global are only 32 (~ 15%) and majority of the 63 indicators (28.77%) are proxy indicators. Class III indicators which denote "no data availability" comprise about ~ 44% of the total indicators. Twenty-nine indicators represent Class IV

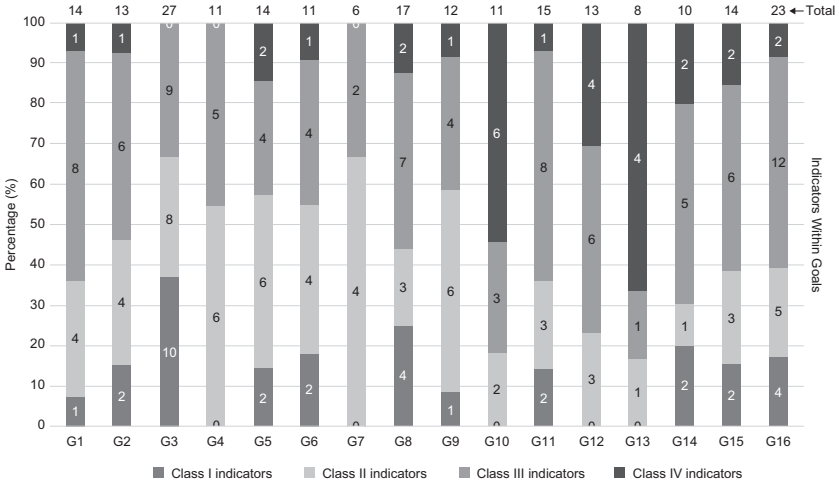


**Fig. 4** Indicator classification and data availability within SDGs 1–16. (Source: Authors' calculations)

indicators and are more suitable for country-level analysis as compared to a sub-national analysis.

The results of the analysis pertaining to data availability and classification of indicators within each SDG from SDG 1 to SDG 16 are presented in Fig. 4.

It may be noted that distribution of indicators in terms of availability is highly variable among different SDGs. In terms of exact matches, SDG 3 is the best performer with 10 indicators (~ 37%), followed by SDG 8 with 4 indicators (~ 24%) and SDG 14 with 2 indicators (20%). Five SDGs—SDG 4, 7, 10, 12 and 13—do not have any indicator which is an exact match (Class I) with global indicators. With respect to Class II indicators or proxy indicators, data could be approximated for nearly all the SDGs. Among Class II indicators, most data are available for SDG 4, SDG 7 and SDG 9 which include six (~ 55%), four (~ 67%) and six (50%) proxy indicators, respectively. Class III indicators signify complete data gap or no data. In this class, highest lack of data is found for SDG 1, SDG 11, SDG 16 and SDG 14. For this class of indicators missing figures are 50% or more. Even the average figure for Class III indicators among all the SDGs is high (~ 40%). Class IV indicators are more relevant or are focused on

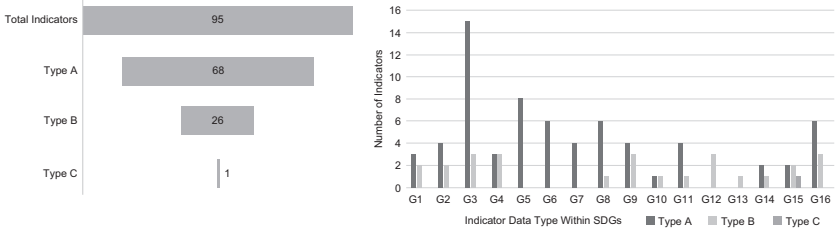


**Fig. 5** Classification of indicator data type overall and within the SDGs. (Source: Authors' calculations)

country-level analysis as compared to sub-national context. Sustainable Development Goals having the largest number of Class IV indicators include SDG 10, SDG 13 and SDG 12 which include six (~ 55%), four (50%) and four (~ 31%) indicators, respectively.

*Classification by Type of Data*

The results based on type of data have been shown in Fig. 5. It was found that 68 indicators (~ 72%) among the total indicators are publicly available (Type A) and can be used in their original form. On the other hand, there are 26 indicators (~ 27%) which are publicly available but cannot be used as such (Type B). Such data need further refinement to get appropriate form similar to the global indicators. There is one privately obtained data (Type C) used in the study, a proxy for Indicator 15.7.1.

Indicators were further analysed within each SDG with respect to data type. It is clearly reflected in Fig. 5 that SDG 3 has the highest number of publicly available indicators (15) which can be used in their original form, followed by SDG 5, SDG 6, SDG 8 and SDG 16.

*Year of Reference of the Indicators*

The data gap in terms of availability of recent indicators or Post-SDG period (year 2016–2018) among the 95 unique indicators is substantial. It is evident from Fig. 6 that Pre-SDG period (year 2015 and before) accounts for almost half of the indicators being used in the study.

In Post-SDG period, years 2016 and 2017 provide the most indicator references. For 2018, even lesser indicators references are available, followed by the "other" category which uses mixed data from the Pre- and Post-SDG period to report the indicator values.

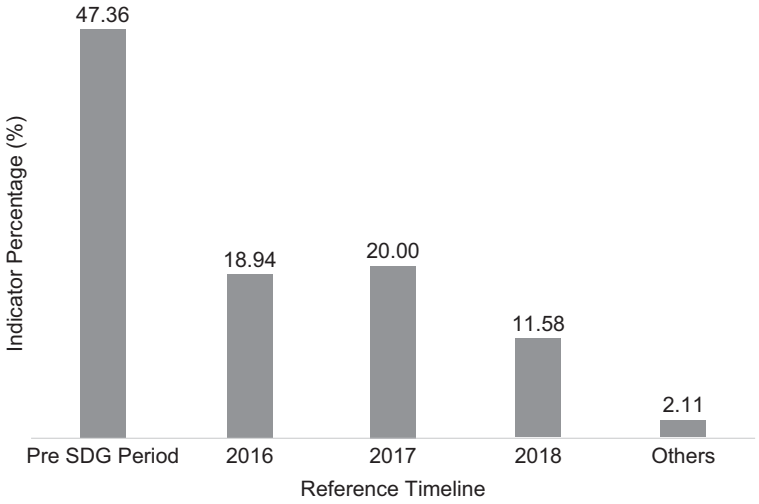


**Fig. 6** Year of reference of the selected indicators. (Source: Authors' calculations)

*Rationale Used to Define Global Targets*

It was found that for almost one-third of the finalized indicators, national targets could be traced through government sources (see Fig. 7). Second largest chunk (28.42%) was based on the top three performing states for target setting as there was no clear national or SDG target specified. This was followed by a group of numerical targets stated directly in the SDGs, and other targets and internationally agreed targets which provided rationale for the remaining 18.95%, 14.73% and 5.26% of the indicators, respectively.

## *SDG Index*

The SDG Index scores of the major states in India along with their performance categories—aspirants, achievers and front runners—have been shown in Fig. 8.

It is evident from Fig. 8 that none of the states qualify in the leaders category. Only two states Kerala and Himachal Pradesh enter the front runners category. The achievers category with 14 states (~ 64%) constitutes the largest category. The aspirants include six states of West Bengal,

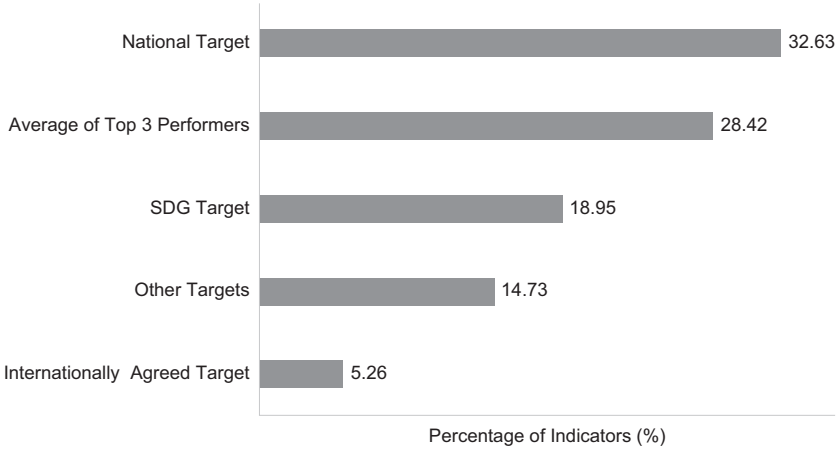


**Fig. 7** Rationale used to define global targets. (Source: Authors' calculations)

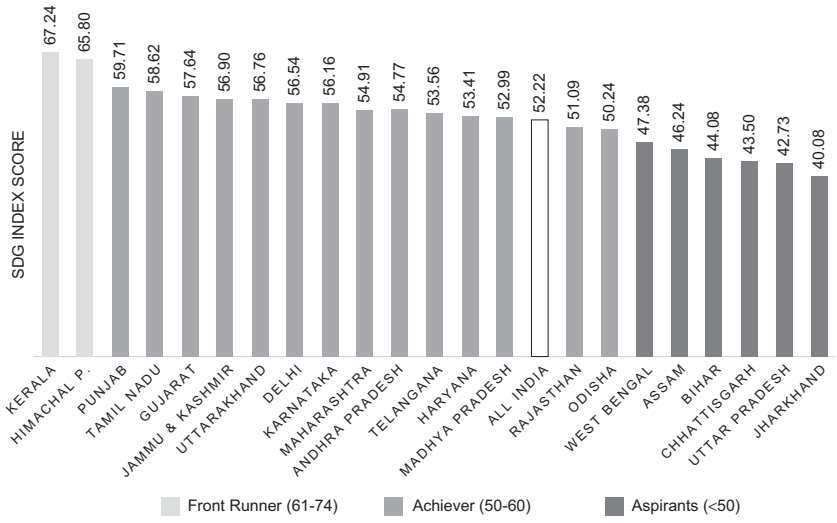


**Fig. 8** SDG Index scores and performance category for major states in India. (Source: Authors' calculations)

Assam, Chhattisgarh, Bihar, Uttar Pradesh and Jharkhand. These are the low-income states and most of them feature in the list of Empowered Action Group (EAG) states or the laggard states (NIHFW, 2014). Among the EAG states, only Rajasthan, Madhya Pradesh and Odisha could find a place in the achievers category. West Bengal, one of the major eastern states, is the only exception whose performance level matches with those of the EAG states. Delhi, the capital of India despite its highest GDP per capita levels in India, could only secure the eighth position. Among the separated states, Uttarakhand (an EAG state) is the only entrant into the top ten spots. These results clearly indicate that high GDP per capita alone cannot guarantee high SDG performance. There are other aspects such as cultural change, environmental concern and cooperative behaviour which have profound impact on human well-being (Eckersley, 2018). Figure 9 shows the geographic representation of the SDG Index performance of the Indian states.

Figure 10 presents regional SDG Index scores. It may be noted that southern states are the best performers, followed by northern, western, central and eastern states. Some of the factors which contributed to high performance of southern states include high literacy rates, better healthcare and educational infrastructure and strong institutional support. The central and the eastern states have close average SDG performance and differ with southern, western and northern states by almost 19–22%, clearly reflecting a large developmental gap and their poor SDG performance.

The northeastern regional performance has not been presented here, as only the state of Assam has been included in the study. The complete list of states and their SDG Index scores for the selected 15 SDGs (1–13, 15–16) has been presented in "Appendix 2".

Another way to look at SDG Index ranking is by clubbing the SDGs into the environmental group (SDGs 12, 13, 15) and the remaining SDG group (SDGs 1–11, 16). According to Papadimitriou et al. (2019), such complimentary view between goals could be very helpful in informing policy decisions at the global and national levels.

Figure 11 shows that quadrant 1 states have the most balanced sustainable development profile indicating highest environmental and socio-economic performance such as Himachal Pradesh and Kerala. On the other hand, quadrant 3 states such as Jharkhand, Uttar Pradesh and others show the lowest levels of environmental and socio-economic performance.

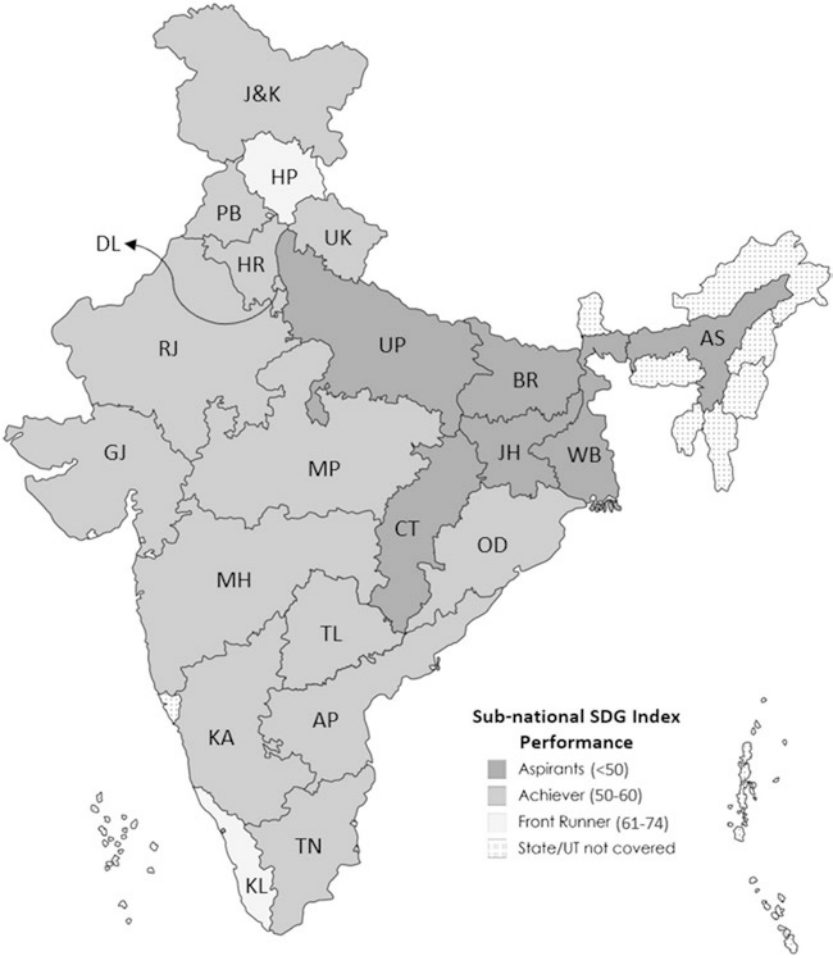


**Fig. 9** Performance of the states on the SDG Index. (Source: Authors' compilation using map from https://mapchart.net/india.html)

Quadrant 2 states comprising Madhya Pradesh and Odisha are high on environmental quality but show low socio-economic performance. Similarly, quadrant 3 states such as Delhi, Tamil Nadu and Punjab are able to achieve high socio-economic development but fare low on environmental performance.

