UNIVERSITY OF LEEDS

Labour market institutions and capitalist development:

an Agent Based-Stock Flow Consistent approach from a Comparative

Political Economy and post-Keynesian perspective

André Pedersen Ystehede

Submitted in accordance with the requirements for the degree of

Doctor of Philosophy in Economics

The University of Leeds

Leeds University Business School

March 2022

The candidate confirms that the work submitted is his own and that appropriate credit has been given where reference has been made to the work of others.

This copy has been supplied on the understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

Acknowledgements

The thesis could not have been completed without the support and guidance from my supervisors, Prof Marco Passarella, Dr Stefan Kesting and Prof Gary Dymski. Our meetings were always stimulating and left me with encouragement, especially when I was less optimistic and felt "stuck". Their expertise provided an environment that allowed me to explore economics broadly and with an open mind. They also made sure I remained on course. The multiple conversations throughout the last four years have shaped my research and my way of seeing economics as a field and how one might navigate it.

I also owe special thanks to good friends that I have had the pleasure of meeting at Leeds and other places. Most notably, these include, but are not limited to:

Dr Emilio Carnevali, Dr Francesco Ruggeri, Dr Arpita Bhattacharjee, Dr Lorenzo Di Domenico, Dr Jose Martin Lima Velazquez, Dr Gabriel Burdin, Dr Tadeusz Gwiazdowski and Dr Antonio Rodriguez-Gil. Moreover, I want to thank all those who commented on my work or otherwise provided fruitful conversations about economics.

I want to express my gratitude to the committee members, Dr Jo Michell and Dr Antonio Rodriguez-Gil, for their thoughtful comments and constructive feedback which have substantially improved this thesis.

Finally, I am forever grateful to my family and friends who have relentlessly supported me throughout this endeavour. A special mention to Laura, who has supported me, without fail, daily during this project.

Abstract

This thesis examines the effect on the wage share, employment and the dividend-wage ratio from bargaining power of labour under two ideal-types of capitalism. These ideal types represent the fordist regime or *wage society* and the post-fordist regime of finance-dominated capitalism or *finance society*. The effect from bargaining power is analysed by studying different bargaining strategies, linked with rates of profits, productivity and firms' leverage position, with varying degrees of bargaining power when wage formation is negotiated collectively and individually. The effect is simulated in an Agent Based-Stock Flow Consistent (AB-SFC) macroeconomic model which is based on benchmark models by Caiani et al. (2016) and Dosi et al. (2010; 2018b). The developed model extends these models with more detailed elaboration of the wage formation process under two regimes in which banks may and may not ration new credit to firms. These models show how the AB-SFC method can be applied to combine economic theory and economic institutional analysis, and how this approach provides a laboratory in which the institutional configuration can be amended. The thesis suggests one possible combination of Comparative Political Economy (CPE) and macroeconomics, exemplified by the combination of post-Keynesian economics and CPE. The thesis argues that the AB-SFC approach, founded on a balance sheet and flow-of-funds approach, is more flexible than other macroeconomic modelling approaches. The effect on the wage share, employment and the dividend-wage ratio from bargaining power is affected by the institutional configuration and the results indicate that institutions may have profound effects on economic relations. However, the model simulations show that institutions are not the driving forces in the economy, but facilitators or *mediators*. Hence, demand

factors are more important for macroeconomic outcomes *per se*. The results contribute to the understanding of the law of motion in capitalist economies with respect to the role of institutions. The use of ideal types illuminates mechanisms and qualitative effects in the simulations, enabling a robust analysis of wage formation under and wage society and finance society.

Contents

List of Figures

List of Tables

Glossary

- The *micro-level* means the direct interaction among individual agents, such as consumers, workers, and borrowers.

- The *meso-level* refers to the institutional configuration which affects how individuals interact.

- The *macro-level* constitutes aggregate variables such as unemployment, output, and government expenditure. It is the outcome of the combination of the micro- and meso-level.

- *Microfoundations* describe the most granular aspect of the model at the micro-level, encompassing microeconomic behaviour, information and knowledge, and preferences and endowments.

- *Macrofoundations* describe the highest level of abstraction in the model, the macro-level. Where the microfoundations explain how the model is working, the macrofoundations explain the structures of the model.

- *Institutional theories of capitalism* means that institutions are understood independently from the capitalistic mode of production.

- *Capitalist theories of institutions* means that institutions are dependent on the capitalistic mode of production.

- *Capitalism* is a mode of production where the means of production and social relations in the production process is of a nature where a (minority) class owns the means of production, and another (majority) class sells their labour-power through wage-contracts.

Chapter 1

Introduction

1.1 Motivation and aims of research

This thesis investigates the effects on the wage share, employment and dividend-wage ratio from bargaining power of labour under two ideal-types of capitalism differentiated by their institutional configurations. The aim is to understand the macroeconomic effects from different wage bargaining strategies and how these effects become altered under the institutional configuration of a *wage society* and a *finance-dominated regime*, the fordist and post-fordist regime, respectively. The role of institutions and the institutional configuration is, therefore, brought into focus of the thesis to understand the characteristics of capitalism which entails the specific *model* of capitalism. The investigation elucidates the importance of institutional analysis for economic. The study provides a concrete example of combining economic theory and institutional economic analysis (cf. Pasinetti, 2021). The thesis applies a method of economic theory and institutional economics to a particular part of the economy as "the labour market really *is* different" than the demand and supply apparatus (Solow, 1990, p. 3, emphasis in original). The main research question explored is: *How are wages and employment affected by labour market institutions under capitalism?*

This research question investigates the effect on the wage share, employment and dividend-wage ratio from different labour market institutions through the

wage formation. The dividend-wage ratio represents the relation between income from selling one's labour-power and income from owning titles of capital. However, labour market institutions are not sufficient to understand the dynamics in the labour market and the functional distribution. The analysis involves adding financial aspects to the institutional configuration which enables the investigation to account for securitisation of loans and credit rationing by banks and these implications on labour market outcomes. The main research question is pursued in four stages: firstly, the combination of economic theory and institutional economic analysis for the study of capitalist economic systems is discussed; secondly, the formalisation of such a framework which can capture the complex dynamics and evolutionary nature of capitalism is analysed; thirdly, the consequences from labour market institutions on the functional distribution of income and employment are assessed; and fourthly, changes to labour market institutions are compared across developed countries and non-financial corporations are analysed under a finance-dominated regime of capitalism.

The functional distribution and remuneration to the owners of capital (through dividends) are essential aspects to understand the distribution of power in society and the inequality of income and wealth. The focus on dividends is driven by the transformation of corporate governance from *retain and reinvest* to *downsize and distribute* (Lazonick and O'Sullivan, 2000; Stockhammer, 2004; Glyn, 2006; van Treeck, 2009b) with the development from a *wage society* to a *finance-dominated regime*. Investigations of this development have recently pointed to a need for more of an institutional focus (Duwicquet, 2021). The wage share informs us about the distribution of value added, but the dividend-wage ratio illuminates the degree of compensation of labour-power and ownership of capital titles. This ratio is of interest because it reflects the owners of the corporation's power to extract earnings from the firm (as opposed to reinvesting them) at the expense of workers. Workers are households whose primary income is through employment-contracts, i.e. beyond the given firm. The dividends paid – determined as a ratio of the firm's earnings – reduces the means available to the firm and consequently has implications on the

2

firm's balance sheet. A higher rate of dividends paid may, therefore, lead to a lower labour share of income or real wages (*if* passed on to the price mark-up) or lower capital accumulation (*if* a smaller share of the surplus funds investment). Demand for labour depends on capacity utilisation which is determined by capital accumulation. Thus, workers in the economy are potentially faced with lower real wages or looser labour market tightness or some combination of both. This point has become a contentious issue in studies of the *financialisation* of capitalist economies. The issue of employment (and unemployment) reflects the state of the economy overall. These aspects are critical to understanding inequality which has long been dormant in economics but has recently been awoken (cf. Piketty, 2014; 2020). Employment is central to economic research and has been a focal point for macroeconomic development since the *General Theory of Employment, Interest and Money* (Keynes, 1936).

The economic and political interest in unemployment stems from the Great Depression and subsequent economic and financial crises. Obtaining work is considered a necessary factor for a good life in a capitalist society, and large masses of unemployment is associated with social unrest and deprivation. The financial crisis in 2007 and the following recession saw sharp increases in unemployment and mark a period of political polarisation and social upheaval with climacteric events such as Brexit, the *gilets jaunes* movement in France and the storming of Capitol Hill before the inauguration of US President Joe Biden. Stagnating wages and an increasingly dual labour market with a more significant share of precarious employment gives cause for concern since employment is the primary source of income for most people and therefore the premise for their standard of life (cf. Edwards et al., 1982; Barth et al., 2016).

The focus on labour market institutions is motivated by a lack of understanding about wage formation and its determining factors in capitalist economies. This lack is apparent due to the extensive literature with starkly different conclusions on the labour's share of income, real wages and employment. Unemployment is an economic cost to society through the loss of output and income. While preserved

fuel today can be used tomorrow, unused labour-power is irretrievable. From a social point of view, unemployment can lead to poverty, ill-health and even death, as shown in *Deaths of Despair and the Future of Capitalism* (Case and Deaton, 2020) and *The Economics of Belonging* (Sandbu, 2020).

These studies emphasise the importance of employment for partaking in capitalist society and how a spell of unemployment, or even precarious employment, can be alienating with dire consequences. The variety of the conclusions from studies on employment, wages and institutions is a testament to the difficulty and controversy around this topic. These conclusions range from microeconomic explanations to macroeconomic explanations. However, the explanations differ mainly in the notions of natural employment levels and market-clearing wages versus endogenously – socially and historically – determined levels of both employment and wages. These opposing explanations are even conflicted within consistent 'branches' of the literature concerning the determining role of labour market institutions, globalisation, financialisation and technological innovation. It is important to note that the heterogeneity of the determining factors reflects the degree of complexity involved in this topic regarding different aspects and their interaction.

1.2 Background

Covering all macroeconomic outcomes is beyond this thesis, so this study focuses on employment, functional distribution of income and dividend-wage ratio. It is imperative when considering implications from the business cycles and other institutions. The experience from the financial crisis in 2007 and subsequent studies point to feedback effects, or circular dynamics, between the labour market and economic activity, the role of finance for economic activity and the dependence of employment on capital accumulation and aggregate demand. The main differences in theoretical approaches to employment and wage formation can be traced to Friedman's (1968) introduction of the 'natural rate of unemployment', which led to a narrow focus on labour market institutions in much of the literature, and thereby neglecting broader

economic structures (Brancaccio et al., 2018).

Although there are merits to a narrow approach, other institutional aspects, e.g. from the finance sector, product markets, technology or government, are excluded. Following this turn in macroeconomics, the Keynesian approach of demand-side economics is downplayed, if not wholly non-existent, generating a narrower perspective on macroeconomic problems in the labour market and beyond. The dominance of one approach to macroeconomics leads to overestimation and over-reliance on a singular view which has severe consequences for economic policy. The focus on frictions in the job-finding and -separation rates to explain fluctuations is the clearest example of macroeconomic analysis of the labour market without much scope for demand-side factors (see Blanchard and Wolfers, 2000; Krusell et al., 2020).

Contrasting economic studies point to demand-side features and hysteresis effects to explain fluctuations in labour markets and economic activity (see Fatás and Summers, 2018; Bakas and Makhlouf, 2020; Girardi et al., 2020). Putting demand and path dependence in an institutional macroeconomic context contributes to understanding demand-side features and path dependence in an institutional context. Formalised, this means a demand-driven model with supply-side features. The model presented in this thesis combines macroeconomic theory and approaches employed to analyse capitalist economies as a *whole* meaning an analysis of economic structures, i.e. supply-side structures in the labour markets, and economic dynamics, i.e. aggregate demand (Kerr and Scazzieri, 2013, pp. 259-262). In these approaches, institutions are a specific part of the analysis (Kerr and Scazzieri, 2013, pp. 259, 281), and the focus on the institutional configuration is necessary for the economic analysis (Pasinetti, 2021).

The adopted approach of agent based and stock-flow consistent macroeconomic modelling provides a framework where agents are connected by their balance sheets generating circular relations. This allows the model to account for the *fallacy of composition* notion meaning that what holds true for an individual may not hold true for a group of individuals as a whole, i.e. one cannot extrapolate from microeconomics directly to macroeconomic aggregates. The fallacy of composition is

important for macroeconomic analysis, for example cutting wages will reduce costs at the individual firm, but when multiple firms cut wages this has a counter-intuitive effect on the economy where aggregate demand falls leading to a decrease in employment (cf. Keynes, 1936). Elaborating on Keynes' principle, Steindl (1985, p. 101) highlights the notion of "leakages" in the form of savings in the economy's circular flow. Government injections or exports can offset these leakages to avoid aggregate demand shortages. However, the rise of consumer debt and its increasing importance for the business cycle (Kim, 2016; 2019) indicate changing tendencies and new dominating structural dynamics. The injection of debt from the financial sector was pivotal for the boom up to the financial crisis in 2007 and remains a central feature of economic growth (Baccaro and Pontusson, 2016; Behringer and van Treeck, 2019; Köhler and Stockhammer, 2021). A growing income inequality, wage dispersion and greater inequality in wealth have coincided with a rise in household debt (Atkinson, 2015; Cynamon and Fazzari, 2016). These factors represent the shift of capitalism from the Fordist era to the post-Fordist era reflecting a new economic structure in which finance dominates the economic drivers.

1.3   Originality

This study conceptualises two capitalistic 'ideal types' – *wage society* and *finance society* – in which different labour market institutions are analysed. Wage society[1] reflects that the wage – received from selling one's labour-power – is the "preponderant form of employment" and "the predominate source of total demand" (Aglietta, 1998, p. 44, fn. 2). By which Aglietta means that employment prospects are high, sufficient income from employment is secure, and labour market institutions are central to the overall institutional configuration in capitalist economies. In contrast, finance society's mode of régulation and decisions depends on financial motives reflecting a type of *finance-dominated capitalism* (Stockhammer, 2008b).

These ideal types represent different dominating logics in the institutional configuration – sometimes characterised as *retain and reinvest* and *downsize and*

---

[1]Translated from la société salariale.

distribute – of the economic system. No economic system is a *pure* capitalist system but constitute a plurality of institutions. Still, some institutions dominate the system, and ideal types allow us to analyse the implications from different institutional configurations whilst maintaining the *essence of capitalism*[2]. Since the collapse of the USSR, capitalism has been the 'only game in town', and paradoxically the *laws of motion* under capitalism are often neglected or outright dismissed (cf. Acemoglu and Robinson, 2015). In the same way that the historical and institutional context is important for macroeconomic research, capitalism – as the fundamental mode of production – is similarly crucial for understanding modern economic systems. This thesis attempts to formulate the vision of re-establishing capitalism as an *explicit* part of macroeconomic research.

The analysis employs an Agent-Based Stock-Flow Consistent (AB-SFC) macroeconomic model to simulate different institutional configurations with respect to the labour market. The AB-SFC model draws on theories of money, of the firm and employment from post-Keynesian (PK) economics and Régulation Theory (RT) combined with specific work from Comparative Political Economy (CPE) by Gøsta Esping-Andersen (1990), Michel Albert (1993) and Andrew Glyn (2006). The theoretical basis of the model is a synthesis of CPE and PK economic theory. This synthesis integrates the distribution of income and aggregate demand in a dynamic framework, including a more explicit handling of power and social interaction. The model elaborates the commonalities between varieties of capitalism as well as variations and, thereby, expands the analysis on institutions to cover commonalities as well as differences, and accounts for the financial system and the role of money in a capitalist economy.

The thesis clarifies implications on labour market outcomes from different institutional configurations in the context of a specific economic structure. Institutions are therefore fully integrated into the model and the analysis of capitalist development. Three arguments are developed in response to the posed research question:

---

[2]Dobb (1978) and Screpanti (1999) provide two discussions of the essence of capitalism from a historical and institutional point of view, respectively.

- understanding capitalism and its inherent logic is crucial for economic analysis of institutional configurations,

- bargaining power of workers are important for nominal wages, but the institutional configuration of the economic system can either amplify or undermine the conflict over wages,

- finance-dominated capitalism is interconnected with the development of labour market institutions resulting higher dividend-wage ratios, reflecting a shift from productive income to rentier income for households

These arguments are important components of the synthesis of macroeconomics and CPE as the historical context of economies resides in the institutional configuration and economic structure. Thus, macroeconomic analysis necessitates institutional aspects to explain macroeconomic fluctuations and cycles. The thesis contributes to the research programme of economic theory and institutional economic analysis by formalising a theoretical model. Moreover, the thesis also contributes to the research programme of combining Comparative Political Economy and post-Keynesian economics. Finally, the AB-SFC models developed illustrates how economic theory and institutional economic analysis can be combined to form an evolutionary approach to economic analysis and investigation.

The three arguments obtained from this research provide a strong case for the evolutionary direction that economic research should pursue in the future. This research illustrate that the use of a *production-based* approach to economics (in line with the classical political economy approach) as opposed to a *scarcity-based* approach, based on the theory of marginal utility associated with the neoclassical approach (Myrdal, 1954, pp. 59-60)[3], better account for a capitalist system which continually reproduce itself with multiple interconnected agents. The difference between these two approaches is the notion of an *objective* and a *subjective* perspective in the economic analysis, respectively. The utility-based approach is inherently

---

[3] *The Political Element in the Development of Economic Theory* was first published in Swedish in 1930 and is based on research material accumulated whilst Myrdal was writing his PhD thesis *The Problem of Price Formation under Economic Change* presented in 1927 (Swedberg, 1954, p. xv).

subjective, and there is no manner in which utility and value can be measured for a person in a way that allows for any meaningful comparison across different persons (Myrdal, 1954, p. 43). The cost-based approach relies on value measured in costs; the trouble is finding a truly objective unit of measurement, something which is outside the scope of this thesis.

1.4   Structure and summary of findings

The thesis starts with a discussion of the literature which provides the foundation of the developed models that are used to analyse the research question. Finally, the analysed results are put in an empirical context by investigating the long-term development of labour market institutions and distributional indicators: real wages, wage share and dividend-wage ratio. The first stage of this thesis focuses on the combination of (macro-)economic theory and institutional economic analysis. The research question pursued here asks: *how can economic theory and institutional economic analysis be combined to analyse capitalism?* Chapter 2 discusses the importance of understanding the institutional configuration for analysing advanced capitalist economies as highlighted in the combination of CPE and PK. Based on the identified compatibility of CPE and PK economics in chapter 2, the synthesis of RT and PK is constructed in chapter 3. Thus, the second and third chapters answer this (sub-)research question.

The second stage – under the question: *how to formalise a framework of macroeconomic theory and institutional economics to analyse capitalism?* – macroeconomic modelling approaches are reviewed in the context set out in the first stage. Chapter 4, therefore, provides a bridge between the theoretical discussion in the first part (chapters 2 and 3) and the modelling in the second part (chapters 5 and 6). The final stages under the questions of *what are the consequences on the functional distribution of income and employment from labour market institutions*, and *how does a finance-dominated regime alter the effects from labour market institutions on the functional distribution of income and employment?* The mac-

roeconomic modelling approach, identified in chapter 4, is applied. The effects are analysed with multiple scenarios to understand the implications from labour market institutions in different institutional configurations. The findings of chapter 5 and 6 provide the background for the empirical analysis in chapter 7. Chapter 7 investigates long-term developments of labour market institutions in advanced capitalist economies and developments in compensation, profits and balance sheets among non-financial corporations in the US as part of analysing real wages, wage shares and the dividend-wage ratio. The thesis is summarised and concluded in chapter 8.

The main purpose of this study is twofold: to establish a connection between economic theory and institutional theory that is both compatible and able to generate a unified framework, and to uncover whether powerful labour unions, collective bargaining and central coordination can provide the conditions needed to reverse the trend of stagnating wages and assess its effect on employment. The study is based on work in CPE and PK economics.

The review of macroeconomic modelling justifies the chosen approach adopted to formalise the analytical framework set out in this study. The conclusion of chapter 6 highlights the difference that arises due to specific assumptions and the intuition which follow modelling choices. The notion of *holism* in original Institutional Economics – the complexity and heterogeneity among agents within a system – favoured descriptive analyses as opposed to general models. The richness of such analyses is reduced in the abstract formalisation of macroeconomic modelling. However, the AB-SFC approach to macroeconomic modelling provides a superior alternative to general equilibrium models (i.e. DSGE-types models) because of its *openness* concerning assumptions and concepts.

The model developed in chapter 5 shows the interaction and feedback effects between macroeconomic outcomes and the institutional configuration. The combination of economic theory and institutional economic analysis in this chapter also shows how institutions act as *mediators* in terms of social interaction and repercussions from this micro-level to the macro-level. Furthermore, the model illustrates that the standard institutional focus is insufficient to explain the laws of motion

in a capitalist economy and the importance of effective demand for employment. The model is simulated with different institutional configurations with respect to the labour market to analyse the implications from the institutional configuration on labour market outcomes under *wage society*. The results support the notion that institutions matter, as well as that bargaining power of labour is important for a more equal functional distribution of income. A novelty of this chapter is the analysis of supply-side features in a demand-led model that captures feedback effects in the economy.

This model is further developed in chapter 6 through a more detailed incorporation of the financial features such as the supply of credit and financial assets. These features mean that liquidity crises can occur and that firms will sell financial assets in case of insolvency. The added mechanisms are supplemented with new scenarios representing the regime of *finance-dominated capitalism*. Firms, therefore, look to pay much higher dividends to their shareholders, leaving fewer funds available for future production cycles. The simulation results generated by the AB-SFC model, in chapter 6, indicate that the bargaining power of labour on the wage share becomes less critical if firms have a higher rate of dividends because firms increase their price mark-up to fund dividends payments. Yet, the institutional configuration in the labour market matters for the effectiveness of wage bargaining, i.e. if nominal wage growth is linked to price inflation, productivity growth or profits. This means that the wage share and the real wage is positively associated with higher bargaining power of labour when the dividend rate is high and low. However, the level effect is significantly lower when the dividend rate is high.

Finally, the penultimate chapter provides an empirical description of changes to labour market institutions and non-financial corporations (NFCs) in the US in the context of long-term capitalist development. The analysis in chapter 7 shows how workers' bargaining positions across various countries have become weaker and decentralised, whilst their compensation has fallen vis-à-vis shareholders. The findings support the notion of *finance-dominated capitalism* as the share of financial assets on the balance sheets of NFCs have increased steadily since the 1980s. This

illustrates how the financial sector dominates the institutional configuration, and labour has become subsumed by finance. The conclusions in chapter VII amplify the benefit of adopting an *open modelling approach* to macroeconomic research, as in chapters 5 and 6, and underscore the usefulness of approaching capitalism as a complex adaptive system.

Chapter 2

A research critique of Comparative Political Economy from a post-Keynesian perspective

2.1 Introduction

This study provides a research critique of Comparative Political Economy (CPE) in response to the new approach set out by Baccaro and Pontusson (2016; 2020). Baccaro and Pontusson propose to combine CPE with post-Keynesian (PK) macroeconomics, specifically the neo-Kaleckian growth model. Incorporating the institutional aspect of PK economics contributes to the literature on the integration of macroeconomics and CPE, which is the motivation for this work. From the perspective of CPE, PK macroeconomics offers essential insights such as finance, as argued by Stockhammer (forthcoming), and the role of distribution (Behringer and van Treeck, 2019). However, these contributions only scratch the surface of the *theoretical* compatibility between CPE theories employed by Baccaro and Pontusson (2016) and PK. The chapter aims to identify the theoretical commonalities and address the differences as seen from a PK perspective. Only on that basis can a rigorous research approach based on CPE and PK macroeconomics be developed. Identifying the differences and commonalities between CPE and PK enables the

incorporation of PK macroeconomics as the macrofoundation of CPE and any potential benefits from the PK framework. This study, therefore, contributes to this research objective by probing into the economic postulates of VoC and thereby its compatibility as a microeconomic theory for the PK macroeconomic foundation.

CPE turned away from a macroeconomic focus for a microeconomic focus during the 1990s and 2000s (Schwartz and Tranøy, 2019). This shift is being reversed in the attempt to rethink CPE as Baccaro and Pontusson (2016) propose to combine a PK growth model with the Varieties of Capitalism (VoC) framework, set out by Hall and Soskice (2001b). This research critique finds benefits from combining CPE and PK as the role of institutions becomes more prominent in the analysis, akin to original Institutional Economics, and offer a research programme that better encapsulates the long-term development of capitalist economic systems. The study also identifies contradictory concepts and assumptions between VoC and PK that makes these frameworks incompatible. However, the history of CPE reveals that there are theories and analytical frameworks that are compatible with PK. Thus, there is scope to explore alternative frameworks that can successfully be combined with PK and fulfil the objectives set out by Baccaro and Pontusson (2016). Such frameworks must place income distribution (both personal and functional) at the centre of the analysis in a framework addressing both commonalities and differences in advanced capitalist economies.

