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# Political Economy of Structural Change

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## 1 Introduction: Concepts and Definitions

This chapter reviews the contributions on structural economic dynamics and extracts from these to which extent one can use them to understand what we might subsume under the political economy of structural change. Let us start with a few definitions:

### 1.1 Structural Change and Structural Change Analysis

By structural change, we mean two things:

(i) changes in the composition of aggregates (industrial output, employment, consumption, exports, etc.)
(ii) structural shifts in behavioural relationships (this is often tested in econometric research).

Let us shortly explore these two types of structural change and look at their impacts on each other: compositional change takes place because either different components of an aggregate (such as different households, firms and

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employees) are exposed to different degrees to specific shocks or forces of change (as in Baumol 1967, or Pasinetti 1981, 1993).[1] Or, given the nature of these units, they might react in a differentiated manner even to the same type of shock or force of change (such as different households showing different responses in their savings behaviour to an inflation increase, or different firms responding differently to the opportunities opened up by IT). Given differentiated behaviour of subcomponents of an aggregate, the aggregate itself will show a change of behaviour as the composition (weights of the components in the aggregate) changes. Such a change can occur even without any change in behavioural specifications (i.e. the way how behaviour responds to a specific set of determinants) of the individual subcomponents of an aggregate. On the other hand, structural shifts in aggregate behaviour could be due to individual units of an aggregate changing their behaviour (e.g. households becoming more aware of the impact of inflation on their wealth positions and thus changing their spending–savings behaviour). Thus, aggregate behaviour might also change even when all individual units' behaviour is characterised by the same functional relationships and all individual units change their behaviour in the same way. In this very particular case, an aggregate model can indeed be represented by a representative agent as very often done in standard macroeconomic analysis. Structural shifts can then be analysed within such a framework based on micro-foundations of a 'representative agent' (econometric studies adopting this approach are common, such as Stock and Watson 1996; Peron 1997; Hansen 2001).

## 1.2 Relative Structural Invariance and Organisational Change

There is an additional element we shall emphasise in structural change analysis, namely that one can associate with structures a certain degree of resistance to change. The analysis of structural change thereby emphasises that structural change involves overcoming such resistances (see also Landesmann and Scazzieri 1990; Scazzieri 2009, where the authors develop the concept of 'relative structural invariance'). We consider the analysis of structural rigidities and the real-time pattern of overcoming these to be an integral part of the analysis of structural change.

[1]We shall use the notion of 'forces of change' to characterise variables (such as technical progress and demographic changes) that impact an economic system in a continuous manner (although often with varying strengths) over a longer period, while 'shocks' (or 'impulses') refer to more sudden impacts that act over a specific and shorter period.

Structural rigidities can be characterised as bounded sets of behavioural responses to shocks or forces of change in that—given the characteristics and strength of that shock or persistent force—behavioural units show specific reactions within bounds (think about employment-level decisions by employers in the wake of a downturn in demand or the willingness of employees or employee representatives to accept wage cuts in the face of higher levels of unemployment). As different decision-making units are characterised by narrower or wider boundaries of such behavioural responses over specific time frames, the impact of a shock or force will lead to elastic responses by these different units (i.e. more or less substantial deviations from their historical behaviour). These differentiated reaction patterns of subunits (or 'sub-systems'—see below under (iii))—give rise to a structured evolution of patterns of structural change in historical (i.e. 'real') time (as in Quadrio Curzio 1986).

Of course, structural change does not only occur in response to external shocks as change can also be initiated by the different units themselves, i.e. behavioural change can—and often does—occur because of learning processes or innovations that take place within or are initiated by these units. This brings us to the topic of organisations and organisational change and makes us ask why are organisations relevant for structural change analysis? Organisations are entities in which a tighter and more routinised pattern of interaction occurs between decision-making units than would be the case with entities outside the realm of any given organisation. There is, furthermore, more durability of 'within-organisation' interactions than of interactions of an organisation with the external environment (that includes of course interactions with other organisations). This durability also affects how an organisation reacts to external shocks or 'forces of change' and how it generates internal impulses of change. The study of organisational forms and of behavioural patterns of organisations are an important aspect of structural change analysis as the relative persistence of behavioural patterns within an organisation is one of the aspects to be considered when one attempts to analyse real-time reactions to external shocks or forces of change (Landesmann and Scazzieri 1996a, b). Returning to the issue of boundedness of behavioural responses by individual decision-making units to shocks or forces of change, we should therefore recognise that such individual decision-making units are embedded in organisational structures. Furthermore, their behaviour is regulated by a variety of institutional and legal constraints. This is an important feature of why we can speak of 'relative structural invariance' in the ways how political-economic systems respond to shocks or forces of change.

## 1.3 Structural Interdependencies, Decomposition and Structural Change

When we think of structure, we also think of structural interdependence, and many economic contributions to structural change analysis (multi-sectoral, multi-process and input-output analysis) emphasised the pattern of interrelationships between different sectors, activities, processes as well as between institutional entities (such as households, corporate sector, banks, government in national income accounting). The pattern of interrelationships can be described within a notional period (an accounting year such as in static input-output analysis) or could be tracked over time (e.g. stock-flow models of national accounting, dynamic input-output or von Neumann type models, traverse analysis).

An important further feature that characterises the way how economic analysis has captured patterns of interrelationships is to take account of decomposability, i.e. the different levels of intensity by which different parts of an economic system are related to each other. Important contributors to this analysis (see, e.g. Simon and Ando 1961; Simon 1962) have also emphasised that the intensity of interrelationships between subcomponents also has implications for the dynamic pattern by which systems react to shocks or forces of change. Authors such as Simon and Ando (1961) (but see also the contributions in the field of 'synergetics', as discussed in Haken 1984) would deduce from the differentiated intensities of interrelationships that the fastest interactions occur amongst units that are most strongly interrelated, to be followed by further rounds of interactions between units that are less strongly interrelated and so on. Simon gives the example of how heat disseminates in a house: first across rooms in a flat, then across flats on the same level, then across levels and so on.

At a more systemic level, we can think of an economy being made up of several subsystems. Each of the subsystems shows certain patterns of interrelationships amongst units of different degrees of intensity. Such economic systems might be completely decomposable (as in the case of economies consisting of the 'vertically integrated sectors' introduced in Pasinetti 1973) in that there are no overlaps amongst subsystems (with units only belonging to one or the other subsystem), or there might be overlaps (so that the same units belong to different subsystems even if the nature and the intensity of interrelationships would differ across subsystems). The dynamic of responses to shocks or forces of change (e.g. the diffusion of IT across enterprises within a sector and then across sectors) would be strongly affected by the differentiated nature of interrelationships within and across subsystems.

## 1.4 Structural Economic Dynamics

All the above is relevant for structural change analysis, but when we speak of 'structural economic dynamics' we would suggest that the term be reserved to investigate the role of structural change for the dynamics of the overall economic system. This means to examine cases in which, for example, a change in sectoral composition affects the aggregate growth dynamics of an economy (as in Baumol 1967), or structural rigidities affect the time-phased pattern of structural adjustment in an economic system (as in the contributions by Hicks 1973; Lowe 1976; Amendola and Gaffard 1998, which investigate the transitional paths, or 'traverses', from one dynamic trajectory to another). This link to aggregate economic dynamics demarcates—in our view—the analytical contributions in the field of structural economic dynamics.

Why can structural change be of fundamental importance to macrodynamic analysis? Firstly, changes in the composition of macroaggregates can be important to understand how aggregate variables develop dynamically. Secondly, the analysis of structural adjustment processes in the sense of overcoming relative structural invariance might again be an essential component to understand the movements in macroaggregates. Both these issues can also affect aggregate behavioural relationships (i.e. functional specifications and estimated parameter values) as outlined earlier on. Thus, without explicitly examining the structural change dimension we would not be able in such instances to understand the behaviour of macroaggregates. Thus, in a model in which a set of aggregate behavioural relationships represent the dynamic behaviour of an economy, both compositional changes and structural shifts (or structural breaks) in behavioural patterns could affect significantly the dynamic behaviour of the aggregate economy.

## 1.5 The Units of Analysis: Interrelatedness and Complexity

Structural change analysis usually occupies a meso-place between micro- and macro-economic analyses. It chooses certain aggregates as units of analysis but does not move all the way towards the aggregates that characterise much of macroeconomic analysis. How are aggregates chosen in structural change analysis that lead to 'classifications' in which individual observations (regarding, e.g. firms, households, employees with different skills, products, technologies) are grouped for theoretical or empirical research?

Well known are sector or industry classifications where the analysis of production activity is the focus of analysis. Also here there are different options: the focus could be on process technologies where sectors might be defined by the similarities in production technologies or techniques of production, or on the product basket produced by individual sectors or industries. Furthermore, the emphasis might be on an 'Austrian' perspective of describing production activity from its starting point of using primary factors of production (such as labour and natural resources) up to the production of the final product. Alternatively, the focus could be on analysing the interdependencies across production activity where different industries supply each other with intermediate inputs and capital goods and where the flow of production through the different stages of fabrication is pushed somewhat into the background (See the inter-industry emphasis of Piero Sraffa's (1960) *Production of Commodities by Means of Commodities* and the contributions in Baranzini et al. (2015), who highlight the distinction between 'horizontal' and 'vertical' integration).

However, there are many other classifications that might be useful to analyse the impact of our two notions of structural change (i.e. compositional and behavioural changes). For example, there could be a classification of households in terms of income or wealth classes, or by lifestyles (similarity of consumption patterns) or by age and gender composition; or, there could be analysis of the population by skill groups, employment status, age groups, etc.