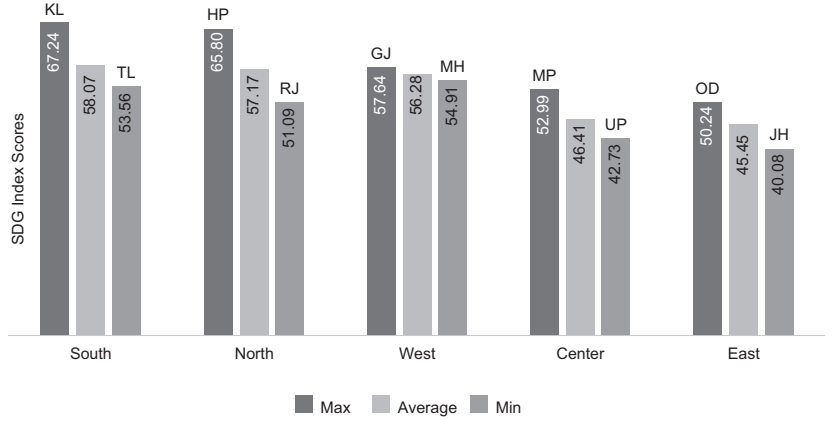


**Fig. 10** Regional performance of the states on SDG Index scores. (Source: Authors' calculations)

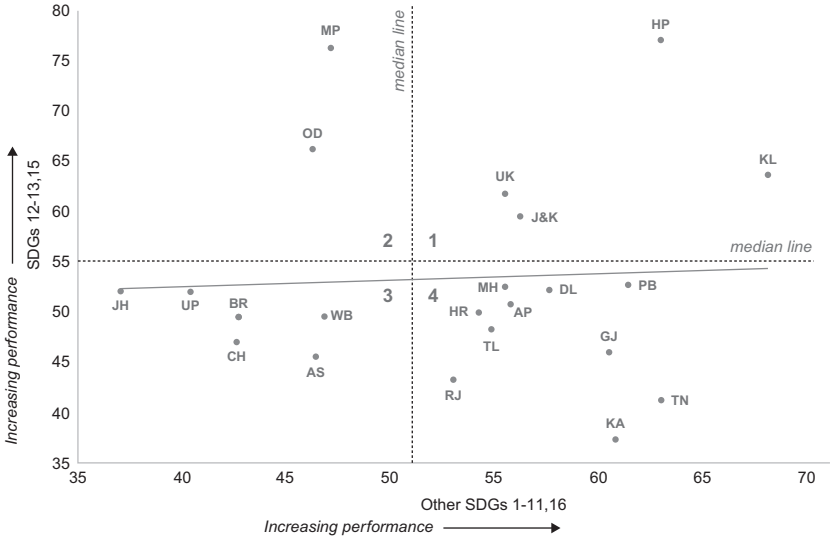


**Fig. 11** Relationship between environmental SDGs and all other SDGs. (Source: Authors' compilation based on Papadimitriou et al. (2019))

**Table 4** Regional classification of the states with their benchmarks

| *Regional classification* | *Regional benchmark state* |
|---|---|
| South | Kerala |
| Andhra Pradesh, Karnataka, Kerala, Tamil Nadu Telangana North | Himachal Pradesh |
| Delhi, Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttarakhand | |
| West | Gujarat |
| Gujarat and Maharashtra Central | Madhya Pradesh |
| Chhattisgarh, Madhya Pradesh and Uttar Pradesh East | Odisha |
| Bihar, Jharkhand, Odisha and West Bengal North–East | Not applicable |
| Assam | |

Source: Authors' compilation

### *Benchmark States*

Based on the SDG Index scores, the top scorers of each region—Kerala, Himachal Pradesh, Gujarat, Madhya Pradesh and Odisha—qualify as the benchmark states for their respective regions (see Table 4).

The benchmarking approach advocates targeting the best practices of the top state in the concerned area. Figure 12 shows a box and whisker plot of SDG Index scores along with the best performing or benchmark state and the worst performing state for each SDG. The benchmark states include Kerala for SDG 3, SDG 5, SDG 10 and SDG 15; Himachal Pradesh for SDG 11, SDG 13 and SDG 16; Madhya Pradesh for SDG 12 and SDG 13; Gujarat for SDG 6 and SDG 9; Delhi for SDG 4 and SDG 8; Andhra Pradesh for SDG 1; Jammu and Kashmir for SDG 2 and Tamil Nadu for SDG 7.

It can be observed from Fig. 12 that there is high SDG Index score variability among the states across the SDGs. Highest disparity within the SDGs, that is difference in score of the best performer and the worst performer, could be observed for SDG 10 (85.29), SDG 13 (75) and SDG 7 (73.49), respectively. Similarly, lowest variation in performance is observed for SDG 5 (31.12), SDG 16 (25.86) and SDG 1 (24.13). The dots in Fig. 12 represent the outliers: Delhi (48.24); Maharashtra (22.65) and Rajasthan (32.27) which have Index scores less than 3/2 times of the lower-quartile values for SDG 1 and SDG 15, respectively.

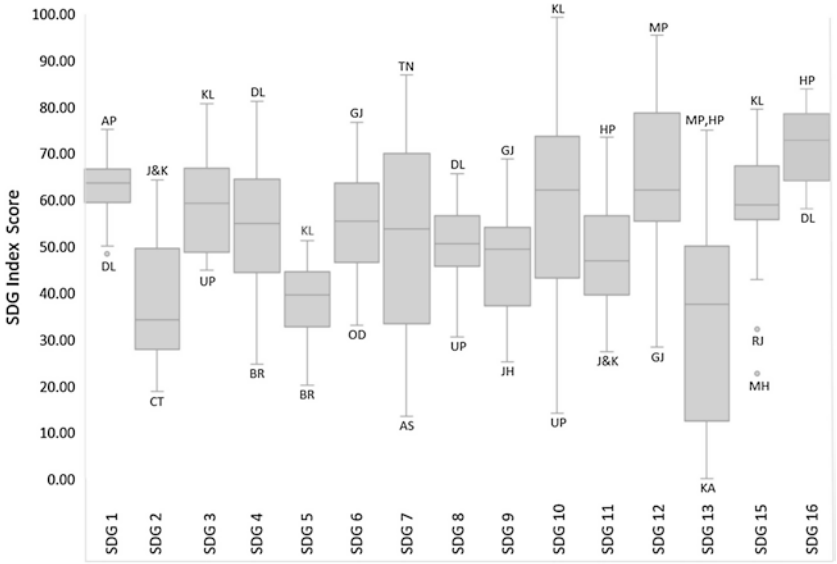


**Fig. 12** Box and whisker plot of the state SDG Index scores. (Source: Authors' calculations)

### *States with Performance Less Than India Average*

It was found that almost one-third of the major states in India have performance below the India Average Score (see Table 5). The most alarming SDGs where more than or equal to 50% of the states performed below the India average value include SDG 6, SDG 9, SDG 11, SDG 12, SDG 15 and SDG 16.

The states with poor performance include Jharkhand, Chhattisgarh, Bihar, Madhya Pradesh, Uttar Pradesh, West Bengal and Assam which perform below the IAS on 14 (93.33%), 13 (86.67%), 13 (86.67%), 10 (66.67%), 10 (66.67%), 10 (66.67%) and 8 (53.88%) SDGs, respectively. Most of these states belong to the low-income category and have one of the highest populations and national disease burdens. Further, these states also have low literacy rates, high poverty rates and have weak governance and institutional setup.

**Table 5** Performance of states with scores less than IAS across the SDGs

| *SDG* | *State scores < IAS (%)* | *States with scores < IAS* |
|---|---|---|
| SDG 1 | 36.36 | BR, CT, DL, GJ, HP, JH, MP, MH, WB (8) |
| SDG 2 | 31.82 | CT, GJ, JH, KA, MH, RJ, UP (7) |
| SDG 3 | 36.36 | AS, BR, CT, JH, MP, OD, UP, UK (9) |
| SDG 4 | 45.45 | AP, AS, BR, CT, J&K, JH, MP, OD, UP, WB (8) |
| SDG 5 | 22.73 | BR, JH, MP, UP, WB (5) |
| SDG 6 | 54.55 | AS, BR, CT, DL, HR, JH, MH, OD, RJ, TL, UK, WB (12) |
| SDG 7 | 40.91 | AS, BR, CT, HP, J&K, JH, OD, UP, WB (9) |
| SDG 8 | 40.91 | BR, CT, HP, JH, MP, PB, RJ, UP, WB (9) |
| SDG 9 | 59.09 | AP, AS, BR, CT, DL, J&K, JH, KA, MP, OD, RJ, UP, WB (13) |
| SDG 10 | 45.45 | AP, AS, BR, CT, JH, MP, OD, TL, UP, UK (10) |
| SDG 11 | 54.55 | AP, CT, DL, HR, J&K, JH, MP, OD, PB, UP, UK, WB (12) |
| SDG 12 | 59.09 | AP, AS, BR, CT, GJ, JH, KA, KL, OD, PB, TN, TL, UK (13) |
| SDG 13 | 40.91 | AP, AS, BR, HR, KA, RJ, TN, TL, WB (9) |
| SDG 15 | 68.18 | BR, CT, DL, GJ, HR, J&K, JH, KA, MP, MH, PB, RJ, TN, UP, WB (15) |
| SDG 16 | 50.00 | BR, CT, DL, HR, JH, MP, MH, OD, RJ, TL, WB (11) |

Source: Authors' calculations

## 5 Conclusion

This study has presented a simple approach to perform a preliminary SDG data gap and availability analysis in developing countries. As a case illustration, it covers SDGs 1–16 and proposes a set of Most Representative Indicator (MRI) set for India based on the secondary data and expert advice. Further, using the MRI set, a SDG Index has been developed to compare the sub-national SDG performance of the major states in India. The results and findings are expected to be of great interest for national and sub-national policymaking.

It has been found that in India less than half of the global indicators have some data and equal proportion have no data at all. In addition, it is possible to find closely related or proxy indicators for all the SDGs. Within SDGs, SDG 3 and SDG 8 have the best data with exact matches to the global indicator. Overall, SDG 3 has the best data availability in the country. For SDGs 4, 7, 12 and 13, this study couldn't find appropriate indicators which could serve as an exact match to global indicators within these SDGs. Out of the 219 global indicators considered under the study,

around 13% are not applicable to sub-national analysis. Out of the 95 proposed indicators, nearly three-fourth of the indicators are publicly available and can be used in their original form. This analysis highlights the focus area for statistical and reporting agencies.

On policy front, greater government intervention in ramping up the statistical capacity in the country is required. At the same time, government needs to make appropriate changes and modifications in its existing surveys and census exercise to fill data gaps and save time and cost. Governments should also explore possibilities of using newer and advanced data computation techniques such as big data and AI to enhance national statistical capacities to analyse SDG data better. Further, international collaborative programmes such as UN Pulse Programme, Data Innovation Labs are improving data quality, enabling informed decision-making and effective targeting of social protection plans and policies.

SDG Indexes are simple and powerful tools to gauge national and sub-national SDG progress. The sub-national SDG Index scores for India show that the country needs immediate attention towards zero hunger (SDG 2), gender inequality (SDG 5), climate action (SDG 13), clean water and sanitation (SDG 6), decent work and economic growth (SDG 8), energy (SDG 7) and sustainable cities (SDG 11). On regional front, southern states perform better on the SDGs as compared to rest of India. The SDG rankings of the states confirm that high GDP per capita alone cannot guarantee high SDG performance. It was also observed that two of the low-income states such as Orissa and Rajasthan have moved out of the traditional laggard category to humble positions. Simple approaches such as the concept of "regional benchmark states" can serve as an effective monitoring tool for governments and policymakers, resulting in better planning and efficient allocation of limited national resources.

The study with its findings, case illustration and policy recommendations intend to benefit the SDG implementation efforts at the national and sub-national level in the developing countries, particularly those in the Asian and the African regions having similar governance structure and geographical diversity as that of India.

**Acknowledgements** We thank Professor Tara Chandra Kandpal, Dhwani Gambhir and Sapan Thapar for valuable comments at different stages of this research. We wish to also acknowledge Pankaj Singh Rawat for his assistance in formatting this chapter.

# Appendix 1

See Table 6.