Baccaro and Pontusson both have a long history in researching economic systems with attention to institutions. The reception of Baccaro and Pontusson's (2016) proposal by PK economists has been positive and constructive, see Behringer and van Treeck (2019) and Hein et al. (2020). There has yet to be a thorough evaluation; only Stockhammer (2021) has commented on the theoretical basis of the research programme. His focus is on the finance sector and growth models. He does not account for microfoundations or the institutional configuration that characterises different national economies. Fundamental aspects such as the role of supply-side factors in VoC and demand-side factors in PK economics remain unresolved. Neither Baccaro and Pontusson (2020) nor Stockhammer (forthcoming) deal directly with

this contention, so this work takes up this issue drawing on CPE. It is, therefore, advantageous to provide a thorough evaluation of CPE from the PK perspective to identify suitable alternatives within CPE. This chapter fills this gap by going deeper in evaluating the synthesis of CPE and PK economics. The chapter starts with a presentation of the PK perspective that forms the basis for the research critique of CPE with a focus on the proposal by Baccaro and Pontusson (2016) in section 2.3. Section 2.4 provides some concluding remarks and points to some potential paths for continuing this research programme.

2.2 The post-Keynesian perspective

Baccaro and Pontusson (2020) are motivated by the need to reconcile the internal debate framed in terms of commonalities and varieties in CPE. They believe that a fruitful way to resolve this is more engagement with macroeconomics. They intend to provide VoC with a PK macroeconomic foundation to address distribution, demand and social conflict in the analysis (Pontusson and Baccaro, 2020). Their argument is motivated by the research focus on CPE in the last ten years that has caused a failure to incorporate a macro-comparative aspect of CPE and, therefore, a pure notion of capitalism. VoC is a framework based on analytical components of the firm and relations to the firm in an economic system. Hence, VoC can provide a set of microfoundations for macroeconomic theory. The following section presents fundamental concepts and assumptions in PK economics for the evaluation of the abovementioned proposal.

The post-Keynesian school of economic thought is a broad school and can be subdivided into multiple strands, as seen by the work of King (2002; 2015), Lee (2009) and Lavoie (2014b). The origin of PK economics can be traced to John Maynard Keynes and Michał Kalecki. The complete list of founders and contributors, however, is far too long for this review. The interested reader is referred to the books abovementioned and references therein. The purpose of this review is to present an overview of some core propositions in PK economics in section 2.2.1 and

the core theory relevant for the research objective of this study, in sections 2.2.2 and 2.2.4, respectively.

2.2.1 Fundamentals

The PK research programme does not rely on the notion of the allocation of scarce resources as a definition of economics[1], but rather that of the scarcity of demand, namely effective demand, and the reproducibility of the economic system (Lavoie, 2014b, p. 24). Thus, the definition of economics is concerned with reproducibility and distribution of social production. This means that prices are not market-clearing but reproductive; price setting ensures that firms' profitability is maintained throughout the business cycle (Lavoie, 2014b, p. 167). The definition of economics is centred on the growth and production of the system either in terms of accumulation or technical progress or utilisation of resources (Hein, 2017b).

PK economics is based on the notion that an economy must be treated as 'open', meaning that it can absorb or incorporate contributions and ideas from other social sciences when relevant (Jespersen, 2009). The PK framework is underpinned by the understanding that it should be 'realistic' instead of 'idealistic' with respect to its assumptions that reflect its understanding of the event analysed (Pasinetti, 2005). The theoretical framework rejects the neutrality of money since economic behaviour is explained in the context of an integrated production and financial structure (Minsky, 1985, p. 7). Money is, therefore, understood as the product of financial interrelations rather than a veil that camouflages the ownership of wealth (Minsky, 1982, pp. 73-74). Uncertainty is an essential proposition in PK economic theory, which influences the description of economic behaviour and delineates how behaviour is affected by related concepts such as risk (Jespersen, 2009).

The notion of imperfect competition runs deep in PK economics, and com-

---

[1]Lionel Robbins described economics as a field of science akin to that of natural sciences and argued for a general unified subject matter for economics in his book *Essays on the Nature and Significance of Economic Science* (1932, pp. 1-3). Economics was defined as the study of the efficient allocation of scarce resources, which by extension became the underlying subject-matter and general definition of economics (Robbins, 1932, pp. 15, 18-22). This definition was based on the established approach of marginalism in economics (Robbins, 1932, pp. 4-7).

petition is treated in an evolutionary manner akin to the view of Schumpeter. He stated that "perfect competition is not only impossible but inferior, and has no title to being set up as a model of ideal efficiency" (Schumpeter, 1942, p. 106). Evolutionary aspects are crucial as there is a strong emphasis on history or circular cumulative causation in explanations of economic development (Skott, 1985; Setterfield, 1997)[2]. The integration of real and financial factors in the economy reflects the understanding of capitalism as a monetary production economy (Lavoie, 2006). A crucial postulate in PK macroeconomics is that investment drives profits since capitalists earn what they spend (Kaldor, 1955). The postulate is derived by Kalecki (1971, p. 82) from the expression: $Net\ profits = Consumption\ out\ of\ profits + Investment + Net\ government\ expenditure + Net\ exports - Savings\ out\ of\ wages.$

The notion of fundamental uncertainty is strongly advocated and the source of much internal debate. Lavoie (2014b, p. 73) summarises the distinction between uncertainty and risk as:

1. whenever an action leads to a specific outcome, i.e. where the value is known, then the choice is *certain* (*uncertainty of value*),

2. whenever an action leads to a set of possible specific outcomes, in which the value of those outcomes is known and associated with some probability, then the choice carries some risk (*uncertainty of probability*), and

3. a choice is uncertain when the value of an outcome is unknown, the associated probability of the outcome is unknown, and outcome from a given choice is unknown. The spectrum of possible choices is unknown[3] (*fundamental uncertainty*).

Another topic that has caused intense debate within PK economics is the theory of endogenous money. The debate between 'horizontalists' and 'structuralists' centred on the creation of money, whether the supply of money was structurally determ-

---

[2]This has a strong affinity to the original institutionalists such as Thorstein Veblen (1898). Circular cumulative causation is often associated with technical progress theorised by Verdoorn (2002) and Kaldor (1972), but in this thesis the institutional notion of Myrdal (1957, chap. 2) and Robinson (1979a) will be used. Keynes (1937) gave the example of a European war was uncertain.

[3]Keynes (1937) gave the example of a European war was uncertain.

ined or determined by the accommodation of the central bank (Lavoie, 2014b, p. 186). Constructive discussions of this debate conclude that the structuralists followed the developments by the horizontalists with further clarification and details explaining interest rates and the money creation process (Fontana, 2003). Nevertheless, both structuralists and horizontalists agree on the premise that the money supply is demand-determined and credit-driven. The remaining points of contention are the degree of accommodation by banks for demand for loans, the central bank accommodation of demand for reserves, and how interest rates are set (exogenously or endogenously) (Deleidi, 2019). This debate is beyond the scope of this study and not significant for its discussion. Hence, the PK view of money is considered endogenous, non-neutral, demand-determined and credit-driven. The non-neutrality of the money condition refers to the fact that the existence of money is non-neutral and that a credit-economy is fundamentally different from a barter economy (Cottrell, 1994)[4].

2.2.2 Microfoundations

A textbook presentation of PK microeconomics can be found in Lavoie's (2014b, chaps. 2 and 3) *Post-Keynesian Economics: New Foundations* and King's (2015, chap. 5) *Advanced Introduction to Post Keynesian Economics*. PK microeconomics is based on the principles of fundamental uncertainty, imperfect or monopolistic competition and the notion of monetary production economies where the business cycle is driven by firms' investments (Hein, 2017b). The following sub-sections summarise key aspects relevant to the VoC framework, notably supply of labour, demand for labour, pricing and investment decisions.

2.2.2.1 Households

Households have a dual role in PK economics since households are both consumers and owners/ labourers. Since workers are assumed to have a higher propensity to consume out of income than owners of capital, increasing real wages can generate

---

[4]This is akin to the meaning given to monetary analysis by Schumpeter (1911).

higher profit rates because higher real wages increases consumption, sales, and rates of capacity utilisation, which lead to higher investment and ultimately higher profit rates (Lavoie, 2014b, p. 18). This gives rise to the paradox of costs which states that what is true for a single entrepreneur is not necessarily true for entrepreneurs as a class in a capitalist economy (Kalecki, 1971, p. 26). This argument assumes that rises in real wages are higher than rises in productivity and could be considered a variant of the realisation problem of profits in Marxian economics (Lavoie, 2014b, p. 18).

Households' also make decisions on how much labour to supply. This decision is assumed to relate to their consumption because consumption reflects a particular living standard (i.e. a specific consumption set) that requires a certain level of purchasing power. Hence workers strive to maintain their consumption level by retaining the associated income level required (Lavoie, 2014b, p. 316). Workers may then decide to work more hours if their wages fall to maintain their consumption (Lavoie, 2014b, p. 317). Moreover, there are often fixed costs associated with housing that households must pay. Such contractual obligations indirectly force households to achieve a certain level of income (Appelbaum, 1979, p. 112; Rima, 1984). Thus, the shape of the labour supply curve is often assumed to be vertical or slightly convex. Therefore, the trade-off between time spent with work activities and leisure activities is not as homogenous as assumed in neoclassical economics (Spencer, 2006). The shape of the curve also reflects contract obligations to employers, meaning that households' decision to supply labour is rigid (Rima, 1986).

Wage bargaining is assumed to be conducted under monopsonistic forms (Kalecki, 1943). Monopsony entails a market in which there are many sellers (buyers) and few buyers (sellers), which lend a natural strength to the 'short-side' of the bargaining party (Robinson, 1943, pp. 28-29). Workers are therefore dependent on institutional factors in order to bargain for 'fair wages' because of firms' superior natural bargaining position on the 'short-side' of the market due to 'market forces' such as unemployment (Skott, 2005). Rowthorn (1977) put forward the role of demand as a disciplining force on market agents, by which he meant that demand

set the outer frames as the 'regulator of conflict'. Thus, although trade unions and bargaining strength are considered vital determining factors, demand could at times overrule the position of such labour market institutions. In a similar vein, Arestis and Sawyer (2005) argue that conflict over wages in bargaining produce inflationary pressures due to capacity constraints following a lack of investment. Recent contributions point to the rise of household debt as another important factor for wage formation. This is based on a notion similar to employment rent, i.e. the cost of job loss becomes higher as household debt increases because unemployment would reduce the households' debt-servicing capability as wages and salaries are the primary sources of income (Appelbaum, 2011). A recent study indicates that higher households debt is positively associated with the cost of unemployment or cost of job loss (Kim et al., 2019).

2.2.2.2 Firms

Consumption affects the cyclical processes in the economy because it acts as a signal for firms' expectations of future sales (Cornwall, 1979, p. 29). Investment is assumed to be a function of capacity utilisation and profits, see Hein (2017a) and Dutt (2017) for two recent discussions. The functional distribution of income usually represents the heterogeneity amongst agents from different classes in society. Essential aspects of the Kaleckian theory of distribution is concerned with microeconomic factors such as market and bargaining power which affects the price mark-up and labour's share of income in capitalist economies (Asimakopulos, 1980). The labour market is a critical link between decision-making at the level of firms and the aggregate price level (Rima, 2003). The conflict over compensation to labour between workers and capitalists plays a crucial role in determining other value relationships in a monetary production economy (Rima, 2003).

PK models usually operate with a concept of *cost-plus* pricing. Therefore, prices are seen as a factor in the income distribution mechanism between wages and profits (Godley and Lavoie, 2007, p. 263). This means that firms set a mark-up on prime costs rather than relying on a market-determined price level (Shapiro and

Sawyer, 2003)[5]. Cost-plus pricing differs between *full-cost* pricing and *normal-cost* pricing. Normal-cost pricing is based on a convention or rule-of-thumb in terms of what 'normal' constitutes. Expected and realised entrepreneurial profit levels are therefore not necessarily equal or need they be close (Godley and Lavoie, 2007, p. 270). Full-cost pricing covers actual average costs plus some profit margin and originates from the work by Hall and Hitch (1939)[6].

The mark-up is influenced by expenditure on sales promotion and advertising (i.e. expenditure directed to influence consumers), the level of overhead[7] costs and the strength of labour unions (Kalecki, 1971, pp. 49-50). The degree of market concentration is therefore also considered to be strongly shaped by institutional factors. These institutional factors accumulate to a firm's monopoly power and thereby its capacity to alter the mark-up favourably for itself (Reynolds, 1983). A strong trade union would deter a rise in the mark-up because firms would expect increasing wage demands in response from the trade union (Kalecki, 1971, p. 162). The firm, therefore, looks to acquire power over its environment, i.e. economic, social and political, because power means more control of future events (Lavoie, 1992, pp. 99-100). Being able to control or direct future outcomes strengthens firms prospects of survival (Lavoie, 2014b, p. 129). This is consistent with the notion of fundamental uncertainty since firms must ensure access to finance, material inputs and information in an uncertain environment (Lavoie, 2014b, p. 129).

Market power, transaction costs and uncertainty cannot be separated entirely in this framework since transaction costs are the result of decision-makers with a certain level of market power who make strategic decisions under fundamental uncertainty (Dunn, 2002, p. 74). Since power is central to the explanation of decision-making in PK theory, the notion of power is associated with a form of

---

[5]See Frederic Lee (1998; 2018) and Marc Lavoie (1992, chap. 3; 2014b, chap. 3) for discussions of post-Keynesian theory of pricing.

[6]Due to the possibility of perverse pricing with historic cost-plus pricing following changes in expected sales and no difference in unit costs, higher sales will reduce price and lower sales will increase prices (Godley and Lavoie, 2007, p. 268). *Normal-cost* pricing (Andrews, 1949) where normal costs refer to the normal level of output or capacity utilisation avoids the issue of perverse pricing (Godley and Lavoie, 2007, p. 269).

[7]Average overhead costs is the standard cost of operation that includes depreciation allowances (Robinson, 1979b).

capital, e.g. *productive, finance, political.* The utilisation of power generates dialectic relationships, i.e. measures to ensure full employment (wage increases) undermine accumulation, or the tension between rentiers and entrepreneurs, which both retain surplus labour but through different channels (Dymski, 1996, p. 133). Hence, the circular relations of capitalist economies and the power vested within those relations give rise to contradictions and instability. The capacity of firms to exert their market power depends on the principle of competition in neoclassical economic theory, but in PK theory, the balancing lever is that of *countervailing power* among those subject to the firms' market power, a concept theorised by Galbraith (1952). A structured discussion of Galbraith's notion of power can be found in Kesting (2005).

Investment decisions depend on expectations of future demand and are based on output capacity and past sales (Eichner, 1976, p. 192). Firms are assumed to combine a strategy of profit realisation and expanding market share – the weighting is expected to vary among firms and industries – which entails differences in profit margins and capacity utilisation in production. Firms undertake investment to grow and increase their profitability and thereby ensure their survival (Lavoie, 2014b, pp. 132-134). Firms require financing to realise planned investment. A firm obtains financial means from issuing equity, past sales or bank credit (Robinson, 1960, p. 146). Banks have an active role in PK economic theory due to their capability of producing money credit, or as argued by Le Bourva, banks monetize debts; they do not create money for themselves (Le Bourva, 1992).

2.2.3 Institutionalism

Post-Keynesian Institutionalism (PKI) refers to the affinity between PK economics and original Institutional Economics[8] exemplified by leading figures such as John Kenneth Galbraith, Hyman Minsky, Alfred Eichner and Dudley Dillard (Whalen, 2020). In his exhaustive review of PK economics, Lavoie (2014b, p. 43) categorises PK institutionalists as a specific strand of PK economics that encapsulates pricing,

---

[8]Original (also labelled as "Old" or "American") Institutional Economics refers to the scholarly work by Veblen, Commons, Mitchell and others, see Myrdal (1978) for a discussion of institutional economics.

theory of the firm, monetary institutions, behavioural economics and labour economics as its main themes. The synthesis of PK and Institutional Economics is often based on the shared vision, expressed by John Maynard Keynes and John Roger Commons, of stabilising capitalism (Whalen, 2020). Another point that makes PKs and Institutionalists natural allies is the criticism of neoclassical economics and the marginalist theory of distribution (Whalen, 2013). Through the works of Eichner and Andrews, both PK and Institutional Economics rely on some form of cost-plus pricing theory and investment as the driver of economic activity and business cycle fluctuations (Whalen, 2013; Lavoie, 2014b, pp. 41-42). The evolutionary view of the economic system and the inherent instability of capitalism is another point of overlap, which is especially apparent in Minsky (1996). Minsky's concept of *Money Manager Capitalism* has been important for both PK and Institutional analysis of capitalism and the need for state intervention (Minsky and Whalen, 1996).

Zalewski and Whalen (2010) apply a PKI analysis of income inequality and financialization by considering banking relations, financial structures and income inequality in developed countries. Their analysis relies on theoretical insights from Minsky and Schumpeter with respect to financial institutions and economic development, respectively. Another example of an analysis of the post-Fordist economy combines Veblen's conspicuous consumption and Minsky's *Financial Instability Hypothesis* in a stock-flow consistent macroeconomic model (Kapeller and Schütz, 2014). This work may also be considered part of the PKI where behavioural aspects from Institutional Economics are integrated into a PK macroeconomic model. An example by Todorova (2013) illustrates how the concept of social provisioning in Institutional Economics helps to illuminate public finances in a PKI analysis. Her approach sees production as a circular flow in which the social surplus, the remainder of output used in production, is distributed among members of society according to public regulation. Therefore, classes and power are vital to understanding the distribution, and economic development depends on this distribution since capitalists require social surplus to expand production (Todorova, 2013). Todorova shows how the concept of social provisioning provides an institutional argument for functional

finance that broadens the analysis of government deficits and full employment.

The behavioural economics theme in PKI was initially based on interdisciplinary work from psychology and sociology (Lavoie, 2014b, pp. 91-94). Human behaviour is theorised in a PKI framework according to motivation, cognition/ reasoning and decision-making (Fernández-Huerga, 2008). The approach in PKI rejects methodological individualism and sees individuals as social beings where behaviour implies social interaction (Fernández-Huerga, 2008). Hence, the assertion that institutional arrangements matter for the workings of the economy is reflected in the weight given to concepts such as norms, habits, customs, conventions and regulation (Minsky, 1985, p. 12). Fernández-Huerga (2019) expands on the behavioural economic theory of PKI in a discussion of decisions on the demand for labour. His study offers a critique of the neoclassical labour demand function. He provides an alternative in which the demand for labour is a function of firms' power and capacity to control their environment. Thus, firms' demand is linked to their strategic plans for growth, profits or both.

Fernández-Huerga emphasises the importance for firms to find employees with interests and competencies aligned with their aims. The labour supply function and decisions of offering labour by workers are presented in Fernández-Huerga et al. (2017). Their paper dives into the behavioural aspect and thereby provides explanations for decision-making regarding labour supply. Their work contributes to the microeconomic foundation for macro-oriented discussions of the labour market in a PK context that have been discussed previously by Lavoie (2003) and Rima (1984), for instance.

2.2.4 Macrofundamentals

PK macroeconomics emphasises the principle of effective demand and the endogenous creation of money and credit (Lavoie, 2014b, p. 182). Effective demand depends on the realisation of desired demand which is related to the financing of investment and consumption. It, therefore, depends on income and increasingly on access to credit (Hein, 2018). The employment rate depends on the demand level of goods,

whilst the functional distribution of income is determined by the economic powers of capital and labour (Hein, 2017a). Hence, investment drives the accumulation of capital and, therefore, employment (Stockhammer et al., 2014). Economic growth depends on inputs such as labour, capital and natural resources. However, the stability and sustainability of growth also depend on past surpluses or net product of production (Rima, 2004). The intuition on which this understanding of expansive reproduction is based goes back to the work of the French Physiocrats and is important for the approach to political economy found in PK, Marxists and Circuitists theories (Rima, 2004).

The endogenous theory of money means that the role of banks go beyond financial intermediation or 'greasing the wheels' of the real economy (Davidson, 1978). PK theory of money and banking emphasises the distinction between the demand for credit (as seen from the prospective borrower) and effective demand for credit (i.e. credit-worthy prospective borrowers as assessed by the bank) (Lavoie, 2014b, p. 248). Money credit creation is often summarised with the catchphrase, "loans create deposits" (Lavoie, 2014a). In a more nuanced form, the endogenous theory of money states that banks create money on demand, given that the loan application is acceptable to their perceived level of risk and the expected return associated with the loan (Dymski, 1992). This means that banks create money without a need for prior savings or other assets – banks' liabilities are matched with assets at the end of the business day with funds from other financial institutions or the central bank (Deleidi, 2019; Lavoie and Reissl, 2019). The banks are licensed by the central bank or government authority which allows them to "produce" bank money *ex-nihilo* according to the PK theory of banking[9] (Dymski, 1988; Ramskogler, 2011) (Dymski, 1988; Ramskogler, 2011). Bank credit – lending – is a systemic requirement for any monetary production economy (Godley and Lavoie, 2007, p. 261).

Counterintuitive relations between microeconomic decisions and macroeconomic variables are often highlighted in PK economics and stems from the *fallacy*

---

[9]There is broad support for this description of commercial banking from institutions (McLeay et al., 2014; Jakab and Kumhof, 2019) and empirical studies (Werner, 2014b;a).

of composition, which states that what holds true for an individual may not necessarily hold true for a collective of individuals. This leads to a 'circular relation' of spending-income-spending that constitutes feedback dynamics between the micro- and macro-levels. At the macro-level, it may seem irrelevant if a single household or small group of workers experience a decrease in their income from lower wages, allowing firms to lower their production costs. However, the micro-economy is interrelated, and such changes may have broad ripple effects (Shapiro, 2012). According to Steindl (1985, pp. 100-101), general fluctuations during normal times[10] in consumption and investment at the micro-level may generate opposite fluctuations at the macro-level. At the micro-level, single firms may reduce costs, especially wage costs, in order to increase their profits; or a single household may reduce its spending to save more of its income. These fluctuations will boost the single firm or household, but at the macro-level, lower costs mean lower income, and lower income reduces spending, which means lower revenues and profits. Thus, savings (from sales or salaries) drains the circular flow of the economy.

The remaining discussion of PK macroeconomics is focused on the neo-Kaleckian model because this is the model adopted by Baccaro and Pontusson (2016). Historically, the neo-Kaleckian models are different from neo-Keynesian models that were developed by Kaldor (1957), Robinson (1962) and Pasinetti (1962) in the late 1950s and early 1960s. This is because of some different assumptions regarding the economy. Still, Keynes' concept of effective demand and fundamental uncertainty remains part of the main body of modern PK theory (Lavoie, 2014b; King, 2015; Hein, 2017b). Furthermore, the distribution of income and wealth are essential channels for how demand drives the economy in different PK models (Jespersen, 2009).

The neo-Kaleckian models rely on oligopolistic features in their assumption of competition, whereas neo-Keynesian models rely more on the assumption of competition with many small firms (Lavoie, 1995). The neo-Keynesian models differ from neo-Kaleckian models also because the former become more classical in the

---

[10]In abnormal times, i.e. during some form of crisis, a discussion of behaviour becomes subject to relevant proviso.

long-run due to the assumption of a fixed rate of capacity utilisation, at the normal level, whereas the rate of capacity utilisation is endogenous in the long-run in the latter (Lavoie, 1995). These theoretical concepts are very prevalent in Kalecki's work (Kalecki, 1954; 1971)[11], and the model is often referred to as neo-Kaleckian models.

2.2.4.1 The neo-Kaleckian model

The first neo-Kaleckian models were developed in the 1980s (Rowthorn, 1981; Dutt, 1984), and the seminal model of wage-led and profit-led regimes is presented in Bhaduri and Marglin (1990). The model is demand-driven in both the short- and long-run and rejects Say's Law because money is assumed to be non-neutral and effective demand matters in the long-run and the short-run (Hein, 2017a). The neo-Kaleckian model is based on the national accounting framework in which Kalecki (1971) based much of his work. Through this framework, the functional distribution of income is linked with different demand regimes. In a wage-led regime, an increase in the wage-share causes more consumption due to workers' high marginal propensity to consume out of income, and this increase in effective demand induces firms to increase the production of output which requires more investment in order to raise the rate of capacity utilisation; in a profit-led regime a decrease in the wage-share must mean a higher profit-share, verified from the national accounts, and the higher profit-share is then invested by the capitalist causing an expansion in production and employment, and ultimately effective demand (Bhaduri and Marglin, 1990). These forces reflect level effects that differ from long-run growth changes, determined by an autonomous component in demand.

The economic structure is crucial because the effect on demand depends on the behavioural traits of the economy; hence its structure, e.g. pro-labour policies or effects causing an increase to the wage-share in profit-led regimes will not lead to higher demand, but stagnation (Lavoie and Stockhammer, 2013a, pp. 17-21). The utilisation effect on investment is the *original* PK feature of the model. However,

---

[11]See Sawyer (1985) and Hein (2017a) for discussions of Kalecki's work and Sardoni (2011) and Bortz (2017) for a discussion of Kalecki's approach to economics with respect to Marx and Keynes.

developments of the model have introduced effects on investment from profits as well (Hein, 2017b;a). This profit channel for investment reflects a Marxian influence based on the notion that capitalists reinvest surplus from the production circuit (Foley, 1986, p. 63).