If we find that there are behavioural differences across these different groups as they react to shocks or forces of change, or evolve differently in terms of innovative behavioural patterns, a classification of such units into distinct groups makes sense as there will be implications for the macro-behaviour of an economy. Overall, one can say that the choice of unit of analysis and therefore how one differentiates the aggregates in an economy into different groupings will be a function of what the focus of the analysis is (e.g. whether the focus is the impact of technological change, increasing international integration, business cycle dynamics, or changing lifestyles). In this chapter, we shall give examples of classifications adopted by different authors in their structural change analysis that were particularly useful or adequate for the questions they tried to address.

## 1.6 Political Economy of Structural Change

The 'political' in the expression 'political economy' means we are interested in structural change affecting the positions of social groupings (through

real incomes, income distribution, employment patterns, other aspects of welfare, their bargaining strength, etc.). This impact can in turn affect the political dynamic and the evolution of policies as political interventions of social groups (i) can influence the pattern of structural change and economic growth and this (ii) again affects the position of social groupings.

Political economy of structural change thus analyses, firstly, the positions of social groupings (the classics would often have spoken of 'classes') in the structural set-up of an economy; secondly, how these positions are affected by patterns of structural change; and thirdly, how social groupings through their actions intervene in the structural dynamic of an economy.

In classical writings, the position of social groupings in the structural set-up of an economy refers to their involvement in different sectors of the economy (in sectors such as agriculture, manufacture and trade as workers, owners of capital or of land, traders) and as receivers of certain types of incomes (wages, profits, rents, trade margins). The analysis then extends to the types of roles social groups play in and for different sectors of the economy (as workers, investors, consumers of different goods and services) and how they thereby shape the sectoral dynamic of the economy and thus also its sectoral composition. Lastly, the dynamic at sectoral level and the dynamic of the economy as a whole in turn affect the positions of social groups, and social groups might respond in one way or the other to the trajectories of structural change and the overall dynamic of the economy.

The following text will do the following. Firstly, we shall trace the various strands of structural economic dynamic analysis back to the classical economists and point to their political economy dimension. Secondly, we shall give an overview of more recent contributions to structural economic dynamics and attempt to analyse their political economy implications and how these could be further developed. Lastly, I shall make a bridge to current work by Ivano Cardinale and myself under the heading of 'structural political economy' (SPE) (see also his essay in this Handbook).

## 2 Political Economy of Structural Change in the Classical Economists

The interesting thing about the classical political economists' approaches to structural change is that they attempted to integrate two aspects of an economic and social system:

(i) The sectoral dimension which showed the position of different sectors in an economy, their interdependencies (horizontal and/or vertical) and their relative roles in the overall dynamic of the economy; and
(ii) The social dimension which attempted to look at different groups in society—defined in different ways by the different classical authors—in terms of their roles in social and economic reproduction.

Social and economic analysis was thus combined in the writings of the classical authors and this lent itself both to positive and to normative types of analyses.

A particularly central position in the sectoral/social structural analysis of the classical authors was occupied by the analysis of the 'viability' of an economic system. This meant investigating whether the sectoral and social interdependencies resulted in an economy that could expand, i.e. grow, or whether an economy was threatened by stagnation or even contraction that could lead to a serious social and political crisis. Furthermore, they examined which aspects contributed towards growth-propelling or growth-retarding features.

The assessment of the roles of sectors in productive activity and hence for the potential growth dynamics of an economic system differed across classical authors, and we shall explore this below. In the centre of attention of all authors in this respect were the contributions of productive sectors to the surplus (net product) that allowed an economy potentially to grow, that is, to generate investible resources that would contribute to the growth of productive capacity of an economy.

Classical authors made significant contributions to analysing the distinct production conditions in different sectors of the economy. Adam Smith analysed the scope for increasing returns in manufacturing (Smith 1976 [1776]); David Ricardo (1815) and Robert Malthus (1815) the phenomenon of decreasing returns in agriculture; Charles Babbage (1832) and Karl Marx (1867, 1978 [1885]) the additional productivity boost that would emerge from the shift from 'manu-facture' to 'machino-facture'. These insights led to assessing the differentiated contributions of different sectors of the economy towards productivity growth of the economy (measured in terms of the ratio of the 'net product' to total production). Furthermore, the analysis of sectoral interrelationships—either in a circular or in a stages-of-production manner—showed the impact that bottlenecks, resource

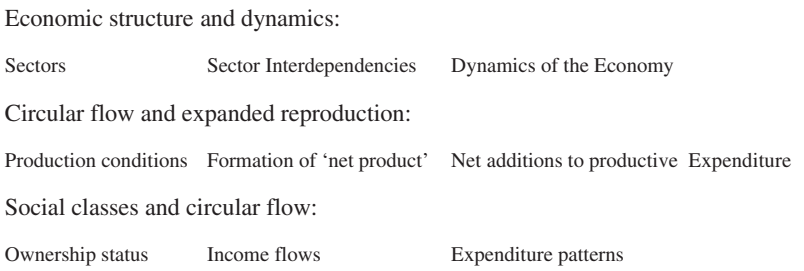


**Fig. 1** Sectoral-social structural analysis in the classical economists

and infrastructural constraints,[2] on the one hand, and differential sectoral productivity growth, on the other hand, could have on the dynamics of the economic system as a whole.

The positions of social groups were introduced in terms of their roles in the production process (as workers or owners of means of production), as recipients of income flows from productive activity and as groups determining through their spending behaviour the level and composition of expenditure in the economy. Social groups thus played their roles at each stage of the 'circular flow', i.e. in production, as receivers of income, and in expenditure.

While ownership status (of land and natural resources, of 'capital', i.e. means of production) was important as it determined the appropriation of the value of an economy's output by different social groupings, it was their pattern of expenditure that decided what went into investment (i.e. adding to productive capacity) and what went into final consumption (Fig. 1).

Appropriation of the economy's net output took the form of income distributional variables, such as wages, profits, rents and trade margins, and the expenditure from these income flows had, furthermore, implications for the sectoral composition of an economy. Production conditions in the different sectors, as well as the involvement of different groups in production activity, led furthermore to productivity-enhancing technological and organisational change. This in turn affected the growth dynamic of an economy.

Thus, the analysis in the classical writings was full of examples of why structural analysis was central to an understanding of macroeconomic

[2]Thus, both Francois Quesnay and Adam Smith pointed to the importance of building canals and other transport infrastructure to connect markets and thus widen the scope of production and market interrelationships within a country.

dynamics. In the following, we give some examples for this focus of their analysis:

## 2.1 Ranking of Sectors in Terms of 'Productiveness' and Economic Development

In the eighteenth century, several classical authors focused on successful and less successful development processes in the form of a stages theory of economic development (see Smith 1976 [1776]; Turgot 1769–1770; Ferguson 1767).[3] In these contributions, as already in the theories of the French Physiocrats (Quesnay 1758), an analysis of the 'relative productiveness' of different sectors (i.e. their ability to contribute to the economy's '*produit net*') played an important role. The authors suggested a hierarchy of sectors in terms of their contributions to an economy's level and rate of change of productivity, and hence their policy recommendation for a successful economic development policy was based on a sequential emphasis on different sectors of the economy as an economy progresses through development stages.

Thus, Adam Smith (1776, Book II, Chapter 5 and Book IV of the *Wealth of Nations*) suggested that the 'natural' sequencing of sectoral development should emphasise in initial stages of economic development (i.e. when the economy is still relatively poor) the development of agriculture. Why is this? There are various reasons for this: for one, agriculture produces the bulk of what is necessary for basic subsistence, food and the raw material for clothing and textile production. The other reason pertains to what Adam Smith thought was the high level of 'productiveness' in that sector. Smith employed in this part of his analysis a concept of 'productiveness' which amounted to an employment multiplier. He defined sectoral 'productiveness' as the amount of 'productive labourers' that a unit of investment could 'put into motion' (Smith, *Wealth of Nations*, 1776; 1976 edition, p. 362). By 'productive labour', Smith referred to work done that contributed to the production in an economy of a 'surplus'.

> …The profits of the farmer, of the manufacturer, of the merchant, and retailer, are all drawn from the price of the goods which the first two produce, and the two last buy and sell. Equal capitals, however, employed in each of those four

[3]The analysis of stages of economic development in classical political economy is a case in point (see e.g. Smith 1776, Book III 'Of the different Progress of Opulence in different Nations').

> different ways, will immediately put into motion very different quantities of productive labour, and augment too in very different proportions the value of the annual produce of the land and labour of the society to which they belong. (Smith, *Wealth of Nations*, 1776; 1976 edition, p. 362)

From this concept of 'productiveness', A. Smith suggested the following hierarchy of sectors:

Agriculture → Manufacturing → Wholesale and retail trade → Domestic transport → International transport (such as shipping)

To avoid too lengthy quotations, we single out the position of the merchants, manufacturers and farmers in complex inter-sectoral relationships, leading to the direct and indirect support of activities in other sectors as well as to the differential employment of 'productive' labour:

> The capital of the wholesale merchant replaces, together with their profits, the capitals of the farmers and manufacturers of whom he purchases the rude and manufactured produce which he deals in, and thereby enables them to continue their respective trades. It is by this service chiefly that he contributes indirectly to support the productive labour of the society, and to increase the value of its annual produce. His capital employs too the sailors and carriers who transport his goods from one place to another, and it augments the price of those goods by the value, not only of his profits, but of their wages. This is all the productive labour which it immediately puts into motion, and all the value which it immediately adds to the annual produce. Its operation in both these respects is a good deal superior to that of the capital of the retailer.
>
> Part of the capital of the master manufacturer is employed as a fixed capital in the instruments of trade, and replaces, together with its profits, that of some other artificer of whom he purchases them. Part of his circulating capital is employed in purchasing materials, and replaces, with their profits, the capitals of the farmers and miners of whom he purchases them. But a greater part of it is always, either annually, or in a much shorter period, distributed among the different workmen whom he employs. It augments the value of those materials by their wages, and by their [masters'] profits upon the whole stock of wages, materials and instruments of trade employed in the business. It puts immediately into motion, therefore, a much greater quantity of productive labour, and adds much greater value to the annual produce of the land and labour of the society, than an equal capital in the hands of any wholesale merchant.
>
> No equal capital puts into motion a greater quantity of productive labour than that of the farmer… In agriculture too nature labour along with man; and though her labour costs no expense, its produce has its value, as well as that of the most expensive workmen… The capital employed in agriculture, therefore, not only puts into motion a greater quantity of productive labour

> than any equal capital employed in manufactures, but in proportion too to the quantity of productive labour which it employs, it adds a much greater value to the annual produce of the land and labour of the country, to the real wealth and revenue of its inhabitants. (Smith, *Wealth of Nations*, 1776; 1976 edition, pp. 362–363).