**Table 6** SDG most representative indicator set for India

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 1.2.1 | Tier I | Class I | Percentage of population below national poverty line | Direct values from source data (DVSD) | 2011 | 10.95 | As per SDGs, half of existing poverty rates in India has been taken as the national target | Poverty estimates (Tendulkar methodology), NITI Aayog | A |
| 1.3.1 | Tier II | Class II | Employment provided to people who demanded employment under MGNREGA (%) | DVSD | 2017 | 100 | As per the SDG Index India Report 2018, the government aims to provide assured wage employment of at least 100 days to every adult member of a rural household who wishes to do unskilled manual work | Official MIS Report of MGNREGA | A |
| 1.4.1 | Tier III | Class II | Number of homeless households per 10,000 households | DVSD | 2011 | 0 | As explained in SDG Index India Report 2018, government wants to ensure access to basic amenities and services to all | SDG Index India Report 2018, NITI Aayog | A |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 1.5.1 | Tier II | Class II | Average lives lost because of damage due to cyclonic storms/heavy rains/ floods/landslides/ earthquake and so on between 2013–2014 and 2018–2019 per 1,00,000 | Numerator: Direct values from source data. Denominator: Population projections from India and the states 2001–2026, Office of the Registrar General and Census Commissioner (ORG-CS, 2006) | 2017 | 0.2743 | Average of the top three states/UTs | Lok Sabha Q No. 628, 2018, Ministry of Home Affairs | C |
| 1.a.2 | Tier II | Class II | Social sector expenditure w.r.t GSDP (%) | DVSD | 2018 | 16 | OECD countries with the best living standards spent on an average ~ 20%, the highest in the world. India's current rate is 8%. The country should target to at least double the figure to 16% | RBI State Finances: A Study of Budgets | B |
| 2.1.2 | Tier II | Class II | Ratio of rural households covered under public distribution system to rural households where monthly income of highest earning member is less than Rs. 5000 | DVSD | 2011 | 1.29 | Average of the top three states/UTs | SDG Index India Report 2018, NITI Aayog | A |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2.2.1 | Tier I | Class I | Children under 5 years who are stunted (%) | DVSD | 2015 | 21.03 | Average of the top three states/UTs used as the target value. It is preferred over WHO recommended figures of 40% reduction in country average value by 2025. For India it equates to 23.4 | National Family Health Survey (NFHS-4) | A |
| 2.2.2 | Tier I | Class I | Children under 5 years who are wasted (%) | DVSD | 2015 | 5 | WHO recommends a value of < 5% by 2025. It is preferred over average of the top three states/UTs (which equates to 7.93 for India) | NFHS-4 | A |
| 2.3.1 | Tier II | Class III | Rice, wheat and coarse cereals produced annually per unit area (Kg/Ha) | DVSD | 2015 | 5018.44 | Double the rate of agricultural productivity has been set as the national target | SDG Index India Report 2018, NITI Aayog | A |
| 2.4.1 | Tier III | Class II | Certified cultivated organic area in Ha per 1000 Ha total cropped area | Numerator: Data on certified cultivable organic area (Ha) from NCOF. Denominator: Total cropped area (1000 Ha) from Ministry of Agriculture and Farmers Welfare reports | 2014 | 22.75 | Average of the top three major states used as the target value | Ministry of Agriculture and Farmers Welfare, Reports; National Centre on Organic Farming (NCOF) | A |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 3.1.1 | Tier I | Class I | Maternal mortality ratio | DVSD | 2016 | 70 | In line with SDG target value of 70 | NITI Aayog, National Health System Resource Centre (NHSRC) | A |
| 3.1.2 | Tier I | Class I | Births assisted by a doctor/nurse/LHV/ ANM/other health personnel (%) | DVSD | 2015 | 100 | Government aspires to provide 100% birth assistance by health personnel | NFHS-4 | A |
| 3.2.1 | Tier I | Class I | Under-5 mortality rate | DVSD | 2015 | 11 | Average of the top three states/UTs used as the target value as it is more ambitious than the SDG target of 25 | Sample Registration System (SRS) | A |
| 3.2.2 | Tier I | Class I | Infant mortality rate | DVSD | 2016 | 10 | Average of the top three states/UTs used as the target value as it is more ambitious than the SDG target of 12 | SRS | A |
| 3.3.1 | Tier I | Class II | HIV/AIDS infected people per 1000 | Numerator: HIV/ AIDS infected people data from India HIV estimation report; Denominator: Population projections using ORG-CS, 2006 | 2017 | 0 | The SDG target as well as Govt. of India aims to reduce HIV/AIDS incidence to zero. It is clearly stated in India HIV estimation report 2017 | India HIV estimation report 2017 | A |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 3.3.3 | Tier I | Class I | Malaria cases reported per 1000 population | Numerator: Malaria cases reported from NVBDC database. Denominator: Population projection using ORG-CS | 2017 | 0 | The SDG target as well as Govt. of India through its National Framework for Malaria Elimination 2016–2030 aims to end it by 2030 | National Vector Borne Disease Control Program (NVBDC) | A |
| 3.3.4 | Tier I | Class II | Viral Hepatitis cases (all causes) per 100,000 population | Numerator: Viral Hepatitis cases from NHP. Denominator: Population projection using ORG-CS, 2006 | 2017 | 0 | India is a signatory to WHO Global Health Sector Strategy on Viral Hepatitis which aims at ending it by 2030 | National Health Profile (NHP) | A |
| 3.4.1 | Tier I | Class II | Total (LRI + COPD + Lung Cancer + IHD + Stroke) deaths per 1,00,000 population | DVSD | 2016 | 105 | SDG recommends reducing mortality to one-third. | The India State-Level Disease Burden Initiative (ISL-DBI) 2017 | B |
| 3.4.2 | Tier I | Class I | Suicide mortality rate | DVSD | 2016 | 6 | SDG recommends reducing suicidal rates to one-third | ISL-DBI (2017) | B |
| 3.6.1 | Tier I | Class II | Persons killed in road accidents per 1,00,000 population | DVSD | 2016 | 5.95 | SDG recommends reducing the rate to half | Road Accidents in India (2016), Ministry of Road Transport and Highways and Transport | A |
| 3.7.1 | Tier I | Class I | Proportion of married women (15–49 years) who have their need for family planning met with modern methods | DVSD | 2015 | 73.57 | Average of the top three states/UTs used as the target value | NFHS-4 | A |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 3.7.2 | Tier I | Class I | Women aged 15–19 years who were already mothers or pregnant at the time of the survey (%) | DVSD | 2015 | 2.33 | Average of the top three states/UTs used as the target value | NFHS-4 | A |
| 3.8.2 | Tier I | Class II | Households reporting catastrophic out-of-pocket expenditure OOPE (%) | DVSD | 2014 | 7.33 | Average of the top three states/UTs used as the target value | Household Healthcare Utilization & Expenditure in India: State Fact Sheets 2014; National Health Systems Resource Centre, MoHFW | B |
| 3.9.1 | Tier I | Class II | DALY rate attributable to air pollution risk factor per 100,000 population | DVSD | 2016 | 1442 | Average of the top three states/UTs used as the target value | ISL-DBI (2017) | B |
| 3.9.2 | Tier I | Class II | DALY rate attributable to WASH risk factors per 100,000 | DVSD | 2016 | 251.25 | Average of the top three states/UTs used as the target value | ISL-DBI (2017) | B |

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|---|---|---|---|---|---|---|---|---|---|
| 3.a.1 | Tier I | Class I | Prevalence of current tobacco use in smoking and/or smokeless for 15 years and older (%) | DVSD | 2016 | 5 | The National Tobacco Control Programme through the GATS data aimed to reduce the prevalence of tobacco use by 5% by the end of Twelfth Five Year Plan (2012–2017) | Global Adult Tobacco Survey (GATS) India Fact Sheet 2016–2017, MoHFW | A |
| 3.c.1 | Tier I | Class II | Number of governmental physicians, nurses and midwives per 10,000 | Direct values from data source. But, dividing by 10 to get per 10,000 as per WHO standard reporting | 2017 | 54.99 | Average of the top three states/UTs used as the target value | SDG Index India Report 2018, NITI Aayog | A |
| 4.1.1 | Tier II | Class II | Average correct response on learning outcomes in mathematics and English by students of Class 3, 5, 8 and 10 combined (%) | DVSD | 2017 | 75 | Distinction or 75% achievement in total marks or more is an established level of educational excellence in India | National Achievement Survey (NAS) 2017, Ministry of Human Resources Development (MHRD) | B |
| 4.3.1 | Tier II | Class II | Gender parity in higher education in youth (18–23 yr) | DVSD | 2017 | 1 | SDG target aims at equal access for all at all levels and modes for education | All India Survey on Higher Education (AISHE) Report 2017–2018 | A |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 4.4.1 | Tier II | Class II | Trained candidates under PMKVY per 10,000 youth and adult population (15–34 yr) | Numerator: Number of trained candidates as of 31 Oct 2018 from PMKVY dashboard. Denominator: Population for 15–34 years approximated as half of population (15–59 years) from population projections RGI-CS, 2006 | 2018 | 163 | Average of the top three states/UTs used as the target value | Pradhan Mantri Kaushal Vikas Yojana (PMKVY) Dashboard | B |
| 4.5.1 | Tier II | Class II | Disabled children in the age group 6–13 years out of school (%) | DVSD | 2014 | 4.27 | Average of the top three states/UTs used as the target value | National Sample Survey of Estimation of Out of School Children (2014), MHRD and Social & Rural Research Institute | A |
| 4.a.1 | Tier II | Class II | School basic facility and infrastructure score (0–100) | Direct values from data source for individual entities (schools with electricity, computers, drinking water, toilets and ramp facility) and then averaged | 2016 | 100 | For equal access and large participation, school infrastructure should be complete in terms of basic amenities and facilities | Unified District Information System for Education (U-DISE), State Report Cards 2016–2017 | A |

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|---|---|---|---|---|---|---|---|---|---|
| 4.c.1 | Tier II | Class II | School teachers professionally qualified (%) | DVSD | 2016 | 100 | Better learning outcomes and student participation in schools requires qualified and well-trained teachers | Unified District Information System for Education (U-DISE), State Report Cards 2016–2017 | A |
| 5.1.1 | Tier II | Class III | Average female to male ratio of average wages/salaries received per day by regular wage/salaried employees of age 15–59 for rural and urban | DVSD | 2011 | 1 | Government aspires to remove the existing wage pay gap between men and women | SDG Index India Report 2018, NITI Aayog | A |
| 5.2.1 | Tier II | Class II | Percentage of ever married women aged 15–49 who have ever experienced spousal violence | DVSD | 2015 | 0 | SDG target aims at eliminating all forms of violence against women | NFHS-4 | A |
| 5.3.1 | Tier II | Class II | Women age 20–24 years married before age 18 years (%) | DVSD | 2015 | 0 | SDG aims eliminating early and child marriages | NFHS-4 | A |
| 5.4.1 | Tier II | Class II | Females > 15 years engaged in domestic duty only per 1000 population | DVSD | 2011 | 218.67 | SDG recognizes unpaid care and domestic work and promotes shared responsibility within households. Average of top three states/UTs used as the target value | NSSO Employment and Unemployment Survey, 68th Round, 2011–2012 | As |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 5.5.1 | Tier I | Class I | Proportion of seats held by women Members of Legislative Assemblies (MLAs) | DVSD | 2018 | 50 | SDG target aims at equal and full participation by women at all leadership levels | Election Commission of India | A |
| 5.6.1 | Tier II | Class II | Women in the age group of 15–49 years using modern methods of family planning (%) | DVSD | 2015 | 100 | SDG target aims at ensuring universal access to sexual and reproductive health | NFHS-4 | A |
| 5.a.1 | Tier II | Class II | Women owning a house and/or land (%) | DVSD | 2015 | 50 | SDG target clearly indicates at ensuring equal rights to women with respect to economic resources as well as land/property | NFHS-4 | A |
| 5.b.1 | Tier II | Class I | Women having a mobile phone that they themselves use (%) | DVSD | 2015 | 80.63 | Average of the top three states/UTs used as the target value | NFHS-4 | A |
| 6.1.1 | Tier II | Class I | Households with an improved drinking water source (%) | DVSD | 2015 | 100 | Clean and improved water source is a basic right of all the individuals | NFHS-4 | A |
| 6.2.1 | Tier II | Class II | Households using improved sanitation facility (%) | DVSD | 2015 | 100 | Improved sanitation is a basic right of all the individuals | NFHS-4 | A |

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|---|---|---|---|---|---|---|---|---|---|---|
| 6.3.1 | Tier II | Class I | Wastewater treatment capacity in urban areas (%) | DVSD | | 2016 | 75.33 | Average of the top three states/UTs used as the target value | Composite Water Management Index (CWMI) 2018, NITI Aayog | B |
| 6.4.2 | Tier I | Class II | Stage of Ground Water Development (%) | DVSD | | 2012 | 31 | Half of current level of ground water development (India average) is set as the national target | Ground Water Year Book 2016–2017, Central Ground Water Board | A |
| 6.5.1 | Tier I | Class II | Composite Water Management Score (0–100) | DVSD | | 2016 | 71 | Average of the top three states/UTs used as the target value | CWMI (2018) | B |
| 6.6.1 | Tier I | Class II | Whether the State has enacted any legislation for protection of waterbodies and water supply channels and prevention of encroachment into/ on them? (0/1) | DVSD | | 2016 | 1 | All the states should take proper measures and enact legislations to protect/ restore waterbodies | CWMI (2018) | B |
| 7.1.1 | Tier I | Class II | Household electrification (%) | DVSD | | 2018 | 100 | SDG talks about universal access | Saubhagya Dashboard, Ministry of Power | B |
| 7.1.2 | Tier I | Class II | Households using clean fuel for cooking (%) | DVSD | | 2015 | 100 | SDG talks about modern energy. Clean fuel sources have lesser environmental and health impacts | NFHS-4 | A |

(*continued*)

**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 7.2.1 | Tier I | Class II | Renewable Energy Sources—RES Installed capacity (%) | DVSD | 2017 | 40 | India aims to generate 40% of its electricity from non-fossil-based resources as part of its NDC commitments under the Paris Climate Agreement | Ministry of Power, 2017–2018 | A |
| 7.3.1 | Tier I | Class II | Energy Efficiency Preparedness Score (0–100) | DVSD | 2018 | 63.83 | EEPI comprises policy & regulation, financing mechanism, institutional capacity, adoption and EE measures. Average of the top three states/UTs used as the target value | State Energy Efficiency Preparedness Index Report 2018, Ministry of Power-AEEE. | B |
| 8.1.1 | Tier I | Class I | Annual growth rate of GDP per capita (at constant price of 2011–2012) | DVSD | 2017 | 10 | There is national aspiration to achieve a double-digit growth rate | SDG Index India Report 2018, NITI Aayog | A |
| 8.3.1 | Tier II | Class I | Share of unincorporated non-agricultural enterprise workers in total workers excluding the construction sector (%) | DVSD | 2015 | 0 | SDG target aims at decent job creation and formalization of MSME sector | National Sample Survey (NSS) 73 Round on Economic Characteristics of Unincorporated Nonagricultural Enterprises (excluding construction) in India, 2015–2016 | B |

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|---|---|---|---|---|---|---|---|---|---|
| 8.5.2 | Tier I | Class I | Unemployment rate per 1000 (15 years and above) | DVSD | 2015 | 7.67 | Average of the top three states/UTs used as the target value | Employment–Unemployment Survey (2015–2016), Labor Bureau | A |
| 8.6.1 | Tier I | Class II | Unemployment rate per 1000 for youth (15–29 years) | DVSD | 2015 | 80.33 | Average of the top three states/UTs used as the target value | Youth Employment-Unemployment Scenario (2015–2016), Labor Bureau | A |
| 8.7.1 | Tier II | Class II | Children aged 5–19 years engaged in child labour per 1,00,000 population | Numerator: Direct data from NCCR. Denominator: Population of states and UTs from population projection, RGI-CS, 2006 | 2011 | 446.13 | Average of the top three states/UTs used as the target value | Census 2011 | A |
| 8.9.1 | Tier II | Class II | Tourism direct gross value added in gross value added (%) | DVSD | 2009 | 7.87 | Average of the top three states/UTs used as the target value | Regional Tourism Satellite Account 2009–2010 Phases I, II and III (2015/2016) National Council of Applied Economic Research (NCAER) | B |

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**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 8.10.1 | Tier I | Class I | Number of functioning offices of commercial bank branches per 100,000 adults (15–34 years) | Numerator: Direct values from RBI archives. Denominator: Adults population percentage and numbers from population projections RGI-CS, 2006 | 2017 | 78.4 | Average of the top three states/UTs used as the target value | Database on Indian Economy, Reserve Bank of India (RBI) | A |
| 9.1.1 | Tier II | Class II | Targeted habitations connected by all-weather roads under Pradhan Mantri Gram Sadak Yojana—PMGSDY (%) | DVSD | 2017 | 100 | National mandate under the PMGSDY is to cover all the targeted habitations with all-weather roads | SDG Index India Report 2018, NITI Aayog | A |
| 9.2.1 | Tier I | Class I | Proportion of state GDP manufacturing w.r.t to GSDP | DVSD | 2015 | 25 | The National Manufacturing Policy and government's Make in India Programme aspires to increase the contribution of manufacturing sector to 25% by 2022 and 2025 respectively | Handbook of Indian States 2017–2018, Reserve Bank of India (RBI) | A |
| 9.2.2 | Tier I | Class II | Manufacturing employment of workers aged 15 years and above per 1000 of total industrial employment | DVSD | 2015 | 285 | Average of the top three states/UTs used as the target value | Employment–Unemployment Survey (2015–2016), Labor Bureau | A |