The assumptions of marginal propensities to consume out of income and profits, profitability's effect on investment and net export price and import income elasticities determine the nature of the regime: wage-led regimes require that the marginal propensity to consume out of income is higher than that out of profits, that investment is not very sensitive to profitability with a high accelerator effect and relatively low elasticities in net export prices and import income; a profit-led regime is characterised by close to or completely equivalent marginal propensities to consume out of income and out of profits, investment decisions that are sensitive to profitability with a low accelerator effect and a very open economy, i.e. high net export price and import income elasticities (Rowthorn, 1981; Dutt, 1987; Lavoie and Stockhammer, 2013a, p. 24). The taxonomy of wage- and profit-led regimes has been a source of some controversy (see dos Santos, 2015; Lavoie, 2017; Stockhammer, 2017; Heise, 2020).

In the closed economy case, the investment function developed by Kalecki (1971) and Steindl (1952) depends on the capacity utilisation rate. The rate of capacity utilisation will lead to new investments as production expands. Therefore, the nature of this relation becomes important in terms of the role played by the normal rate of capacity utilisation. For example a too low capacity utilisation rate compared to the 'normal' rate would depress investment due to the excess capacity (Nikiforos, 2016). The impact on capital accumulation, i.e. rate of capital accumulation, comes from either wages or profits, depending on the dominating channel of the regime of accumulation in the economy (Heise, 2020)[12], see Skott (2012) for a theoretical and empirical discussion of Kaleckian investment function specifications.

The wage- and profit-led model has become the workhorse model of PK research in macroeconomics and economic growth (Stockhammer, 2017; 2019). Yet,

---

[12]Heise (2020) provides a thoughtful and critical review of neo-Kaleckian models.

despite that the model has been researched extensively, both theoretically and empirically, for an overview see Lavoie and Stockhammer (2013b), empirical research on the nature of economies to determine if they are wage-led or profit-led remains inconclusive. The ambiguity is due to effects from exports and imports on domestic economies that may alter the *domestic demand-regime* from the *total demand-regime* (Lavoie and Stockhammer, 2013a, pp. 22, 24). Empirical analysis suggests that most countries are wage-led *domestically*, but analysis of *total* demand regimes indicate more ambiguity (Onaran and Galanis, 2013; Onaran and Obst, 2016). Analysis by Blecker (1989; 2016) suggest that a regime's response to distributional 'shocks' also differ depending on the nature of the shock itself, i.e. the magnitude of an increase in the wage- or profit- share. Skott (2017) presents a similar criticism and argues that the model focuses on distributional outcomes and does not deal appropriately with questions of *how* to change the distribution.

Institutions are effectively neglected in the core wage-/profit-led model which is paradoxical because PK theory often argues that institutions *matter* and economic theory should not be ahistorical. The critical attention drawn to the treatment of time in the wage-/ profit-led model (Blecker, 2016) lends further support to the point raised by Skott (2017). However, Hein (2017b) dismisses most of Skott's criticism and argues that in the long-run most empirical results suggest that domestic demand and growth seem to be wage-led; that profit-led growth and demand arises via the net export channel for economies that are tightly integrated with global markets, i.e. that the Marshall-Lerner condition holds, and that countries follow an export-led strategy for growth. This does not cement the matter as PK work on international trade suggests that the Marshall-Lerner condition is a special case that relies on the assumption of complete exchange rate pass-through to import prices (Godley and Lavoie, 2007, pp. 454-455; Carnevali et al., 2020). This supports Hein's (2017b) rebuttal of Skott's (2017) argument, but more importantly, reflects the importance of the historical context.

2.3 A research critique of Comparative Political Economy

The previous section presented the PK perspective from which CPE is to be reviewed. PK economics emphasises fundamental uncertainty, effective demand, and credit creation in monetary production economies and highlights the importance of social interaction and the role of institutions. This nominates some key features that must be carefully considered in the VoC approach and potential alternative approaches in CPE. An explicit notion of what capitalism is and how it works, what constitutes the economic system – it is more than the sum of its parts – and social interaction at the micro-level causes feedback effects which may amplify or suppress macroeconomic tendencies are key theoretical aspects that PK and CPE must reconcile in order to erect a common research paradigm.

CPE is a relatively new term that can be traced to the 1960s. However, it received more scholarly attention in the 1970s as a response to the economic crisis and stagflation period (Baccaro and Pontusson, 2016). CPE consist of a core framework, namely Varieties of Capitalism, with criticism from periphery schools of thought such as Régulation Theory, Social Structures of Accumulation and Marxian Political Economy. However, neighbouring research programmes such as New Institutional Economics[13], Economics of Geography, Comparative Capitalism, Comparative Economic Systems and New Political Macroeconomics has affinities and varying degrees of influence on CPE. Since capitalism and polity encompass areas outside the strictly economic sphere and the comparative analysis among countries, other fields in social sciences – sociology, anthropology and political science – is and has been involved to varying extents in the development of CPE[14] and continues to influence its development.

---

[13]There are different approaches to institutional analysis that can be labelled New Institutional Economics – Rational Choice Institutionalism, Historical Institutionalism and Sociological Institutionalism (Streeck, 2011).

[14]The multitude and diversity represented in contributions are clearly apparent from journals and books that have had significant impact on the development, e.g. Socio-Economic Review, Politics & Society, British Journal of Political Science, Varieties of Capitalism (Hall and Soskice, 2001b), Varieties of Capitalism, Varieties of Approaches (Coates, 2005b), to mention a few.

CPE has an emphasis on institutions and how economies differ due to institutional differences. Institutional differences are used to explain political and economic responses to crises and the role of the state and the organisation of labour in an economy (Baccaro and Pontusson, 2016). Therefore, much attention was given to social relations, power balances, social conflicts, and class struggle in the early work of CPE. However, since the 1990s and especially with the emergence of VoC in the early 2000s, the analytical focus shifted towards the firm and business networks with consequently less attention to social structures outside the firm sphere. This also meant a shift from capitalist systems to business systems as the firm's structure represented the economic structure. The proposal by Baccaro and Pontusson (2016) of combining VoC and PK is not only an attempt of incorporating macroeconomic aspects such as income distribution and effective demand with a theoretical framework of CPE. It also reflects a move towards reconciliation of different strands within CPE: national models of capitalism, post-Fordist production regimes and the political economy of wage formation and macroeconomic policy (Pontusson and Baccaro, 2020). In response to their proposal, Piore (2016) argues that the proposed approach combines a macro (neo-Kaleckian model) with a micro (VoC model) approach, but the addition of VoC is incapable of offering *real* insight into the mechanisms and workings of the economic system. In a similar vein, Streeck's (2016) response is that the growth model perspective deals a "death blow" to the firm-centred approach of VoC.

2.3.1 Developments in Comparative Political Economy

Andrew Shonfield's *Modern Capitalism: the changing balance between private and public power* (1965) scrutinised the UK and French economy with respect to the balance of power between public and private ownership of corporations. The comparative nature of his analysis remains very much in the contemporary CPE scholarship, although he made no attempts to classify or categorise 'types' of national models or economic systems. Instead, Shonfield suggests that capitalism can be variegated depending on the institutional configuration because institutions regulate the bal-

ance of power between private and public interests. Here, *institutional configuration* refers to *how* institutions are empowered as *mediators* by the state. The role of the state is, therefore, a key component to understand the formation of institutions as well as it is to discipline capitalism. This understanding has similarities with Galbraith's *countervailing* and *conditioning* power (Galbraith, 1952; 1983).

Shonfield's analysis of capitalism shares similarities with PK analysis and their conclusions of the need for institutions as mediators in a capitalist economy overlap. Shonfield's focus on decision-making bodies such as governance boards and its implications for economic development and social provisioning has an affinity to PKI work by Lee (2011), Todorova (2013) and Seccareccia (2015). Moreover, Kesting's (2005) discussion of (countervailing) power shows the analytical emphasis of and structural use of power in Galbraith's work that is shared in Shonfield's work. Shonfield's systemic analysis of institutions is in some ways also similar to the régulationist perspective (Becker and Jäger, 2012) as power relations and formal institutions are at the heart of the analytical schema. Régulation Theory (RT) investigates economies by analysing institutions and social structures and their long-run tendencies (Sum and Jessop, 2013, pp. 241-242).

Shonfield's work motivated further explorations on institutional configurations in different economic systems using comparative analysis. However, the initial focus on ideas such as Keynesianism or Monetarism came out of fashion in CPE towards the end of the 1980s (Blyth, 1997). The results of economic reforms in the 1970s and 1980s had become more apparent, and with it, an interest for understanding the role of the welfare state. In *Three Worlds of Welfare Capitalism*, Gøsta Esping-Andersen set out a typology for welfare regimes in a capitalist economy based on an index created from different welfare measures such as out-of-work benefits, coverage of social services (i.e. education, health) and economic redistribution (Esping-Andersen, 1990, pp. 49-54). This index reflected the extent of de-commodification in society, and Esping-Andersen's categorisation demonstrates a focus on the provision of key services by the market, the family and the state: liberal, corporatist and social democratic welfare regimes, respectively (Esping-Andersen, 1990, pp. 26-29).

The increasing trend of exposing social provisioning to free markets and privatising the provisioning such as health care, education and pensions has also been described as *Privatised Keynesianism* (Crouch, 2009).

Esping-Andersen argues that the constructed index is correlated with the institutional configuration in an economy (Esping-Andersen, 1990, chaps. 3 and 4). Therefore, the institutions' role as mediators found in Shonfield remains with Esping-Andersen's scholarship, but with a focus on how institutions form different types of welfare states in economic systems. This reflects the notion that the institutional configuration has different implications despite similar individual institutions. Esping-Andersen's analysis focuses on distribution and class struggle issues in society that are also central to PK analysis; his work could be viewed as a social policy analysis of contemporary PK thinking when considering later work on social provisioning (Todorova, 2013; Seccareccia, 2015, cf.). Esping-Andersen (1990, pp. 17-19, 26) investigates the dynamics between social structure and politico-economical regimes. This demonstrates the important effects of the process of Polanyi's *double movement* (1944) in the context of how de-commodifying labour counters the exploitative forces of capitalism (Esping-Andersen, 1990, pp. 35-37)[15]. Where PK focus on the income side of distribution and relation to bargaining power between social groups, Esping-Andersen's thesis provides the social narrative of how institutions become more active in their role as mediators. However, the focus on political ideologies, as seen in Shonfield, diminishes as the institutional configuration in welfare regimes entered the centre stage (Standing, 1991).

Consequently, the significant shifts of capitalist development and its fundamental traits come out of focus. Accumulation of capital and issues of effective demand are outside the scope of Esping-Andersen's analysis, reflecting a much more sociological and polity perspective. This reveals a clear difference compared to PK economic analysis, but it is intentional since Esping-Andersen is less concerned

---

[15]The Marxist terminology and thinking has a strong presence throughout *Three Worlds of Welfare Capitalism* which is not surprising. Esping-Andersen's influence from Marxist thinking is already presented via Erik Olin Wright who was on Gøsta Esping-Andersen's PhD committee and an Assistant Professor at University Wisconsin-Madison when Esping-Andersen was a graduate student there.

with economic development and stability. The common expression of capitalism in *Three Worlds of Welfare Capitalism* and PK economics allow for potential synthesis between the two, something which has been picked up recently (Hein et al., 2020, cf.).

The book *Three Worlds of Welfare Capitalism, Capitalism against Capitalism*, by Michel Albert (1993) focuses on competing forms of capitalism and presents a narrative explicitly on the nature of capitalism. Similar to Esping-Andersen, Albert (1993, pp. 101-106) builds his narrative on a classification of capitalism (as opposed to the institutional configuration), 'Neo-American' and the 'Rhine model', based on the United States and Germany, respectively. His study presents a thorough analysis of capitalism and concludes that capitalism has competed with itself since it saw first light. Capitalism has therefore undergone different stages that cover epochs (Albert, 1993, pp. 251-257):

1. *capitalism against the state* was the transition from a monarchical rule of law to a state enforced rule of law with property rights that saw the birth of capitalism and competition between capitalists and the state. The subsequent class struggle and exploitation of labour revealed by Karl Marx (1867) slowly led to the second stage.

2. *capitalism disciplined by the state* was a series of reforms implemented to regulate the forces unleashed by capitalism, mainly driven by a growing labour movement and a reaction to the Great Depression in the 1930s and two world wars. This gave rise to the emergence of the modern welfare state.

3. *capitalism instead of the state* coincides with the golden age of capitalism (Marglin and Schor, 1990) in the 1950s and 1960s but refers, in reality, more to the 1970s and 1980s. This stage is characterised by how capitalism is taking over for the state in the provision of several services previously provided by the state (e.g. education, pension and health).

For Albert (1993, p. 256), capitalism is a force in every society that by its nature seeks to break free from any form of regulation or restriction imposed by a com-

munity. These features are, to some extent, described by Esping-Andersen as well, but Albert provides a historical explanation of capitalism in which capitalism's nature becomes apparent. This is reflected by Albert's focus on long-term capitalist development.

The works by Shonfield, Esping-Andersen and Albert reflect an explicit interest in the institutional configuration under capitalism, although their focus differs. In their work, sociological and political factors are given a higher weight than in PK work – and economics in general – something which was 'rectified' by the approach set out by Hall and Soskice and others (Hall and Soskice, 2001b) with a focus on the firm and business networks with respect to technology and innovation. The timid presence of economics before VoC in CPE is paradoxically one explanation for the compatibility with PK. Another explicit aspect is the strong Marxian flavour in CPE before VoC and its intense scrutiny of capitalism and power relations in capitalist economies.

2.3.2 Varieties of Capitalism

The extensive introduction of app. seventy pages in the edited book, *Varieties of Capitalism*, describes the main theoretical framework used for empirical identification of capitalist types (Hall and Soskice, 2001a, pp. 1-68). This framework draws on game theoretic perspective for coordination and interaction among agents and is an 'actor centered' approach, where actors may be individuals, firms, producer groups or governments (Hall and Soskice, 2001a, pp. 5-6). VoC connects a game theoretic microeconomics to the macroeconomy by extrapolating from the micro to macro (Hall and Soskice, 2001a, pp. 4-5). This is akin to the use of the representative-agent in macroeconomics (Christiano et al., 2018). Capitalist regimes are categorised as Liberal Market Economies (LME) and Coordinated Market Economies (CME) based on the institutional configuration for *internal structure, corporate governance, inter-firm relations, industrial relations* and *education and training* (Hall and Soskice, 2001a, p. 4). Their framework describes the nature of the relations across the institutional configuration in which 'company needs' and

'company competition' are the focal points of CME and LME, respectively (Hall and Soskice, 2001a, pp. 28-32). The institutional configuration ensures different outcomes in the game theoretic setting in the model (Hall and Soskice, 2001a, pp. 27,32). Since the firm is in the centre and all relations are with respect to the firm, the *production regime* is identified in the CME and LME (Hall and Soskice, 2001a, pp. 14-17). The type of capitalism is identified by how the system deals with coordination problems from the firm's perspective (Blyth, 2003). Coordination problems are analysed in terms of associated transaction costs (Hall and Soskice, 2001a, p. 17). This resonates with neoclassical economic analysis because it shifts the focus from power relations to economic costs. Hall and Soskice introduced two concepts, *Comparative Institutional Advantage* and *Institutional Complementarity*, that show how comparative advantage and complementarity (specialisation) of the institutional configuration minimises transaction costs (Hall and Soskice, 2001a, pp. 17-18). Social interaction has been reduced to firm interaction. The economic system is defined by how efficient this interaction is, measured in transaction costs, instead of how institutions may impede or intensify capitalists law of motion. The approach set out by Hall and Soskice is later expanded to account for the relation between the production regime, the political system, the welfare state and the aggregate demand management regime (Soskice, 2007, pp. 89-90). This expansion draws in macroeconomics, specifically the 3-equation model (cf. Carlin and Soskice, 2006; 2015), to explain aggregate demand management regimes in CMEs and LMEs (Soskice, 2007, pp. 107-110, 119-120).

2.3.2.1 Transaction cost economics

Transaction costs can be grouped into three categories: search and information costs, bargaining and decision costs, and policing and enforcement costs (Williamson, 1981; 1985)[16]. The definition of transaction costs in VoC reflects the cost of being under-

---

[16]The Williamson-type transaction costs is different from transaction costs in original *Institutional Economics* in which transaction costs are units of economic investigation that constitutes dependence, conflict and order through the medium of social control (Mitchell, 1935). This means that individuals are mutually dependent and must cooperate regarding the allocation of scarce resources. Private property therefore give rise to social conflict that must be addressed with collective action (Commons, 1934, p. 58). This definition of transaction costs is also closer to the PK position.

informed in the market (Dunn, 2002, p. 65). This restricts the analysis to market and non-market operations and evaluates coordination in terms of one (intra-firm transactions) or multiple (inter-firm transactions) agents' decision-making (Dunn, 2002, p. 68). These assumptions build a market-clearing logic into the analytical framework because the efficient allocation of resources depends on market information, i.e. if transaction costs can be minimised and information made cheap, then the market is more likely to clear. There is an implied assumption of a strict need for clear property rights which makes pricing more transparent[17]. In such a framework, agents should act rationally and aim to maximise their utility (Estevez-Abe et al., 2001, pp. 149-150).

The concepts used to analyse the coordination among different agents orbit the firm, making the firm the (implicit) centre of the analysis (see figure 2.1). This firm-centric view risks neglecting macroeconomic mechanisms such as a reduction in investment (rate of accumulation) that leads to reduced profits (profit rate) unless other components of aggregate demand compensate for the decrease (van Treeck, 2009a). In other words, the firm-centric view suffers from the fallacy of composition 'blind spots' when applied to macro-level analyses of economic systems. There is a need for a framework that enables a *dual view*, accounting for macroeconomic mechanisms and changes at the microeconomic level so that effects from changing economic behaviour are captured not only at the level of the change.

Through the concept of *institutional comparative advantage*[18], Hall and Soskice (2001a, pp. 36-44) can show that institutional configurations provide advantages relative to others and include *incentive compatibility*, which leads to specialisation according to one's comparative advantage defined by the opportunity cost. The institutional specialisation implies that economic performance is endogenously maximised since the institutional comparative advantage is ensured because of institutional complementarity. Whereas institutions are socially constructed and managed in PK, reflecting power relations in society, market forces shape institutions in

---

[17]This is an important assumption in the neoclassical version of transaction costs economics (Coase, 1960).

[18]Comparative advantage is an old concept in economic theory that is associated with David Ricardo (1951, edited by Sraffa and Dobb).

Figure 2.1: Analytical framework of Varieties of Capitalism
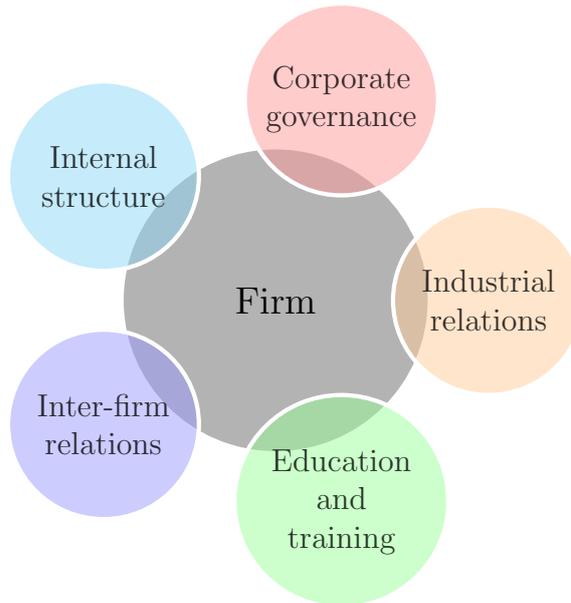
VoC via a systematic approach to minimise transaction costs in society. This means that certain policies and institutional characteristics dominate (Hall and Soskice, 2001a, pp. 45-49). The market process causes institutions and agents to change like in a 'natural' reiterative process until an optimal equilibrium is reached. Thus, such a notion of market forces leading to efficiency naturally exposes a fundamental gap between VoC and PK.

Institutional change can be described in terms of its institutional comparative advantage because institutional complementarity will work more efficiently with similar institutions and policies due to path dependency. However, the criticism of North's (1990) use of path dependency is anticipated because the two regimes, LME and CME, each facilitate radical and incremental innovation, respectively (Hall and Soskice, 2001a, pp. 38-39). Hence, LMEs which are more flexible and less regulated are more responsive to new developments and can more easily adapt through radical innovation. Regulation, norms and culture are therefore reflected in the institutional configuration and contrasting tendencies will quickly adapt due to rational behaviour (Hall and Soskice, 2001a, pp. 54-55).

Hall and Soskice's model reflect economic theories which can be found in textbooks for microeconomics (Varian, 2019), macroeconomics (Mankiw, 2016; Blan-

chard, 2017) and international economics (Krugman et al., 2018). The economic assumption reflects 'New neoclassical' influences since agents' make decisions *without* the classical assumptions of perfect information and complete information which allows for market failure in the model. The structure of the model explains the economic system as a natural development ensured by the institutional comparative advantage and institutional complementarity (see figure 2.2). Hence, institutional change is always complementary to the dominating market hierarchy unless there is a significant exogenous shock to the economy.

Figure 2.2: Circular relations between individuals and institutions
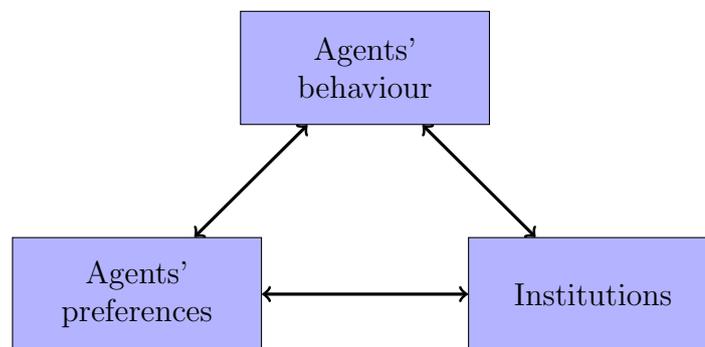
At the macroeconomic level and in international trade, the market-clearing condition of quantities produced and consumed (Say's law) means that the role of prices is to clear the market. Prices are therefore given by the system whereas, according to the PK perspective, prices are not market-clearing but reproductive. Thus, prices are set to recuperate costs and yield some return to the producers so that producers may 'reproduce their economic activities' at the very least. Specialisation and technological innovation are determined within the agency of firm in this case. In contrast, according the VoC theory, specialisation depends on technological factors (preferences) and factor endowments. VoC explains how institutions shape the direction of technological innovation and how the form of incentives depend on factor endowments. For example, the adoption of incremental (radical) innovation is linked with the skill- and educational-level of the labour force which is compatible with a bank-based (market-based) financial system. Another difference between PK theory and VoC is that firms tend to keep spare capacity and inventories in case of unexpected rises in demand, and Say's Law is not assumed to hold in the former.

Hence, there are adjustment mechanisms in these two frameworks with stark differences as two how they adjust and the factors motivating the adjustment which cause difficulties when trying to combine the two theories as Baccaro and Pontusson (2016) proposes. This difference lies in the neoclassical flavour of VoC and the theory of a monetary production economy in PK.

2.3.2.2 Equilibrium in Varieties of Capitalism

There is symmetry between the micro-level and macro-level in VoC as the institutional logic reflect agents' preferences, ensuring that agents' decision-making is consistent with the institutional configuration (Martin, 2005, pp. 57-59). This is akin to providing micofoundations to macro-characteristics of national political economies (Hancké et al., 2007, p. 5). Hence, the purpose of institutions is to reduce transaction costs associated with decision-making. Coordination among agents is therefore stripped from a strong notion of conflict (Pontusson, 2005, p. 185). This means that, the two ideal types, LME and CME, represents two diametrical equilibria that are both optimal given their institutional comparative advantage and institutional complementarity (see table 2.1). However, the institutional configurations (re-)directs national economies to either LME or CME – depending on their institutional comparative advantage – due to institutional complementarity and path dependency (Hall and Soskice, 2001a, pp.63–64; Hancké et al., 2007, p.6). Economies in their optimal equilibrium will, therefore, prosper due to low transaction costs that ensure efficient resource allocation (Hall and Gingerich, 2009).

In contrast, economies where transaction costs are not minimised suffer since the resource allocation will be inefficient, and consequently out of equilibria. These economies will gravitate towards one of the optimal equilibria, of LME or CME, depending on their proximity. The price mechanism ensures that markets clear, even in inefficient economies, but the inefficiency has a higher cost to the national economy in the form of higher unemployment, lack of training, low competitiveness and so on. Table 2.2 summarises the core assumptions of the VoC approach as set out by Hall and Soskice (2001a) discussed so far. These assumptions show a

degree of consistency with the general equilibrium approach in economics (Hahn, 1971; Hart, 1975).