Thus, when Smith distinguishes three types of employing capital, i.e. to cultivate land, process raw materials in manufacturing and transport and distribute the produced goods, he clearly suggests such a priority in sector development stemming from such a hierarchy in terms of 'productiveness'[4]:

> When the capital of any country is not sufficient for all those three purposes, in proportion as a greater share of it is employed in agriculture, the greater will be the quantity of productive labour which it puts into motion within the country; as will likewise be the value which its employment adds to the annual produce of the land and labour of the society. After agriculture, the capital employed in manufactures puts into motion the greatest quantity of productive labour, and adds the greatest value to the annual produce. That which is employed in the trade of exportation has the least effect of any of the three. (Smith, *Wealth of Nations*, 1776; 1976 edition, p. 366).

Francois Quesnay who took a more radical stance than Adam Smith on the relative 'productiveness' of different sectors talked similarly of a 'natural order' (*ordre naturel*) that ranked sectors according to their relative contributions towards the production of a net surplus in an economy. Such rankings and the detailed examination of the positions of different sectors in a scheme of inter-sectoral interdependence thus played an important role in a normative theory of prioritising sectors at different stages of economic development. The relative allocation of investible resources towards different sectors—while taking account of interdependencies between sectors—was crucial for the results an economy reaps in terms of overall economic growth. Ignoring the 'natural order' of differential sectoral patterns of development would lead to a lack of 'take-off' of growth or to non-sustainable patterns of economic and social development. Remarkable examples for the latter are the developments of the Northern German Hanse cities or some of

[4]See, however, Landesmann (1991) where a contradiction of two different concepts of 'productiveness' in Adam Smith, i.e. that of the employment multiplier and that of the more traditional productivity notion—output relative to inputs used—is explored.

the Northern Italian cities (Venice, Florence) that neglected the importance of development of the agricultural hinterland and moved too fast in their emphasis on international trade and building up large shipping fleets for international transport (see Smith 1776; 1976 edition, Books III and IV).

## 2.2 Production Conditions in Individual Sectors and Their Impact on Overall Dynamics

The detailed analysis of production conditions, pointing out the qualitatively different situation with respect to the scope for productivity growth in different sectors of the economy, was another feature of the classical multi-sectoral economic analysis. Thus, Adam Smith's analysis of the scope for division of labour in manufacturing in his example of the pin factory pointed to the increased potential for learning processes and the speeding up of throughput when production processes could be subdivided and workmen could concentrate on more narrowly defined tasks. There was saving of time compared to the old craftsman's workshop in which tasks had to be executed in sequence by the same workman, picking up alternative tools until the same unit of the product was completed. In such pre-industrial forms of production organisation, production could not proceed in a continuous flow but rather in batches. It required the higher scale of demand in the wake of the industrial revolution that provided the basis for dramatic increases in the scope for productivity improvements by exploring and installing new forms of production organisation (for a detailed account of different forms of production organisation, see Scazzieri 1993; Landesmann and Scazzieri 1996a).

The analysis by Adam Smith and other classical authors of productivity benefits that could be reaped from scale-dependent processes of learning and specialisation is an example of how the detailed assessment of the conditions of production in specific sectors—in this case manufacturing—could make an important contribution towards assessing the potential for growth in an economy and thus for macroeconomic dynamics. Charles Babbage and Karl Marx proceeded further in analysing the scope for productivity increases when the 'factory system' could reap additional economies of scale through an arrangement of fixed capital equipment in such a way that allowed a further massive increase in the throughput of material in an uninterrupted manner through its various fabrication stages (see Nicholas Georgescu-Roegen 1970, 1976; Landesmann 1986; Scazzieri 1993; Landesmann and Scazzieri 1996a, for an analytical treatment of the modern factory system).

David Ricardo and Thomas Robert Malthus made another famous contribution towards the detailed analysis of the conditions in another sector vital for the dynamics of the economic system, namely in agriculture and in other natural resource-based industries (such as mining). It was their well-known analysis of decreasing returns in sectors that faced a 'natural grading' of production facilities where nature imposed the constraint of the limited availability of different essential production inputs (such as lands of different soil quality or ease of cultivation). The insights gained by these authors in their analysis of intensive and extensive rents (see Ricardo 1815; Malthus 1815) was again of extreme importance for analysing the potential impact of production conditions specific to particular sectors for the dynamics of the economy. In fact, David Ricardo warned of the prospects of a zero-growth stationary state resulting from this sector-specific constraint in agriculture, a sector that was considered vital for producing the main food staple for the population as well as the raw materials to be processed and distributed by the other sectors of the economy.

We should not complete this section without mentioning that the classics also explored the nature of technological progress in relation to the specific conditions in productive sectors. An example is Francois Quesnay's analysis of the shift in agriculture from '*petite*' to '*grande culture*', i.e. the possibility of shifting from one ploughing technique to another when land gets consolidated in larger land holdings (allowing ploughs to be pulled by horses rather than cattle). Linked to this analysis was an identification of the incentives of different social groups—in Quesnay's case the '*metayer*', the tenants of agricultural plots, to invest part of their surplus into new agricultural techniques. We shall return to the role of social groups in the innovative process as part of the analysis of the 'political economy of structural change' in Sect. 3.4.

The classical economists developed also analytical techniques to study—what in modern parlance is called—'transitory dynamics', i.e. how a system adjusts to an 'external shock' or 'impulse' and moves from one equilibrated state to another equilibrated state. This type of analysis in which the structural features of an economic system changes (be it a shift in techniques of production or in expenditure structures) is an important part of structural change analysis. For example, David Ricardo's analysis of the big shift towards more mechanised techniques of production (see the chapter 'On Machinery' in his *Principles*; Ricardo 1817, third edition 1821) is an early precursor of traverse analysis. In this analysis, important shifts in production go along with equally important shifts in the macro-distribution of income (a decline in the 'wage fund' out of which the employed labour

force is being paid) and different phases of adjustment to a more capital-intensive form of production are carefully distinguished. Ricardo's analysis was also the starting point of later studies on 'technological unemployment' (see Neisser 1931, 1942; Lederer 1931).

## 2.3 Sectoral Interdependencies: Production and Expenditure Structures

As mentioned earlier, classical analysis was characterised by a rich description of the 'circular flow', i.e. not only of the production activity of an economy, but also how the value of production was distributed in the form of various income flows across social groups giving rise to a structure of expenditures which then in turn affected the composition of production. Marx's analysis of the 'schemes of expanded reproduction' (vol. 2 of *Das Kapital*; Marx 1867, 1978 [1885]) built on Francois Quesnay's *Tableau économique* (Quesnay 1758) by carefully examining the fulfilment of 'viability' conditions of an economy. This implied the importance of synchronising input-output production requirements across sectors with the expenditure patterns of different social groups given their income distributional claims. Thus, investment activity and the production levels in the investment goods-producing sector were directly determined by the propensity of 'capitalists' to invest part of their income that derived from profit flows. On the other hand, the production of consumption goods was determined by workers' demand emanating from their wage income and from capitalists' demand for consumption goods financed from the part of their income that is not invested. Hence, the structure of expenditures emerged from 'class-based' income flows and these in turn were determined by bargaining positions of different groups in production (Marx used the notion of a 'rate of exploitation' to characterise this bargaining situation). For income distribution to be such as to lead to exactly that expenditure structure that allows a balanced evolution of production structures to emerge without the emergence of excess capacities or unsold output was the focus of the analysis of 'viability' in Marx's analysis of expanded reproduction in a capitalist economy.

Francois Quesnay undertook many exercises of comparative dynamic analysis in the context of his *Tableau économique* (see also Eltis 2000). The position of different social groups (aristocracy—landowners; farmers—'capitalists'; landless labourers) played a crucial role in the context of national income generation and economic growth. Quesnay analysed how

different policy contexts (such as different forms of taxation; different legal contracts in tenancy agreements) might affect income flows and expenditure patterns and thus the growth trajectory of an economy. For example, we may ask whether a lengthening of tenancy contracts would lead to a growth in profits of farmers who could then increase their investment and thus move from '*petite culture*' to '*grande culture*', thus increasing the productivity levels in agriculture and giving the economy a growth stimulus? Or, would the improvement in transport infrastructure or a reduction in intra-country regional tariffs lead to greater competition on markets, thus reducing the income flows to regional landowners but provide cheaper food and other commodities to the population and thus raise real incomes and/or reduce the costs of labour? We can see in these examples that classical political economy employed the tools of structural change analysis combining insights into inter-sectoral relationships and economic growth with an astute analysis of positions of power and of social behavioural characteristics of the dominant social structure at the time.