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|---|---|---|---|---|---|---|---|---|---|
| 9.4.1 | Tier I | Class II | Reduction in $CO_2$ emission per unit of GSDP (kg/INR) from 2005 to 2013 (%) | Numerator: Combined values of $CO_2$ emissions from energy and industrial production and process use used from source data. Denominator: GDP values at constant prices (2004–2005) base year from MoSPI | 2013 | 35 | India has pledged to decrease its emissions intensity of GDP by 33–35% compared to that of 2005 by 2030 under the Paris Climate Agreement. Here we have used the upper figure as target value | GHG Platform India, MoSPI | C |
| 9.5.1 | Tier I | Class II | University, Higher and Technical Education budget to GSDP (%) | DVSD | 2014 | 2 | India's present R&D expenditure is ~ <1% and Science, Technology and Innovation Policy 2013 aims to increase it to 2% | Analysis of Budgeted Expenditure on Education 2012–2013 to 2014–2015, MHRD | A |
| 9.5.2 | Tier I | Class II | Fulltime PhDs and faculty members per million population | Numerator: From AISHE report. Denominator: Population projections RGI-CS, 2006 | 2017 | 2297.43 | Average of the top three states/UTs used as the target value | AISHE Report (2017–2018) | A |
| 9.c.1 | Tier I | Class II | Wireless Tele density (per 100 persons) | DVSD | 2017 | 100 | SDG target calls for universal coverage. Digital India programme of the government also aspires for universal mobile connectivity | The Indian Telecom Services Performance Indicators 2018, The Telecom Regulatory Authority of India (TRAI) | A |

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**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 10.1.1 | Tier II | Class III | Population falling under bottom 40% of the wealth quantiles (%) | DVSD | 2015 | 2.23 | Average of the top three states/UTs used as the target value | NFHS-4 | A |
| 10.4.1 | Tier II | Class II | Average of schedule caste and tribal plan funds utilized (%) | Direct values from data source and then average of SC and ST fund utilization taken | 2013 | 100 | GOI allocates special funds to empower SC and/ST groups in each state/UT and wants 100% utilization of these funds | SDG Index India Report 2018, NITI Aayog | A |
| 11.1.1 | Tier I | Class I | Urban households living in slums (%) | DVSD | 2011 | 0 | SDG target aims at adequate, safe, affordable housing and upgraded slums | Census 2011 | A |
| 11.2.1 | Tier II | Class II | Number of state road transport undertakings buses per 10,00000 population | DVSD | 2015 | 353 | Average of the top three states/UTs used as the target value | Review of the Performance of the State Road Transport Undertakings 2015–2016, Ministry of Road Transport and Highways | A |

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|---|---|---|---|---|---|---|---|---|---|
| 11.6.1 | Tier II | Class II | Total municipal solid waste processed in Urban Local Bodies (%) | DVSD | 2018 | 100 | GOI's Swachh Bharat Mission aims to cover 100% of the urban population by solid waste management services by 2030 | Swachh Bharat Mission Dashboard (Urban), Ministry of housing and Urban Affairs | B |
| 11.6.2 | Tier I | Class I | PM 10 Annual average cities (µg/$m^3$) | Direct values from data source. Average of all the city monitoring stations within the state taken as state value | 2017 | 20 | WHO guidelines recommend a safe value of 20 µg/$m^3$ for PM 10 (annual mean) | National Ambient Air Quality Monitoring Programme Data, Central Pollution Control Board (CPCB) | A |
| 11.b.2 | Tier II | Class II | Disaster Resilience Score (0–100) | DVSD | 2018 | 64.2 | SDG aims at substantially increasing the adoption, implementation and resilience rate. Hundred per cent increment in resilience capacity as compared to existing state has thus been set as the national target | Disaster Score Card for States and Union Territories of India—Volume I, National Institute of Disaster Management (NIDM), Ministry of Home Affairs | B |

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**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 12.2.2 | Tier I | Class II | Level of change in natural capital during 2005–2015 (%) | Direct values from data source. Increase b/w 0% and 5% given avg. value of 2.5, increase > 5% given value of 6, decrease < 0% given value of -1 | 2005/2015 | 6 | An increase in natural stock by the best performing state/UT (i.e. > 5% category) has been set as the national target | EnviStats-India 2018: Supplement on Environmental Accounts, MoEF | B |
| 12.3.1 | Tier II | Class II | Storage loss of food grains per capita (kg/ capita) | Numerator: Direct values from data source. Denominator: Population Projections RGI-CS, 2006 | 2015 | 0 | SDG target aims at reduction of food losses | Wastage of food grains, Lok Sabha Unstarred Question Number 4285 | C |
| 12.4.2 | Tier III | Class II | Hazardous waste generated (kg/capita) | Numerator: Direct values from data source. Denominator: Population Projections RGI-CS, 2006 | 2015 | 0 | The National Hazardous Waste management strategy aims at reduction and zero waste disposal of hazardous wastes | Hazardous Waste Generation Inventory, CPCB | B |

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|---|---|---|---|---|---|---|---|---|---|
| 13.2.1 | Tier III | Class II | State Action Plan on Climate Change (SAPCC) Document Comprehensiveness and Quality Score (0–15) | The SAPCC documents of individual states were assessed based on three components: Implementation and monitoring framework and existence of a dedicated climate change cell/ department; impacts and vulnerability assessments; adaptation strategy and action plan. All the three components had equal weights (i.e. score of 5). Final score was sum of all the three components | Multiple, ranging between 2009/10 and 2018 | 15 | The SAPCC document should be comprehensive, detailed, well planned and should be updated regularly | SAPCC Documents available at MoEF/State Environment/ planning department websites | C |
| 14.2.1 | Tier III | Class II | Positive change in Mangrove area from previous year (1/0) | Direct values from data source. If there is an increase of more than or equal to 1% from previous year then 1 else 0 | 2017 | At least 1% annual increment | Green India Mission identifies mangroves as crucial in increasing resilience and preserving the coastal ecosystems. An addition of 1000 sq km to the existing area has been set as a target for 2020 by MoEF. Same target till 2030 with present achieved state in 2017 requires an annual increase by ~ 1.05%. Thus, 1% is set as the minimum annual target | Forest Survey of India (FSI) Report, 2017 | A |

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**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 14.3.1 | Tier II | Class II | Stations having average marine acidity (pH) within CPCB standard (%) | DVSD | Multiple, ranging between 2006 and 2010 | 100 | SDG target aims at minimizing ocean acidification. Thus, all stations should comply with CPCB standards | Integrated Coastal and Marine Area Management Project (ICMAM), East and West Coast, Ministry of Earth Sciences | B |
| 14.5.1 | Tier I | Class I | Marine protected area as % of total geographical area | DVSD | 2018 | 10 | SDG target aims at having minimum of 10% marine protected areas | ENVIS Centre on Wildlife & Protected Areas Database, MoEF | A |
| 15.1.1 | Tier I | Class I | Forest area to total geographic area (%) | DVSD | 2017 | 33.33 | GOI's National Forest Policy (1988) requires at least 33% (one-third) of the geographical area under the forest/tree cover | FSI Report (2017) | A |
| 15.1.2 | Tier I | Class II | Total protected area as % of state area | DVSD | 2018 | 17/10 | The Aichi target aims at achieving 17% for terrestrial and inland water areas; 10% for coastal and marine areas by 2020. Hence, we take this target for 2030 | ENVIS Centre on Wildlife & Protected Areas Database, MoEF | A |

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|---|---|---|---|---|---|---|---|---|---|
| 15.2.1 | Tier I | Class II | Loss in forest area from 2015 to 2017 (%) | Direct values of change in forest area from previous year from data source. Positive values treated as negative loss and assigned value 1. In other case, 0 assigned. | 2017 | 0 | The Aichi target aims at reducing the rate of forest loss to zero | FSI Report (2017) | A |
| 15.3.1 | Tier II | Class I | Total area under desertification/land degradation (%) | DVSD | 2011–2013 | 0 | SDG target aims at combating desertification by 2030. Government of India is committed to achieve land degradation neutrality by 2030 | Desertification and Land Degradation Atlas of India, ISRO (2016) | A |
| 15.7.1 | Tier II | Class II | Average wildlife cases reported per year between 2010 and 2017 | DVSD | 2017 | 0 | SDG target aims at ending poaching and wildlife trafficking | Wild Life Protection Society of India (WPSI) | D |
| 16.1.1 | Tier I | Class II | Murders reported per 1,00,000 population | DVSD | 2016 | 1 | As per UN Office on Drug and Crime most of the EU member countries have a rate < 1 and these are the countries with best quality of life and rule of law. Hence, 1 is being used as a suitable target for India for 2030 | NCRB (2016) | A |
| 16.2.1 | Tier II | Class II | Crime against children per 1,00,000 population | DVSD | 2016 | 0 | SDG target aims at ending abuse and all forms of violence | NCRB (2016) | A |
| 16.2.2 | Tier II | Class I | Human trafficking cases reported per 1,00,000 population | DVSD | 2016 | 0 | SDG target aims at ending abuse and all forms of violence | NCRB (2016) | A |

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**Table 6** (continued)

| *Global indicator no.* | *IAEG tier class* | *Data availability at sub-national level by class* | *Indicator identified by the study* | *Indicator calculation/ input approach* | *Latest available data (year)* | *National target 2030* | *Rationale for national target* | *Data source* | *Data source category* |
|---|---|---|---|---|---|---|---|---|---|
| 16.2.3 | Tier II | Class II | Young women victims of rape 18–29 years per 1,00,000 female population | Direct values from data source. Numerator: Victim numbers. Denominators: Mid-year projected total female population | 2016 | 0 | SDG target aims at ending abuse and all forms of violence | NCRB (2016) | A |
| 16.3.2 | Tier I | Class I | Undertrials as percentage of total prison population | DVSD | 2015 | 33.6 | GOI aims to reduce the prison population and fast track the undertrial cases. Half of India's average value used as national target. This is also very close to global average figure of 32.49 (2018) given by Institute of Criminal Policy Research | NCRB (2016) | A |
| 16.5.1 | Tier II | Class II | Corruption cases reported per 10,00,000 population | Numerator: Corruption cases reported from NCRB Report. Denominator: Projected population RGI-CS, 2006 | 2016 | 0 | SDG target aims at substantially reducing corruption cases | NCRB (2016) | A |

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|---|---|---|---|---|---|---|---|---|---|
| 16.6.1 | Tier I | Class I | Primary government expenditure outlay as a proportion of original approved budget outlay (%) | DVSD | 2014 | 100 | SDG target aims at effective and accountable institutions. State should aspire to utilize complete approved budget | Indian Public Finance Statistics (2017), Ministry of Finance | A |
| 16.6.2 | Tier III | Class II | States which have notified/enacted public service guarantee act (1/0) | DVSD | Multiple | 1 | SDG target aims at developing effective and accountable institutions | Various State Departments | B |
| 16.9.1 | Tier I | Class I | Children under age 5 years whose birth was registered (%) | DVSD | 2015 | 100 | SDG target aims at providing legal identity for all | NFHS-4 | A |

# Appendix 2

See Table 7.

**Table 7 SDG Index scores for select SDGs for major states in India**

| *State* | *G1* | *G2* | *G3* | *G4* | *G5* | *G6* | *G7* | *G8* | *G9* | *G10* | *G11* | *G12* | *G13* | *G15* | *G16* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andhra Pradesh | 75.10 | 31.61 | 59.63 | 48.86 | 37.85 | 57.64 | 81.79 | 58.02 | 48.84 | 46.07 | 45.39 | 60.41 | 25.00 | 67.12 | 78.20 |
| Assam | 64.71 | 49.97 | 48.77 | 34.66 | 36.28 | 47.10 | 13.38 | 50.13 | 38.57 | 43.73 | 55.57 | 56.62 | 12.50 | 67.66 | 73.93 |
| Bihar | 61.19 | 41.26 | 48.21 | 24.60 | 20.05 | 54.38 | 36.08 | 39.73 | 33.25 | 37.85 | 49.61 | 61.37 | 25.00 | 62.39 | 66.18 |
| Chhattisgarh | 49.90 | 18.83 | 46.55 | 43.22 | 34.10 | 53.50 | 32.98 | 44.12 | 56 | 41.01 | 47.07 | 47.99 | 37.50 | 55.84 | 72.37 |
| Delhi | 48.24 | 47.80 | 74.50 | 81.10 | 48.69 | 38.62 | 54.06 | 65.55 | 44.62 | 91.34 | 38.84 | 77.13 | 35.71 | 43.84 | 58.02 |
| Gujarat | 55.82 | 26.73 | 62.10 | 53.38 | 34.46 | 76.62 | 70.49 | 60.18 | 68.77 | 70.55 | 65.78 | 28.40 | 50.00 | 60.58 | 80.81 |
| Haryana | 64.88 | 32.26 | 58.62 | 68.92 | 40.23 | 44.79 | 59.62 | 61.38 | 50.56 | 59.38 | 38.43 | 82.00 | 12.50 | 55.37 | 72.23 |
| Himachal Pradesh | 61.42 | 45.67 | 70.14 | 56.27 | 49.59 | 74.03 | 45.92 | 47.01 | 58.60 | 89.61 | 73.45 | 78.36 | 75.00 | 78.09 | 83.88 |
| Jammu and Kashmir | 73.09 | 64.14 | 71.20 | 52.56 | 43.41 | 62.51 | 39.58 | 52.62 | 46.02 | 67.04 | 27.36 | 80.25 | 37.50 | 60.88 | 75.36 |
| Jharkhand | 54.99 | 28.26 | 51.01 | 44.56 | 26.85 | 39.52 | 17.71 | 45.62 | 25.09 | 14.04 | 36.23 | 47.37 | 50.00 | 59.01 | 60.98 |
| Karnataka | 62.42 | 28.03 | 61.56 | 65.33 | 42.62 | 68.25 | 78.89 | 52.43 | 49.80 | 80.66 | 59.56 | 55.87 | 0.00 | 56.35 | 80.56 |
| Kerala | 63.77 | 56.22 | 80.66 | 73.40 | 51.17 | 66.64 | 65.94 | 58.14 | 53.67 | 99.34 | 71.31 | 61.57 | 50.00 | 79.51 | 77.31 |
| Madhya Pradesh | 52.34 | 31.48 | 46.38 | 49.82 | 28.02 | 61.47 | 51.40 | 38.04 | 33.38 | 54.89 | 46.41 | 95.44 | 75.00 | 58.71 | 72.06 |
| Maharashtra | 60.50 | 25.34 | 66.23 | 57.86 | 41.63 | 51.27 | 74.11 | 51.26 | 55.25 | 67.39 | 53.15 | 72.52 | 62.50 | 22.65 | 62.07 |
| Odisha | 64.65 | 50.37 | 46.94 | 39.79 | 43.10 | 33.02 | 33.39 | 50.92 | 44.05 | 47.41 | 39.82 | 70.50 | 62.50 | 65.48 | 61.73 |
| Punjab | 66.26 | 60.00 | 66.70 | 69.17 | 47.37 | 68.20 | 69.73 | 47.13 | 50.74 | 71.19 | 40.13 | 62.68 | 37.50 | 57.94 | 80.96 |
| Rajasthan | 69.44 | 23.51 | 58.37 | 59.94 | 34.43 | 52.88 | 67.88 | 45.56 | 47.07 | 67.35 | 47.99 | 85.21 | 12.50 | 32.27 | 61.87 |
| Tamil Nadu | 74.48 | 34.15 | 66.98 | 64.15 | 39.07 | 59.00 | 86.87 | 47.96 | 62.23 | 82.65 | 64.37 | 53.71 | 12.50 | 57.51 | 73.61 |
| Telangana | 67.64 | 34.13 | 62.31 | 61.48 | 40.88 | 55.15 | 68.86 | 55.94 | 50.85 | 43.61 | 52.75 | 51.85 | 25.00 | 68.24 | 64.74 |
| Uttar Pradesh | 65.38 | 27.27 | 44.75 | 47.62 | 28.50 | 57.64 | 23.45 | 30.51 | 31.43 | 14.46 | 40.71 | 75.75 | 37.50 | 42.84 | 73.14 |
| Uttarakhand | 63.46 | 45.81 | 50.34 | 63.59 | 49.90 | 55.44 | 53.13 | 52.88 | 67.70 | 41.79 | 42.43 | 56.28 | 50.00 | 79.10 | 79.61 |
| West Bengal | 62.55 | 49.37 | 56.43 | 35.17 | 23.14 | 38.87 | 33.06 | 46.23 | 50.00 | 64.87 | 30.02 | 79.52 | 12.50 | 57.09 | 71.91 |
| All India | 62.35 | 30.46 | 53.80 | 52.80 | 33.56 | 57.53 | 48.60 | 49.36 | 50.53 | 54.99 | 47.98 | 71.75 | 33.28 | 63.72 | 72.54 |