Table 2.1: Equilibrium notion

	Radical innovation	Incremental innovation	
Impatient capital	efficient equilibrium	disequilibrium	Inflexible labour market
Patient capital	disequilibrium	efficient equilibrium	Flexible labour market

VoC does not formulate an explicit theory of money or credit (Mettenheim, 2013); however, financial systems depend on the monitoring of and access to information by banks: easier access to private information allows for 'patient' capital; less access to private information means a shift towards market signals such as profitability and 'impatient' capital (Hall and Soskice, 2001a, pp. 10, 22-23)[19]. This reflects a demarcation of a bank-based and market-based financial system (Levine, 2002). How the financial sector is theorised in VoC is consistent with its treatment of institutions – which are essential for any financial system – and leaves out social interaction or power among social relations.

Comparing the assumptions in table 2.2 with the discussion of PK economics, opposing conditions are revealed. In VoC, transaction costs are a core part of the approach (Hall and Soskice, 2001a, p. 6). Transaction costs arise because of incomplete contracts, but institutions may reduce these by reducing the cost of information between the parties of the contract (cf. Hart, 1988). The role of institutions in VoC, is therefore, to facilitate the coordination among the different entities. Transaction costs enter the analysis of VoC in the relation between two entities, e.g. a firm and labour, firm and another firm or firm and a bank. This relation is sealed with contracts, but shirking, adverse selection and moral hazard means that these contracts are incomplete (Williamson, 1985, cf.). Consequently, transaction costs

---

[19]A similar distinction of financial systems is made by Albert (1993, pp. 101-108) about the Rhine model, dominated by patient capital and strategic cooperation between firms and banks, and the Neo-American model, stock-market dominated by short-term orientation and market coordinated relations between firms and banks.

and institutions are a core part of the VoC approach because it provides the basis of how coordination problems are dealt with in the analysis (Hall and Soskice, 2001a, pp. 6-7). The institutional complementarity works as to increase the efficiency of the institutions, and consequently, the economy which encompasses a state where transaction costs also are minimised following the *strategic interaction* of economic agents (Hall and Soskice, 2001a, pp. 5-6). Thus, the economy is in equilibrium (of either an LME- or CME-type) when transactions costs are minimised.

In contrast, PK theory understand institutions as results of power relations that are formed throughout history and transaction costs are inseparable from market power and uncertainty (Dunn, 2002, p.74; Zalewski and Whalen, 2010). Thus, agents are not concerned with transaction costs, but how they can obtain a greater degree of control of their environment (Lavoie, 2014b, pp. 128-129). Hence, the difference is not only about the notion of transactions and institutions but also concerning the interpretation of transaction costs. The allocation of scarce resources are determined by the price mechanism – this is fully compatible with the understanding of transaction costs – which requires clearly defined property rights, but in PK economics, prices are reproductive, and resource allocation reflects a struggle between different vested interests in society. Labour has a unique attribute in PK theory since labour-power cannot be separated from humans. Thus, labour (power) and capital are not complete substitutes[20]. PK economics relies on a notion of procedural rationality which is at odds with the constrained-optimisation approach in VoC. The notion that LME and CME represent two unique equilibria (in their ideal-type form) is hard to accommodate with PK economics in which equilibria depend on history and are results of cumulative causation, see Skott (1985) and Setterfield (1997)[21] for a discussion of equilibrium.

---

[20]Although, automation and machinery might turn certain uses of labour obsolete. This reflects a different technique of production.

[21]Setterfield's (2001) clarifies his argument in a reply to Toner (2001) and Argyrous (2001). The notion of cumulative causation, in the context of economic growth, means a shift from the *allocation* of resources to the *creation* of resources over time Setterfield (1997; 2001).

Table 2.2: Varieties of Capitalism model

Transaction costs	Non-market operations are implicit in market operation outcomes as decisions are made by firms, or in relation to firms
Resource allocation	Resource allocation and coordination in society result from property rights
Factors of production	Labour and capital are perfectly mobile across industries in the long-run, i.e. labour and capital are substitutes
Social preferences	Individuals' preferences are exogenous in the sense that they are complete and transitive; behaviour follows constrained-optimisation problem-solving
Path dependence	Path dependence is equilibrium generating as the institutional complementarity ensures that feedback effects reinforce the institutional comparative advantage

2.3.2.3 The financial system

In LMEs, firms must protect their profitability because their access to finance in capital markets and risk of a hostile takeover depends on their profitability, the potential for losing market shares matters less due to the ease at which workers can be laid off; in CMEs, firms can reduce their returns by squeezing their profits in order to maintain their market share since their access to finance is independent of their profitability (Hall and Soskice, 2001a, p. 16)[22]. These descriptions of corporate governance and firm's access to capital markets is referred to the typology of bank-based and market-based financial systems (cf. Levine, 2002; Chakraborty and Ray, 2006). The bank- and market-based financial systems represent two main channels for financing investment and production, bank lending and raising finance from issuing equity shares, respectively (Allen and Gale, 2000, p. 4). Hall and Soskice draws on the delineation of markets and hierarchies (cf. Williamson, 1975), but note that these two institutional forms are exhaustive (Hall and Soskice, 2001a, p. 14). However, the lack of what else might exist on this list makes it difficult to elaborate on the delineation in the VoC approach. The description in Hall and Soskice (2001a,

---

[22]The issue of hostile takeover is dropped in the CME case.

pp. 14-16), and by others (see Allen and Gale, 2000; Levine, 2002; Chakraborty and Ray, 2006) reflect a financial intermediation structure based on the loanable funds theory (cf. Holmström and Tirole, 1997).

This is problematic for two reasons. Firstly, it confounds *initial finance* with *final finance* – terms from the Theory of the Monetary Circuit (TMC) – when compared to PK economics (Passarella, 2014; Sawyer, 2014). Firms rely on external and internal financing for their investment, and the different systems affect firms' preferences due to the time horizon and information available. This ignores questions of where money comes from and how money enters the system – which is theorised in both TMC and PK economics – and relies on the transaction cost approach discussed above. Secondly, as a description of financial systems, it relies on a representative agent-view and provides a reductive lens of which to understand the economic regime. The period between 1990 and 2010 is identified as a period of radical change in financial systems and corporate governance (Dore et al., 1999; Lazonick, 2010). The changing character of corporate governance and shareholder value emphasis altered employment relations, and VoC do not conform with the managerial capitalism view (Appelbaum et al., 2013). VoC suggest that LMEs and CMEs would become purified versions of LMEs or CMEs over time, but evidence indicates that capitalism is changing across LMEs and CMEs (Deeg, 2012). The rise of a shadow banking sector, deregulation and financialization in society is part of the development often referred to as New Capitalism (Glyn, 2006, pp. 52, 75; Fumagalli and Lucarelli, 2011, p. 9). Thus, bank- and market-based typology fails to provide insight to the logic of the financial system and inform about the development of the financial system (based on its description).

The link between the financial system and the labour market is much emphasised in VoC (Hall and Soskice, 2001a, pp. 14-16,17-19), as in PK economics and TMC. In both financial systems (bank- and market-based), there is an assumption that central bank independence increases credibility and thereby shifts the expectations-augmented Phillips curve providing the monetary authorises with a better rate for the trade-off of inflation and employment (Franzese Jr., 2001,

p. 124). This follows the so-called New Neoclassical Synthesis in macroeconomics (Goodfriend and King, 1997). This is problematic as seen from a PK perspective, 1) due to the general lack of a theory of credit and money, and 2) because the relation between the financial sector and the labour market is dependent on a natural rate of unemployment and a natural rate of interest. Therefore, the conclusion and explanation from a PK analysis and VoC analysis will be very different and, to some extent, irreconcilable.

The financial systems framework adopted in VoC is criticised for lacking the necessary fundamental basis to address the new finance-led accumulation patterns in western economies (Tooze, 2018, p. 76). This has led to a failure in adequately analysing the institutional reconfiguration following financial deregulation and labour market flexibilisation (Oren and Blyth, 2019). This is problematic because the process of financialisation has affected countries differently as shown by comparative economic analysis (Brown et al., 2017). Brown et al. find that despite a growing tendency of financialisation, the share of value added or share of employment in the finance sector varies, e.g. the employment share is much larger for the UK than Germany or France, and under a narrow definition of the finance sector the employment share in Germany and France is stable. Considering the average growth rate of the financial sector's value added, some countries experienced negative growth in the early 1990s (Finland and Spain) and later experienced booms in the 2000s. Their analysis indicate that countries have been affected differently despite being closely integrated, due to EU membership and trade, and that the effects have occurred at different time periods (Brown et al., 2017). This criticism is based on a PK approach to investigating cross-country capital flows, financialization and different financial systems.

The financial system and structure are important for corporate governance and ownership structures, thereby influencing organisations within and across firms (Grittersova, 2014). The transformation seen with the process of financialisation of non-financial enterprises is parallel to changes in labour market institutions and political institutions (Fadda, 2013; Pariboni and Tridico, 2019). This is at odds with

the intuition from the institutional complementarity between the banking system and corporate sector indicated by VoC. For instance, Germany, the prime example of CME, is dominated by non-financial corporations that are 'stronger' whilst banks are seemingly becoming 'weaker' (Braun and Deeg, 2019). Braun and Deeg argue that this is an unintended consequence from the financialisation of non-financial corporations, which are export oriented, and this requires more research on relations between non-financial corporations and banks with respect to funding and feedback dynamics between non-financial and financial sectors in different accumulation regimes (Braun and Deeg, 2019, pp. 17-18). Stockhammer (forthcoming) highlights the analysis of finance as an area that CPE would benefit from drawing on PK economic theories, specifically the notion of financial instability and household credit and balance sheet analysis, in his contribution to providing a PK macroeconomic foundation to CPE. However, the more fundamental notion of *initial* and final finance, associated with the TMC (Graziani, 2003, see), is left out of Stockhammer's discussion. This component is missing in the debate about a synthesis of CPE and PK economics, which is problematic because the bank- and market-based notion in VoC is at odds with the PK theory of money and credit.

2.3.2.4 Industrial relations

The industrial relations in VoC determine types of employee contracts and organisational structure that reflects labour productivity. Empirical analysis suggests that structural labour market reforms of the LME-type lead to increasing proportions of managerial employees in firms compared to firms under the CME regime because more managers are required to monitor and attain the knowledge base with a so-called *flexible* workforce, i.e. employees that are easy to hire and fire (Kleinknecht et al., 2016). The effect on labour productivity and firm innovation from LME and CME types also indicate that these flexible workforces are more associated with Schumpeter-I innovators – concentration of innovating activities is low and entry of new innovators is high – whilst Schumpeter-II – concentration of innovating activities is higher than in mark I and entry of new innovators are low – innovators are asso-

ciated with CME type industrial relations since it preserves firm-specific knowledge and long-tenured employees (Kleinknecht, 2020). Decentralised or non-wage compression also has adverse effects on the process of *creative destruction* since it puts less pressure on lagging firms to innovate and modernise their production (Barth and Moene, 2016; Kleinknecht, 2020). Kleinknecht's work illustrates the supply-side view of the labour market and innovation and highlights missing aspects of VoC on the different types of labour, e.g. supervisory and non-supervisory workers. Supervisory labour is part of overhead labour costs in PK economics (Lavoie and Nah, 2020). Hence, PK economics can increase the analytical aspects in CPE.

The notion in VoC suggest that there is a trade-off between wage-inequality and unemployment since labour coordination requires a more rigid labour market in CME than the more flexible labour market found in LME. Glyn and Rowthorn (1988) argue that conventional measures such as unemployment and employment rates are inadequate for assessing countries' labour market performances. A study adhering to Glyn and Rowthorn's criticism by examining different segments of the unemployed, employed and low-wage shares found that the US employment experience was poorer compared to European countries such as France (Howell and Okatenko, 2010). However, the appropriate institutional configuration and policies for *good* labour market performance are widely disputed (Blanchard and Giavazzi, 2003; Blanchard, 2009). Glyn (2009; 2006) argues that the more flexible labour markets observed in typical LMEs do not explain the lower unemployment rate. Instead, he suggests that the rise of the 'New Economy' – also called New Capitalism – has caused CMEs to implement policies that increase their labour markets' flexibility.

Pontusson et al. (2002) argue that factors from labour market institutions, such as unionisation, centralisation of wage bargaining and public sector employment, primarily affected unskilled workers' wages, while left-oriented governments had more egalitarian effects through wage compression. This resonates with the PK narrative of labour economics and the functional distribution of income (Storm and Naastepad, 2008; 2009; 2013). The inherent notion in PK that workers are also consumers and that employment is driven by demand is lacking in VoC. Instead,

VoC focuses on compatibility across institutions and see employment solely as a supply-side issue. This means that a combination of the two requires a trade-off between these views. The problems and contradictory views in VoC identified from a PK perspective gives concern to how much of VoC would be left if a proper combination was conducted. It is tricky to pick appropriate models and theories for analytical work in economics. However, compromising on the key features would be counterproductive.

2.3.2.5 Institutions and type of capitalism

Following the notion of institutional complementarity, institutional change will cause other institutions to change (Hall and Gingerich, 2009). However, the direction of change is not necessarily as certain as expected, depending on the power of the institutions, as seen with changes in financial institutions (O'Sullivan, 2007). Structural reforms in product markets also reflect a more lax approach as exemplified in the US since the 1970s, with the consequences of falling competition (Gutiérrez and Philippon, 2018). This can be seen in contrast to the experience in Germany which has stricter antitrust laws in the same period (Ergen and Kohl, 2019). The increasing concentration in the US has been identified as one of the leading causes for the lower investment (Gutiérrez and Philippon, 2017). Comparative evidence suggests that there are contradictory forces within LMEs and CMEs; for instance, Kesting and Nielsen (2008) found that Denmark and New Zealand, which are classified as CME and LME respectively, could be classified as LME and CME when looking at political processes. Their findings, therefore, contradicts the conventional conclusion of the VoC theory. Similarly, longitudinal analysis of countries indicates such fluidity among countries concerning their *type* of capitalism (Schneider and Paunescu, 2012). Schneider and Paunescu (2012) analyses data for 26 OECD countries from 1990 to 2005 and find that some CME countries have moved closer to LME in the sample period. These countries are strongly export-led and therefore expected to respond quickly to international factors.

Schneider and Paunescu's results provide support to the proposal by Bac-

caro and Pontusson of combining VoC with PK growth models. Baccaro and Pontusson (2016) identified Germany as an export-led economy, the UK as a consumption-led economy (where consumption was financed mainly by household debt) and Sweden as a hybrid between export- and consumption-led (primarily funded by higher real wages). Hence, there are good reasons for including a growth model perspective from macroeconomics to VoC, but there are fundamental issues that must be resolved if VoC is to be combined with PK. Baccaro and Pontusson's work has received some criticism from PKs in terms of the time period analysed (does not include data post the 2008 crisis) and specification of their econometric model (their model is underspecified due to a lack of control variables, notably the dynamics of foreign demand), see Hein et al. (2020). The econometric criticism relay critical observations made by Hope and Soskice (2016). Hein et al. (2020) also raise some critical points directed to the theoretical application by Baccaro and Pontusson (2016) based on how Baccaro and Pontusson have distinguished between wage- and profit-led demand regimes in their analysis. Specifically, the wage-led post-World War II period referred to by Baccaro and Pontusson does not fit actual distributional and economic policies of the structural parameters required for a wage-led demand regime. They claim that Baccaro and Pontusson are confusing the structure of wage- and profit-led demand regimes when debt-financed consumption-led and export-led regimes are presented as counterparts to the wage-led regime (Hein et al., 2020). Nonetheless, Hein et al. (2020) are overall supportive of the contribution by Baccaro and Pontusson (2016).

Building on Baccaro and Pontusson's (2016) contribution, Hein et al. (2020) analyse different demand regimes under financialisation that they combine with different welfare regimes á la Esping-Andersen (1990) with the additions of Mediterranean, Central and Eastern European Countries as described by Hay and Wincott (2012). Hein et al. (2020) analysis integrate the notion of welfare regimes with PK demand regimes, thereby illustrating the fruitfulness of combining CPE and PK approaches for economic analysis. Their focus on socio-economic institutions is simplified compared to Amable (2003; 2018a) but shares Amable's and the Régulationist

sentiment. Since the study by Hein et al. (2020) abstracts from firm-level behaviour, it cannot encompass potential feedback effects between the micro- and macro-level, nor the potential amplifying effects from the meso-level (i.e. from the institutional configuration). Although Hein et al. raise important points at the theoretical level, these are first and foremost important for the empirical application and do not address deeper fundamental issues at the theoretical level of CPE, especially VoC, and PK. Yet, their work suggests that constructing a common theoretical foundation for CPE and PK would be worthwhile as a basis for future research that combines institutions, welfare models and macroeconomic models.

Table 2.3: Assumptions of Varieties of Capitalism and post-Keynesian economics

	Varieties of Capitalism	post-Keynesian economics
Employment (and output)	supply-determined	demand-determined
Finance	loanable funds theory	endogenous money theory
Agent's behaviour	constrained (intertemporal) optimisation	procedural rationality
Price and wage formation	market clearing	reproductive
Inflation	natural rate of unemployment	distributional conflict
Investment	savings-driven	demand (capacity utilisation rate)-driven
Institutional configuration	institutional complementarity and institutional comparative advantage (naturally path dependent)	circular cumulative causation (historically path dependent)

A combination of CPE and PK macroeconomics cannot encompass the VoC approach. Table 2.3 compares key assumptions (on the micro- and macro-level) of VoC and PK that are in contradiction or where the difference implies a stark opposition. An example is how investment depends on savings according to the economic theory of VoC which is an implication from the loanable funds theory. Another example is the market-clearing function of prices (and wages) reflecting a specific set of assumptions of agents' behaviour. Thus, PK (macro)economics

cannot be coupled with the VoC approach unless one set of assumptions succumbs to the other, which entails a radical transformation of the two frameworks. The institutional configuration in VoC results from 'natural' market forces that gravitate towards some efficient and socially optimal equilibrium. In contrast, institutions are mediators of social relations and the outcome from power relations developed throughout history in the PK view of the economy.

2.4 By way of conclusion

This research critique of CPE has discussed VoC and CPE from a PK perspective. The discussion and careful analysis suggest that the institutional aspect is important to understand *types* of capitalism. The inclusion of the institutional configuration in the theoretical framework enforces an explicit consideration of the historical context, that is to say, *institutions matter*. Understanding the institutional configuration – the dominating institutions and their logic – and the complexity among institutions illuminate the characteristics of the capitalist system. However, it is necessary to place capitalist laws of motion in the centre of the theoretical framework to gain the necessary insight into advanced capitalist economies. Identifying the core features of capitalism – the commonalities of capitalist systems – and the qualitative features of institutions in capitalist economies – the differences across capitalist systems – is vital for analysing comparative political economy.

The aim was to investigate the compatibility of VoC and the neo-Kaleckian growth model as proposed by Baccaro and Pontusson (2016). This included a historical look at the origin and development of CPE in order to address the criticism raised against the proposal (Piore, 2016; Streeck, 2016) and more in general against VoC from peripheral theories in CPE (Coates, 2005b; Peck and Theodore, 2007). This reduces the risk of throwing the baby out with the bathwater.

The potential theoretical apparatus of VoC-PK economics seems robust on the surface. However, the review of VoC highlighted flaws and weaknesses that undermine the intention and aim of Baccaro and Pontusson's proposal. This is due to

the methodological and theoretical foundation of VoC, which is incompatible with the PK approach to economic analysis. Merging VoC and PK economics would be assembling a set of assumptions for macrodynamics with two different sets of assumptions for the microfoundation. Thus, the analytical framework would be overdetermined and contradiction. The contradiction occurs because the microeconomic assumptions of VoC are incompatible and, to some extent, contrary to the PK macroeconomic assumptions. Therefore, the proposition of VoC plus PK economics is unsatisfactory.

Identifying compatible and incompatible assumptions and aspects of VoC and PK economics does, however, enable a basis for ways forward to complete the synthesis proposed by Baccaro and Pontusson (2016). In the literature of CPE, there is much work that can be substituted for the VoC approach in order to construct the envisioned synthesis, see, for instance, Hein et al. (2020) on welfare regimes. Hence, future work on combining CPE and PK economics should look to the treatment and understanding of power, capitalism and institutions' role. Another key issue is that of finance, as already touched upon by Stockhammer (forthcoming). The core notion of how finance enters and exits a monetary production economy is essential for a deep understanding. The bank- and market-based notion in VoC reflects a misunderstanding of *initial* and *final* finance, which is due to the reliance on the loanable funds theory of money. A PK turn would therefore have profound implications for the VoC framework. Adapting the VoC framework to PK economics would mean rejecting much of the economic theory of VoC and subsequently remove a core part of its theoretical premise. In this respect, the alternative proposal of combining VoC with the new Keynesian reduced-form DSGE (Dynamic Stochastic General Equilibrium) 3-equation model (Hope and Soskice, 2016) reflects two more compatible frameworks.

Rather than rethinking the VoC framework, a look at alternative theories in CPE would be more appropriate. Analytical frameworks from Régulation Theory, Social Structure of Accumulation and Marxian Political Economy have more in common with PK economics. These CPE approaches originate from Marxian

ideas – which already reflect some overlap with PK economics – but also include a stronger sense of institutions as seen in the work by Shonfield, Esping-Andersen and Albert. The benefit to CPE from PK economics has already been discussed. Still, for PK economics, a CPE perspective would entail paying greater attention to the implications of the institutional configuration and how institutional factors affect capitalism. How such a synthesis of CPE and PK economics can be constructed is explored in the next chapter. In chapter 3, the institutional configuration is made a central component of the economic analysis.

Chapter 3

A synthesis of Comparative Political Economy and post-Keynesian economics

3.1 Introduction

This chapter presents an alternative approach to that proposed by Baccaro and Pontusson (2016) which combine on institutional economic analysis and economic theory. The presented approach draws on theoretical frameworks from Comparative Political Economy (CPE), specifically Régulation Theory (RT), and post-Keynesian (PK) economics; and is grounded in an approach of critical political economy and of monetary production economy. This approach is used to investigate the effect on distributional indicators such as real wages, wage shares and the dividend-wage ratio. Régulation Theory (Aglietta, 1979; Boyer and Saillard, 2002b) serves as alternative in CPE to Varieties of Capitalism (VoC) (Hall and Soskice, 2001b), and complements earlier work on welfare regimes and comparative capitalism by Esping-Andersen (1990) and Michel Albert (1993), respectively. RT is a suitable choice because in addition to providing a contrasting approach to VoC for CPE analysis (Boyer, 2018b), RT has strong theoretical ties to PK economics (Aglietta, 1979; Lipietz, 1985; Setterfield, 2011; Boyer, 2011b).

Baccaro and Pontusson (2016) propose a framework to study national models of capitalism with a macroeconomic perspective that includes income distribution and effective demand.
They intended to:

a) integrate the distribution of income and aggregate demand in a dynamic framework, including a more explicit handling of power and social interaction; and,

b) elaborate on the *commonalities* between varieties of capitalism as well as variations, and, thereby, expand the analysis on institutions to cover commonalities and not only differences.

This chapter follows their aim but focuses more on how institutions can be fully integrated with such a framework. Specifically, by elaborating a third point which is crucial for analysing a monetary production economy:

c) to account for the financial system and the role of money in a capitalist economy.

The purpose is to provide a theoretical basis for a framework that can be applied for institutional economic analysis of capitalist economies. Thereby providing a theoretical framework for macroeconomic analysis of institutions and capitalist economies.

Stockhammer (forthcoming) has picked up on the proposal by Baccaro and Pontusson and is supportive of CPE with PK macroeconomic foundations. His constructive effort plays the part of antagonist in this study because of the neglect of institutional configuration and his focus on demand regimes and financial flows. This chapter contributes to the emerging literature on combining CPE and PK economics by providing a unified framework based on PK economics and RT that build on the started work by focusing on the labour market and institutions. The proposed framework is inspired by the discussion on the notion of capitalism in VoC where *institutional theories of capitalism* and *capitalist theories of institutions* are formulated by, respectively, Streeck (2011) and Bruff and Horn (2012) as two different starting points where capitalism is central to the latter and a figurehead in the former. A similar 'taxonomy' is developed, but with an outlook based on

two approaches to economics: the *scarcity-based* (subjective value) approach, and the *production-based* (real value) approach (Myrdal, 1954, pp.15–16, 59–60)[1]. This separation of approaches to economics is similar to the split from orthodoxy by the Keynesian revolution, that was also drawn on utility and production, respectively (Pasinetti, 2007, pp.18–21). The role of supply-side factors in VoC and of demand-side factors in PK economics leads to several contradictions related to Say's Law, the role of prices and the relation of the equality between savings and investment. This contention, described as supply-side versus demand-side, is about fundamental dynamics and their causation in the economy. Baccaro and Pontusson (2018) are aware of this contention but do not deal directly with it. This chapter seeks to mend this gap by addressing the issue head-on. Section 3.2 presents RT as an alternative to the VoC framework for the synthesis with PK economics. In section 3.3, criteria for incorporating institutions into the economic analysis of capitalism are developed and applied in the assessment of VoC and RT before the synthesis with PK economics is presented in section 3.4. Section 3.5 concludes.