## 2.4 Economic Fluctuations and Structural Theories of the Business Cycle

Another aspect of economic dynamics that can also be related to structural change is the analysis of economic fluctuations, i.e. of business cycles. Already in K. Marx's analysis, the possibility of failures to satisfy the viability conditions for balanced expanded reproduction led to the analysis of the possibility of crisis, i.e. situations in which various proportions were mismatched. Such a mismatch could occur between the composition of production capacity and the composition of expenditure such that situations of overcapacity and/or underconsumption could occur. The mismatch between production (capacity) and expenditure could furthermore be traced back to developments in income shares of different social groups as these determined behaviours with respect to the levels and structures of expenditure. In the tradition of Marx's analysis, authors such as Mikhail Tugan-Baranowsky (1913 [1894]) and Rosa Luxemburg (1951 [1913]) emphasised the possible mismatch in the composition of productive capacity in different sectors of the economy and levels and composition of expenditure. These contributions also considered shifts in technology (such as the shifts towards more capital-intensive techniques of production) and how a system would adjust to these.

In various non-Marxist theories of economic fluctuations (see, e.g. Aftalion 1913; Bouniatian 1922), other analytical representations of the productive system were chosen, such as what later was considered a 'time-structure of production' representation which gained prominence in the Austrian capital and business cycle theory (von Böhm-Bawerk 1889; von Hayek 1941). In such a context, the time horizons of investment processes, production lags in the delivery of investment goods and expectations formation (later also the inter-temporal analysis of consumption–savings behaviour) were considered. In this line of research, economic fluctuations emerged because of expectations-driven investment cycles due to the characteristics of expectations formation processes. These would lead to a malfunctioning of the inter-temporal price system (as a signalling mechanism) that would result in distortions in and mismatches between sectoral production and expenditure structures. At some point, such distortions had to be corrected and this would occur through sectoral and income distributional adjustment processes resulting in the periodic recurrence of economic fluctuations.

Let us summarise the core components of classical political economy of structural change analysis and lessons to be learnt from these.

*Sectoral decomposition and sectoral interdependencies*: we have seen that the authors of classical political economy employed in their analytical and historical analyses schemes of sectoral decomposition that they regarded as fundamental to the investigation of principal features of production activity and for analysing its dynamic evolution. Sectoral interdependencies (both of a horizontal and a vertical variety) were carefully considered and formed part of analysing potential growth paths of an economy. Attention was given to detect the characteristics of production sectors as being growth-enhancing or growth-retarding for the economy. Here, the classics developed rather sophisticated tools of production analysis to identify why sectors might fall into one or the other of these two categories (economies of scale, division of labour, learning processes; decreasing returns and resource constraints). Their analysis included the investigation of the scope for and the characteristics of technical and organisational change in the different sectors.

*The role of 'classes' or 'social groupings'*: the identification of social strata was undertaken partly because of their links to sectors of the economy and partly based on the types of income they received, which in turn relied on property relationships. Both these aspects anchored the social groups in structural features of an economy in terms of production sectors, income and expenditure patterns. Finally, the classical economists developed a

variety of analytical methods that also became central in later contributions to structural dynamic analysis such as multi-sectoral growth analysis, stock-flow analysis in national income accounts and traverse analysis.

# 3 More Recent Analytical Approaches

## 3.1 Political Economy of Multi-sectoral Modelling

The classical economists introduced multi-sectoral analysis because they wanted to analyse specific features of different sectors in the economy and their roles in overall economic growth of the economy. In the previous section, we pointed to the importance in the classical writings of identifying certain sectors as 'growth-propelling' and others as 'growth-retarding'. These features were in turn traced back to a detailed analysis of the sources of productivity growth or productivity decline in these sectors (e.g. increasing returns in manufacturing, decreasing returns in agriculture and other natural resource-dependent sectors).

In the technically more developed models of multi-sector or multi-activity analysis developed post-WWII, these principal preoccupations of the classical economists faded away. The analytical representation of sectors lost their specific characteristics as the mathematical representation required a rather uniform treatment. There was no explicit analysis why changes in input coefficients (representing the technology used in a sector) should follow specific characteristics derived from production conditions (or from different scope for and directions of technological change) in specific sectors. The concerns of multi-sector modelling moved towards the identification of steady-state growth paths along which all sectors grew at the same long-term rate. On such a steady-state growth path, no natural resource constraints are encountered, no differential scale dependencies emerged as sectors changed their production levels, and no specific differences in the potential for productivity advances (including technological progress) were identified across sectors. Nonetheless, important results emerged from this type of analysis, for the nature of general inter-sectoral interdependencies imposed constraints on the maximal growth paths of the economy. This was a result arrived at already in the von Neumann growth model (von Neumann 1935–1937). Further, important dualities in the determination of price and cost structures, on the one hand, and quantities (both output composition and input structures reflecting the choice of techniques), on the other hand, were extracted from the analysis. In this respect, the technical analysis went far

beyond what the Classics had achieved. Nonetheless, many of the insights into the specific nature of the structural economic dynamic of capitalist economies gained by the Classics disappeared. This referred particularly to the important roles that 'growth propelling' sectors, on the one hand, and 'growth restraining' sectors, on the other hand, played in determining the overall dynamics of an economic system.

The deficit with regard to the obtained insights by the Classics was even more apparent regarding the 'political economy' side of structural economic analysis: the identification of social groupings (or 'classes') was not followed up in the modern approaches to structural economic dynamics. The 'social' aspects were limited to the introduction of basically two macroeconomic income distributional variables, the wage rate and the rate of return on capital. These two variables had a role to play as an important determinant of the price system and through it for the choice of techniques. The full circular flow in which incomes determine the expenditure patterns of different social groups and thus the output composition of the economy was rarely examined.

However, an interesting result was obtained—in line with some of the classical analysis: one of the important variables of income distribution—the rate of profit or return on assets—was linked to the rate of expansion of the economic system. And here, the notion of the 'productiveness' of an economy in terms of its ability to produce a surplus over and above its reproduction requirements at a given scale emerged clearly and in a technically well-specified way in the von Neumann model (von Neumann 1935–1937). Furthermore, the maximal expansion rate of the economy and thus the rate of profit were jointly determined with the choice of techniques in each of the sectors (where such choice exists) as well as the use of different pieces of capital equipment. This also implied the 'endogenous' determination of rates of scrapping of capital equipment (see, e.g. Schefold 1978; Baldone 1996; Pasinetti 1973; Kurz and Salvadori 1995).

Theoretical developments in the classical tradition showed that it is not easy to represent unbalanced growth, i.e. the evolution of sectors at different rates of growth, in an analytical model. This was possible in the open economy version of the Leontief model where differentiated developments of the components of final demand (consumption demand, investment, net exports, government expenditure) could be specified in a way that allowed unbalanced growth. But once the economy—and thus the 'circular flow'—was 'closed', it was not easy to analytically represent the phenomenon of uneven sectoral growth. In fact, in both the dynamic Leontief model (see Petri 1972) and in the von Neumann model, one ended up with balanced

and steady-state growth models; otherwise, major problems of stability were encountered. The combination of linearity (fixed input-output coefficients) and general interdependence did not allow unbalanced or disproportional growth. However, it is important to conceive of uneven or 'disproportional growth' not as a long-run persistence of the same structural dynamic, as this would lead in the long term to the complete dominance of one sector in the economy as a whole—and this is obviously unrealistic. It is better to think of it in terms of phases in which specific patterns of disproportional growth take place followed by other phases in which other patterns of disproportional growth take place. Models of 'product cycles' or 'industry cycles' (see e.g. Segerstrom et al. 1990; Helpman and Trajtenberg 1998) are examples or such circumscribed phases in which industries or technologies go through growth phases followed by other phases in which other industries and technologies take over in terms of their growth phases which then peter out. It is much more appropriate to think of disproportional growth models in such terms where the composition of more dynamic and more stagnating industries, activities and technologies changes over different periods of economic development, rather than extrapolating the same pattern of uneven growth ad infinitum.

The development of multi-activity and multi-product industry models provided the possibility to move from 'square' to 'rectangular' representations of structural interdependencies, and thus to cover issues such as multi-process industries, choice of techniques and the analysis of industries' multi-product output. The latter also allowed an analytical representation of fixed capital in production as a 'joint product' (see e.g. von Neumann 1937; Schefold 1978; Baldone 1980). However, the models moved quite quickly to an analysis of 'optimal' (i.e. cost-minimising) choice of techniques and no further development in the analysis of changing product composition of industrial production (i.e. within industries) was pursued. With several mathematical techniques (Hawkins–Simon in the case of square matrices; fixed point theorems in the case of von Neumann), one also attempted to find the maximal growth rate for the economy. The pattern of inter-industry (cross-process) interdependencies showed the constraints that an economy is facing. Only later was the impact of 'natural resource constraints' reintroduced that had already concerned the classical economists (see earlier on Ricardo and Malthus). The analytical investigations of such constraints in the work of Quadrio Curzio (Quadrio Curzio 1986, 1996; Quadrio Curzio and Pellizzari 1999) made substantial progress in this respect (see also Quadrio Curzio and Pellizzari in this Handbook; see further also Sect. 3.2 on this).

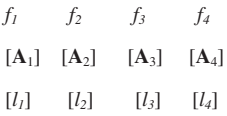


**Fig. 2** Pasinetti's decomposition into backwardly linked vertically integrated sectors

Regarding the introduction of changing consumption patterns, the work by Richard Stone and his group (Stone and Brown 1962a, b) was followed by the theoretical contributions by Luigi Pasinetti (1981, 1993). These authors made use of the well-formulated analysis of consumer expenditure patterns attributing an important role to differing income elasticities with regard to the products supplied by different sectors of the economy. Further, through the impact of differences in long-run productivity and cost developments in different sectors changes in relative prices act via substitution effects on expenditure structures.[5] Hence, consumer expenditure systems became an important ingredient to the modelling of structural change in final demand thus affecting the production structures of an economy. It is an example where the insight of neoclassical analysis of consumer behaviour (see the early contributions by Allen and Hicks 1934) made an important contribution to structural change analysis that went beyond that provided in the classical writings.