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# Illusions and Disillusions with Poverty Reduction Strategies: Growth, Crisis and the MDGs in Bolivia, Honduras and Nicaragua

*Rob Vos*

## 1 Introduction

The Poverty Reduction Strategy Paper (PRSP) framework was introduced in 1999 creating great expectations for the Heavily Indebted Poor Countries (HIPCs). It was not only visualized as a framework to pair debt relief with poverty reduction, but also regarded as an opportunity to introduce a participatory process that would tailor the strategy to the country's needs, assuring ownership and long-term viability. Improved budgeting procedures would guarantee transparency and accountability in the policy process, allowing a more efficient allocation of development assistance.

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Overall, the PRSPs take a comprehensive approach towards poverty reduction. In the PRSP experience of the three Latin American HIPCs discussed in this chapter (Bolivia, Honduras and Nicaragua), this approach led to broad-ranging plans that generally lacked prioritization of actions and clear indications on how these interventions were expected to meet poverty reduction targets. Moreover, the PRSPs or the related "National Development Plans" assumed rather optimistically that the strategies would yield high and sustained rates of economic growth benefiting the poor, and support the achievement of the millennium development goals (MDGs). The lack of prioritization makes decision-making more complicated when adjustments are required under volatile economic conditions which, time and time again, demand the imposition of new budget constraints, as evidenced most painfully with the global economic crisis that unleashed in 2008. In addition, while the PRSPs clearly aspired to achieve the MDGs, government budgets did not undergo the adjustments needed to accelerate progress towards those social goals (Vos et al., 2006). Lastly, macroeconomic policies in the three countries were conducted without consistent consideration of the PRSP agenda, thereby not only weakening overall policy effectiveness but also eroding political support for the PRSP process (Vos & Cabezas, 2006).

Conventional wisdom as to how to make economic growth conducive to poverty reduction has been subject to drastically changing perspectives (Cornia, 2006, 2010; Besley & Cord, 2007; Filho, 2010; and United Nations, 2010a). At the time the PRSP approach was conceived, the predominant policy perspective was that of the Washington Consensus, which advocated prudent macroeconomic policies with a focus on fiscal restraint and inflation control and structural reforms aiming at liberalization of commodity and financial markets and opening up to global markets. This remained a central focus of much of economic policy advice to developing countries and conditions to multilateral lending, even though the PRSP approach itself recognized that market-based growth strategies would be insufficient to solve the problem of widespread poverty. As a result, most PRSPs came to focus in practice on expanding social services and targeted poverty reduction programmes. The macroeconomic policy stance often would stand in the way of poverty reduction objectives. The conventional wisdom, also embedded in policy conditionality countries had to comply with to become eligible for the debt relief under the HIPC initiative, was that macroeconomic policies aiming at keeping inflation and government budgets under control would be most conducive to economic growth

and, hence, poverty reduction. In practice, however, this narrow focus of macroeconomic policies constrained the scaling up of social spending and poverty reduction programmes and tended to fail to protect employment during economic downturns.

The global recession of 2008–2009 shook this conventional wisdom. Ambitious fiscal and monetary policy stimulus packages and revisions of market regulating frameworks were launched in rich and poor nations alike in attempts to find ways out of the crisis.

It has also led to renewed calls for a broader approach to macroeconomic policies, which would in fact provide a framework to ensure fiscal, monetary and exchange-rate policies that are consistent with sector policies in support of dynamic productivity and employment growth and with labour market and social policies to underpin both productivity growth and poverty reduction (see e.g., Cornia, 2006; Ocampo, 2008; Ocampo & Vos, 2008; and United Nations, 2010a). Achieving such coherence between macroeconomic, sector, labour market and social policies is no easy undertaking. It is particularly challenging for small open developing economies with little policy space to counteract the typically pro-cyclical impact of volatile world markets on their economies and many Latin American countries faced such limitations when trying to launch countercyclical measures in response to the global crisis (Ocampo et al., 2010). Expanding social protection programmes in times of crisis can be an effective part of pro-poor countercyclical policies and support households to continue to invest in their human development as the case of Brazil shows, for instance (Cornia, 2010). However, if the short-term significant run-up of public indebtedness which could set a constraint to private spending and exchange-rate (productivity) growth effects of such a strategy are limited, important trade-offs could emerge, including an appreciation which could undermine export competitiveness.

This chapter assesses such macroeconomic trade-offs and financing constraints associated with the poverty reduction strategies in Bolivia, Honduras and Nicaragua. It reviews the key approaches to growth and human development as laid down in the PRSPs of the three countries in Section 2. Section 3 analyses and quantifies macroeconomic constraints to achieving the poverty reduction targets and other MDGs in Bolivia, Honduras and Nicaragua by using economy-wide models that allow detailed assessments of the quantitative links between aggregate economic growth, social spending and poverty reduction. The analysis shows that the global crisis not only will cause severe setbacks in progress towards

poverty reductions targets, but will also significantly raise the costs of MDG strategies in the three countries. Section 3 also analyses whether the fiscal stimulus implied by PRSP or MDG-oriented strategies could pave the way towards economic recovery. The final section summarizes the main conclusions and some reflections on how poverty reduction strategies in the three countries can move forward.

## 2 Growth and Progress Towards the MDGs and the PRSPs for Bolivia, Honduras and Nicaragua

### *Economic Growth and the MDGs*

In retrospect, the PRSPs generally assumed rather robust rates of economic growth. Initial PRSPs projected annual GDP growth rates of 6% on average, ranging from 4% (Zambia) to 9% (Mozambique). Bolivia, Honduras and Nicaragua had an average of 5% as the target. As the global economy entered a boom from the early years of the twenty-first century, such targets seemed far from unrealistic. Developing country growth averaged around 6% during 2002 and 2007. Also, the least developed countries and most HIPCs (including those in Latin America) showed similar levels of robust growth during the period (see United Nations, 2010b). Buoyant commodity prices and strong growth of world trade supported what seemed like robust export-led growth. However, the global economic crisis that emerged in 2008 revealed that this growth pattern was unsustainable being overly dependent on strong consumer demand in the United States, fuelled by easy credit and an asset-price bubble on the back of far-reaching financial deregulation. When the bubble burst, credit supplies dried up, global demand and world trade nose-dived and commodity prices collapsed, imposing a multiple of external shocks on developing countries, manifesting pervasive vulnerability to world markets.

As in the rest of Latin America and the Caribbean, Bolivia, Honduras and Nicaragua came out of a period of slow growth during the beginning of the present decade and enjoyed high growth from 2004 until the beginning of 2008, thanks to increased external demand and higher prices of export commodities. The latter was especially true for Bolivia's exports of natural gas and other hydrocarbons. During this same period, the region, including these three countries, experienced relatively low levels of inflation until 2007 when most countries and their consumers were affected by higher food and oil prices. With the global recession and drop in world

market prices, inflation came down again in 2009. Total public debt was drastically reduced to about a third during the past five years in these countries, thanks to more available resources to repay debt as well as substantial external debt relief from bilateral and multilateral creditors in the context of the HIPC and the multilateral debt relief initiatives (see Table 1).

The three countries made visible progress towards the MDGs during the 1990s, yet fell well short of the international targets for 2015 (Table 2). Most progress was made towards the international health goals of reducing child and maternal mortality (except in Nicaragua, where existing—albeit admittedly not very reliable—data suggest a rise in maternal mortality). Much less relative progress was recorded in terms of poverty reduction, which in part can be blamed on rising income inequality associated with the economic liberalization policies conducted during the 1990s

**Table 1** Macroeconomic indicators and social expenditures

| | *2000* | *2001* | *2002* | *2003* | *2004* | *2005* | *2006* | *2007* | *2008* | *2009 P* |
|---|---|---|---|---|---|---|---|---|---|---|
| ***GDP growth*** | | | | | | | | | | |
| Bolivia | 2.5 | 1.7 | 2.5 | 2.7 | 4.2 | 4.4 | 4.8 | 4.6 | 5.3 | 1.6 |
| Honduras | 5.7 | 2.7 | 3.8 | 4.5 | 6.2 | 6.1 | 6.3 | 6.3 | 4.0 | -2.0 |
| Nicaragua | 4.1 | 3.0 | 0.8 | 2.5 | 5.3 | 4.3 | 3.9 | 3.8 | 3.0 | -0.5 |
| **Inflation** | | | | | | | | | | |
| Bolivia | 3.4 | 0.9 | 2.4 | 3.9 | 4.6 | 4.9 | 4.9 | 11.7 | 12.1 | |
| Honduras | 10.1 | 8.8 | 8.1 | 6.8 | 9.2 | 7.7 | 5.3 | 8.9 | 10.9 | |
| Nicaragua | 9.9 | 4.7 | 4.0 | 6.6 | 8.9 | 9.6 | 10.2 | 16.2 | 15.2 | |
| ***Total public debt as a % of GDP (non-financial public sector)*** | | | | | | | | | | |
| Bolivia | | | | | 83.9 | 78.3 | 52.6 | 40.0 | 33.0 | |
| Honduras | | | | | 59.4 | 44.8 | 30.2 | 18.3 | 17.3 | |
| Nicaragua | | | | | 100.7 | 92.8 | 69.1 | 43.0 | 35.4 | |

| | *1990/1991* | *1995/1996* | *2000/2001* | *2005/2006* |
|---|---|---|---|---|
| **Social expenditures as a % of GDP** | | | | |
| Bolivia (CG) | 5.2 | 7.4 | 12.0 | |
| Bolivia (NFPS) | | 13.2 | 16.3 | 16.6 |
| Honduras (CG) | 7.5 | 6.7 | 10.0 | 11.4 |
| Nicaragua (CG) | 6.6 | 6.7 | 8.1 | 11.1 |

P = projection, based on baseline scenario of United Nations (2009)

CG = Central government; NFPS = Non-financial public sector

Source: ECLAC, Statistical database and United Nations database of the *World Economic Situation and Prospects*

**Table 2** Progress towards the MDGs in Bolivia, Honduras and Nicaragua

| | *1990* | *Mid-point*[a] *(2000–2005)* | *Target for 2015* |
|---|---|---|---|
| **Bolivia** | | | |
| MDG 1: extreme poverty (% of total population)[b] | 29.0 | 27.0 | 14.5 |
| MDG 2: primary school completion rate (% of pop in age cohort) | 52.0 | 69.9 | 100.0 |
| MDG 4: under-5 mortality rate (per 1000 live births) | 89.0 | 54.0 | 29.7 |
| MDG 5: maternal mortality rate (per 100,000 live births) | 416.0 | 230.0 | 104.0 |
| MDG 7a: access to safe drinking water (% of population) | 57.0 | 70.0 | 78.5 |
| MDG 7b: access to safe sanitation (% of population) | 28.0 | 40.0 | 64.0 |
| **Honduras** | | | |
| MDG 1: extreme poverty (% of total population)[b] | 38.0 | 26.3 | 19.0 |
| MDG 2: primary school completion rate (% of pop in age cohort) | 64.7 | 75.9 | 100.0 |
| MDG 4: under-5 mortality rate (per 1000 live births) | 58.0 | 30.5 | 24.0 |
| MDG 5: maternal mortality rate (per 100,000 live births) | 280.0 | 108.0 | 70.0 |
| MDG 7a: access to safe drinking water (% of population) | 73.0 | 82.2 | 86.5 |
| MDG 7b: access to safe sanitation (% of population) | 66.0 | 76.7 | 83.0 |
| **Nicaragua** | | | |
| MDG 1: extreme poverty (% of total population)[b] | 44.0 | 39.4 | 22.0 |
| MDG 2: primary school completion rate (% of pop in age cohort) | 44.3 | 73.1 | 100.0 |
| MDG 4: under-5 mortality rate (per 1000 live births) | 68.0 | 38.0 | 22.7 |
| MDG 5: maternal mortality rate (per 100,000 live births) | 160.0 | 230.0 | 40.0 |
| MDG 7a: access to safe drinking water (% of population) | 70.0 | 76.0 | 85.0 |
| MDG 7b: access to safe sanitation (% of population) | 45.0 | 46.3 | 72.5 |

Source: Vos et al. (2008), Jiménez et al. (2008), Bussolo and Medvedev (2008), and Sánchez and Vos (2008)

[a]Mid-point refers to mid-point between 1990 and 2015. Years differ for the three countries depending on data availability for each indicator, but refer mostly to data between 2000 and 2005

[b]Extreme poverty estimated against (original) international poverty line of $1 per person per day (valued in purchasing power parity)

(e.g. Taylor & Vos, 2002) and insufficient progress in delivering human and physical capital (especially infrastructure) which elsewhere has been found to be a major contributor to achieving more broad-based and, hence, pro-poor growth (e.g. Besley & Cord, 2007). Most of the observed progress took place during the period prior to the PRSPs. The model analysis in the next section suggests that even with the debt relief and the rise in social spending during the 2000s, the three countries are not expected to achieve the targets set for 2015.