3.2 The case for combining economic theory and institutional economic analysis

Economic theory and institutional economic analysis have been at odds since the 19th century (cf. Veblen, 1898). Although economic theory "won" the race and institutional economics became some ancient arcane field, a tenacious faction has continued the argument for combining economic theory and institutional economic analysis (Myrdal, 1978; Dillard, 1986; Harvey, 1994). It has been argued that economic theory should retract to allow institutional economic analysis to re-enter the stage (Pasinetti, 2021). This envisioned research programme has not materialised, and part of this failure lies with the notion of economic theory, i.e. neoclassical economic theory. Pasinetti (2021) clarifies the contention because neoclassical eco-

---

[1]Myrdal (1954) discusses the value concept in classical and neo-classical economic theory in chapter 3 and 4, respectively, but his discussion is far too broad to be given the space it deserves in this study.

nomic theory is not opposed to institutions but operates with an implied institutional framework of a free market competitive economy. Hence, there is little to no room for further institutional elaboration within the neoclassical economic framework. Modern approaches such as Solow's discussion of the labour market (Solow, 1990) or Williamson's 'New Institutionalism' seemingly mould an institutional economic analysis out of neoclassical economic theory, but these approaches fail to capture a central tenet of institutionalism – process – due to their reliance on the concept of optimum in the theoretical framework (Dugger, 1990). Pasinetti (2021, p. 441) argues that the combination of economic theory and institutional analysis should be based on two (main) fields of investigations in which the first – economic theory – provides a theoretical background for all purposes of institutional investigation – the second field (see table 3.1).

The combination of economic theory and institutional economic analysis is based on connecting the dynamics and laws of motion in an economy via its economic structure with the qualitative aspects of the economy through its institutional configuration. Institutional and other qualitative aspects are stripped from the analysis in the former, and the latter focuses solely on the descriptive characteristics. This has a parallel to CPE and macroeconomics because CPE tends to focus exclusively on descriptive characteristics and features specific for a time period or region, whilst macroeconomics often extrapolates or simplifies institutional and other context-specific features in the analysis and conclusion.

Combining PK economics and CPE means that these two fields of investigation can be joined and based on common ground, rather than being linked ad-hoc to each other's framework. Therefore, the proposed synthesis of PK economics and RT fulfils the criteria of *capitalist theories of institutions* as opposed to the institutional theory of capitalism framework of VoC (Hall and Soskice, 2001b).

Table 3.1: Fields of investigations in institutional economic analysis

'Natural' level	'Institutional' level
It brings out where, and for which problems, institutions are necessary	There is no constraint or pre-conception imposed on the hypotheses or on the analysis of economic or social behaviour or on the type of institutions to be considered
It does not pre-determine the type of institutions that may be developed, or may be analysed	The field of institutional analysis remains entirely autonomous
It leaves the field of institutional economic analysis entirely open	At the same time, investigations of a historical, sociological or anthropological character are thrown entirely open, and thereby become not only possible and compatible with economic and institutional analysis, but actually able to bring complementary and enriching fruitful developments

Note: The table is reproduced from Pasinetti (2021, p. 4).

3.3 An alternative to the Varieties of Capitalism approach

The CPE has a long tradition in analysing different economic systems, hereunder different variegations of capitalism. Albeit, VoC is the dominating strand of CPE, the VoC approach lacks a theory of capitalism, for example, in the extensive introduction by Hall and Soskice (2001a), 'capitalism' is only mentioned in reference to 'varieties of capitalism' or the literature on 'comparative capitalism'[2]. In addition, there are issues with building a synthesis of CPE and PK macroeconomics using VoC and the neo-Kaleckian growth model. Therefore, an alternative to the VoC approach is presented, namely, RT which is concerned with how an economic system reproduces itself (Aglietta, 1979, p. 12). RT explores the hierarchy of the constituent relationships of the economic system that ensures that the system do is reproduced rather than raptures in its transformation (Aglietta, 1979, p. 12). This body of theory focus on institutions in the macroeconomic analysis because 'regulation' (i.e. institutional forms) are analysed to make up the economic sys-

---

[2]On page 21 they refer to a 'type of capitalism' which falls outside their LME and CME categories, namely that of Mediterranean countries (Hall and Soskice, 2001a, p. 21).

tem as a whole which supports the regime of accumulation (Aglietta, 1979, p. 68). Thus, RT is a theoretical body of CPE that PK macroeconomic foundations can be coupled with to provide a solid basis for the research agenda set out by Baccaro and Pontusson (2016).

This is important because the fundamental issue of combining VoC and PK economics is that they are based on the paradigms, a utility-based and production-based approach, respectively, that are in contradiction with each other (Pasinetti, 2007, pp. 20-21). This incompatibility has been discussed elsewhere, but no alternative to VoC is suggested, instead a PK macroeconomic foundation is suggested for CPE (Köhler and Stockhammer, 2021; Stockhammer, forthcoming)[3]. Their focus is on the financial flows, and adopted a Minskyian approach (Minsky, 1982; 1986b), and the growth regime of an economy, in keeping with the neo-Kaleckian growth model (Blecker, 1989; Bhaduri and Marglin, 1990). This draws on earlier work on wage- and profit-led growth models and international financial flows by the authors (cf. Lavoie and Stockhammer, 2013b; Köhler, 2019). Their approach provides insight into the analysis of national models of capitalism and differences between such models concerning demand drivers and financial flows. But, the approach does not illuminate the institutional aspects of such national models of capitalism, which is a core part of the focus of CPE (cf. Pontusson and Baccaro, 2020) and in Minsky's work (Minsky, 1986a; Ferri and Minsky, 1992)[4].

Behringer and van Treeck (2017; 2019) suggest that a successful approach to CPE from a PK perspective should focus on the economic system overall and include a view of the qualitative factors of the regime of accumulation. . This is an important aspect in RT, where transformation is understood as qualitative changes, or rapture (Aglietta, 1979, p. 12). RT analyses the role of institutions through the mode of régulation and its implications on the regime of accumulation (Lipietz and Jenson, 1987). The mode of régulation with respect to production refers to how the social relations of production are mediated (Aglietta, 1998). The mode of

---

[3]See chapter 1 of this thesis for a thorough discussion of the compatibility of VoC and PK economics based macroeconomic models which goes deeper and broader than Stockhammer's paper.

[4]The interest in Minsky's work was renewed after the financial crisis of 2008 and two recent books on his research (one by a long-time co-author) are summarised in Bezemer (2021).

production consists of the commodity relation, wage-earner-capitalist relation and the organisation of means of production (Lipietz, 1985, p. 20). The regime of accumulation, the growth regime, is the reproduction scheme at the marco-level. The dynamics of capitalism means that there is always a process of reproduction where social relations are continuously transformed (Aglietta, 1979, p. 12). The form of the social transformation describes the increase in value from the social process of production (Aglietta, 2000). The systematic redistribution of the social product needs to be coherent with the regime of accumulation to avoid the emergence of crises (Lipietz, 1988).

3.3.1 Macroeconomic developments and New Capitalism

RT offers a historical comparative analysis of configurations of institutional forms that requires "*macroeconomic foundations to microeconomic adjustments*" (Robert Boyer, 2018a, p. 595, emphasis in original). Hence, the macroeconomic foundation implies that microeconomic behaviour and institutional change reflect macroeconomic development. Economic agents interact on the basis of institutions, rules and established conventions (Boyer, 2002, p. 14). Economic policy, fiscal or monetary, can be categorised as *fluid* and *structural*, which indicate the strength of their feedback effects and permanent effect (Amable, 2018b, p. 245). Thus, structural economic policy changes the mode of régulation and the regime of accumulation – this circular cumulative causation – leads to a new trajectory for the economy, a 'new' economy.

The period associated with New Capitalism and the finance-led regime of accumulation is known as the post-Fordist era in RT (Boyer, 2000; Aglietta and Breton, 2001). The post-Fordist era saw a slowdown in productivity growth and an increasing proportion of investment in durable goods and assets such as housing (Lindbeck, 1983). Moreover, the post-fordist era reflect a shift to a 'downsize and distribute'-regime in which firms' distribute a larger share of their profits (Lazonick and O'Sullivan, 2000; Stockhammer, 2008b). Finance dominated capitalism entails a distributional shift with stagnating wages, a declining wage share and higher

dividend-wage ratio (cf Glyn, 2006). In contrast, the Fordist era reflects a *wage society* and is characterised by the integral position of the wage-labour nexus in the mode of production (Aglietta, 1979, p. 403; Aglietta, 1998). This means that the social institutions ensured that productivity gains were matched by real wage growth (Guttmann, 2015). This period also saw a stability to labour's share of income, one of Kaldor's stylised facts (Kaldor, 1957).

3.3.2 The Régulation Approach

The method of analysis in the Régulation School investigates the macroeconomy by exploring three levels of abstraction (from highest to lowest): the mode of production, the regime of accumulation and the mode of régulation (Jessop, 2001b;c). There are no axioms or 'one' model to follow in RT because the structure of an economy corresponds to a set of economic evolution and crises (Boyer, 2002, p. 15). RT is built upon the concepts of competition regime and the wage-labour nexus; these are core capitalist social relations and are based on Karl Marx's scholarship (Boyer, 2018b). RT aims to analyse how the transformation of social relations contribute to new economic and non-economic forms. Aglietta (1979, p. 16) argues that:

> "The definition of the field of economic science does not derive from a universal principle that founds a pure economy. It is solely a methodological demarcation within the field of social relations, one perpetually probed and shifted by the development of theoretical analysis itself. The study of capitalist regulation, therefore, cannot be the investigation of abstract economic laws. It is the study of the transformation of social relations as it creates new forms that are both economic and non-economic, that are organized in structures and themselves reproduce a determinant structure, the mode of production."

Régulation Approach (RA) considers the intermediate level between production mode and empirical observations of adjustments at the micro- and macro-level (Boyer, 2018b). Boyer (Boyer, 2018b) summarises key points of the RA:

i) The institutional configuration matters and the process of institutional evolution are therefore at the centre of the analysis.

ii) Individual behaviour and microeconomic interaction are understood in accordance with the structures implied from the institutional configuration.

iii) The long-run historical view means that it is a dynamic analysis that includes implications on and effects from macroeconomic processes.

In the RA, capitalism is viewed as a market economy made up of class relations, i.e. the wage-labour nexus, with an endogenous creation of money and credit in the economy (De Vroey, 1984). The wage-labour nexus is central to the RA because the capacity to act on economic initiatives lies with the *capitalist* class, which includes rentiers, entrepreneurs and owners of various forms of capital, essentially those with access to money markets. Thus, wage-labour, or workers, are compelled to seek employment despite the exploitation of labour and the appropriation of surplus value by the capitalist class. Hence, workers' economic security, realised through employment, depends on the capitalists' success in exploitation because unsuccessful capitalists will not invest and employ workers (De Vroey, 1984). Such a class-based theoretical framework reflects the common Marxian heritage found in Kalecki (1954).

The RT approach treats microeconomic and macroeconomic factors as intertwined in the theoretical framework in which economic processes emerge (new or reproduced) and disappear under the effects of capitalisms' unstable development (Aglietta, 1998). The approach is a local and period-dependent analysis of macrodynamics with a strong focus on short-run adjustments in microeconomics (Boyer, 2014, pp. 115-116). The institutional configuration, the mode of régulation, determines the qualitative nature of class relations which has feedback effects on institutions. This meso-level structure affects and is affected by the macro and growth regime. It is reflecting the notion of circular cumulative causation (Myrdal, 1957; Kaldor, 1972). The growth regime, mode of accumulation, refers to how the system reproduces itself through the organisation of work, relations between investment and consumption sectors and the productive system (Fagerberg, 1984).

RT also share PK's view of uncertainty, and individuals make decisions without knowing what decisions other individuals are making or what the future brings (De Vroey, 1984). The wage-labour nexus represents the class relation between workers and employers, and it is implied that workers are both a source of demand for firms and a cost in the aggregate. The employee-employer relation lies at the centre of the class conflict, but these classes are structurally dependent and configuration for their relationship provides the starting point for the wage-labour nexus concept (Boyer, 2018b).

There is a broad separation of crisis between micro and macro, in which micro-crisis, concerning losses to firms and individuals, may not necessarily propagate into a broader macro-crisis, whereas a macro-crisis always implies a micro-crisis (De Vroey, 1984). Another separation of crises is that of *structural* and *cyclical*, referring to the dysfunction of institutions and social process in a regime of accumulation, and a particular phase of the business cycle apparent in an increase in unemployment or decrease in financial assets, respectively (De Vroey, 1984).

3.4 A new Synthesis in Comparative Political Economy

This section aims to present a framework to assess compatibility among theories at a profound level where fundamental contradictions and opposing positions that will cause logical inconsistencies can be identified. The criteria are formed from the aim of addressing different capitalist systems with respect to the institutional configuration. The period from 1973-1979 saw an abrupt change in developed economic systems, not just in terms of rising inflation but also falling profitability, the *functioning* of markets and *efficiency* of incentives deteriorated, and consequently, the behaviour of private agents changed (Lindbeck, 1983). During such periods, being able to assess the economy and differentiate between effects from the institutional configuration and capitalism is essential in terms of forming appropriate responses. The transformation of how the subject-field of economics was being understood,

namely from being a *Political Economy* to *Economics*; and the study of economics transformed from *understanding capitalism* to the study of economics as a *science* (Heilbroner, 1953, pp. 210, 312-314)[5] reflect profound alterations of what issues become the focal point of economic analysis.

3.4.1 Criteria for a capitalist theory of institutions

The institutional configuration refers not only to economic structures and relations but also encompass broader institutions, e.g. Iversen and Soskice (2006a) show how political systems (majority versus proportional representation) lead to different political platforms and consequently policies – from social to economic – which are dominated by political alliances. This suggests that institutional configurations should be understood in a political economy sense where the economy is political and, thus economic policy is never independent of politics. Neither are economic policies (fiscal or monetary) necessarily *fluid* and thereby easily removed or reversed since some policies are *structural*, which change the economic structure and type of institutions (Amable, 2018b, p. 455). There is a feedback effect, and, in addition, certain policies may require specific modifications to existing institutions. Economic policies (fiscal, monetary or structural), therefore, requires aspects of social conflict and distribution to be covered as illustrated by Bruno Amable (2018b, p. 442):

> "Social and economic differentiation breeds conflict among interests and the divergence on what a 'good' policy is. Most economic policy decisions, be it decisions concerning monetary or fiscal policy or more 'structural' policy decisions such as financial regulation, product market competition and public ownership, or employment protection legislation, have distributional consequences: distribution of income, wealth or power, or the allocation of risks and protection. Therefore, economic policy involves by necessity a conflict of interests. It is, by nature, political."

[5]Heilbroner's understanding of these terms must be considered since economists such as Schumpeter (which is included in Heilbroner's book) had a scientific approach to economics and emphasised that economics needed to explain capitalism.

The delineation described above by Heilbroner (1953, pp. 210, 312-314) is useful to explain the criteria put forward for the classification of *institutional theory of capitalism* and *capitalist theory of institutions* because these criteria[6] are intended to ensure a focus on understanding capitalism in a political economy sense as opposed to economics as an ahistorical, apolitical system, or as a 'science' as argued by Heilbroner. An institutional theory of capitalism (ITC) takes institutions as the reference point and explain capitalism (i.e. the economic system) in terms of an institutional theory. For example, in transaction cost economics, incomplete contracts increase the transaction costs of a relation, e.g. between an employee and the employer. However, this economic problem is not specific to the capitalist mode of production. The same problem could be expected in a system under a socialist mode of production or any other system *if* there are employee-employer relations. ITC, therefore, generalises beyond the mode of production and consequently ignores the essence of the economic system (which is capitalism) under investigation.

In contrast, a capitalist theory of institutions (CTI) starts from the premise of the capitalist mode of production and so the transaction costs problem is insufficient to explain the employee-employer relation unless it is extended to account for the capitalist mode of production. The issue no longer becomes limited to coordination failures but must include notions of power and conflicts of interest (between the employee and the employer) over the remuneration and working conditions. Hence, the reference (institutions or capitalism) is key as it sets the frame of the theory and thereby the scope of the analysis.

It is worth, pointing out that the generality of ITC (or institutional theories of a static indefinite point) removes its analytical applicability as a tool for investigating a dynamic monetary production economy (which capitalism is).

Attention is, therefore, given to assumptions that are important for the workings of economic models and the intuition of those models. The focus on assumptions is necessary because any abstraction from reality require simplifications,

---

[6]Construction a criteria set is no simple task and there are bounds to be room for improvement. For example, it took 8 years, 4 major revisions and multiple smaller alterations of the American Economic Association to land the JEL codes in use today, see Cherrier (2017).

and these simplifications are determined by the presented assumptions. Hence, in order to evaluate and categorise the theory as ICT or CTI, the assumptions (and their implications) are assessed against a capitalist economy. Thus, the criteria are the measuring tools for evaluating the assumptions. The criteria reflect economic arenas and economic actions that contain the economic part of society (Granovetter, 1985; 2005). The assumptions of economic behaviour and market interaction form the theoretical premise in which capitalism is described and understood. Assumptions and conditions are necessary to abstract from reality and provide an explanation of the object of analysis. According to Claudio Sardoni (2011, p. 142): "theory has to grasp the essential and fundamental characteristics of its object of study through a process of abstraction". Thus, theory should be based on how well the assumptions, of which the abstraction reflects, corresponds to the object that the theory is intended to explain.

Table 3.2 shows the criteria and classifies assumptions belonging to capitalist theories of institutions and institutional theories of capitalism. These criteria are formulated on the basis of ideas set out by Marx about the social conflict between labourers and capitalists under capitalism (Dobb, 1978, pp. 49–54; Hunt, 1978, pp. 54–64); Veblen on the evolutionary nature of capitalism (Veblen, 1898) and behaviour and coordination in the economy (Veblen, 1908b; Sweezy, 1958), as well as Myrdal's elaboration on the principle of circular cumulative causation (Myrdal, 1957, pp. 12-13); and, Keynes, Robinson and Graziani on money, credit and the demand-driven monetary production economy in the short- and long-run (Robinson, 1956; Keynes, 1963; Graziani, 2003).

'Focus of analysis' refers to methodology and would be considered a form of methodological individualism for the right-hand side column. However, capitalist theories of institutions do not share a common methodology (Hodgson, 1996; Jessop, 2001a; Amable and Palombarini, 2009; Jespersen, 2009). Market coordination is theorised by social interaction mediated by institutions. In the work of Esping-Andersen (1990) and Albert (1993), market failure occurs due to a breakdown in interaction which is explained by power relations and social conflict. The

66

economic governance structure is constantly evolving because the social structure is in motion following agents' behaviour. Thus, change results from a circular feedback mechanism and cumulative effects (Myrdal, 1957, pp. 11–22; Berger, 2008). Exploiting the richness from CPE work on capitalist economies and institutions (Esping-Andersen, 1990; Albert, 1993; Boyer, 2004; Amable, 2009; Streeck, 2011) will help construct a theoretical framework that meets the requirements of *capitalist theories of institutions* rather than *institutional theories of capitalism*. These terms reflect the position and role of capitalism in the theoretical framework provided and was used to describe the lack of a proper understanding of capitalism in VoC (cf. Bruff and Horn, 2012).

Table 3.2: Criteria for capitalist theories of institutions and institutional theories of capitalism

	Capitalist theory of institutions	Institutional theory of capitalism
Market coordination	social interaction with institutions as mediators	asymmetric information; transaction costs
Market failure	social conflict; fundamental uncertainty	incomplete information; imperfect information
Economic structure	circular cumulative causation	comparative institutional advantage
Monetary system	monetary production economy; endogenous theory of money; credit-liability relations	exchange production economy; loanable funds theory of money; money as a veil
Economic behaviour	social conventions, norms and habits	constrained intertemporal optimisation
Institutions	power relations; social structure	institutional complementarity; transaction cost minimisation
Economic development	demand-driven in the short- and long-run	supply-driven in the short- and long-run; demand-driven in the short-run
Economic stability	endogenously unstable	exogenously unstable
Focus of analysis	evolutionary; non-equilibrium	atomistic; partial or general equilibrium

A *capitalist theory of institutions* is first and foremost based on capitalism as a way of organising production and market exchange (Lange, 1935; Lichtenstein, 1983, p. 18; Phelps, 2007). Production relies on institutions that ensure the free exchange of labour-power in a (labour) market (Sweezy, 1942, p. 56). However, capitalism is also manifested beyond economic activities to political and cultural institutions (Lazonick, 1978). Therefore, the capitalist theory of institutions incorporates the evolutionary aspect of an economic system via institutions because institutions and social structures co-evolve. Capitalism is reflected in the legal regime and social formation in an economy (Boyer, 2011a). Therefore, the understanding of capitalism can be abstracted and applied to time and space specific settings of which concrete theories of institutions can be built (Crotty, 1990). The mode of production consists of social relations affected by institutions (Amable and Palombarini, 2009). Institutional change under a capitalist theory of institutions is determined by institutions and agents' actions in an uncertain environment (Boyer, 2005). *Capitalist theories of institutions are defined as a theory of institutions in which institutions are understood interdependently of the capitalistic mode of production.*

An example is the analysis of institutional change in France since the 1980s and how it has altered 'French capitalism' by Amable et al. (2012). Radical reforms in finance, product and labour markets have changed the institutional configuration and political line for economic policy which have affected the socio-economic structure and social formation in the French economy (Amable et al., 2012). Considering this work with that of the crisis of 2007-08 in France imply a strong tendency of capitalism to be unstable (Alvarez, 2015; Cordonnier et al., 2019). For another example explicitly of finance and *Money Manager Capitalism* in the United States, see Wray (2011) and Passarella (2012), which lends further support to instability caused by the financial sector. These studies build on Minsky (1980; 1982; 1986b) and illustrate how finance is an essential aspect of a capitalist economy because it affects the financing of capital assets, how payment commitments are met and economic activities are funded. Again, studies on the US investigating the crisis in 2007-08 point to instability generating dynamics following structural changes, see

Krippner (2005), Lin and Tomaskovic-Devey (2013) and Tooze (2018). Hence, any theoretical apparatus analysing capitalism must reflect the potential for instability in a capitalist economy. Moreover, money and credit are highlighted as key characteristics of any capitalist economy in the post-Fordist era (Köhler et al., 2019; Köhler, 2019). Thus, the capital-labour relation cannot be boiled down to a market transaction (Boyer, 2018b). A capitalist theory of institutions is not *one* theory but a suite of theories that assess institutions in a capitalist context subject to time and space.

An institutional theory of capitalism includes a notion of capitalism. However, capitalism has little explanatory power. Instead, institutions and politics are the driving forces for economic development and explanation of an economic system (Robinson and Acemoglu, 2012). This means that institutions and technology are in focus at the expense of concepts such as the mode of production, as argued in their discussion of the *general laws of capitalism* (Acemoglu and Robinson, 2015). Compared to the capitalist theory of institutions, the institutional theory of capitalism dismisses the notion that capitalism is based on an inherent distributional conflict. In any capitalist economy, there is a tendency for growing inequality of income, see Yoshihara (2017) for a recent survey. Thus, inequality, economic growth and crises are explained by institutions, politics and technology[7]. Therefore, the institutional theory of capitalism seeks to explain how institutions affect decisions related to innovation and skill accumulation in different economies. *Institutional theories of capitalism are defined as a theory of institutions that can be understood independently from the capitalistic mode of production.*

Inequality of income and wealth are outcomes from individual and collective decisions in terms of schooling and work (Estevez-Abe et al., 2001) and political preferences (Iversen and Soskice, 2006a; Alt and Iversen, 2017). Preferences for economic policy and institutions are understood as embedded in society but independent from the mode of production (Tabellini, 2010). This is problematic because the free exchange of labour includes a conflictual social relation in the capitalist mode

---

[7]Issues of inequality and crises have gained much attention among those interested in economic policy and economic curriculum, see Bowles and Carlin's (2020) work related to the CORE-project.

of production in CTI, but the conflictual component is absent in ITC. The explicit notion of conflict in social relations invites the notion of power and any imbalances between the involved parties. Consequently, ITC within CPE, arguably, neglect essential factors – power and social conflict – that are crucial for understanding the capitalist mode of production and capitalism as an economic system. Another clear contentious issue is the treatment of money and credit, which is crucial to comprehend contemporary economies. The distinction of institutional theories as CTI or ITC contributes to the primary purpose of identifying how capitalism and institutions are treated in CPE and macroeconomics. Moreover, it emphasises key aspects concerning the modelling of a capitalist economy and institutions. Assessing VoC, PK and RT against the criteria of CTI and ITC, therefore, provides a measure of their compatibility while identifying underlying differences and even contradictions.