We may now examine in which way the contributions of multi-sectoral/multi-activity analysis lend themselves to an analysis of the political economy of structural change. Let us start with Luigi Pasinetti's contribution. In this case, structural change analysis is based on the representation of the economic system as a collection of backwardly linked 'vertically integrated sectors' constructed behind any one of the final consumption goods (Fig. 2):

where $f_i$ refers to the final consumption good being produced; $[\mathbf{A}_i]$ refers to the ith column of the Leontief inverse, i.e. to the inputs required directly and indirectly to produce one unit of the final consumption good $f_i$, tracing these input requirements through the entire chain of input-output (or inter-industry) relationships; and $[l_i]$ refers to the labour required directly and indirectly to produce one unit of the final consumption good $f_i$.

The simplest version of Pasinetti's model examines disproportional growth of these different vertically integrated sectors of an economy (each vertically

[5]The analysis of consumer expenditure patterns was a very active area of theoretical and empirical research, starting with R. Stone's early work on the linear consumer expenditure system (Stone 1954), see also Deaton and Muellbauer (1980).

integrated sector represented by a specific {[$\mathbf{A}_i$];[$\mathrm{l}_i$]} tuple). Pasinetti's analytical construct of 'vertically integrated sectors' decomposes a system of interrelated production relationships into one that completely separates the input requirements required directly and indirectly to produce a final consumption good and hence works with a fully decomposed model of $n$ differentiated subsystems. However, at any point one could return to an examination of the horizontal interdependencies amongst the different industries of the economy under consideration. Pasinetti is keen to identify key forces of change that generate disproportional growth across the different vertically integrated sectors. One force of change comes from the demand side, i.e. the fact that—given a structure of relative prices across final commodities—consumers will change their pattern of expenditure across products as their incomes rise (this is the well-known Engel curve effect that identifies how the structure of expenditure changes with rising incomes). The other force comes from the production side and refers to the uneven incidence of productivity increases, identified in Pasinetti's simple model with falling labour input coefficients [$l_i$] at different rates across the different vertically integrated sectors.[6] In an important part of Pasinetti's analysis of disproportional growth, he points to the fact that changes in 'consumption coefficients', i.e. the shares of different consumption goods in a household's expenditure, depend on that household's real income. The combined productivity developments across all vertically integrated sectors then feed into changes in relative (cost or production) prices and determine through their impact on real income growth also changing consumption patterns.[7] The dynamics on the production side (uneven productivity growth across sectors) thus determines the changing pattern of consumption both through their impact on real incomes and their impact on relative (cost or production) prices.

We may ask what the significance of Pasinetti's analysis is for the political economy of structural change. Pasinetti's model shows that certain patterns of coherence of different sectors depend differentially on two different

[6]Pasinetti uses in his model an assumption that falls in labour input coefficients and thus inversely increases in labour productivity take place at differential but constant rates in different subsystems. This is of course a gross oversimplification, as the labour input coefficients of each vertically integrated sector are—any point in time—a linear combination of labour productivity levels in the original sectors of production. The growth rate of the labour input coefficient of the vertically integrated sector would therefore change as a function of the growth rates of the different original sectors, but also because of changing weights of these original sectors in the vertically integrated sector.

[7]In a further piece of analysis—which Pasinetti does not undertake—one could also introduce uneven productivity developments into the input coefficient matrices [$\mathbf{A}_i$], which would also affect cost developments and thus relative prices. In turn, changes in relative prices may also introduce substitution effects as determinants into consumers' expenditure systems.

types of forces: the demand side forces changing consumption patterns and the supply-side forces changing productivity levels in backwardly linked production activities. Since a sector's position in the overall productive system depends on these two forces, this highlights the likelihood of cross-sectoral interests. For example, firms located originally in different industries will have 'joint interests' with regard to demand and supply-side developments that link them to specific vertically integrated sectors. Looking at this issue from a policy angle, economic interest groups linked to one another via their involvement in the same vertically integrated sector would find it in their interest to support policies that shift final consumption expenditure in their direction even if such groups are involved only in backwardly linked stages to the production of a specific final consumption good. On the other hand, those interest groups are also linked to one another through productivity developments in all the backwardly linked stages of production as these stages affect the cost conditions under which they produce. Finally, in an imperfectly competitive setting, there could also be conflicts of interest within the *same* vertically integrated sector as productivity advances in one stage might not (or not fully) be passed on through price reductions to the forwardly linked stages, which leads to conflicts of interest along the different stages of production.

## 3.2 Traverse Trajectories

An interesting strand of structural change analysis is represented by the analysis of transitional paths (traverse analysis) (see Hicks 1973; Lowe 1976; Hagemann 1990; Magnan de Bornier 1990; Belloc 1996; Gehrke and Hagemann 1996; Hagemann and Scazzieri 2009; Scazzieri 2009). We have seen that in the classical economists, an important contribution was the analysis of a 'traverse' where an economy shifts from one structural set-up to another as technology changes thereby affecting the overall growth path of an economy and also impacting distributional relationships. Examples are Ricardo's analysis of shifts towards more mechanised methods of production and his analysis of the impact of decreasing returns in agriculture upon the growth path of the economy (Ricardo 1817, 1821 edition).

In later contributions, 'traverse analysis' used both the 'Austrian' representation of production (as in Hicks 1973) and the departmental scheme of inter-industry relationships (see Lowe 1976). These analytical representations were already prevalent in the late nineteenth and early twentieth century (see Tugan Baranowsky 1913 [1894], on the one hand, and

Albert Aftalion 1913, on the other hand) and then continued in the writings of the interwar period (von Hayek 1941; Luxemburg 1951 [1913]). The main interest of traverse analysis is to follow the structural adjustment process of an economic system when it is exposed to an 'impulse' or 'shock'. We have emphasised throughout that such a structural adjustment process is a core concern of 'structural change' analysis. It emphasises that there are reasons why adjustment does not take place instantaneously. Recent traverse analysis is limited mostly to the characteristics of fixed capital using economies. The main reason for a structural adjustment process not being instantaneous is that fixed capital takes time to produce and is durable. Hence, when an 'impulse' (such as the emergence of a new technique of production that requires a different combination of capital equipment or a fall in the level of demand either at the aggregate or sectoral level) hits an economic system, the economic system takes time to adjust its structure of fixed capital. This type of analysis could be extended to deal with the adjustment of 'skills' that are 'embodied' in the labour force that also take time to adjust (see also Amendola and Gaffard 1998).

Alberto Quadrio Curzio combines his analysis of multi-sectoral growth with traverse analysis and thus deserves a mention also in this section on traverse analysis. Quadrio Curzio (1986; Quadrio Curzio and Pellizzari, this Handbook) examines the topic addressed by David Ricardo regarding the structural shifts that an economy experiences when it adjusts to natural resource constraints while its population and thus its economy are growing. A growing economy will require additional raw materials to be available and, with a growing population, an increased amount of food to be produced. The latter requires more extensive or intensive cultivation of land and here is where the principle of 'decreasing returns' applies. In the extensive case, land of worse quality must be taken into operation and this requires an increased amount of labour, more ploughing and fertiliser to be spent on it to extract the same amount of output. The same would be true if one attempts to produce more output through intensive cultivation on the same piece of land (or, in the case of mining, on the same extraction site). The 'decreasing returns' phenomenon can be technically represented by an increase in some of the input coefficients (the amount of an input to be used to produce a unit of output) that characterise the technique of production used in a particular industry. Quadrio Curzio represents the decreasing returns phenomenon by showing that, as some input coefficients in one or more industries rise (reflecting the decreasing returns phenomenon), the maximal growth rate $g^*$ of that productive system falls (using the

Hawkins–Simon theorem in the case of a quadratic matrix representation of the productive system):

Thus $g^*(\mathrm{A(II)}) < g^*(\mathrm{A(I)})$, where the output level produced with $\mathbf{A}(\mathrm{I})$ is smaller than with $\mathbf{A}(\mathrm{II})$, i.e.

$\mathbf{x}(\mathrm{I}) < \mathbf{x}(\mathrm{II})$

Hence, as output levels increase in an economy to feed a growing population, but also a range of other raw materials must be supplied at an increased scale, the economy 'traverses' across productive systems $\mathbf{A}(\mathrm{I}) \rightarrow \mathbf{A}(\mathrm{II}) \rightarrow \mathbf{A}(\mathrm{III}) \rightarrow \cdots$ With each of these productive systems, a maximal growth rate is associated such that with an increased scale of production a fall in the maximal growth rate will set in. This is the formalisation of Ricardo's principle of decreasing returns.

Quadrio Curzio also emphasises that old and new productive systems operate alongside each other (i.e. more and less fertile lands are cultivated) and hence, the overall (or global) maximal growth rate will be a linear combination of the maximal growth rates of different subsystems, i.e. one subsystem that is based on the use of the most fertile pieces of land and the other subsystems on less fertile plots of land. The weights in this linear combination are changing continuously as the scale of production increases, and less fertile pieces of land are brought into cultivation to increase the overall output of food.

The 'global technology' is thus a linear combination of the different productive subsystems operating alongside each other:

$$\mathrm{A}_{\mathrm{global}} = \lambda_{\mathrm{I}}(\mathrm{A(I)}) + \lambda_{\mathrm{II}}(\mathrm{A(II)}) + \lambda_{\mathrm{III}}(\mathrm{A(III)}) + \cdots \text{ where } \sum \lambda_i = 1 \text{ and } i = \mathrm{I, II, III, \ldots}$$

The maximal growth rate of the global technology will—with a continuously rising level of output of the economy as a whole—thus decline in a gradual manner as increased amounts of output must be produced on inferior lands. As Ricardo suggested, at some point the situation might arise when the maximal growth rate of the economic system will approach zero, i.e. the stationary state. If one were to attempt to increase output levels even more, the economy would no longer be able to produce a positive net output vector, i.e. the system would go into contraction. The reason is that the inputs required to produce this increased level of output would outstrip the outputs to be produced, i.e. such an increased scale of production will not be 'viable'.