There would be insufficient expansion of MDG-related services and employment generation to ensure accelerated progress towards the human development goals.

### *Bolivia*

During a prolonged period of political instability, the PRSP process in Bolivia became heavily discredited and perceived as too much donor-driven. Nonetheless, national development strategies which were elaborated later on reproduced much of the country's PRSP though with shifting emphases. The original PRSP, the *Estrategia Boliviana de Reducción de la Pobreza* (EBRP), of 2001 gave prominence to aggregate growth objectives, thereby continuing development policies of the 1990s. It intended to stimulate growth in the modern sectors of the economy, especially the exploitation of natural gas, which would help increase government revenue and facilitate income redistribution through social programmes satisfying basic needs (education, health, water and sanitation).

The EBRP added two lines of action to this basic strategy. First, it aimed at strengthening the social protection network for the poor. Second, it acknowledged that in order to generate pro-poor growth it is necessary to find a way to improve the growth-poverty elasticity. To do so, the EBRP proposed to support micro enterprises (in rural and urban areas) and create an emergency employment programme through public works. In 2006, Bolivia's new government turned the EBRP into a new national development plan (NDP) called "*Bolivia digna, soberana, y productiva para vivir bien*" ("A Dignified, Sovereign and Productive Bolivia for a Better Life"), with strong similarities to the preceding plans. The new NDP introduced strengthened policies aimed at reducing malnutrition and illiteracy. The government also introduced a conditional cash transfer programme with incentives to increase primary school attendance. Further, the plan included additional measures to strengthen social protection and

community development targeted at municipalities with high poverty levels (Jiménez et al., 2008). The 2006 NDP also embraced the MDGs among its core objectives. Yet, the underlying growth strategy was not dissimilar to the previous plans. Natural gas remained central to its present growth path and a key source of government revenue to finance investments in human capital and physical infrastructure which could lay the foundations for a more diversified economy that could underpin more sustained employment growth and poverty reduction.

The Bolivian strategy assumes its natural resource endowment will effectively generate real and stable resources for the government in the coming decades. This expectation could be rather optimistic. The degree of government control over gas exploitation and exports and the allocation of the revenues continue to be subject to much controversy and political debate in the country. Further, government revenue remains highly sensitive to external shocks, including those stemming from volatile world market prices for oil and gas and the outfall of global demand during the Great Recession of 2008–2009.

Achieving the human development targets will require stable and sustained investments in social services, infrastructure and economic diversification over a prolonged period of time. Bolivia's strategy assumes this can be done, but does not address how to overcome the macroeconomic constraints stemming from an unstable external environment and the country's limited capacity to mobilize domestic resources for long-term development finance.

### *Honduras*

The PRSP of Honduras focused on achievement of the MDGs through targeted programmes for rural and urban poverty reduction, increased investment in human capital and social protection networks. The underlying growth strategy sought to enhance the economy's competitiveness through investments in infrastructure (to establish the so-called *corredor logístico*), extension of trade integration and promotion of tourism. The PRSP assumed that these actions would, in themselves, foster pro-poor growth, but at the same time proposed to strengthen this through increased social expenditure. Most of the increase in social spending went to education, while health spending barely increased as a share of total government spending during 2001–2007. What is more, increased wages and salaries for teachers and medical personnel account for most of the

increase in social spending as part of the PRSP. This went to the detriment of investments in social infrastructure, while indicators of the quality of education showed relatively little improvement (ibid.). However, resources for targeted social programmes, such as the Honduran Social Investment Fund and the cash transfer programme, PRAF, increased significantly, benefiting the rural poor in particular.

The plan further assumed that the growth impacts would be strong, sustained and almost immediate. Possible inter-temporal trade-offs are not explicitly dealt with. Dependence on *maquila* exports and tourism and volatility in prices of food and energy imports continue to make the economy highly vulnerable to swings in the global economy. Social policies as conducted during the 2000s did not appear to have visibly contributed to reducing the high income inequality, thus keeping the growth-poverty reduction elasticity low (Bussolo & Medvedev, 2008). The PRSP aimed to achieve more broad-based ("pro-poor") growth through export diversification into labour-intensive activities. It assumed this could evolve along a robust and stable growth path. The setbacks caused by the global crisis and the political turmoil in Honduras that emerged in 2009 have made achievement of such targets highly uncertain.

### *Nicaragua*

In Nicaragua, both the original PRSP (*Estrategia Reforzada del Crecimiento Económico y la Reducción de la Pobreza*, ERCERP) of 2001 and the subsequent National Development Plan (NDP) of 2003 gave priority to economic growth as the key towards poverty reduction. The ERCERP supplemented this central focus with enhanced government spending on education and health and a range of social programmes targeted towards the poor. Yet, the NDP dismissed these expenditures for being "charitable" ("asistencialista") and, while not fully abandoning these, gave more priority to spending on infrastructure aimed at strengthening competitiveness of economic regions within the country and thereby achieving higher growth and employment generation (Vos & Cabezas, 2006). With the entrance of a new government the policies underwent further revision from 2007. A new government re-introduced free health and education services for all and converted some targeted social protection programmes (including the conditional cash transfer programmes) into more production-oriented programmes, including provisioning of cattle and credit to the poor (Guimarães & Avendaño, 2008).

Household survey data suggest that inequality in the distribution of consumption expenditures has declined in Nicaragua, possibly owing to government subsidies on basic goods and services and targeted food support programmes (Sánchez & Vos, 2008). This trend was already apparent from the mid-1990s and contrasts with persistent high income inequality. This effect of social spending also seems to be behind the modest reduction in consumption poverty achieved in the first half of the 2000s,[1] given the weak capita income growth during this period. Income growth weakened further in the second half of the 2000s and came to a halt with the global economic crisis. Much of the rise in public spending during 2006 and 2008 were related to further increases in consumer subsidies in attempts to protect the poor against the steep rises in imported food and energy prices. The ensuing fiscal problems have been responded to in part by delaying public investment programmes. These recent problems reveal the difficulties Nicaragua is facing in pursuing its poverty reduction strategy by expanding social spending and public infrastructure programmes in a volatile economic environment. Investing both in infrastructure and human development will be needed to generate greater economic diversification, such as developing new markets that could take advantage of the free trade agreement with the United States (CAFTA). As analysed in Sánchez and Vos (2006), the gains from this agreement are likely to be very modest at best given the weak competitiveness of most of Nicaragua's export sectors. However, if investments in infrastructure and human capital as envisaged in the NDP can be accelerated, productivity gains can only be expected over the medium run and thus will meet short-term financing constraints.

## 3 Macroeconomic Trade-offs in Achieving Poverty Reduction Goals

Neither the original PRSPs of the three countries nor the subsequent versions each country presented as national development strategies paid much attention to the policy trade-offs that could emerge between the short- and long-term objectives outlined in each plan. The strategies of

[1] According to the data of the living standards survey (EMNV) of INEC, extreme poverty as measured through the (original) international poverty line of $1 per person per day relative to per capita household consumption fell from 43.0% to 39.4% between 2001 and 2005. When using the (lower) national extreme poverty line, however, consumption poverty would have increased from 15.1% to 17.2% in the same period.

Honduras and Nicaragua rely on enhanced competitiveness, but gains in this area depend on new investments in infrastructure and human capital with returns that can only be obtained in the medium run. The PRSPs assume, in contrast, that such gains will come more or less instantaneously. This lack of attention to inter-temporal trade-offs creates doubts as to whether the financing of these investments will be sustainable, and whether existing political support for the strategies can endure. Similarly, PRSPs in Latin America and elsewhere have been weak in integrating broader macroeconomic policies to sector policies aiming at enhancing human development and achievement of the MDGs (Vandemoortele & Roy, 2004; Vandemoortele, 2009). The analytical aspects of such macroeconomic trade-offs, including Dutch disease effects which may emerge from significantly scaling up public expenditures for social sectors, have been conceptualized in several studies (e.g. Bourguignon & Sundberg, 2006). Empirically, the importance of short- and medium-term macroeconomic adjustment effects of development strategies built on enhanced public investment in human development has been assessed in a recent study for 18 countries in Latin America and the Caribbean (Vos et al., 2008). The study used a macro-micro economy-wide framework to assess feasible financing strategies to achieve the MDGs in these countries. The present chapter extends this model-based analysis for Bolivia, Honduras and Nicaragua by considering the impact of the 2008–2009 crisis.

### *Model Framework*

The economy-wide model framework accounts for both the microeconomic determinants of needs satisfaction in education, health, drinking water and basic sanitation, and macroeconomic trade-offs in the financing of public spending options aimed at satisfying those needs. The analysis further considers synergies between degrees of progress towards education, health, access to drinking water and basic sanitation, and reduction of income poverty. First, the model framework builds on in-depth microeconomic and sector analyses of determinants of outcomes for MDG 2 (universal primary school completion), MDG 4 (reducing child mortality), MDG 5 (reducing maternal mortality) and MDG 7 (increasing access to drinking water and basic sanitation). Considering each country-specific context, human capital models were estimated to identify the influence of both supply and demand factors on outcomes in education, health, drinking water and sanitation. Regarding MDG 2, the demand for primary and

other levels of schooling is modelled as a function of student behaviour (enrolment, repetition, graduation). Student behaviour, in turn, depends on the quality of education (identified by variables such as classroom availability and student-teacher ratios), the income incentives (the expected wage premium from education), the under-five mortality rate (a proxy for the health status of the student population), household consumption per capita (a proxy for the capacity to pay for education and opportunity costs) and the level of public infrastructure (a proxy for the effective distance to school). Regarding MDGs 4 and 5, under-five and maternal mortality are determined by the availability of public and private health services, household consumption per capita, the level of public infrastructure (a proxy for the effective distance to health centres and hospitals) and the coverage of water and sanitation services. Access to drinking water and basic sanitation was modelled as a function of household consumption per capita, the provision of such services by public or private providers and the level of public infrastructure. Country-specific conditions were considered in all case studies through adding additional explanatory and control variables.

Second, the findings of the analysis of MDG determinants are subsequently inserted into a dynamic computable general equilibrium (CGE) model. The framework, labelled MAMS (***Ma****quette* for **M**DG **S**imulation), was originally presented in Lofgren (2004) and subsequently adapted and improved to fit specific country contexts in Latin America. MAMS has been built from a fairly standard CGE framework with dynamic-recursive features, but incorporates a unique module which specifies the main determinants of MDG achievement along the lines exposed above.[2] MAMS is designed to perform policy experiments (such as testing alternative financing scenarios) that consider the economy-wide implications of scaling up public expenditures in order to reach the MDGs. The parameters of the MDG module determine to what extent more spending on education, health and water and sanitation directly impact on MDG achievement, as well as in what degree these are influenced through second-round effects, including adjustments in prices and household incomes. In turn, MDG achievements, especially education, influence economy-wide outcomes dynamically over time through changes in the composition in labour supply and through the impact on productivity. The model is further designed to assess macroeconomic trade-offs, such as Dutch disease effects, high

[2] See Lofgren and Díaz-Bonilla (2008) for a detailed formal description of MAMS as applied here.

public indebtedness affecting private investment and growth, and supply constraints in different labour market segments.

Third, the achievement of the goal for reducing income poverty is defined in the integrated macro-micro framework as a function of the overall general equilibrium effects from dynamic adjustments in production, employment, wages and other relative prices, as well as changes in the quality of human capital through MDG-related expenditures. The final outcome for income poverty can be estimated by looking at the outcomes for per capita household income and consumption for different household groups. However, MAMS, alike most other CGE models, only specifies a limited number of representative households. This provides insufficient detail regarding household income distribution for making robust statements regarding the poverty outcomes. Therefore, the CGE analysis is supplemented by a microsimulations methodology that takes the labour market outcomes (unemployment, employment structure, relative remunerations and skill composition) from the CGE for different types of workers and applies them to a micro data set (such as a household survey) to obtain the required details about income distribution for the poverty analysis. This approach follows a recent tradition of combining economy-wide modelling instruments and with micro-level data of the full income distribution as developed by, among others, Bourguignon and others (2002) and Ganuza and others (2002). The non-parametric approach of the latter has been followed here and is linked in top-down fashion to outcomes from the CGE model simulations; that is, labour market results of the CGE model are imposed on micro data from household surveys, but there is no further feedback from the poverty and inequality outcomes to the CGE model.

### *Pre-crisis Business as Usual Is Not Good Enough*

The analysis uses two alternative baselines as benchmarks. The first states that continued pre-crisis growth would be sustained until 2015 and that public spending would evolve along pre-crisis trends and unchanged policies. The second, discussed below, takes the disruptive effects of the 2008–2009 recession into account. Even under the pre-crisis baseline trends and assumptions, none of the selected MDGs for Bolivia would be achieved by 2015 (see Table 5). Using the pre-crisis baseline average growth trend of 4% per year, the extreme poverty incidence would drop from 27% in the base year (2000) to 21.4% in 2015, well short of the

14.5% target. The share of children in primary school age that enrol in and complete school would rise to 93%; infant mortality would fall to 40 infants per 1000 live births (the target being 30); maternal mortality is reduced to 159 per 100,000 live births (a figure that is higher than the target of 104); and, the coverage for water and sanitation increases, but stays, respectively, around 2 and 7 percentage points short of the target. Also in Nicaragua and Honduras, progress towards the MDGs would fall well short of the targets in the pre-crisis baseline (Table 5).

### *Crisis and the MDGs*

In the alternative "crisis" baseline scenarios, upward trends in real GDP (at factor cost) and real public spending are interrupted in 2009–2010 and are assumed to recover only slowly and gradually towards pre-crisis growth levels by 2015.[3] Continued weaknesses in the global economy are expected to prevail in the coming years (United Nations, 2010b; IMF, 2010), and it is assumed that this will also affect the three countries. The projected recession in 2009 and 2010 followed by a slow recovery would put Bolivia, Honduras and Nicaragua substantially further off track towards the MDGs. As shown in Fig. 1, there would be substantial setbacks for primary school completion, child and maternal mortality. Primary school completion rates would be more than 9% less in Nicaragua as compared with the pre-crisis baseline and about 5% less in Bolivia. Health indicators would be affected more strongly in Bolivia with progress in reducing child mortality slowed by 17%, and that in reducing maternal mortality by more than 21%. While not as severe as in Bolivia, Honduras and Nicaragua experienced visible setbacks in the progress towards MDGs 4 and 5. Progress towards the targets for increasing access to drinking water and sanitation likewise declined, as shown in Table 5.

The model analysis suggests further that the crisis would not have a major impact on unemployment, as overall open unemployment rates would remain virtually unchanged in the three countries. This outcome is

[3] In the most recent estimates and forecasts 2009–2010 of the United Nations (2010b), growth in Nicaragua decelerated by 5 percentage points in 2009 from the previous year and the economy contracted by 2.1% and a modest recovery of growth to 2.0% is projected for 2010. Growth in Honduras decelerated by 7 percentage points and the economy contracted by 3% in 2009, and the projected recovery is 3% in 2010. Bolivia shows a milder growth deceleration (3 percentage points) in 2009, but growth is projected to stay well below pre-crisis growth rates in the years to come.