3.4.2 Varieties of Capitalism: an institutional theory of capitalism

Hall and Soskice's work set out the paradigm-defining contribution to CPE in the early 2000s (Hay, 2020, pp. 304-305). This shift in CPE gave prominence to a specific set of economic theories and ideas which altered the dominating research programme. In some ways, events since the 1970s and their effect on economics and economic policy are apparent in the theoretical apparatus that culminated with geopolitical developments in the 1990s, resulting in a specific theoretical framework for understanding capitalist economies. During this time-span, a deterioration of *wage society* (Aglietta, 1979; 1998), a rise of 'Stagflation'[8] in advanced economies (Lerner, 1977a;b; Robinson, 1979b) and a revolution in economic ideas and policy (Mjøset, 1987; Snowdon and Vane, 2005) represent analyses and explanations from different theoretical perspectives. VoC takes its starting point in institutions, whilst capitalism is only the contemporary system in which these institutions exists (Bruff and Horn, 2012). The focus is mainly on institutional details explaining either

---

[8]Although there is broad agreement on the definition of stagflation, 'its causes and cures' (Lerner, 1977b) are distinctly different according to the applied theoretical framework (Robinson, 1979b).

varieties or commonalities in economic systems (Coates, 2005a; Bruff, 2011). There is no clear definition of 'capitalism' in the VoC framework nor notion of what effects are from capitalism as a mode of production (Peck and Theodore, 2007). Hence, capitalism is unspecified and absent in the theoretical framework of VoC (Bruff and Horn, 2012). The lack of abstraction means that the theory is unable to function as a capitalist theory. As institutions mediate economic behaviour, which explains most effects, and the intuition of VoC reflects the institutional configuration, it is considered an *institutional theory of capitalism* according to our criteria. The neglect of the capitalist mode of production has led to criticism stating that VoC reflects varieties of exchange economies, making *capitalism* an 'empty vessel' in the theoretical framework (Hay, 2005, p. 110).

The lack of a clear definition of capitalism in VoC leads to a misunderstanding of capitalist dynamics with respect to power imbalances, social conflict and accumulation of capital. Therefore, the proposed combination of VoC and neo-Kaleckian models is problematic because of the treatment of power, conflict, and income distribution in the respective theories. The neo-Kaleckian framework is a macroeconomic theory without explicit microfoundations beyond the treatment of pricing. VoC is a micro-level framework from which a macro perspective is generalised. There is a requirement for consistency between the micro theory of VoC and the macro theory of the neo-Kaleckian model. The neo-Kaleckian model implicitly relies on PK microeconomics that, apart from the price formation, is often downplayed in favour of macroeconomic investigations. As seen from the earlier discussion, VoC's assumptions of microeconomic behaviour are at odds with PK microeconomics. The assumptions of VoC means that power and social conflict play no active role in their analysis of the implications from institutions on the economy. Since power, via the degree of monopoly power in particular, and social conflict are essential components of the neo-Kaleckian model and the role of the income distribution. The neo-Kaleckian model and the VoC framework are not compatible nor reconcilable.

3.4.3 Comparative Political Economy and macroeconomic foundations

Baccaro and Pontusson's proposal is an attempt to refocus the research paradigm of CPE to the concept of capitalism and how it develops (Baccaro and Pontusson, 2016; Pontusson and Baccaro, 2020). From the review of VoC from a PK perspective, incorporating the neo-Kaleckian growth model with CPE will certainly bring questions of income distribution and aggregate demand to the vanguard. Baccaro and Pontusson's (2020) targets a fundamental point in CPE research: unifying the varieties vs commonalities debate by using a framework that provides a general analytical basis for capitalism. Still, Baccaro and Pontusson (2016, p. 201) deliberately 'downplayed the role of supply-side institutions' represented in VoC. The discussion has highlighted some contentious points between PK economics and VoC, which arise from conflicting assumptions. This section argues that this contention is not solvable without radical alteration of the theoretical assumptions of PK economics or VoC, i.e. *something got to give*. VoC and PK economics belong to opposing economic paradigms and reference points for institutional economic analysis, namely, institutional theory of capitalism and capitalist theory of institutions (see table 3.2). Hope and Soskice (2016) proposed an alternative to VoC + PK economics, namely a combination of VoC with a new Keynesian reduced-form DSGE 3-equation (henceforth 3-ECS) model developed by Carlin and Soskice (2006; 2015). Before setting out the synthesis of RT and PK economics as a proposal of CPE with macroeconomic foundations, Hope and Soskice's proposal will be discussed as it is an alternative to Baccaro and Pontusson's (2016) proposed approach where VoC is maintained in its initial form (cf. Hall and Soskice, 2001a; Soskice, 2007).

3.4.4 Varieties of Capitalism and new Keynesian macroeconomics

Hope and Soskice (2016, p. 216) acknowledge some of the shortcomings in the VoC framework with respect to explaining the increased earnings-inequality, lower bar-

gaining power of labour and falling employment protection in Germany, the champion CME. They, therefore, agree with the need to introduce income distribution and aggregate demand to the VoC framework (Hope and Soskice, 2016, pp. 210-211, 218). There is a broad consensus on this as seen from Hall (2018). He argues that the financial crisis and the Eurozone crisis have strengthened the need to integrate demand-side models into the VoC framework. Still, he emphasises that the VoC framework remains capable of explaining the structural features of these crises. Hope and Soskice (2016) argue that the neo-Kaleckian model is helpful for the purpose of gaining a demand perspective alongside the VoC analysis, but they argue that Baccaro and Pontusson (2016) do not address the issue of conflict between workers and employers and how the distribution of income is related with inflation and unemployment despite its prominent role in Kaleckian and Marxian economics (cf. Rowthorn, 1977; Lavoie, 1995). They see it as insufficient because it lacks an explicit theory of the state's role. Instead, Hope and Soskice (2016) propose the adoption of the 3-ECS model on the basis that it offers a more comprehensive symbiosis and a more prominent role for the state, i.e. fiscal and monetary policy. They argue that their counter-proposal better encapsulates the benefits from expanding VoC with macroeconomic analysis to understand the Aggregate Demand Management Regime (ADMR) and its association with production regimes (i.e. LME and CME), the political system and the welfare state that have been explored in earlier works by Soskice (with Iversen 2006b; 2007, p. 90).

Monetary policy is included in the 3-ECS model as the central bank determine the money supply with the base rate of interest to guide the real economy and the financial sector. However, there is little else that reflects the role of finance and the financial side of an economy. PK economics concur that the central bank set the interest rate but argue that banks operate as profit-driven firms and use a mark-up on interest rates to generate profits. The class conflict that the 3-ECS model "captures" (Hope and Soskice, 2016, p. 219) is restricted to the short-run because the assumptions of the price- and wage-setting curves state that there is an exogenously determined relation between inflation and unemployment in the long-run

via the Phillips curve and an exogenous Non-Accelerating Inflation Rate of Unemployment (NAIRU). The price curve (PS) is assumed to be flat; the wage curve (WS) assumes that effort depends negatively on employment and positively on the real wage. Hence involuntary unemployment is demand-driven in the short-run but supply-determined in the long-run (Carlin and Soskice, 2015). This implies that lower bargaining power of labour, less provision of social benefits, and lower unemployment benefits positively affect employment in the long-run (Carlin and Soskice, 2018, pp. 176, 185).

The assumptions underpinning the 3-ECS model leads to a pre-determined outcome when used in VoC analysis. This implies that variations of capitalism that do not conform to these assumptions will suffer in terms of policy and analysis, i.e. government intervention is very restricted for long-run effects beyond market facilitation and 'greasing' the wheels for market coordination in the short-run. Although there is a notion of conflict in the 3-ECS model, its long-term view is driven by a free-market logic (Baccaro and Pontusson, 2018). Hence, fiscal policy is restricted to a short-run, strictly counter-cyclical function in the economy which is at direct odds with its function in *Social Democratic* economies (Esping-Andersen, 2015). This leads to a strange composition in which CMEs will have lower growth than LMEs ceteris paribus. What this reveal is that the economic idea of the 3-ECS model favours certain institutional configurations. An empirical study of the finance-led growth model in the UK since the 1970s by Oren and Blyth (2019) illustrate how the path dependency between institutions and economic ideas can become a self-fulfilling prophecy. Although the link between economic ideas and policy is a nuanced reality, there exist strong ties between institutions and policies (Ban and Patenaude, 2019).

The discussion on VoC and macroeconomic models show the importance of assumptions for analytical outcomes and the political element that these assumptions shelter. The critique of VoC highlights methodological nationalism (individualism) and institutional functionalism (Peck and Theodore, 2007), static determinism (Jessop, 2014), homogeneity and hierarchical determination (Kesting and Nielsen,

2008, pp. 37-47). These atomistic features of VoC dictate many of the behavioural aspects of the VoC model. The stated assumptions in VoC and the 3-ECS model do not fit the understanding of a capitalist system nor a monetary theory of production. Economic theories and methods that downplay distribution and social conflict will naturally ignore such aspects in terms of policy recommendations and institutional configuration. The VoC approach lies closer to the economic theory of the 3-ECS model than PK economics. From the discussion above, a VoC and 3-ECS approach suppress issues related to the distribution of income, social conflict and accumulation regimes. Thus, there is a need for an alternative to VoC to explore "why different countries developed different growth models since the end of the Post-Fordist period" (Behringer and van Treeck, 2017, p. 19). By presenting an alternative proposal – of PK economics and RT – shows two approaches that are more compatible than VoC and PK economics and better retain the aim and spirit of Baccaro and Pontusson's (2016; 2018) proposal than the VoC and 3-ECS model proposed by Hope and Soskice (2016).

3.4.5 Régulation theory and post-Keynesian macroeconomics

The similarities of RT and PK economics are alluded to by Baccaro and Pontusson (2016, p. 184):

> "The New Kaleckian approach [. . .] resonates with core ideas of the French Régulation School. More so than New Kaleckian macroeconomists, 'regulationists' have emphasised that the rapid and remarkably stable growth characteristic of the 1950s and 1960s was made possible by a set of institutional arrangements [. . .] that boosted labor's bargaining power and served to ensure that wage growth kept pace with productivity growth, thus feeding aggregate demand."

However, Baccaro and Pontusson do not probe the point of bargaining power and distribution of income further. An alternative framework to PK and VoC, based on

PK and RT, to pursue these aspects is therefore set out.

Both RT and PK economics focus on the 'workings of modern capitalist economies' and this determination of economic activity allow them to be synthesised at the macroeconomic level (Delaunay, 1988). Stockhammer (2018) highlights that although PK economics is very much aware of the sociological and political aspects of a class-based society, the impact of these aspects are not adequately incorporated in the PK modelling framework, nor is the notion of power usually introduced formally beyond the discussion. Hence, RT can be considered a suitable complementary method of analysis to PK growth models (Boyer, 1990, p. xviii). Boyer's point is shared by Lipietz (1985, p. xviii) who argue that the Régulation School and PK economics share theoretical branches and research interests. The connection between RT and PK economics is also found throughout the development of PK economics (Ferri and Minsky, 1992; Lavoie, p. 8; Stockhammer et al., 2016). Baccaro and Pontusson draw attention to the underdeveloped part of neo-Kaleckian models, namely the institutional arrangements, the institutional aspects are mostly left to a vague discussion in their paper (Baccaro and Pontusson, 2016). Their objective is to provide a base for which a 'coherent analytical framework' of CPE and macroeconomics can be built (Baccaro and Pontusson, 2018, p. 19). Such a theoretical framework must be compatible with a microeconomic foundation for the neo-Kaleckian model. This is to say that there exists an implicit notion on which the neo-Kaleckian model is based, and this notion must be consistent with a proposed set of microfoundations and institutional theory. There cannot be two assumptions of microeconomic behaviour that are in contradiction with respect to the same macro foundations. If the real wage is set by the principle of optimal allocation of scarce resources, i.e. according to the marginal productivity of labour then, this is in direct contradiction with the neo-Kaleckian model in which real wages are implicitly determined in the product market dependent on output and the price mark-up.

CPE, as understood in this thesis, understand variegated capitalism as "*an evolutionary process*" (Boyer, 2018a, p. 596, emphasis in original) of institutional

development both domestic and international. Thus, the theoretical repertoire demanded by CPE's new research paradigm is found in the PK and RT frameworks. The scope for a beneficial synthesis is also discussed in International Political Economy (IPE), where a link between RT and PK economics is being developed by Blyth and Matthijs (2017) and others. This is motivated by having a more active role in analysing power and social conflict (Stockhammer et al., 2016). A broader combination of CPE and IPE has also been proposed by Boyer (Boyer, 2018a, p. 597). Hence, the integration of CPE and PK economics has some overlap with the combination of IPE and PK economics.

PK economics and RT both understand capitalism as a monetary production economy where labour-power is exchanged as a commodity and social relations are exposed to different forms of market competition (Dillard, 1984; Lavoie, 2006; Boyer, 2018b). This view also encapsulates the notion that *unregulated* capitalism is unstable because wages are both a cost to firms and a source of profits, and the principle of *effective* demand means that credit money is essential for aggregate demand (Eichner and Kregel, 1975; Lipietz, 1988; Thirlwall, 1993). These assertions mean that both PK economics and RT reject the notion that an unregulated market economy would lead to a natural unique equilibrium point (Kaldor, 1972; Aglietta, 1979, p. 9). In a natural unique equilibrium, all individuals would be satisfied and consequently would not change their behaviour, which implies that the equilibrium is also socially optimal and by extension stable (Robinson, 1960, pp. 130-131). Instead, PK economics and RT operate with a framework in which multiple equilibria are possible without conditions enforcing these to be an optimum in any respect nor exogenously determined in the long-run. This is a result of treating an equilibrium as a steady state in a historical process, i.e. the process of cumulative causation depends on the technological and institutional regime (Setterfield, 1997). This understanding of economic development of capitalist economies is built on the Cambridge models of growth and distributions developed by Kaldor, Robinson and Pasinetti, and developments in microeconomics such as the PK theory of firms, pricing, neo-Kaleckian models of growth and financial instability (Lavoie, 2014b, p.

31). The basis for the macroeconomic analysis in RT is inspired by the work of Kalecki (more so than Keynes) (Boyer, 2002, p. 16) and pioneering work on economic structures using Kaleckian models (Bowles and Boyer, 1988; 1990; 1995) are early examples of the connection between PK economics and RT.

The balance-sheet approach to macroeconomic analysis where the *real* economy and the financial sector are integrated is a fundamental part of the PK approach. How accumulation regimes and institutional reconfiguration are interconnected is of central importance to RT. Therefore, a combination of PK economics and RT allows for the activation of demand, income distribution, institutions, the state and social preferences in a consolidated analytical framework based on their similar approach to political economy analysis, see Uemura et al. (2019). Table 3.3 below illustrates how the objects of analysis cover the broad aspects that can be included in the analytical framework, whilst the specific emphasis and detail depend on the posed research question.

Table 3.3: CPE approach – microfoundations: post-Keynesian + Régulation Theory

Object of analysis	
Classes	Sectors
i.e. workers, capitalists, rentiers, entrepreneurs	i.e. finance, production, government
Institutions	Social interaction
i.e. rules, norms, laws, conventions	i.e. employee-employer, borrower-lender

Table 3.3 constitutes the microfoundations of the analysis because behaviour and institutions are at the centre. The balance sheet approach requires well-defined 'sectors', and stocks and flows are clearly delineated at whichever required level. This ensures that the microeconomics abide by the macrofoundations stressed in PK macroeconomic analysis (Caverzasi and Godin, 2014; Nikiforos and Zezza, 2017). The relevant nexus between the classes, i.e. worker-manager, labourer-capitalist, reflects the social structure and interaction. Since social relations are never ahistorical or static but affected by institutions and the historical context, institutions become an

active part of the analysis. Therefore, the analysis can never truly be *general* since it reflects the context of the research question.

Minsky stressed the role of institutions and the evolutionary character of capitalism and consequently emphasised the inclusion of institutions in any analysis of capitalist economies (Minsky, 1996). This evolutionary and institutionalist understanding of capitalism is explicit in the concept of *thwarting systems* that cover institutional forms – labour market institutions, economy-state nexus and market and industry structures – what is called the mode of régulation in RT (Ferri and Minsky, 1992, p. 84, fn. 19). The role of institutions and interventions is to constrain capitalist market processes to "contain and dominate the endogenous economic reactions that, if left alone, breed instability" (Ferri and Minsky, 1992, p. 80). This reflects an understanding of macroeconomics in which the institutional configuration affects how macroeconomic patterns affect the formation of microeconomic behaviour (Billaudot, 2002, p. 141).

In the RT terminology, as summarised by Boyer and Saillard (Boyer and Saillard, 2002a, pp. 38-39), the highest level of abstraction is the *mode of production* – defined by Marx as the description of the form of production and exchange relations – in which a capitalist mode of production means that exchange value dominates use-value. The level below, in terms of abstraction, is the *accumulation regime* which represents the growth regime as discussed in PK macroeconomics; the regime of accumulation is the pattern between two structural crises. The *mode of régulation* determines the hierarchy among institutional forms which is the structures of social relations such as the wage-labour nexus, the monetary form – the institution of money – and the forms of competition. Therefore, the mode of régulation reproduces fundamental social relations according to the mode of production and influences the current accumulation regime. At the sectoral level, the mode of régulation is a process combining economic regimes of operation and institutional configurations in the economy. Thus, this decomposition of analytical concepts by abstraction allows institutional similarities and differences to be identified through the analysis and the implications for the higher-order abstractions. The macrodynamics of the

framework illustrate how an accumulation regime is interconnected with the mode of régulation and mode of production. The connection between the accumulation regime and mode of régulation enables the analysis to illuminate feedback effects or cumulative causation between the micro and macro level. Figure 3.1 shows that social interaction is situated within one or more sector(s) mediated by the institutional configuration of which the totality makes up the accumulation regime.

Figure 3.1: CPE approach – macrodynamics: post-Keynesian + Régulation Theory

```
┌─────────────────┐
│   Mode of       │
│   Production    │
└─────────────────┘
        │
        ▼
┌─────────────────┐
│   Regime of     │
│   Accumulation  │
└─────────────────┘
        │
        ▼
┌─────────────────┐
│   Mode of       │
│   Régulation    │
└─────────────────┘
        │
        ▼
┌─────────────────┐
│ Social Interaction │
└─────────────────┘
```
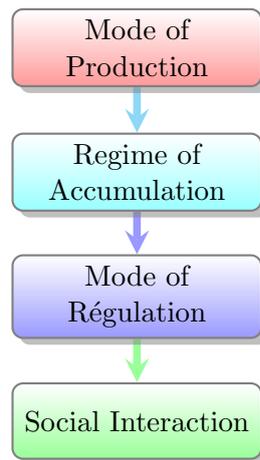
This thesis, therefore, proposes an approach in which the wage-labour nexus (labour market) and borrower-lender nexus (monetary regime) become interrelated since workers spend out of income *and* credit (product market), as highlighted by Graziani (2003, pp. 28-29). Financial markets are important for firms in both VoC and PK-RT. However, the relationship between the *real* economy and the financial sector is very different in these two frameworks. In the mode of régulation, property rights, laws and regulations and markets are enforced, implemented and facilitated according to the capitalist mode of production which makes out the regime of accumulation (Labrousse and Michel, 2018, pp. 58-59). Hence encompassing the product market, financial system, and labour market in a monetary production economy as illustrated in figure 3.2.

The shared perspectives of PK economics and RT generate the synthesis depicted in figure 3.2, but the dominating forces in the regime of accumulation reflect the difference in RT and PK economics due to a Marxian and Kaleckian emphasis, i.e. profit-led and wage-led growth, respectively (Setterfield, 2011). Furthermore,

Figure 3.2: Regime of accumulation in a monetary production economy
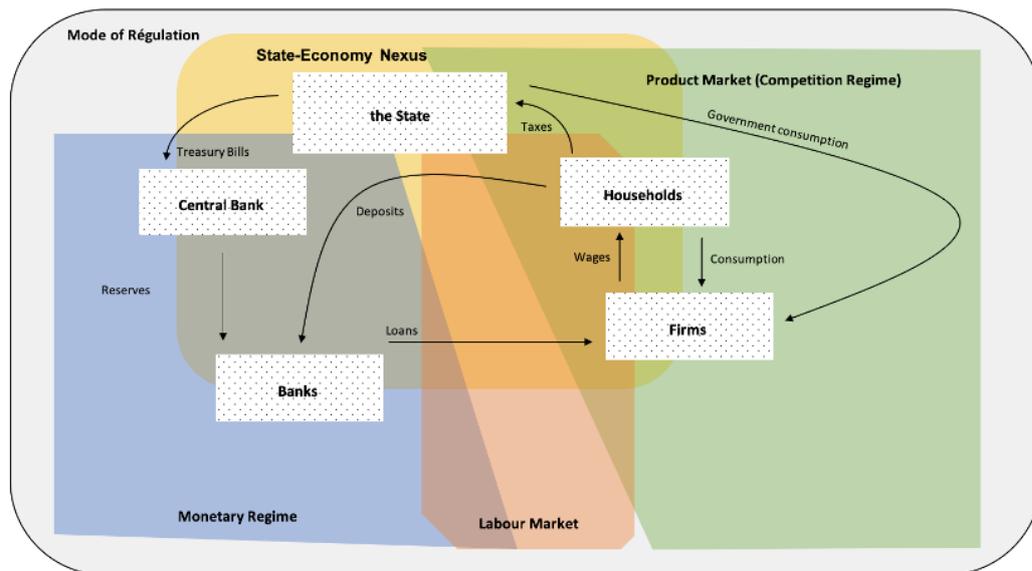
although the RT view tends towards longer phase waves and the PK view is more focused on short-run cycles, the given weight by these two theoretical frameworks does not mean incompatibility. There is a broad congruity due to their basis on the income-generating process, institutions' role, and the functioning of a capitalist economy (Setterfield, 2011). The construction of a PK and RT research program can be built on the notion of cumulative causation and growth regimes (i.e. accumulation regimes); the integrated view of the real economy and finance in the so-called Stock-Flow Consistent models, see surveys by Caverzasi and Godin (2014) and Nikiforos and Zezza (2017); the financial instability hypothesis and institutional theory of Minsky; the interconnection between short-run and long-run tendencies of growth and cycles; and, the role of institutions for capitalist economies (Boyer, 2011b).

Capitalism is understood as an evolutionary force, and this must be, and indeed is, reflected in a capitalist theory of institutions. Institutions act as mediators in social interaction and are therefore instrumental in how feedback mechanisms move between the macro and micro levels. These feedback effects reflect the motion of cumulative causation, i.e. the evolutionary character of capitalism, a term taken from Myrdal (1957). The adoption of the principle of cumulative causation is common in RT studies because it weaves institutional and historical factors with economic factors (Petit, 2002, p. 168). The macroeconomic theory of RT holds

that there is positive feedback (increasing returns) between aggregate demand and productivity (Amable, 2002, pp. 162-163). This approach is inspired by the work of Kaldor[9] (Thirlwall, 1983) and state that increases in aggregate demand promote economies of scale. Hence, if the productivity gains feed into higher real wage growth this translates into further increases in aggregate demand and generates a virtuous circle (Grahl and Teague, 2000). This dynamic is shared by PK macroeconomics and known as the 'Kaldor-Verdoorn Law' (Kaldor, 1961; 1978; Verdoorn, 2002) or the 'Smith-effect' (Sylos-Labini, 1983; 1995). The increasing returns to scale are achieved through the division of labour, illustrated in the classic example of the pin factory in Adam Smith's *An Enquiry into the Nature and Causes of the Wealth of Nations* (1776), in which labourers specialise and therefore become more productive in completing tasks. Empirical analyses are supportive of the Kaldor-Verdoorn law (Storm and Naastepad, 2012, p. 82; Magacho and McCombie, 2018; Carnevali et al., 2019). Such an evolutionary approach to the study of capitalism also reflects the influence of Marx, Veblen and Schumpeter. The alternative approach to CPE presented in this chapter follows the tradition of these critical approaches in economics and political economy.

3.5 Conclusion

Building on the research agenda set out by Baccaro and Pontusson (2016; 2020) and by PK economists (cf. Behringer and van Treeck, 2019; Stockhammer, forthcoming; Köhler and Stockhammer, 2021), this chapter investigate the basis for a combination of macroeconomic theory and institutional economic analysis. The findings of this study have produced a new framework to analyse distributional indicators such as the real wage, wage shares and the dividend-wage ratio. The proposed framework in this chapter argues that the institutional configuration, specific to a sector, market or the economy, and the economic structure are interdependent. The findings indicate the benefit of applying institutional economic analysis with macroeconomic theory

---

[9]Kaldor's work on circular cumulative causation draws on work by Verdoorn (2002) and Young (1928). Arthur (1989) has also worked on increasing returns in relation to Complexity Economics.

to understand economic mechanisms and processes in market exchange, production and industrial relations.