Quadrio Curzio mentions several other issues that could be general features of traverse analysis:

(i) a possible mismatch between the composition of output produced by one subsystem to be used by another subsystem; Quadrio Curzio uses the concept of 'residuals' to characterise such a mismatch;
(ii) the appearance of residuals opens up the possibility that such residuals might lead to the temporary use of further 'sub-systems';
(iii) there could be responses by the economic system to the incidence of decreasing returns leading to *induced technological change* responses, i.e. inventions/innovations that would bring new technological 'sub-systems' into play. Such subsystems might develop in the sectors in which the natural resource constraints are directly felt (e.g. better extraction methods in the case of mining or technological improvements in agricultural methods) or in other sectors that might compensate through technological or organisational innovations of their own the effect of the decreasing return phenomenon in the natural resource-based sectors on the growth rate of the economy as a whole;
(iv) there are multiple income distributional implications of traverses: in particular—just as David Ricardo pointed out—as different 'sub-systems' characterised by different levels of productivity (i.e. ratios of net outputs to inputs used) operate alongside each other, this gives scope for 'rents' to emerge. Such 'rents' reflect the relative 'productiveness' of different subsystems and the question in the classics emerged as to who receives such rents. In Ricardo, these were the owners of the 'scarce' input used in production, in his case land of particular fertility. Such differences in 'fertility' in turn lead to different techniques of production being used on different lands, i.e. worse lands require more intensive ploughing and more fertiliser. Hence, we get a different picture of 'vertically integrated sub-systems' in this framework, i.e. those based on the uses of different types of 'non-produced means of production' (NPMP) (Fig. 3).

We should mention over here that the 'rent' concept developed in this context, re-emerged later when the use of different techniques of production (or different technologies)—again characterised by different levels of productivity—alongside each other in the same industry was analysed by people such as Alfred Marshall (Marshall 1893) or Joseph Schumpeter (Schumpeter 1934). Marshall used the term 'quasi-rents' to describe such a situation, and Schumpeter spoke simply of profits (or 'super-normal profits') as he thought that in a stationary system in which no differentiation of technologies exist

| | | |
|---|---|---|
| g*[A(I)),l(I)] | g*[A(II)),l(II)] | g*[A(III)),l(III)] … |
| [A(I)),l(I)] | [A(II)),l(II)] | [A(III)),l(III)] … |
| NPMP(I) | NPMP(II) | NPMP(III) …. |

**Fig. 3** Quadrio-Curzio's decomposition into forwardly linked vertically integrated subsystems

in the same line of business, 'profits' would no longer emerge (just the general rate of return on invested capital). We shall return to a discussion of these different rent concepts in Sect. 3.4.

We now move towards a discussion of the political economy dimension of transitional dynamics. As shown above, Quadrio Curzio's analysis points to the existence of 'forwardly integrated sub-systems', as productive systems A(I), A(II), A(III), …, are linked to a differentiated natural resource base. The 'forwardly integrated sub-system' is based on the use of a specific raw material base [NPMP(i)] and the 'subsystems' of techniques of production that have to be used on these. This provides all producers that are 'forwardly linked' to these different primary resource bases a 'commonality of interest'. For example, they are bound by the 'high'- or 'low'-cost structures linked to the methods of cultivation or extraction of this primary resource, or they are interested in progress made in finding less costly methods of cultivation or extraction on 'less fertile' lands or high-cost extraction mines. Such commonality of interest will, on the one hand, activate their specific interest in distributional or price issues (such as the price of fertiliser or the costs of labourers or miners) and their willingness to invest into finding better methods of production (e.g. for deep-sea drilling) and, on the other hand, will also mobilise their interests in political lobbying, e.g. for public investment into R&D in the specific areas that affects them.

This concept to commonalities of sectoral interests can be extended to some other essential inputs, be they a skill base or infrastructure. The dependence of sector or firm interests upon a given essential input—either directly or indirectly—allows one to identify a fundamental ingredient of the political economy of interest formation. We shall return to this issue in Sect. 4 of this paper.

A common feature of traverse analysis modelling is the concentration of attention on physical *constraints on the adjustment of production structures* to the exclusion of other reasons why structural adjustment takes time. We mentioned in Sect. 1 of this chapter the importance of organisations in structural change analysis and defined organisations through the *persistence*

*of behavioural patterns* within an organisation and the degree of intensity of behavioural interdependencies within an organisation. Both these two features should make organisations a central focus of structural adjustment processes. Once we have identified adjustment processes as being complex and taking time within organisations, we can automatically infer that such persistence of behavioural patterns within organisations will also affect adjustment processes of relationships between organisations, as the patterns of adjustment within organisations will set boundaries on the way organisations will relate to each other in a phase of 'structural adjustment'. Hence, resistances to change within organisations will also affect relationships between organisations (see also Olson 1965, 1982). It will also allow entry of new types of organisations that are not affected by the historically grown patterns of behaviour within existing organisations.

There is another dimension in which traverse analysis is more directly associated with a 'political economy' approach, and this refers to the positions of the *relative power* of different groups in a process of structural adjustment. Traverse analysis points to a core issue of political dynamics that accompany structural change: during processes of structural adjustment, positions of different social groups and organisational structures get weakened and others get strengthened. Hence, there are forces whose interest lies in changing the patterns of structural interdependencies and forces whose interests (at least in the short- or medium-term) lie in resisting such patterns of structural change. The same is true of changing organisational structures that affect historically formed (or contracted) patterns of behaviour and interrelationships within an organisation and between organisations. There are costs and benefits of such changes to different groups, and these costs and benefits will be distributed in a differentiated manner. Furthermore, during a 'traverse', i.e. during a changeover from one longer-term pattern of organisational arrangements and structural interdependencies to another, the positions of different groups and their bargaining strengths will themselves change dynamically. In the fixed capital setting of traditional traverse analysis, the different vintages of fixed capital equipment embodying different technologies will be differentially affected by the 'creative destruction' effect of the emergence and introduction of a new technology (some of these vintages will be scrapped, others might survive and might even provide complementary services to the new vintages). The same applies to vintage structures of skills embodied in different segments of the labour force or of firms embodying different organisational structures and technologies. This political dynamic of interest articulation and the analysis of 'winners' and 'losers' are well known from international trade analysis where its impact on the

| Matrix of interdependencies | Vector of eigenvalues | Associated eigensectors |
|---|---|---|
| Irreducible, non-negative, square matrix $X = \{x_{ij}\}$ of sectoral interdependencies | $\lambda_1, \lambda_2, \lambda_3, \ldots\ldots, \lambda_n$ n distinct eigenvalues some may be negative or complex; one the Frobenius root | $e_1, e_2, e_3, \ldots\ldots, e_n$, these are separable sub-systems following their own 'dynamic modes' |

**Fig. 4** Goodwin's decomposition into eigensectors with distinct dynamic modes

political economy of protectionism has been analysed (see, e.g. Grossman and Helpman 2002). This suggests an interesting way forward to the investigation of the political economy of transitional paths.

## 3.3 Economics of Fluctuating Growth

Richard Goodwin's analysis of combinations of linear and nonlinear models opened up the vision that even simple disaggregated models can exhibit complex dynamics (Goodwin 1974, 1983; Goodwin and Landesmann 1996). Goodwin highlights that fluctuating dynamics is what characterises capitalist economies and, hence, one should examine quite carefully the different potential 'dynamical modes' inherent in any disaggregated but interdependent economic system. Thus—if one starts off with a linear disaggregated system—a simple focus on the steady-state dynamic (associated with the maximum eigenvalue; using the Hawkins–Simon theorem[8]) might not be sufficient for examining the complex dynamics that such a system could exhibit. Even if the maximum eigenvalue might dominate in the long run, the other dynamic modes (such as oscillations of various amplitudes and lengths) also matter as transitory dynamics. To make these different dynamic modes transparent, Goodwin also suggests a method of decomposition, by identifying the so-called eigensectors each associated with the different 'eigenvalues' of a disaggregated (n-dimensional) linear system (see Goodwin 1974). Each of these 'eigensectors' then responds to an 'impulse' with its own dynamical mode even though the eigenvector associated with the maximum eigenvalue will exhibit a steady-state, proportional growth path that will in the long run dominate the dynamics of the other eigensectors (Fig. 4).

[8]See e.g. Hawkins et al. (1949).

The basic insight of Goodwin's model for the political economy of structural change is that his decomposition highlights that structures are potentially exposed to a multitude of dynamical shocks, which they must accommodate. Different entities within such structures might have a wider or narrower range of ability to adapt to the differentiated dynamical modes of an economic system. From a political economy perspective, Goodwin's decomposition shows to which extent different sectors are exposed to different dynamical modes (each 'eigensector' is a linear combination of the original sectors in an input-output matrix). This leads to various 'coherences' across economic sectors, in this case in relation to the dynamical patterns that are inherent in a system of interrelationships. Hence, Goodwin's analysis points to the very demanding nature of an economy as a complex dynamical system (see also Anderson et al. 1988; Arthur et al. 1991). When impulses (shocks) impinge upon an economic system, various dynamical responses get initiated and then reverberate across an economic system (growth trends, but also cycles of various amplitudes, and these interrelate giving rise to irregular cyclical and trend patterns). The decomposition that Goodwin adopts isolates in the first place the different dynamical modes, and it shows through the construction of 'eigensectors' to which extent the different original sectors of an economy are affected by each one of these modes. When we return to original sectors, the formerly isolated individual dynamical modes then combine and generate irregular dynamical patterns, just as the ones we see in actual economic systems. Finally, although Goodwin makes through this decomposition distinct dynamical modes transparent, he also points to relationships that establish coherence across eigensectors by introducing various macroeconomic relationships that affect them all, such as economy-wide wage bargaining or the full employment constraint that imposes a 'ceiling' to output expansion across the aggregate economy.