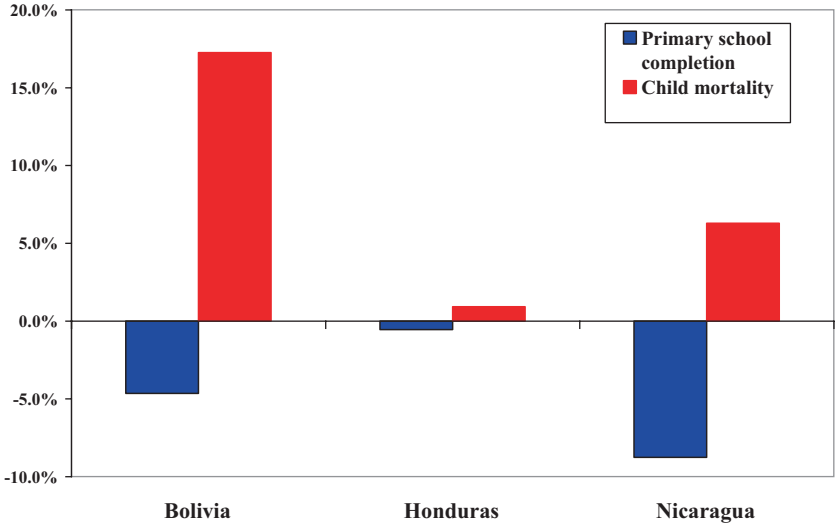


**Fig. 1** Impact of the crisis on primary school completion and child mortality rates by 2015 in selected Latin American countries (percentage change). (Source: Vos et al. (2008) for the pre-crisis scenarios and Sánchez and Vos (2009) for the crisis scenarios. Results refer to percentage change in primary school completion rates and child mortality rates, respectively, comparing outcomes for crisis and pre-crisis baseline scenarios by 2015. The pre-crisis scenario assumes continued growth trends for GDP and public spending up to 2015 from around 2000 to 2007. The crisis baseline scenario assumes significant growth deceleration for GDP and public spending during 2009 and 2010 and gradual recovery from 2011 to return to pre-crisis growth rates by 2015)

induced by the models' assumption of the existence of segmented labour markets with the informal sector acting as residual employer, absorbing mostly unskilled workers. In fact, the results of Table 3 indicate that aggregate employment would grow even faster in the crisis scenario as compared with pre-crisis conditions on account of increased absorption of unskilled workers. This might be consistent with two likely crisis impacts: first, fewer children would enrol or stay in the schooling system and enter the labour market at the bottom end; and, second—as has happened in previous crises—layoffs in modern sectors lead to increased informal sector employment rather than pushing up unemployment. Further, growth

**Table 3** Simulated impact of the crisis on employment and real labour incomes[a] in Bolivia, Honduras and Nicaragua, 2010–2015

| | *Bolivia* | *Honduras* | *Nicaragua* |
|---|---|---|---|
| Crisis impact on employment level | 0.1 | 0.9 | 0.0 |
| Workers with less than completed secondary education | 0.2 | 1.4 | 0.4 |
| Workers with completed secondary education | 0.0 | -0.6 | -0.9 |
| Workers with completed tertiary education | -0.2 | -0.2 | -1.4 |
| Crisis impact on real labour income per worker | -2.2 | -3.4 | -1.0 |
| Workers with primary education or less | -2.0 | -3.7 | -1.2 |
| Workers with (some) secondary education | -1.8 | -1.3 | -0.2 |
| Workers with (some) tertiary education | -2.1 | -3.2 | 0.0 |

Source: Model simulations with MAMS for Bolivia, Honduras and Nicaragua

Percentage point difference between average annual growth rates under crisis and pre-crisis baseline scenarios

[a]Average income per (type of) worker deflated by consumer price index

in real wages and other labour incomes would drop well below pre-crisis levels. In Honduras and Nicaragua, unskilled workers would suffer most from downward pressure on labour income in line with aforementioned employment effects. In Nicaragua, skilled workers would, on average, not feel strong negative real income effects because of institutional wage setting in most modern sectors, as assumed in the country model that was based on observed reality (see Sánchez & Vos, 2008). In Bolivia, negative real wage effects would be fairly similar across types of workers as greater wage flexibility is assumed to exist in the country's labour market. These labour market outcomes would suggest that the crisis will significantly slow any progress in poverty reduction in the three countries, but most strongly in Honduras where informal sector employment gains for unskilled workers would be more than offset by strong average income losses for workers in that labour market segment.[4] Also in Bolivia and Nicaragua, slight employment gains for the working poor would be offset by stronger rates of real income losses.

[4] Unfortunately, microsimulations could not be run for the crisis scenarios at the time of preparing this chapter, failing timely renewed access to relevant household surveys for the three countries. In the case of Honduras, the target might be met in the pre-crisis MDG scenario, if scaled up MDG spending is accompanied by a large-scale public investment programme. See Bussolo and Medvedev (2008).

### *Costs of Achieving the MDGs by 2015*

To make up for lost MDG progress owing to the crisis, the governments of Bolivia, Honduras and Nicaragua would need to spend an extra 1.6 (Bolivia) to 3.4% (Honduras) of post-crisis GDP per year on education, health and basic services between 2010 and 2015 in order to achieve the MDGs, as compared with the pre-crisis scenario (see Fig. 2 and Table 6). This would come on top of an additional required annual social spending of 2% of GDP in Bolivia, 5% in Nicaragua and 7% in Honduras in absence of the crisis. The differences in required spending across the three

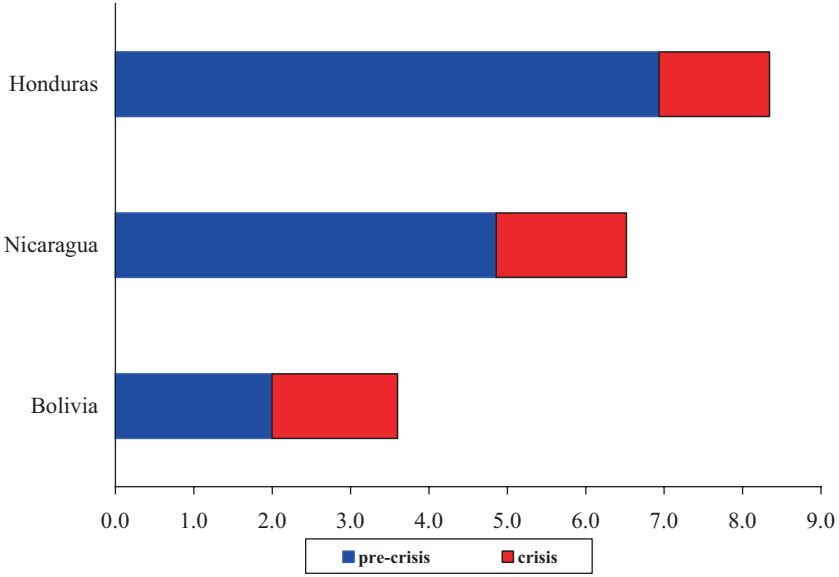


**Fig. 2** Additional public spending for MDGs needed to achieve education, health and water and sanitation targets by 2015 (percentage of GDP; average annual cost for 2010–2015). (Source: Vos et al. (2008) for the pre-crisis scenarios and Sánchez and Vos (2009) for the crisis scenarios. Estimates refer to the difference between the levels of public spending needed to achieve the targets by 2015 in the MDG scenario with foreign borrowing and the baseline scenario under both pre-crisis and crisis baseline assumptions. MDG targets are for primary school completion (100%), child and maternal mortality (two-third and three-quarter reductions, respectively, from 1990 levels), and drinking water and sanitation (reducing people without access by half))

countries are explained by differences in the gaps that must be bridged to achieve the MDGs, different degrees in existing efficiency in social expenditures (and hence differences in MDG-cost functions) and different impacts of general equilibrium effects due to differences in economic structure. Yet, in all cases it holds that the additional costs of achieving the MDGs would stretch government finances as discussed below.

### *MDG Spending and Pro-poor Economic Recovery?*

Further analysis shows that increased social spending as part of the MDG strategy is countercyclical and would contribute to growth recovery, albeit not enough to return swiftly to pre-crisis levels of economic growth and employment (see Fig. 3). Not surprisingly, the short-term countercyclical effects of the MDG strategy spending are strongest where the required increase in public spending is largest, which is the case for Honduras. In the case of Nicaragua, however, multiplier effects from fiscal stimulus in the form of higher social spending are weaker because of stronger "Dutch disease" effects visible in strong real exchange-rate appreciation and weaker export growth which in turn partially offsets the initial aggregate demand impulse. The countercyclical response becomes much stronger if the MDG strategy is complemented by much-needed investments in public infrastructure in these countries, as is shown in Fig. 3. In the cases of Bolivia and Nicaragua, the domestic stimulus would be insufficient. As a result, external factors, especially a rebound in global demand to facilitate a resumption of export growth, would be needed for a return to pre-crisis growth rates. In Honduras, the low efficiency in public spending would require a larger fiscal stimulus for achieving the MDGs. This could suffice for achieving full recovery, but at cost of greater losses in export competitiveness and unskilled worker employment, as well as other trade-offs.

The stimulus through increases in MDG-related spending would yield very modest aggregate employment effects. However, real labour income effects are more significant and would offset making up part of the crisis-induced setbacks in poverty reduction. The labour market outcomes shown in the top half of Table 4 are the difference in the rates of growth in employment and real wage growth (in the scenario of scaling up MDG spending and infrastructure investment, called "MDG+") and those in the crisis baseline scenario. However, compared with the pre-crisis MDG scenario outcomes, the employment, and in particular real wage growth, would be much weaker in this countercyclical scenario and therefore be

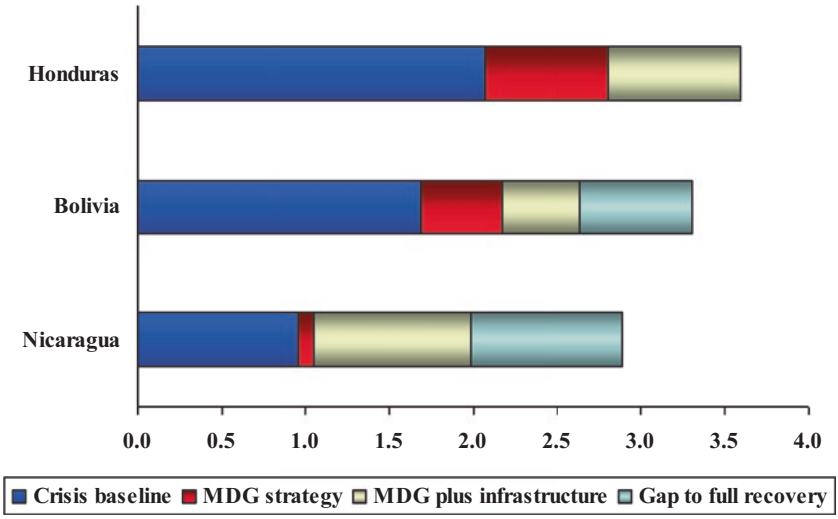


**Fig. 3** Simulated countercyclical impact of increased MDG and public infrastructure spending on GDP growth, 2010–2015 (average annual rate of growth in per cent). (Source: Vos et al. (2008) for the pre-crisis scenarios and Sánchez and Vos (2009) for the crisis scenarios. For this figure the MDG strategy is one in which all additional public spending for MDGs needed to achieve education, health, and water and sanitation targets by 2015 is financed through foreign borrowing. The gap to full recovery is the difference between the pre-crisis rate of GDP growth and the simulated rate of GDP growth in the scenario of increased public spending for MDG achievement and expansion of infrastructure)

expected to produce weaker poverty reduction effects. This outcome is consistent with the previous finding that, except in the case of Honduras, the aggregate growth effects of the simulated fiscal stimulus would fall short of reaching full economic recovery.

Even under the pre-crisis MDG scenarios, the three countries would fail to meet the poverty reduction targets (see Vos et al., 2008). Consequently, given the indicated labour market outcomes discussed above, the MDG-oriented fiscal stimulus should be expected to be insufficient to meet the poverty reduction targets in the three countries by 2015. It should be noted that the CGE models for the three countries assume that total factor productivity effects from enhanced levels of human capital and infrastructure availability would kick in beyond 2015. This is

**Table 4** Crisis and pre-crisis MDG scenarios and stimulus effects on employment and real labour incomes[a] in Bolivia, Honduras and Nicaragua, 2010–2015

| | *Bolivia* | *Honduras* | *Nicaragua* |
|---|---|---|---|
| **Comparison MDG+[b] and crisis baseline scenarios** | | | |
| Effect MDG+ scenario on employment | 0.3 | -0.5 | 0.1 |
| Workers with less than completed secondary education | 0.2 | -1.2 | -0.1 |
| Workers with completed secondary education | 0.3 | 1.9 | 0.9 |
| Workers with completed tertiary education | 0.4 | 0.1 | 0.8 |
| Effect MDG+ scenario on real labour incomes | 0.3 | 2.4 | 0.4 |
| Workers with primary education or less | 1.1 | 3.2 | 0.8 |
| Workers with (some) secondary education | 0.6 | -0.7 | -0.5 |
| Workers with (some) tertiary education | -0.3 | 2.5 | -0.5 |
| **Comparison crisis MDG+ and pre-crisis MDG scenarios** | | | |
| Effect MDG+ scenario on employment | 0.0 | 0.1 | -0.2 |
| Workers with less than completed secondary education | 0.0 | 0.1 | 0.0 |
| Workers with completed secondary education | 0.1 | 0.0 | -0.4 |
| Workers with completed tertiary education | -0.1 | -0.2 | -0.9 |
| Effect MDG+ scenario on real labour incomes | -0.6 | -1.4 | -0.3 |
| Workers with primary education or less | -0.8 | -1.3 | -0.2 |
| Workers with (some) secondary education | -0.7 | -1.0 | -0.1 |
| Workers with (some) tertiary education | -0.4 | -1.7 | -0.1 |

Source: Vos et al. (2008) for the pre-crisis scenarios and Sánchez and Vos (2009) for the crisis scenarios

Percentage point difference between average annual growth rates under crisis and pre-crisis baseline scenarios

[a]Average income per (type of) worker deflated by consumer price index

[b]"MDG+" refers to scenarios under which MDGs 2, 4, 5 and 7 are achieved plus additional investments in infrastructure, as explained in the text

not unrealistic since many more children will need to have completed at least 12 years of primary and secondary school cycles before making a significant impact on the average skill level of the total labour force.