This chapter has addressed weaknesses in the theoretical foundation of the synthesis between CPE and PK economics that were identified in chapter 2. The alternative synthesis of PK economics and RT resulted from analysing the key objectives of the proposed research programme and the critique of VoC. This analysis identified several critical theoretical concepts and assumptions. By categorising these findings, a set of conceptual building blocks for analysing different capitalist accumulation patterns and governance structures could be established. Consequently, two taxonomies – *institutional theories of capitalism* and *capitalist theories of institutions* – have been constructed to analyse and evaluate national models of capitalism. These concepts provide constructive tools for contributing to a theoretical framework with PK macroeconomic foundations in CPE. The criteria of capitalist theories of institutions enhance our understanding of the theoretical requirement for such a framework. Motivated by Baccaro and Pontusson's proposed research agenda of:

a) integrating the distribution of income and aggregate demand in a dynamic framework, including a more explicit handling of power and social interaction;

b) elaborating on the *commonalities* between varieties of capitalism as well as variations, thereby expanding the analysis to institutional commonalities and not only institutional differences.

A third component is added to the proposed research paradigm, namely:

c) to account for the financial system and the role of money in a capitalist economy.

The amended proposition of VoC and the 3-ECS model suggested by Hope and Soskice (2016) does not suffer from a theoretical *misconstruction* as such. But the discussion of contemporary approaches to macroeconomics indicates that such an alternative would not fulfil the aim of incorporating income distribution to CPE analysis nor adequately deal with the national model as a monetary production economy. Now, since capitalism *is* a monetary production economy any theoretical

framework intended to analyse and understand capitalistic economies must include an active role of money and finance. The key principles of the proposed research agenda – points a)-c) above – therefore excludes the VoC-3-ECS model. In contrast, integrating an approach of PK economics and RT captures these three points. The compatibility of PK and RT is acknowledged by Baccaro and Pontusson (2016, p. 184) but never pursued. This study has picked up on this loose end and composed an alternative theoretical framework grounded in PK economics and the RT. This alternative is based on the criteria of *capitalist theories of institutions*. Thus, capitalism is given a central position in the theoretical framework that can be applied to analyse institutional differences *and* commonalities across national economic models.

Chapter 4

A review of modern macroeconomic modelling

4.1   Introduction

This chapter reviews contemporary macroeconomic modelling for the purpose of formalising the *macroeconomic foundations* of Comparative Political Economy (CPE). The aim is to investigate how macroeconomic theory and institutional economic analysis can be formalised to analyse capitalist economies. This work evaluates the development of modern macroeconomics and systematises different approaches to macroeconomic modelling in the context of analysing capitalism. The novelty of this work is the established link between the main approaches of macroeconomic modelling and how institutions and capitalism are theorised in CPE, as *capitalist theories of institutions* (CTI) or *institutional theories of capitalism* (ITC).

The study contributes to the work on combining CPE and macroeconomics by going deeper into macroeconomic modelling and its consequences for the formalisation of CPE theories than previous work (Hope and Soskice, 2016; Pontusson and Baccaro, 2020; Stockhammer, forthcoming). The interaction of CPE with macroeconomics has been somewhat limited (see Pontusson and Baccaro, 2020), and considering the plurality of macroeconomics approaches, and this study seeks to

broaden that scope. The formalisation of theoretical concepts and assumptions is an integral part of the necessary abstraction in economic modelling. This process is taken seriously through a careful review and systematic assessment. The chapter contributes to a debate about macroeconomic modelling from a political economy perspective where capitalism and institutions are central in the analysis.

Hope and Soskice (2016) argue for integrating the New Consensus macroeconomic model (3-ECS) – developed by Carlin and Soskice (2006; 2015) – with CPE. Their approach uses a new Keynesian (NK) reduced form DSGE (Dynamic Stochastic General Equilibrium) model with the Varieties of Capitalism (VoC) framework. On the opposite side of the spectrum, Stockhammer (forthcoming) makes a case for drawing on post-Keynesian (PK) macroeconomic approaches but without much reliance on the VoC framework. His suggestion strips out much of CPE in analysing varieties of capitalist economies. Baccaro and Pontusson (2020) discuss CPE and the varieties of macroeconomics and point to the need for CPE to have a pluralist view on 'macroeconomic management'. They argue for introducing more supply-side features in the growth model approach already set out (see Baccaro and Pontusson, 2016). Hence, their position is in between Hope and Soskice and Stockhammer. Still, Baccaro and Pontusson stress that the PK approach, in many ways, is more compatible with key CPE aspects such as the balance of power, multiple equilibria as political constructs and the causal relation between power and distribution (Pontusson and Baccaro, 2020).

This study proposes an alternative way going forward by looking to Agent Based-Stock Flow Consistent (AB-SFC) macroeconomic models. These models allow key aspects of CPE to be retained whilst supply-side features can be introduced in the analytical framework. The AB-SFC method is an alternative macroeconomic modelling approach to DSGE models (Dosi and Roventini, 2019), which have not been discussed as an alternative to the 3-ECS model or neo-Kaleckian model. The strengths of applying an AB-SFC model is shown by assessing the main assumptions and underlying concepts in macroeconomics' modelling approaches. The focus on assumptions is important because it reflects both the theoretical premise *and*

requirements for formalising the theories. The assumptions determine the intuition of models and therefore illustrate the understanding and view of the economy, from which the analysis abstracts. Considering accounting identities – a significant starting point for macroeconomic modelling and theory – and their causal relations, the identity itself means very little, and it is through theory and associated assumptions that causality is determined in the model and analysis. Thus, macroeconomic modelling approaches are categorised – as *open*, *semi-open* or *closed* – to indicate their flexibility with respect to assumptions and thereby theoretical adjustment. The modelling categories are a tool that can be combined with the CTI and ITC distinction of theoretical frameworks for analysing capitalist economies. Section 4.2 presents contemporary macroeconomics and discusses the current dominating modelling approaches. Section 4.3 presents the agent-based alternative, and section 4.4 cover some alternative modelling approaches. A discussion follows in section 4.5, and the final section concludes.

4.2   Mainstream macroeconomic modelling

4.2.1   Mainstream macroeconomics

Blanchard defines macroeconomics as "the study of fluctuations, mundane – recessions and expansions – or sustained – sharp recession, long depressions, sustained high unemployment" (2000, p. 1376, fn. 2). Contemporary macroeconomics is based on a revamp of classical ideas – New Classical Macroeconomics (NCM) developed by Lucas (1972; 1976), Kydland and Prescott (1977) and Sargent (1987) – combined with NK macroeconomics (Galí and Gertler, 2007). NK macroeconomics is developed from Samuelson's (1948) neoclassical synthesis based on Hicks's IS-LM interpretation of Keynes (Hicks, 1937). The NCM and NK macroeconomics are at the centre of what is called the New Consensus in macroeconomics (Blanchard, 2009) – also known as the New Neoclassical Synthesis (NNS) (Goodfriend and King, 1997). This is the so-called mainstream approach to macroeconomics and stands in contrast to alternative approaches such as the PK approach adopted by Baccaro

and Pontusson (2016).

Mainstream macroeconomics has become more focused on empirical calibration of models and applied economics (Backhouse and Cherrier, 2017). This applied turn is based on macroeconomic theory informed by empirically calibrated parameters in computational experiments (Angrist and Pischke, 2010). Such an approach can be traced back to the origin of business cycle modelling illustrated in a discussion by Haavelmo albeit without the same careful consideration of the model's theoretical foundation:

> "The degree of *conformity* between these [business cycle models'] theoretical solutions and the corresponding observed time series is used as a test of the validity of the model. In particular, since most economic time series show cyclical movements, one is led to consider only mathematical models the solutions of which are cycles corresponding approximately to those appearing in the data. This means that one restricts the class of admissible hypotheses by inspecting the *apparent form* of the observed time series.
>
> This condition for a "good" theory is of course not a sufficient one, since there are in general many *different* a priori setups of theory which are capable of reproducing approximately the observed cycles. But, what is more important, it may not even be a necessary condition, and its application may result in a dangerous and misleading discrimination between theories" (Haavelmo, 1940, p. 312, emphasis in original)

In parallel to this empirical turn, 'microfoundations' in macroeconomic models have attained a greater focus since the Lucas critique (Lucas and Rapping, 1971; Lucas, 1976). The Lucas critique stresses the need for macroeconomic models to reflect changes in individual behaviour following macroeconomic shocks and policy changes. Initially, microfoundations was represented with a single representative agent. The Real Business Cycle (RBC) framework – the DSGE model – is combined with new Keynesian elements – nominal rigidities and imperfect competition – in the NNS framework. NNS is characterised by intertemporal optimisation, the

rational expectation hypothesis, imperfect competition in goods, labour and credit markets, and costly price adjustments (Snowdon and Vane, 2005, p. 411). Models are therefore affected by the demand-side in the short-run and supply-side driven in the long-run. The strong emphasis on real magnitudes and supply-side shocks from technological innovation in production reflects the RBC origin of these models (Snowdon and Vane, 2005, pp. 297-298). The monetarist view of money is also present through the concept of money neutrality (Snowdon and Vane, 2005, pp. 322-323). Therefore, this approach was initially founded on a counter-revolution to Keynesian ideas and explicitly downplayed or ignored critical aspects of capitalism.

A recent 'internal' critique of the NNS' emphasis on a 'hard' approach to economics is that this emphasis comes at the expense of a 'soft' approach and consequently to 'sins of omission' – the obstruction of new ideas outside of the dominating theoretical paradigm – and failure to reflect upon the core assumptions of dominating theories (Akerlof, 2020). Thereby confirming Haavelmo's words of warning as alternative theoretical approaches are discriminated against, e.g. in journal publications[1] (Heckman and Moktan, 2020). That is not to say that this critique is wholly ignored. There has been a broader debate about macroeconomics if recent developments of macroeconomics have been at the expense of theoretical developments (Vines and Wills, 2018; Krugman, 2018; Blanchard, 2018a). However, this has led to (rather minuscule) amendments and additions to the (existing) core rather than some fundamental overhaul (cf. Galí, 2018; Reis, 2018). One of the most profound developments has been the adoption of models with two representative classes of agents or heterogeneous agents, see Ravn and Sterk (2021) and Acharya and Dogra (2020). This has allowed for greater integration of new Keynesian features such as the *multiplier* through the marginal propensity to consume and distributive effects (Bilbiie, 2020; Galí, 2020); and involuntary[2] unemployment (Blanchard, 2016;

---

[1]This publication *bias* among the top mainstream journals reflect a closely inward focus with few citations of economic journals outside the "top" (Kapeller, 2010).

[2]The notion of involuntary unemployment will be discussed more in detail below. For now, it is worth noting that in DSGE-type models, involuntary unemployment is linked with search effort due to the adoption of search and matching framework. This is often referred to as *frictional unemployment* since it is explained by inefficiencies in the matching process. This differs from the involuntary unemployment definition in a 3-ECS model which is defined by the paid wage and labour supply. Neither of these definitions of unemployment fits the Keynesian notion of

Christiano et al., 2016; Krusell et al., 2020).

The financial crisis in 2008 and the subsequent Great Recession caused controversy[3] for the mainstream approach and forced some self-reflection. Initially, leading macroeconomists argued that the "state of macro is good" (Olivier Blanchard, 2009, p. 210). However, criticism of fundamental features of core macroeconomic model – mainly DSGE models – such as its microfoundations, see Hendry and Muellbauer (2018) and Wren-Lewis (2018), has altered the discussion and new arguments that DSGE macroeconomic models were working as expected and provided consistent results compared to empirical data before the crisis (2018). DSGE models, therefore, remains at the core of mainstream macroeconomic modelling[4], but with new additions in the form of financial frictions and heterogeneous agents.

The view of capitalism, institutions, social interaction and collective decision-making in mainstream macroeconomic modelling is problematic from a CPE perspective. Central issues in CPE – development of economic systems, public and corporate governance and social conflict – are not "in focus" in the macroeconomic debate. The closest branch of mainstream macroeconomics to CPE is the 'new political macroeconomics' literature which focuses on government policy quantitatively and qualitatively (Snowdon and Vane, 2005, pp. 517-522). Still, there is no unified framework of institutional economics and mainstream macroeconomics. Consequently, the institutional configuration in economies is relegated to exogenous rules with respect to inflation targets, automatic stabilisers, wage bargaining and financial activities. These matters signify arenas of social conflict and power

---

involuntary unemployment due to insufficient effective demand.

[3]The *Rebuilding Macroeconomics* (RM) research initiative which is funded by the Economic and Social Research Council (ESRC) in the UK is one such example. RM aims to "transform macroeconomics back into a useful and policy-relevant social science. ... [By asking] fundamental questions about macroeconomics in the 'real world' and encourage rigorous, innovative and interdisciplinary research" (RM website, accessed: 22.04.2020, `https://www.rebuildingmacroeconomics.ac.uk/about-us`). The Institute for New Economic Thinking (INET), founded by George Soros in the US, is another example. INET is "devoted to developing and sharing ideas that can repair our broken economy and create a more equal, prosperous, and just society. To meet current and future challenges, we conduct and commission research, convene forums for exchanging ideas, develop curricula, and nurture a global community for young scholars" (INET website, accessed: 22.04.2020, `https://www.ineteconomics.org/about/our-purpose`).

[4]See the three symposiums on macroeconomics in the Oxford Review of Economic Policy (vol. 34, issue 1-2, 2018) and Journal of Economic Perspectives (vol. 24, issue 4, 2010; vol. 32, issue 3, 2018) for an 'insider's' view of the state of macro.

relations but are reduced to constrained maximisation problems.

4.2.2 Macroeconomic modelling in the New Neoclassical Synthesis

The modelling approach to the NNS is based on the DSGE model which was first developed from the RBC theory, and later different versions with NK features were developed (Woodford, 2009). The adoption of DSGE models by NK economists is motivated by the view that "[m]acroeconomics is about general equilibrium analysis" (Kaplan and Violante, 2018, p. 169). NK economics emphasis features such as dynamics, stochastic and general equilibrium in favour of static, deterministic and partial equilibrium, therefore, adopting the DSGE modelling method (Galí, 2018)[5]. The Keynesian features of the macroeconomic analysis are imperfect competition in the goods market (and sometimes the labour market) and rigidities of prices, wages and interest rates (Galí, 2018). DSGE models have become "the leading tool" for macroeconomic analysis "in an open and transparent manner" (Christiano et al., 2018, p. 113). The economic analysis of DSGE models follows the RBC approach as idiosyncratic shocks are used on labour productivity (and therefore wages due to the adoption of the Marginal Productivity Theory of Wages) or on marginal propensities to consume (Galí, 2018) to analyse deviation from the equilibrium and the economy's path back to equilibrium.

The NK features are represented through nominal rigidities and imperfect competition. This means that exogenous changes in monetary policy have significant effects on *real* variables and responses to shocks are dependent on monetary policy. Thus, the NK DSGE model always tends toward the natural output level determined by the real or natural rate of interest[6]. The actual output in the model is determined by a dynamic IS (Investment-Savings) equation based on the output

---

[5]This reflects a sort of NCM/ RBC capture of the macroeconomic research field that previously was dominated by the Keynesian view up to the 1970s.

[6]Although the notion of natural rate of interest and of unemployment has become increasingly scrutinised, especially with respect to hysteresis-effects on unemployment (Summers, 2014), the natural rate hypothesis remains a core tent in NK and DSGE macroeconomic modelling (Blanchard, 2018b).

gap, the nominal interest rate, inflation and the natural rate of interest (Galí, 2018). The new Keynesian Phillips Curve (NK-PC) explains inflation based on expected inflation and the output gap (from the IS equation). Expected inflation is determined from optimal consumption behaviour with clearing conditions that ensure equality between consumption and output (Galí, 2018).

The interest rate is determined by the Taylor rule (Taylor, 1993) modified to allow monetary policy to be tighter or looser (Galí, 2018). Thus, the NK-DGSE model gravitates towards an equilibrium obtained from the IS equation, the interest rate rule (aggregate demand), and the NK-PC. The intuition of this model is that economic activity (demand) is rising or falling depending on the distance between the real rate of interest and the natural rate of interest. Hence, fluctuations are demand-driven in the short-run whilst in the long-run the model is supply-driven since the real rate of interest converges to the natural rate of interest (Christiano et al., 2018).

The application of DSGE models has been developed from an ideal-type economy following classical postulates to an empirically calibrated and more recently an estimating model of the economy. This reflects a modelling approach in stark contrast to the approach of VoC or broader approaches in CPE where multiple ideal-types of economies can be identified. Moreover, the focus on generating observed macroeconomic statistics with the model have undermined the validation of the model's assumptions. Theoretical concepts have therefore become secondary or even tertiary in terms of developing macroeconomic theory and analysis.

4.2.2.1   The microfoundations of DSGE models

Recent discussions on the DSGE model focus on the use of the Rational Expectation Hypothesis (Muth, 1961) and the representative agent and its application in the microfoundations of macroeconomic models (Lucas, 1972; 1976). This focus is due to the lack of realism and failure to account for adaptive behaviour to changes in its environment in these models (Stiglitz, 2018). The failure to abide by the applied turn which macroeconomist pride themselves in, namely, to validate the

theoretical concepts with the observed phenomena, has led to a stronger focus on heterogeneous agents and imperfect knowledge among agents that must coordinate with each other (Backhouse and Cherrier, 2017). This is an acknowledgement of the social composition of an economy which suggest that the issue of what comprises an economy – a multitude of interacting agents in markets – is expanding[7]. Under what rules and regulations these agents are operating under is a political question and there is common ground to be found in modern macroeconomics and CPE.

The classical 'monetarist' view is rejected by most NK economists (Woodford, 2010) and some RBC theorists (Kehoe et al., 2018). Still, the behaviour of agents remains largely unaltered, i.e. it is still determined through intertemporal optimisation by a form of rational expectations (Kaplan and Violante, 2018; Galí, 2018). These models operate with individual decision-making which is based on assumptions that include rational forward-looking agents that optimise behaviour based on varying degrees of (im)perfect knowledge[8] and (im)perfect information [9] (Krusell and Smith, 2006). More recent work relaxes the assumption of rational expectations by assuming incomplete information, see Woodford (2013), De Grauwe and Ji (2019) and Gabaix (2014; 2020). This is often portrayed as introducing bounded rationality as theorised by Simon (1972). However, it is a special case of bounded rationality as agents' response to the limited information and uncertain prospects are unaltered – agents still optimise and perfect knowledge is assumed – since irrationality is introduced via a sparse max operator (Gabaix, 2014). This means that agents decide (rationally) how inattentive they should be to their surroundings.

The adoption of heterogeneous agents in DSGE models stems from work on heterogeneous agent models such as the Overlapping Generational (OLP) and Principal-Agent (PA) models (Kaplan and Violante, 2018). OLP models follow agents' lifecycle to capture coordination and heterogeneity at the microlevel in a

---

[7]Although, the matter of interaction remains unsolved, it remains to be seen whether the introduction of heterogeneous agents is to produce frictions or realism.

[8]Perfect knowledge means that uncertainty is treated like the possibility of multiple states of the world with some probability based on the occurrence in the past (Arrow, 1974).

[9]The assumption of complete or perfect information meaning that the agents know each other's utility function and are therefore able to anticipate each other's behaviour.

macroeconomic framework. The finite horizon means that the Ricardian Equivalence no longer holds [10] (Foley et al., 2019, p. 301) since agents no longer live infinite lives. The Ricardian Equivalence states that over an infinite horizon decision-makers will alter current and future consumption and investment decisions, so higher spending now means less spending in the future (with more saving due to consumption smoothing). The Ricardian Equivalence also relies on the assumption of perfect foresight or perfect knowledge since the constrained optimisation problem for the lifetime is solved by the agent with respect to the budget constraint and utility. OLP models rely on optimising behaviour and intertemporal choices, i.e. in terms of labour supply (Erosa et al., 2016), and are therefore still guilty of the criticism raised against behavioural rules and cognitive capacity of individuals.

PA models also operate with heterogeneous agents. These agents are assumed to maximise their utility under the influence of incentives and are subject to constraints (Holmström and Milgrom, 1991). Therefore, these models are prone to the same critique as OLP in regard to behavioural rules. PA models assume that agents constantly focus on the tasks modelled and behave perfectly rational, meaning that agents are incredibly systematic and organised in their decision-making process and not affected by whims or impulses. This assumption needs to be amended with macroeconomics' renewed interest in imperfect information (knowledge) and incomplete information (Phelps, 2007; Farmer, 2011; Frydman and Goldberg, 2013; Syverson, 2019). Examples of PA models without such strict behavioural assumptions regarding optimisation and perfect rationality can be found in evolutionary game theory, see Bowles (2004) for an exposition and references therein. This could be a useful source for the continuing development of non-rational non-optimising microfounded macroeconomic models. OLP and PA provide early examples of models with different types of agents (PA) or agents with different endowments and preferences (OLP).

Endowments and preference sets determine the magnitude of the friction

---

[10]The Ricardian Equivalence has been an important concept in political economy for arguments against state intervention and spending since tax raises now or later makes no difference as households adjust their spending immediately to take account of the higher tax burden (Buchanan et al., 1978). The assumption of rational expectations is crucial for this concept.

from heterogeneous agents and intuition of HANK (Heterogeneous Agent New Keynesian) models (Ravn and Sterk, 2017). Therefore, the dynamic of the model depends on the agents' traits, i.e. source of income, wealth stock or propensity to consume (Broer et al., 2020). This also has significant consequences for policy analysis such as how progressive taxation affects consumption over the business cycle (McKay and Reis, 2016). Incomplete information and the degree of rational inattention determines the level of optimal taxation in terms of marginal social utilities (Farhi and Gabaix, 2020) or what the level of taxation that minimises the negative effect on the labour supply is (Heathcote et al., 2020). In other words, there is a risk of situational determinism when the model outcome is predetermined by the initial endowments and preferences[11]. Moreover, this modelling approach reflects a harmonious economy where conflicts of interests are resolved irrespective of the power balance in social relations.

4.2.2.2 The financial sector in DSGE models

DSGE models have also received much criticism after the crisis for not including a financial sector (McKibbin and Stoeckel, 2018). Part of this criticism is linked to the use of representative agents because a representative agent meant a consolidation of individual balance sheets, i.e. of agents liabilities and assets and the distribution of assets meant neglecting the implications from marginal propensities to consume out of wealth and income and access to credit for businesses and households (Kaplan and Violante, 2018). This criticism has led to the development of a more prominent financial sector in DSGE-type models. The financial sector incorporated into the DSGE framework reflects financial mechanisms in which banks assess risk and ensure financial intermediation[12]. This means that financial and systemic risk has

---

[11]This is not to indicate that these examples are not worth pursuing, but to illustrate that the current dominating approach in macroeconomic modelling excludes certain research questions and issues, like social conflict or unbalanced power relations among agents.

[12]In a caricature, the role of banks as intermediaries among agents arises due to economies of scale and economies of scope. Hence, banks specialise in assessing risk and affordability which reduces loss from 'misplaced' bets because of the huge amount of applications for loans (scale) and the variety of these applications (scope). Thus, it is more efficient for a deposit holder to allow banks to lend out some part of the money at a 'market rate' than it is for the deposit holder to find someone looking to borrow. The strict understanding of banks as pure intermediaries is known as the Loanable Funds Theory (Werner, 2016).

entered the analysis, but money remains neutral, see Gertler and Gilchrist (2018). Furthermore, market disruption is due to failed policy or frictions as the general equilibrium conditions would ensure harmonious coordination (Gertler et al., 2020). Thus, financial disruption arises from liquidity traps due to insufficient (safe) assets that restrain banks' lending (Caballero and Farhi, 2017) or leverage effects among households and firms (Jensen et al., 2020).

Chadha (2014) gives a general survey of financial frictions in DSGE models, e.g. by introducing multiple interest rates that have different effects on demand and thereby the stability of the economy[13]. Chadha (2014) presents three versions of an NK-DSGE model with financial frictions and analyses effects from aggregate demand shocks on monetary policy aspects: 1) changes in optimal reserves ratio preferred and reserves act as a buffer against firing and hiring of workers; 2) effects from different interest rates (short- and long-term) on consumption decisions; and 3) financial intermediation by commercial banks via leverage levels which determine the lending to firms. In the DSGE models with financial frictions, financial crises are driven by the expectation, endowments or preferences that are shocked, e.g. agents that rationally expect ever-rising asset prices have their expectations shocked or enlightened, and this cause a crisis to occur (Farmer, 2013); or there is insufficient assets leading to a liquidity crisis, see Mian and Sufi (2018) for a summary. Nevertheless, crises are not endogenous in these models, except for the NK-DSGE model by Beaudry et al. (2020) that contain stock accumulation and strategic complementarities among agents' behaviour which lead to deep cycles.