## 3.4 Technological and Organisational Change

An important aspect of structural change and dynamic analysis in general is the study of 'innovation'. Innovation means that something 'new' is introduced in an economic (or social) system that had not been known and/or implemented before. Innovation thus has intrinsically something to do with new knowledge being generated either about new technologies, product development or organisational forms or about the feasibility and nature of their implementation in an economic (and social) system.

What are the 'structural' aspects of innovation analysis and, furthermore, what are the 'political economy' aspects of a 'structural approach' to innovation analysis?

One thing that one can say from a 'structural' point of view is that anything new is most likely going to be generated from some components that already exist. Josef Schumpeter spoke of innovation being 'new combinations'. But we can go beyond that and analyse in a systematic manner how 'innovation' might be shaped by existing 'structures', i.e. patterns of interrelationships and behavioural patterns. Thus, for example, R&D organisations have particular set-ups that are designed to lead to new ideas regarding technology or organisational improvements. In fact, any part of an organisation usually has some incentive to think up some new ideas regarding its 'mode of operation' and implementing such ideas in one way or another. The interplay of innovative ideas and initiatives within an existing organisational arrangement then shape the actual generation and implementation of innovations in an organisation.

However, there is an additional important ingredient that includes a 'political economy' dimension to a 'structural view' of the innovation process: any change in the 'mode of operation' in any sub-area (or 'module') of an organisation will change positions of existing members and teams (task allocations, power positions in decision-making, etc.) and will thus encounter '*resistances to change*', but also mobilise '*advocates of change*' that are likely to lose or gain from such changes. The evaluation of the relative strengths of these two forces and their changes in the processes of organisational change will be a central concern of 'structural analysis' of innovation (and diffusion) processes.

The 'structural' analysis of organisational change thus has to deal with: (i) an evaluation of the characteristics of 'technological' and 'organisational' change in terms of changes in task allocations, how these affect the flow of production, etc., within an organisation as well as the relationships to other entities (other organisations, government, etc.) and (ii) analyse the 'political force-field' that determines the nature of the change itself, i.e. the resistances that have to be overcome, the compromises with regard to changes that have to be struck, the nature of adjustments and sequence of adjustments with regard to the 'blueprint of change' that was originally envisaged.

Let us turn to another aspect of the economic analysis of innovation: Josef Schumpeter was keen to show that innovation initiates changes in market structures. Innovators hold a (temporary) advantage over their competitors and thus acquire additional market power. This led him to think of quite a different use of the 'rent' concept as compared to the one we encountered in the classical writings of David Ricardo and Robert Malthus. Both in the classical context and in Schumpeter, the emergence of 'rents' reflects 'heter-

ogeneity' in production structures. However, in the classics such heterogeneity stems from the constraints that limited availability of 'scarce resources' have on an economic system. In Schumpeter, however, 'rents' emerge as a reward for 'innovations' that lead to better (more cost-effective) practices in production or to improved and more market-adequate products. Hence, in Schumpeter as in Ricardo, 'rents' emerge as long as heterogeneity in production structures persists, i.e. as long as 'better' or 'worse' techniques of production (or products) coexist in the same lines of business and are not (yet) 'weeded out' by competition (or a diffusion process) leading to only the 'best practice' techniques to survive. Furthermore, it is the reward of a 'rent' ('quasi-rent' in Marshall or 'super-normal profits' in Schumpeter) that acts as an incentive to put resources into investments that might lead to innovations and taking on the risky business of being a pioneer in implementing such innovations.[9]

Let us further discuss the pricing mechanisms that accompany innovation and diffusion processes, as 'rent' after all is a price (rewarding the differential between 'actual' technique used and the 'worst' technique still employed in a 'particular line of business'). As expectations of 'rents' also act as the incentive mechanism to 'innovators', the price mechanism giving rise to rents is of additional interest as it influences the speed and direction of innovations and the changeovers in productive (and one might add—organisational) structures. In the classics (as very well formalised in Quadrio-Curzio's model), the pricing mechanism is straightforward: price of output (in a particular 'line of business') is determined by the least cost-efficient technique or productive system still in operation. This productive system only earns—what the classics called—a 'production (or cost) price', i.e. a price that covers unit costs plus a uniform rate of return on invested inputs. Given this price, all the other producers operating with 'better' (i.e. more cost-efficient) techniques earn a rent as the difference between that price and their unit costs. As mentioned above, Marshall called this a 'quasi-rent' and in the Schumpeterian framework, this represented 'super-normal profits.

In conclusion, when we speak of a 'structural' approach to innovation we mean basically three things:

(i) the emergence of innovations from existing 'structures' that impact on the nature and likely direction in which innovations evolve in an economic (and social) system;

[9]See Landesmann (2015) where the two different concepts of 'rent' in the classics, on the one hand, and in Marshall and Schumpeter, on the other hand, are explored.

(ii) the impact of innovations on production and market structures that also leads to all kinds of 'transitory dynamics' that will also be reflected in cost, price and rent dynamics; and
(iii) the 'political economy' aspect of 'innovation' analysis: we pointed here to the incentives and resistances by different social groups that shape and impact on the speed and direction of innovations and their implementation within specific organisational arrangements and in an inter-organisational context.

## 4 Structural Interdependencies and the Political Economy of Structural Change

What the analysis in Sect. 3 has demonstrated is that detecting patterns of structural interdependencies is vital for analysing congruence and conflicts of interest across different actors in an economy. Already in von Neumann's model, the viability condition (i.e. the ability of the economic system to produce a positive net output vector and thus grow) presupposes a fundamental congruence of interests across all sectors in the economy. Secondly, both in the classical and in more recent contributions there is a recognition that sectors with low levels of productivity constrain the growth path of the economy. Thirdly, the choice of techniques in any sector is a function of the price system faced by the producers in all sectors of the economy and this in turn results from a simultaneous choice of minimum cost techniques in all activities in an interdependent system; hence, the price system affecting the distribution of value added across sectors results from such interdependencies. Fourthly, innovations and changes in organisational arrangements in any part of the economy affect in turn cost conditions and market structures throughout an interdependent system. Let us review some of these issues and draw out the political economy implications:

The lessons from Pasinetti's, Quadrio Curzio's and Goodwin's models are that various methods of decomposition allow one to identify specific and differentiated dependencies amongst sets of actors located in different sectors in an interdependent system. Thus, in Pasinetti's system forward linkages of actors in different sectors leading to the supply of specific final consumption goods create one type of differential link across actors in the economy. The linkage backwards to productivity developments in the sectors that supply directly or indirectly inputs is another such link. In Quadrio Curzio's analysis, the differentiated backward linkages towards different raw material bases are the source of a differentiation of interests in an interdependent economic

system. Finally, Goodwin's decomposition allows one to trace the complex dynamics that different sectors exhibit distinct 'dynamical modes' that can be identified through the construction of 'eigensectors'. The dynamics of the original sectors then follow a particular linear combination of the dynamics of the eigensectors. Decomposition techniques thus allow in all these cases to identify distinct features that determine the specific characteristics of the positions of different sectors and actors located in these sectors in an economy as well as the nature of interdependencies in an economic system. Once the system is exposed to 'forces of change' or 'shocks', these patterns of interdependencies then characterise differential dynamical responses of different parts of an economy.

In the context of—what we called—'structural analysis of innovation' as well, authors have investigated important interdependencies across sectors and technology fields. Thus, Nathan Rosenberg (1976) has pointed to interdependent sequences of innovations and implementations of such innovations across sectors of an economy. These give rise to technological trajectories as pointed out by Giovanni Dosi (1982) and also to cyclical patterns of waves of innovation, technology development and implementation as discussed in 'long wave theories' of Joseph Schumpeter and Simon Kuznets, but also by more recent authors who investigated the concept of 'Generalised Process Technologies' (GPT) (see, e.g., Helpman and Trajtenberg 1998).

*Decomposition techniques* thus allow us to analyse the formation and articulation of conflicts of interest emerging from the disaggregation of the economy into subsystems. First of all, decomposition of an economy into sectors or 'sub-systems' defines a sector's position in an overall economic system and thus defines 'sectoral interest' (more on this in the concluding Sect. 5). However, there are also cross-cutting issues across an economy characterised by interdependencies of sectors or subsystems. Thus, already in von Neumann's model the basic conflict between the costs of subsistence of workers and the maximum rate of expansion of the economic system is clearly developed. While these are cross-cutting conflicts of income distribution across sectors of the economy, they also affect sectors to different degrees (e.g. labour-intensive sectors where wage increases play a bigger role). Cross-cutting conflicts of interest also appear in Quadrio Curzio's analysis of the relationship between wages, profits and the differentiated emergence of rents along the growth trajectory of an economic system that is subject to natural or technological scarcities. Again, while these emerge from an economic dynamic at the aggregate economic level (i.e. increase in the overall scale of production), the impact on income distribution

(e.g. between profits and rents) will differ across sectors. Also, Goodwin's analysis of the different 'dynamic modes' shows that these manifest themselves in different linear combinations across sectors of an economy thus giving rise to differentiated dynamics across sectors. Furthermore, both Goodwin and Pasinetti highlight that sectoral differentiation of interests coexists with requirements for coherence through certain macroeconomic behavioural relationships (economy-wide wage-profit dynamic) and constraints (such as the overall availability of a given labour force).