Meanwhile, many infrastructure projects have long gestation lags and yield productivity effects only once certain thresholds are achieved. The upshot is that there could be a trade-off in the short run in trying to achieve the MDGs for education, health and drinking water, on the one hand, and the poverty reduction goal, on the other. More importantly, it suggests that the MDG strategy, through increased public spending on education and health services, and on water and sanitation, does not stimulate the required employment and income generation for the poor

needed to achieve poverty reduction targets. Hence, the countries would require complementary production sector and employment policies targeted at the poor.

### *Financing Scaled-up Social Spending*

The increase in the required additional spending to achieve the MDGs owing to the simulated effects of the crisis would likely make it implausible for the three countries to finance the MDG strategy by increasing either taxes or public borrowing. Based on Latin America's experience with tax reforms in recent decades, studies by Tanzi (2000) and McKinley (2007) suggest that the feasible range for raising the tax burden would be somewhere between 1.0 and 2.5% of GDP over a five to ten-year period. Above the upper bound, tax reform would be much more demanding, especially in political terms. With this in mind, the required increase in government revenue was estimated in a financing scenario where all required increase in social spending to reach the MDGs would be funded through taxation. In the model assessments undertaken here it is assumed that the increase in government revenue is to be achieved through an increase in income taxes which are generally low in the three countries. In the pre-crisis scenario, a fully tax-financed MDG strategy would require raising the income tax burden in Bolivia, Honduras and Nicaragua by, respectively, 2.9%, 10.0% and 3.9% of GDP on average per annum during 2010 and 2015, which would seem a tall order in each case. In the crisis scenarios, even bigger increases would be required: 4.3%, 13.2% and 6.4%, respectively, of GDP (see Table 7). Mere reliance on tax financing of the MDG strategy thus would not seem to be a feasible option.

Public borrowing also appears difficult as it would increase debt (domestic or public) to unsustainable levels. In the pre-crisis scenarios, total public debt was found to rise to close to 100% of GDP or more under the domestic and foreign borrowing scenarios in Bolivia, Honduras and Nicaragua (see Table 7). This clearly would put public indebtedness beyond critical levels of sustainability—even under the much higher growth paths of the pre-crisis scenarios. The debt outlook worsens when the effects of the crisis are taken into account since, as explained earlier, the amount of spending that needs to be financed increases.

Given these expected financing constraints, Bolivia, Honduras, and Nicaragua would continue having to rely heavily on official development assistance to finance their PRSPs and the scaled-up social spending for the achievement of the MDGs. Though helping to overcome financing constraints, the additional inflow of aid would still generate upward pressure on the exchange rate, which in turn would reduce export competitiveness and call for supplementary macroeconomic and industrial policies. Preferably though, the three countries could negotiate with donors on the basis of a mixed strategy of domestic resource mobilization and external financing. Furthermore, the substantial differences in MDG costs would suggest there is considerable scope for improving the efficiency and effectiveness of social spending, as also suggested in other studies for these countries and elsewhere (see e.g. De Jong et al., 2006). Honduras, in particular, could earn much additional fiscal space from making its social service delivery more efficient.

## 4 Conclusions and Policy Implications

The PRSPs and national development strategies of Bolivia, Honduras and Nicaragua have emphasized both policies aimed at higher rates of economic growth and enhanced human development, and the achievement of the MDGs. The strategy papers took as a given that both goals would be achievable simultaneously and within a set time frame. Yet, little attention was paid to the possible macroeconomic trade-offs and inter-temporal financing constraints that might emerge from the strategies. As the analysis of this paper has shown, macroeconomic financing constraints could become an impediment to the achievement of human development goals and poverty reduction targets. The debt relief obtained is no guarantee that sufficient fiscal space is available to finance the ambitious poverty reduction and national development strategies. Important financing constraints remain, and these have been exacerbated by the global crisis. The model simulations presented in Sect. 3 suggest that, during 2010–2015, the governments of Bolivia, Honduras and Nicaragua would need to spend an additional 3–10% of GDP per year on education, health and basic services in order to achieve the MDGs. The crisis would account for between 1.6 and 3.4 percentage points of GDP of the required spending

increase. If recovery and sustained growth do not set in swiftly and if countries are not strongly supported by the donor community, additional costs of this magnitude may stretch government finances, lead to unsustainable increases in public debt, and become a source of macroeconomic instability in the future.

The model-based analysis also shows that increased social spending would contribute to economic growth recovery, but not sufficiently return to pre-crisis levels of GDP and employment growth. This is because stimulus through fiscal spending is partly offset in the short run by decreased private sector demand and by a loss in export competitiveness. Stronger growth effects are likely to emerge over time only, especially once improved education and health outcomes start making an impact on factor productivity. The countercyclical response becomes much stronger if the MDG strategy is complemented by needed investments in public infrastructure. For a full recovery, however, other factors apply, especially the resumption of export demand. This will require globally concerted stimulus measures to take effect.

Non-debt creating development assistance will be required to provide the needed fiscal space, and to avoid an insurmountable rise in public debt in Bolivia, Honduras and Nicaragua alike. Careful macroeconomic management would nonetheless be required to avoid growth costs elsewhere in the economy—especially a loss of competitiveness in export sectors owing to appreciation of the real exchange. The disappointing experience with PRSPs and national development strategies does not give rise to much optimism that such conditions can be created easily. Dijkstra and Komives (2008) concluded that the PRSPs generated little ownership with national governments and that the debt relief and additional aid flows came with too many policy conditions attached. National policy makers should first agree on how they wish to pursue their national development goals and define a medium-term macroeconomic policy and budget framework in line with those goals. This should also lead to transparent rules for countercyclical policy responses to better cope with external shocks and to facilitate sustaining more adequate levels of long-term investment and social spending. With such a framework in place, governments would be able to coherently determine needs for external development finance, while donors would be able to decide on providing such support without a need to impose any particular policy conditionality on the recipient countries.

# Appendix

**Table 5** Achievement of the MDGs under pre-crisis and crisis baseline scenarios in Bolivia, Honduras and Nicaragua, 2015

| *Country* | *MDG 2* | | *MDG 4* | | *MDG 5*[a] | | *MDG 7a* | | *MDG 7b* | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Indicator*[b] | *Target* | *Indicator*[c] | *Target* | *Indicator*[d] | *Target* | *Indicator*[e] | *Target* | *Indicator*[f] | *Target* |
| Bolivia | | | | | | | | | | |
| – Pre-crisis scenarios[g] | 93.4 | 100.0 | 40.0 | 30.0 | – | – | 76.1 | 79.0 | 57.1 | 64.0 |
| – Crisis scenarios 1[h] | 89.1 | 100.0 | 46.9 | 30.0 | – | – | 72.2 | 79.0 | 46.3 | 64.0 |
| Honduras | | | | | | | | | | |
| – Pre-crisis scenarios[g] | 90.7 | 100.0 | 32.6 | 24.0 | 90.0 | 69.9 | 85.2 | 95.0 | 81.5 | 95.0 |
| – Crisis scenarios 1[h] | 90.2 | 100.0 | 32.9 | 24.0 | 90.5 | 69.9 | 84.9 | 95.0 | 81.3 | 95.0 |
| Nicaragua | | | | | | | | | | |
| – Pre-crisis scenarios[g] | 71.9 | 100.0 | 24.3 | 22.7 | 48.9 | 40.0 | 83.3 | 85.3 | 65.4 | 72.5 |
| – Crisis scenarios 1[h] | 65.6 | 100.0 | 25.8 | 22.7 | 57.9 | 40.0 | 83.0 | 85.3 | 63.7 | 72.5 |

Source: Vos and others (2008) for the pre-crisis scenarios and authors' MAMS simulation results for the crisis scenarios

[a]Entries have been left blank for Bolivia where data constraints did not allow to study the impact on maternal mortality (MDG 5)

[b]On-time primary school completion rate

[c]Under-five mortality rate (per 1000 live births). For Bolivia, the indicator is the infant (under-one) mortality rate

[d]Maternal mortality rate (per 100,000 live births)

[e]Percentage of the population without sustainable access to safe drinking water

[f]Percentage of the population without sustainable access to basic sanitation

[g]Baseline and MDG financing scenarios as reported in the study of Vos and others (2008)

[h]Scenarios based on a baseline whereby real GDP (at factor cost) and real public spending do not to grow in 2009–2010 and recover steadily from 2011 until converging to the pre-crisis annual average growth rate by 2015

**Table 6** Required additional public spending for achieving the MDGs[a] under alternative financing scenarios in Bolivia, Honduras and Nicaragua, 2010–2015 (*percentage of GDP*)

| | *Public spending in BAU scenario* | | *Required additional public spending* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | *MDG scenario with foreign grants* | | *MDG scenario with income taxes* | | *MDG scenario with foreign borrowing* | | *MDG scenario with domestic borrowing* | |
| | *Total* | *MDG-related*[b] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] |
| Bolivia | | | | | | | | | | |
| – Pre-crisis scenarios[d] | 17.5 | 4.1 | 1.3 | 1.5 | 3.4 | 3.5 | 1.8 | 2.0 | 3.4 | 3.5 |
| – Crisis scenarios 1[e] | 15.4 | 4.1 | 3.3 | 3.6 | 4.1 | 4.3 | 3.3 | 3.6 | 3.3 | 3.6 |
| – Crisis scenarios 2[f] | 15.4 | 4.1 | 5.8 | 2.9 | 6.5 | 3.6 | 5.8 | 2.9 | 5.8 | 2.9 |
| Honduras | | | | | | | | | | |
| – Pre-crisis scenarios[d] | 18.5 | 7.3 | 6.9 | 6.9 | 7.4 | 7.3 | 6.9 | 6.9 | 7.4 | 7.3 |
| – Crisis scenarios 1[e] | 21.6 | 8.5 | 8.3 | 8.3 | 8.7 | 8.7 | 8.3 | 8.3 | 8.7 | 8.7 |
| – Crisis scenarios 2[f] | 21.6 | 8.5 | 10.1 | 7.3 | 10.4 | 7.7 | 10.1 | 7.3 | 10.4 | 7.7 |
| Nicaragua | | | | | | | | | | |
| – Pre-crisis scenarios[d] | 30.2 | 6.6 | 4.1 | 4.9 | 5.3 | 6.1 | 4.1 | 4.9 | 7.3 | 6.4 |
| – Crisis scenarios 1[e] | 24.3 | 5.3 | 5.8 | 6.5 | 7.4 | 8.1 | 5.8 | 6.5 | 10.1 | 9.0 |
| – Crisis scenarios 2[f] | 24.3 | 5.3 | 6.6 | 4.8 | 8.2 | 6.4 | 6.6 | 4.8 | 10.5 | 7.1 |

(*continued*)

**Table 6** (continued)

| *Public spending in BAU scenario* | | *Required additional public spending* | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *MDG scenario with foreign grants* | | *MDG scenario with income taxes* | | *MDG scenario with foreign borrowing* | | *MDG scenario with domestic borrowing* | |
| *Total* | *MDG-related*[b] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] | *Total*[c] | *MDG-related*[c] |

Source: Vos and others (2008) for the pre-crisis scenarios and authors' MAMS simulation results for the crisis scenarios

[a]The MDGs being achieved by 2015 are the following: MDG 2 (100% on-time primary school completion rates for the relevant age cohort), MDG 4 (reduction of the under-five mortality rate by two-thirds from 1990), MDG 5 (reduction of the maternal mortality ratio by three-quarters from 1990) and MDG 7 (reduction of the proportion of people without sustainable access to safe drinking water and basic sanitation)

[b]MDG-related public spending comprises final-consumption and investment spending in primary education, health, and water and sanitation

[c]Annual average public spending under the respective MDGs financing scenario minus the annual average public spending under the baseline scenario, all in percentage points of GDP. The additional public spending for achieving MDG 5 is not accounted for in the cases of Bolivia and Brazil. Some entries have been left blank because the MDG scenario with foreign grants is irrelevant in the context of the country

[d]Baseline and MDG financing scenarios as reported in the study of Vos and others (2008)

[e]Scenarios based on a baseline whereby real GDP (at factor cost) and real public spending do not to grow in 2009–2010 and recover steadily from 2011 until converging to the pre-crisis annual average growth rate by 2015

[f]These are the "crisis scenarios" assuming also that public spending on non-MDG public infrastructure is 3 percentage points of GDP higher during 2010–2015

**Table 7** Annual average income tax revenue (2010–2015) and total stock of public debt (2015) under the baseline and MDG financing scenarios in Bolivia, Honduras and Nicaragua (percentage of GDP)

| | *BAU scenario* | | *MDG scenario with income taxes* | | *MDG scenario with foreign borrowing* | | *MDG scenario with domestic borrowing* | |
|---|---|---|---|---|---|---|---|---|
| | *Revenue* | *Debt* | *Revenue* | *Debt* | *Revenue* | *Debt* | *Revenue* | *Debt* |
| Bolivia | | | | | | | | |
| – Pre-crisis scenarios[a] | 8.1 | 52.4 | 11.0 | 51.6 | 8.1 | 95.6 | 8.1 | 111.4 |
| – Crisis scenarios 1[b] | 6.1 | 57.0 | 10.4 | 54.8 | 6.1 | 116.1 | 6.1 | 116.1 |
| – Crisis scenarios 2[c] | 6.1 | 57.0 | 10.5 | 52.5 | 6.1 | 126.9 | 6.1 | 126.9 |
| Honduras | | | | | | | | |
| – Pre-crisis scenarios[a] | 8.6 | 68.8 | 18.6 | 66.4 | 8.4 | 112.6 | 8.7 | 131.0 |
| – Crisis scenarios 1[b] | 10.2 | 79.8 | 21.0 | 76.7 | 9.9 | 124.8 | 10.4 | 149.1 |
| – Crisis scenarios 2[c] | 10.2 | 79.8 | 22.6 | 75.1 | 9.8 | 128.4 | 10.3 | 153.5 |
| Nicaragua | | | | | | | | |
| – Pre-crisis scenarios[a] | 2.6 | 127.8 | 6.5 | 124.6 | 2.6 | 158.3 | 2.7 | 192.7 |
| – Crisis scenarios 1[b] | 2.7 | 137.8 | 9.1 | 133.5 | 3.6 | 175.5 | 3.7 | 224.0 |
| – Crisis scenarios 2[c] | 3.2 | 137.8 | 10.0 | 131.8 | 4.2 | 174.3 | 3.8 | 221.1 |

Source: Vos and others (2008) for the pre-crisis scenarios and authors' MAMS simulation results for the crisis scenarios

[a]Baseline and MDG financing scenarios as reported in the study of Vos and others (2008)

[b]Scenarios based on a baseline whereby real GDP (at factor cost) and real public spending do not to grow in 2009–2010 and recover steadily from 2011 until converging to the pre-crisis annual average growth rate by 2015

[c]These are the "crisis scenarios" assuming also that public spending on non-MDG public infrastructure is 3 percentage points of GDP higher during 2010–2015

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