We may also detect congruence and conflicts of interests in the time pattern of structural adaptation to an economic 'impulse' in the traverse analyses of the Hicks type and Lowe type. For example, the transition speed when introducing a more capital-intensive production technique may be constrained by available 'loanable funds' and the costs of such funds. In this case, all actors interested in the introduction of more capital-intensive techniques would have an interest in facilitating liquidity conditions leading to a quick and low-cost transition to these new techniques. However, the dependence on liquidity provision will be different across sectors of an economy as techniques and thus the nature of sectoral switchovers will differ.

Finally, we pointed in the context of the 'structural approach to innovation' analysis to two important aspects: (i) the importance of 'forces of resistance' and of 'advocates of change' and (ii) the core concept of 'rents'. Both of these play a major role in influencing the speed and direction of innovation and diffusion processes in an economic system and they will, by their very nature, be differentiated across sectors (and firms within sectors).

## 5 Conclusions

In conclusion, we want to summarise some of the main features of a 'structural approach' to the political economy of economic and social change.

*Structures and structural change*: political economy refers to the relationships of social groups to each other, the dependencies, common purposes, tensions and conflicts that characterise such relationships. In this essay, we have tried to use the notions of 'structure' and 'structural change' to point towards those features that lead to 'persistence' not only in those relationships but also to other 'structures' (physical, legal, organisational) in which such relationships are 'embedded' or which impose a certain context in which such relationships exist.

By 'structures' is not meant a unique pattern of behaviour, but the demarcation of 'bands' of behavioural patterns that have certain bounda-

ries. Behavioural patterns within such boundaries would not be considered 'structural change' even when variations of behavioural interactions could be observed. But once such 'boundaries' are crossed, one can speak of 'structural change'. Of course, the definition of 'boundaries' seems to introduce a certain degree of arbitrariness. On what grounds are certain variations of behavioural patterns seen as belonging to a particular 'structure', while persistent transgressions of these boundaries would lead to a switch of structure?

It is the prerogative of the analyst or theorist to define, within his or her theoretical framework, where such boundaries lie. The analyst will define 'structure' and therefore 'structural change' in a way that he/she thinks contributes towards an understanding of the behaviour and dynamics of an economic and social system, thereby focussing on the main forces of 'persistence' of behavioural patterns as well as the strains and stresses, 'shocks' and innovative forces that lead to overcoming such established patterns of behaviour and organisational forms, thus paving the way towards 'new structures'. These in turn initiate new patterns of behavioural persistence and define new 'boundaries' within which social interaction takes place. Thus, the analytical device of defining 'boundaries' within which behavioural patterns define a given 'structure' has the purpose to put into focus 'forces of persistence' and 'resistances to change' that provide the stability of 'structures'. These can also act as 'rigidities' that affect and shape patterns of adjustment to 'shocks' or 'forces of change'. As such 'rigidities' are overcome, 'structural change' can take place which implies a qualitative move towards establishing new types of sectoral set-ups (changes in techniques of production, in organisational forms, numbers and types of agents in these sectors) as well as of sectoral interdependencies. This 'new structure' will, most likely, also bring about a new dynamic of the economic system as a whole.

*Political economy of structural change*: we emphasised in Sect. 3 that many of the recent models of structural change focussed on the analysis of production conditions in different sectors of the economy and their interrelationships. This allowed us to identify the roles different sectors play (directly and indirectly through their relationships with other sectors) in the overall growth process. We pointed out that as production conditions are different in different sectors this would also differentiate the ways how technological and organisational change would take place in them. We also emphasised that an important ingredient in structural change analysis is to identify not only what constitutes the 'forces of change' but also the characteristics of 'resistances to change'. This is where—in our opinion—the political economy of structural change analysis has to come in.

Some 'resistances to change' can be deduced from physical conditions of production—such as the use of fixed capital equipment or the rigidities involved in skills embodied in the labour force. The use of existing installations of equipment and the set of available skills constrain the organisational options in terms of the sets of tasks and arrangements of tasks that can be executed. All of these we consider 'physical' constraints to organisational options and thus define one dimension of 'structural rigidities'. But there are other 'forces of change' and 'resistances to change' that require a political economic analysis:

The 'political economy' dimension is one that brings in the behaviour of social groups into the analysis of change and resistance to change. What leads to a certain behaviour of such groups to articulate themselves as either forces of change or resistances to change and what are the characteristics and directions of such behaviour?

One of the reasons why 'resistances to change' arise is that existing behavioural patterns are the result of having solved, over time, complex 'coordination problems' of interactions in a social system. Once a particular *pattern of coordination* has evolved in an organisation, behavioural patterns become attuned to each other. While they provide scope—as mentioned above—to a range of responses to 'impulses' or 'forces of change', there are also boundaries with respect to such responses.

But the establishment of certain patterns of coordination and their manifestation in organisational forms is only one aspect by which social patterns of behaviour determine 'structures'. The other are *power relations*, which imply that the relationships between social groupings involve 'asymmetries' in mutual dependencies. That is, the degrees of behavioural freedom which one group has in relation to another group are 'asymmetric', i.e. constrains one group more than another. Furthermore, power relationships go further as one group can influence and constrain the behavioural options of the other group. This gives rise to another dimension of 'resistance to change' in that certain groups want to maintain those power relationships and even strengthen them—which could imply maintaining certain organisational arrangements or changing them—while other groups might want to widen their behavioural options and thus might push towards different organisational arrangements.

Let us turn in this context to report on new work recently initiated on political economic aspects of structural change that goes under the heading of 'Structural Political Economy' (SPE). We refer here to recent papers by Cardinale (2017), Cardinale and Coffman (2014), Cardinale et al. (2017) and Cardinale and Landesmann (2017). What are the features of this approach and how does it relate to what has been covered in this paper?

We might summarise the approach in the following way: the choice of a particular system of decomposition defines the 'units' of analysis (be they 'sectors' or 'social groupings'). Such units are in relationships with each other in an interdependent system. These interdependences lead to certain 'system-wide' behaviour and reaction patterns when they are exposed to 'impulses' or 'forces of change'. The 'impulses' or 'forces of change' might be exogenous to the system or endogenous. Examples of the latter might be 'innovations' emerging from the units themselves and from their pattern of interactions.

Structural Political Economy (SPE) emphasises that, while sectoral interests are 'partial' (i.e. articulate themselves without full insight into or responsibility for general interdependencies in an economy), these interdependencies nonetheless generate a systemic 'coherence' of sectoral interests that determines the overall workings of the economy as a whole.

Cardinale and Landesmann (2017, 2018) have applied an SPE approach to the analysis of international interdependencies and stresses and strains that such interdependencies produce. It thus goes beyond the structural political economy approaches pioneered by Francois Quesnay, David Ricardo and Karl Marx that confined their analysis largely to the interdependencies of social groups within a nationally confined economy. The SPE framework in a setting of international economic interdependence (think of the European Union) would look something like the following:

In Fig. 5, we can see that the SPE approach adopted by Cardinale and Landesmann (2018) preserves the features of the classical approach to structural political economy in that it locates social groupings in sectoral schemes, traces sectoral interdependencies, looks at income distributional implications and analyses the impact of all of these on the dynamics of the economic system as a whole. But it adds further dimensions to the analy-

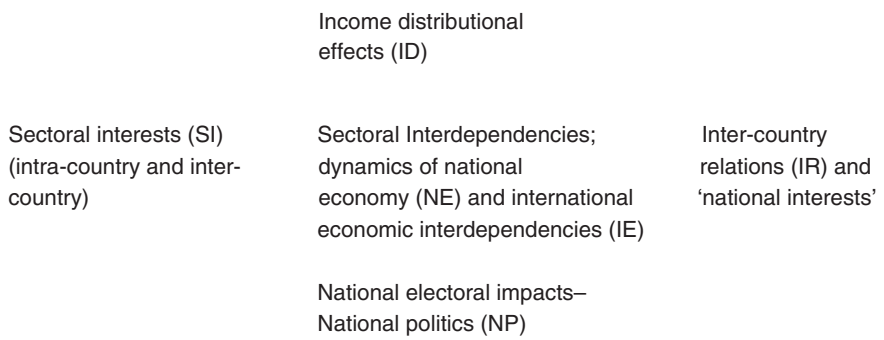


**Fig. 5** Extended Structural Political Economy (SPE) Approach—diamond of systemic relationships

sis: it tracks sector definitions and sectoral interdependencies at the international level and also analyses how international interdependencies impact on the dynamics of aggregate economies. Thus, the dynamics of different national economies is seen as interdependent.

Furthermore, the income distributional analysis is introduced not simply in terms of affecting the dynamics of economies through their impact on expenditure patterns and thus on output structure and overall economic growth, but social groupings do also react politically to income distributional outcomes and to the overall dynamics of an economic system (such as fluctuating employment levels, changes in the functional or personal distribution of incomes, the provision of public goods, the incidence of negative externalities, etc.) These political reactions feed into political processes in manifold ways: into national electoral processes, into the platforms and programmes of political parties, into coalition formations, etc. The political dimension is further explored in that political responses to evolving structural interdependencies and economic dynamics do not stop at national levels. Interdependencies of the dynamics of national economies (such as through balance-of-payments disequilibria and evolving debt and creditor positions of countries) impact on international relations (IR), at times putting these under strain and leading to—often asymmetric—adjustment processes. We have seen such dynamics during the recent crisis in the Eurozone and the strains and stresses it has put on relations between debtor and creditor countries (for details, see Cardinale and Landesmann 2017). Such crises in international relations can bring about changes in 'coordination mechanisms' that might also get their institutional expressions (such as the ESM and the 'Banking Union' that emerged during the recent EMU crisis).

The above shows that 'structural political economy' (SPE) has a lot of scope to be further developed, linking the analytical schemes and insights developed by classical political economists to the complex circumstances of the current regional and global environments.

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