4.2.2.3 Unemployment in DSGE models

Initially, involuntary unemployment could not be generated in DSGE models because all markets would clear in the general equilibrium framework (Galí, 2011). In other words, unemployment was non-existence in equilibrium. The introduction of

---

[13]This misses the point of the criticism related to money and credit. The continued reliance on prices (interest rates) as the market clearing mechanism (for credit) reflects that money is introduced as an ad-hoc factor in the model. This reflect the neutrality of money in the theory as its effect is not from money itself but from the inefficiency of bartering in which money is used as a 'lubricant'. The fundamental understanding of the financial sector is therefore not changed, but finance has been included in the model simply as an additional friction.

frictions in the labour market has allowed for involuntary unemployment to arise. Although, this type of involuntary unemployment is not due to insufficient effective demand in the economy, but rather due to frictions in the labour market. The labour market in contemporary DSGE or HANK models is usually modelled with the Search-and-Match (SAM) framework by Diamond-Mortensen-Pissarides (DMP) (Diamond, 1982b;a; Mortensen, 1982; Pissarides, 1984; 1985). This has introduced involuntary unemployment via the friction between vacancies and unemployed workers in DSGE models (Blanchard, 2009).

The 'interaction' among agents in the DMP model relies on a Cobb-Douglas function with inputs of effort and utility via some 'search technology', with the returns to scale assumed to be constant, agents decide on effort spent to find employment (Ravn and Sterk, 2021). Thus, the agent's job-finding rate is a positive function of effort exerted. Agent's decision-making depends on the structure of the model, i.e. if employers or employees are searching, but decisions are based on received offers (from employers or employees) (Diamond, 1982b; Mortensen, 1982; Pissarides, 1984). This leads to a Beveridge type model where higher employment increases the resources that must be spent to fill additional vacancies or diminishing returns to searches from the firms' point of view. The matching function relies on the Euler equation that encapsulates a probability distribution in an intertemporal optimisation problem so that outcomes are not necessarily globally optimal (Ghironi, 2018). Wage bargaining is usually determined through a Nash bargaining structure with some exogenous parameter reflecting bargaining power.

Analysing labour market fluctuations in a general equilibrium model with heterogeneous agents, Krusell et al. (2020) model gross worker flows in and out of employment, unemployment and the labour force and consider effects from shocks[14] to the Total Factor Productivity (TFP). The model parameters determine the friction in these flows, i.e. job-finding and job-separation rates (Krusell et al., 2020). A

---

[14]These shocks are so-called 'MIT shocks' are unexpected shocks which hit the economy in the steady state, where the assumption of perfect foresight lead "to a transition path *back* towards the economy's steady state" (Boppart et al., 2018, p. 70, emphasis added). Note that the 'path back' reflects the illogical notion of time which Joan Robinson often highlighted in her critique of neoclassical economics (Robinson, 1974).

recurrent theme in these models – that have evolved from the RBC model (Kydland and Prescott, 1982) – is price adjustment reacting to shocks which force the model back to some general equilibrium (Krusell et al., 2020). The TFP shock causes changes to prices that affect the labour supply which leads to fluctuations in employment, unemployment and labour force participation. Such an approach relies on the gravitational forces of general equilibrium economics, in which the model transits towards an equilibrium. Hence, demand factors and the demand for labour are suppressed in the analysis because there are no constraints to demand, only to supply in the form of technology.

4.2.2.4 Institutions in DSGE models

Institutional aspects are 'implied' in the workings of the DSGE (or HANK) model and are only mentioned in the explanation of the intuition of the model. The institutional configuration of the economy is therefore not particularly relevant for the workings of the model. How this would be rectified with the VoC approach is unclear since qualitative aspects in the VoC framework are not suited to the DSGE approach. Different institutional features could be expressed *implicitly* with exogenous parameters, but this would not necessarily generate the qualitative features of Liberal Market Economies and Coordinated Market Economies as explained in VoC, especially when considering the centrality of institutional complementarity. Even the capitalist type taxonomy would be challenging to adopt with DSGE models because the link between economic systems and DSGE features are abstruse. Money and credit are *ad-hoc* components or residuals in the DSGE-type model since money and credit are treated as additional components of the utility maximisation function instead of an integral part of the system (and thereby the model). Capitalist features are difficult to identify in DSGE-type models because of the general equilibrium and the implied strong notion of natural balance. Another issue is how economic behaviour is modelled, which reflects a lack of social interaction among agents that are also associated with ITC. Economic behaviour and market coordination, therefore, become situationally determined by market forces unless impeded by exogenous

factors. In addition to the lack of *active* institutions and social interaction in the DSGE modelling approach, the financial sector has a passive role in the economy.

The incorporation of finance has significant consequences for the analysis provided by the DSGE model as it has real effects. However, as banks are greatly simplified due to their sole role as financial intermediaries, the impact from the financial sector and agent heterogeneity come from preferences, expectations and price/ wage rigidities rather than individual interaction and financial bubbles (McKibbin and Stoeckel, 2018)[15]. This treatment of finance and financial agents or institutions cause confusion because banks' lending is seen as restricted by their funding costs. Thereby, neglecting the issue of causality, namely that banks' demand for assets arise with increases in their liabilities, i.e. lending cause deposits or investment cause savings and not the other way around. A similar confusion arises in the bank-based and market-based taxonomy of financial systems in Comparative Political Economy. This confusion leads to the view that surplus agents use banks to reduce transaction costs when surplus is lent to deficit agents. Thus, efficient institutions minimise transaction costs and institutional complementarity is therefore important to reduce the risk of disruption in the financial system and the potential for financial crises.

The notion of interaction also stands out in the modelling of the labour market. The matching function applied in search models[16] is not a micro-level function because it does not fully account for the heterogeneity among workers but reflects aggregated notions (Goudet et al., 2017). Searches occur using some 'technology' which takes the form of a Cobb-Douglas function with constant returns (Ghironi, 2018). Thus, there is no interaction in the labour market (LeBaron and Tesfatsion, 2008). In the context of the CPE, labour market institutions' sole purpose in this macroeconomic framework is to minimise transaction costs, i.e. maximise the

---

[15]This is the standard view, there exist dissident views most prominently presented by Bank of England's senior research advisor Michael Kumhof (see Benes and Kumhof, 2015; Jakab and Kumhof, 2019).

[16]DMP models have also be characterised as 'black boxes' since the intuition of the model is well understood but not verified (Petrongolo and Pissarides, 2001). The theoretical validity of these models have been question because the models have not been able to describe fluctuations in empirical data, the so-called 'Shimer Puzzle' (Shimer, 2005).

transmission of information among workers and employers so that labour market frictions will fall. This reflects the understanding of ITC as opposed to the CTI where institutions reflect social conflict and power relations in the economy.

In the DMP models, frictions and miscoordination are due to resource misallocation by firms or workers because it depends on the effort spent in searching. Wage setting institutions have a negative impact on search effort and vacancies creation because it decreases workers disutility (higher unemployment benefits) and increases costs of workers (higher wages) (Vejlin, 2017). This means that unemployment exists because workers have too high wage expectations or reservation wages and that the generous unemployment benefits dissuade unemployed workers from spending effort to find employment[17]. Unemployment is, therefore, a supply-side phenomenon that cannot be explained by demand deficiencies in the model but is explained as friction due to inefficiencies in the market. The introduction of dual heterogeneity, i.e. heterogeneous workers and employers, in these search models have amplified the effect from frictions in the labour market but has not addressed the lack of interaction (Mangin, 2017). The supply-side reliance of these models exhibits the same intuition as the institutions in Liberal Market Economies. This poses a problem if this approach is to be imported into CPE because it will amplify the predisposition in the VoC approach.

4.2.3 Alternative mainstream models

There are macroeconomic models of a Keynesian persuasion without the same use of explicit rational representative or classes of agents. A textbook model developed from the New Consensus in macroeconomics is the 3-ECS model (Carlin and Soskice, 2015) and a (New) Keynesian Search Model (KSM) (Farmer, 2013). These models resemble the IS-LM model (Hicks, 1937), but differ due to the inclusion of a monetary rule instead of an LM curve. Moreover, these models operate with an adaptive expectations Phillips curve and Keynesian search theory, respectively, rather than

---

[17]A lack of vacancies may produce some unemployment, but it is unlikely to persist over time (due to price stickiness) and the reward of higher wages would eventually attract unemployed workers.

rational expectations. The former model also includes a monetary function representing the central bank which determines interest rates. Each type of model differs from the DSGE modelling approach because both deviate from rational expectations and can generate multiple equilibria. The KSM is based on Keynesian Search Theory developed from the Indeterminacy School in macroeconomics, and its key elements are a belief function and incorporation of asset markets (Farmer, 2020). These models offer a potential macroeconomic approach to CPE analysis.

4.2.3.1 Keynesian search theory

Keynesian search theory incorporates the concept of sunspots, search-and-matching and the interpretations of Keynes' *General Theory of Employment, Interest and Money* by Hansen (1936) and Hicks (1937). A sunspot equilibrium reflects an equilibrium attained due to a 'sunspot' variable which can be interpreted as a psychological factor or belief (Azariadis and Guesnerie, 1986). Farmer (1999) develops this concept into a *belief function* that captures a path dependency effect among individuals, i.e. their expectations about nominal income growth next year is a function of nominal income growth this year and a supply shock term. Therefore, the belief function follows a random walk, which generates multiple equilibria since each possible equilibrium reflects the belief or sunspot variable. Thus, the obtained equilibrium is not unique nor necessarily optimal but considered rational in the sense that agents act rational on their available information. The Keynesian search theory is based on the DMP search model. However, there is no bargaining between workers and employers. Instead, it is assumed that employers hire all the workers they demand. The demand for labour depends on the demand for outputs which depends on consumers' wealth that is determined by the value of assets held (Farmer, 2013; 2020). Thus, the search and matching function ensures the ease at which employers find employees. This model is demand driven in the *short-run*. However, in the long-run, the model is driven by supply-side factors following the neoclassical synthesis (Farmer, 2016). Wages and prices are given in these models, and unemployment is a function of contracts that are based on effort expressed in the matching pro-

cess (Farmer, 2010). This model is distinguished from the textbook new Keynesian model (Carlin and Soskice, 2015; Mankiw, 2016) by the Keynesian search theory and the explanation of price and wage deflation in the immediate aftermath of the Great Depression in the 1930s (Farmer, 2018).

The assumptions of economic behaviour are atomistic and follow the notion of rational expectations with the caveat that these expectations are adaptive. Agents are not assumed to exhibit the same cognitive capabilities as in the DSGE framework. However, this poses the issue of the institutions' role. In the standard rational expectations' framework, the agents optimise their behaviour based on all information available, and institutions are information transmitters that minimise transaction costs of searching. If agents are recursive in terms of rationality, but also optimising, the role of institutions are either transaction cost minimising and falls within the ITC; or structures of social conflict and power relations and falls within the CTI. The problem then arises in the latter case because institutions have no role in this model as bargaining is absent[18].

Farmer (2017) has made an attempt to reconcile post-Keynesian theoretical aspects with a DSGE model. His model must be considered an alternative model then the DSGE models that follow the NNS. His interpretation of the DSGE framework differs from NNS because it follows the development of Hicks's IS-LM framework by Patinkin, Clower and Leijonhufvud and later via the dynamic macroeconomic approach by Benassy and Malinvaud (Farmer, 2017). This interpretation of DSGE, therefore, include disequilibrium or non-market clearing. The PK-DSGE model built by Farmer drops the representative agent assumption and uses the assumptions of finitely lived people as found in the OLP model. Farmer also makes use of his belief function as opposed to the rational expectation hypothesis. Finally, Farmer expends with sticky prices and relies on the Keynesian search theory in order to describe the labour market (Farmer, 2017). Aggregate demand is determined by the animal spirits of participants in the asset markets; hence new vacancies are connected to the asset markets or the belief about the values of assets in the future

---

[18]This halfway position is known as "falling between two chairs" (å falle mellom to stoler) in Norwegian.

(Farmer, 2017). Farmer does not address the monetary issues such as credit creation and how money affects behaviour. His model does not abide by the notion of fundamental uncertainty. Thus, it is by no means a standard PK model and reflects an attempt to explain PK concepts with the KSM. Therefore, this 'version' of the KSM model does not clarify the position of the model concerning ICT and CTI.

4.2.3.2   3-ECS model

The 3-ECS model developed by Carlin and Soskice (2006; 2015) consists of a demand function (IS), supply function (PC) and monetary policy rule function (MR). The difference between the core 3-ECS model and 'standard' DSGE models used by most central banks is somewhat "blurred" (Carlin and Soskice, 2015, p. 611). Employment in the short-run is determined by the aggregate demand through the IS-curve as output depends on the real rate of interest (Carlin and Soskice, 2015, chap. 1). In the medium- to long-run, employment is 'classical' since employment is determined by the supply-side, specifically a vertical Phillips curve (PC) with a Non-Accelerating Inflation Rate of Unemployment (NAIRU). The third equation (MR) which reflects decisions by the central bank reflects that the central bank sets a policy rate so that the NAIRU is achieved at the target rate of inflation. The MR equation, therefore, brings the economy into equilibrium in the medium- to long-run. This means that money supply is endogenous and the central bank action (with respect to the policy rate) has the equivalent role of the *real balance effect.*

The medium- to the long-run rate of employment is set in the NAIRU model and depends on the wage-setting (WS) and price-setting (PS) curves. The PS curve represents standard profit maximising behaviour, but the PS curve is assumed to be flat – a simplifying assumption – reflecting constant variable unit costs (or marginal costs) or that firms operate in an imperfectly competitive environment and set prices on a normal unit cost basis. Thus, firms do not react to fluctuations in aggregate demand by changing prices leading employment and output to change instead (Carlin and Soskice, 2015, p. 64)[19]. The WS curve follows an *efficiency*

---

[19]In a newer version of the model, lower market competition of product goods will reduce employment because firms will increase their mark-up and therefore also reduce real wages (Carlin

wage model[20], what can be called a 'no-shirking curve' (Lavoie, 2015), that relies on the concept of asymmetric information and the Marxian notion of the *reserve army of labour* that higher employment induces workers to exert less effort pressing (profit-maximising) firms to raise real wages to increase workers' cost of job loss (cf. Gordon et al., 1983; Bowles et al., 1986; Green and Weisskopf, 1990). Thus, at the intersection of the WS and PS curves, firms will maximise profits. The discrepancy between the level of employment and the supply of labour at the real wage (determined by the PS curve) is characterised as *involuntary* unemployment by Carlin and Soskice (2015, p. 57). Thus, the assumptions in the model state that real wages determine work effort (Carlin and Soskice, 2015, p. 73). Consequently, trade unions and labour market institutions that protect workers real wages or increase it will be positively associated with shirking or 'bad behaviour' among workers (De Vroey, 2004, pp. 196-197). The WS-PS model works, in the medium- to long-run, in an equivalent manner as the long-run *vertical* aggregate supply curve of the standard AS-AD[21] model (Lavoie, 2015).

Wage bargaining is described using a Phillips curve with an exogenously given NAIRU in the long-run. The constant NAIRU is a standard NK assumption which means that unemployment is determined by labour market institutions in the medium- to long-run (Layard et al., 1991). This assumption implies that class conflict is restricted to the short-run; since in the long-run lower bargaining power of labour, less social benefits and unemployment benefits – any factor which contributes to labour market flexibility – will increase employment because the wage will be lower (Carlin and Soskice, 2015, p. 58). Therefore, the NAIRU is interpreted as the natural rate of unemployment under the given conditions since there must be

---

and Soskice, 2018).

[20]There is an issue with this interpretation by Carlin and Soskice of the model's capacity to produce involuntary unemployment because involuntary unemployment is defined in an efficiency wage model (Lavoie, 2015). Considering firms' price-setting behaviour, one could argue that firms' reluctance to lower profits impedes the actual employment level (compared to the potential employment level) and thereby causes involuntary unemployment among workers. However, this argument only holds if there is no shirking among workers. This is certainly not the case according to efficiency wage theory (Shapiro and Stiglitz, 1984; Akerlof and Yellen, 1986) where workers' effort depends on their received real wage and workers will shirk on the job unless the cost of losing the job is sufficiently high.

[21]AS-AD stand for Aggregate Supply-Aggregate Demand.

some level of unemployment that is consistent with a constant level of inflation (Ball and Mankiw, 2002). Thus, revealing the assumption that there is a *natural* level of unemployment associated with a constant level of inflation[22].

The 3-ECS model treats labour market institutions as structures of social conflict and power relations in accordance with the CTI. However, the mechanism of the efficiency wage model is determined by supply-side features so demand for labour and output falls if the reservation wage – determined by unemployment benefits and other welfare goods – rises. This is due to a shift in the horizontal part of the labour supply curve, see Carlin and Soskice (2015, chap. 2). Therefore, the model implicitly favours the institutional configuration of a Liberal Market Economy when compared with the VoC framework. The 3-ECS model recognises that power is important in social relations, as illustrated in how the labour market is modelled. Institutions can, therefore, be understood as arenas of social conflict, but the role of institutions is to minimise costs (or maximise benefits) to *society as a whole*. Thus, restrain workers whilst providing some minimum level so that the point of intersection between supply and demand of labour minimises the distance to full employment (minimises involuntary unemployment) under the assumption of imperfect competition. This is determined by the position of the NAIRU.

4.2.3.3 The Non-Accelerating Inflation Rate of Unemployment in macroeconomics

The NAIRU model adopted in the 3-ECS model by Carlin and Soskice (2015) is not the only version available. The NAIRU model can be shown to accommodate a wide range of different economic theories by altering the assumptions of the natural rate of unemployment (Stockhammer, 2008a). This is because a core part of the NAIRU is

---

[22]It should be noted that the natural rate of unemployment in Monetarist and NAIRU theories are defined differently. In the monetarist sense it refers to a real equilibrium determined by structural characteristics in the goods and labour markets based on the Walrasian general equilibrium framework – a market clearing concept; in the NAIRU theory the natural rate of unemployment is the level of unemployment in which the target real wage is consistent with the feasible real wage with respect to labour productivity and price mark-ups – a concept of microfoundations (Snowdon and Vane, 2005, p. 403). Stockhammer (2008a) argues that the difference is that monetarist understand it as voluntary unemployment and the NAIRU model understand it as involuntary unemployment.

the short-run Phillips curve that illustrates the trade-off between unemployment and inflation in the short-run. The NAIRU can therefore be shown as either endogenous or exogenous in the medium- to long- run depending on the assumptions of the demand function (Stockhammer, 2008a). With an exogenous determination, WS equals PS in the long-run and hence the associated level of employment with the given production level. On the other hand, with endogenous determination, supply follows effective demand and is subject to hysteresis so that employment depends on demand and consequently, the NAIRU will be continuously changing in adherence to demand. Thus, the stability of the NAIRU depends on the adjustment in the goods market. Moreover, the presence of hysteresis effects in the labour market indicate that aggregate demand has permanent effects on the macro-level which can be characterised as nonlinear and selective at the micro-level (Hughes Hallett and Piscitelli, 2002), see Røed (1997) for a discussion of hysteresis in the labour market, and Yagan (2019) and Rodriguez-Gil (2018) for recent investigations of the US, and of the UK and the Netherlands, respectively.

The NAIRU reflects wage bargaining in the labour market which is accepted across different economic schools of thought. However, it does not imply that the wage formation is the market-clearing function (Carlin and Soskice, 2006, pp. 51–53; Stockhammer, 2011). Wages can easily be assumed to be determined by social institutions and norms in the labour market and are therefore unable to move freely with the forces of supply and demand. This is akin to the assumptions of CTI as wage bargaining is related to social conflict (of the nominal wage level) and power balance (between workers and employers). Stockhammer (2008a) shows how employers and employees are assumed to exert power in relation to each other depending on the employment level. Macroeconomic variables are thereby linked with the social relations within the labour market. Inflation, therefore, becomes the result of the conflict regarding the distribution of income created between these two classes (workers and capitalists) and capital formation (Rowthorn, 1995; 1999; Arestis and Sawyer, 2005). The demand for labour is assumed to be determined by effective demand in the short run which is influenced by and influences investment (Arestis and

Sawyer, 2005). However, if the NAIRU is assumed to be constant through time, then unemployment will be determined by the NAIRU in the medium- to long-run, not effective demand (Stockhammer, 2008a). The assumptions made about the NAIRU clarify which theoretical framework in CPE the macroeconomic modelling approach is compatible with. If NAIRU is endogenously determined by demand, then bargaining – social relations of conflict and power – is a primary factor, whereas an exogenous determined NAIRU means that a natural market equilibrium exists. The former reflects the development of capitalist phases as the economy fluctuates and the latter assumes a given economy.

4.2.4   Some controversies in macroeconomics

Despite the analytical strengths of the macroeconomic models mentioned above, the brief discussion reveals some fundamental issues at the bottom of the mainstream macroeconomic foundation. The microeconomic foundation relies on aggregate functions, i.e. a Cobb-Douglas function that has been calibrated with assumed homogeneity in the estimation of parameters adopted (Baqaee and Farhi, 2019). A recent review of the elasticity of substitution between capital and labour by Gechert et al. (2021) argues for the rejection of the Cobb-Douglas specification based on a meta-study. The controversy of the Cobb-Douglas production function is based on the 1950s to mid-1970s *Cambridge Capital Controversies*[23] and illustrate a similar divide as observed between CTI and ITC in CPE. The divide in the Cambridge controversies reflects distinct approaches to economic research as different assumptions and concepts in macroeconomics separated the two Cambridges. Thus, the capital controversies and the issues discussed therein are of interest because similar criticism raised against the aggregate production function by the UK Cambridge side were also raised by Thorstein Veblen against the marginalist approach to economics promoted by John Bates Clark and Irving Fisher in the early 1900s, see Cohen (2014).

Veblen's argument was based on the categories of capital – tangible and

---

[23]The name reflects the scholarly camps of the competing sides, the neoclassical side in Cambridge, US and the post-Keynesian side in Cambridge, UK.

intangible – and their relation to the capitalisation of value (Veblen, 1908c). Veblen also focuses on individualism in the marginalist theory of distribution and productivity and its effort to identify individual efforts in a collaborative process (Veblen, 1908b, pp. 517-518). His point highlights several issues with the marginalist approach, seen from an institutional perspective, such as coordination among workers either producing capital goods or employing capital goods in production; the notion of habits in the production process, i.e. the conventional use of capital goods; and the role of immaterial 'intangible' assets such as knowledge and information shared within and between groups across generations (Veblen, 1908b). Veblen argues that capital in its tangible and intangible form is not defined as physical equipment but as a business's specific practices (Veblen, 1908a). This notion helps us understand why Veblen included institutional factors in the determination of firms' return on capital (Cohen, 2014). According to Veblen, the distribution of income depends on social differences between capitalists and wage earners, i.e. institutionalised power relations, instead of the marginal productivity of financial or physical capital (Cohen, 2014). The Cambridge controversies[24] centred on three theoretical issues:

 i) the meaning, and consequently, the measurement, of capital in capitalist economies,

 ii) the notion of the equilibrium concept in the analysis of capital accumulation and growth, and

 iii) the role of ideology and analytic vision concerning the discussion and analysis of capital (Cohen and Harcourt, 2003)[25].

These points provide a macroeconomic lens to view CTI and ITC as it covers the same abstract level (point ii) – liberal and coordinated market economies, analytical level (point iii) – how does the empirical observation fit with the analytical framework; and empirical level (point i) – case studies or statistical analysis – as

---

[24]The neglect of the capital controversy debate is partly explained by such a flawed understanding of concepts set out by neoclassical economics by present-day economists (Petri, 2019).

[25]These issues were grounded in the neoclassical approach advocated by Paul Samuelson, Robert Solow, Frank Hahn and Christopher Bliss which were challenged by the PK approach through Joan Robinson, Piero Sraffa, Pierangelo Garegnani and Luigi Pasinetti.

in VoC for example. The Cambridge UK followed a Ricardian/Marxian vision of the capitalist economy. Therefore, the critique raised was as much methodological as theoretical, which is reflected in the issues covered and the general critique on the marginal productivity theory of distribution (Harcourt, 2015). Such approaches rest on an "understanding of the laws of motion of capitalism cumulative causation processes" (Harcourt, 2015, p. 252), which resonate with the CTI.

The modern empirical critique is based on the theoretical controversy of how capital can be measured[26]. Any theory must rely on a set of assumptions. Shaikh (1974) illustrated how the Cobb-Douglas production function still fits a model without any of the neoclassical assumptions, thereby disproving the validity of these assumptions. McCombie draws on Shaikh and shows that the Cobb-Douglas production function actually shows factor shares of income, i.e. wage- and profit shares, rather than the elasticity of substitution between labour and capital (McCombie, 2001). Empirical studies have verified this, and since the Cobb-Douglas function is merely reproducing factor shares, i.e. the national account identity, between labour and capital, it "will always yield a negative relationship between the level of employment and the real wage" (Felipe and McCombie, 2009, p. 165). Hence, an essential part of mainstream macroeconomic models imposes assumptions that do not describe what they are intended to represent. This poses a problem for macroeconomic modelling approaches.

The ITC is reflected in the continuing reliance on the Cobb-Douglas function in mainstream macroeconomics which reflects the neoclassical extension of the Malthusian theory of rent to explain the division of products between wages and profits (Garegnani, 2012). Through the substitutability of the factors of production the concept of surplus product in production is discarded in ITC. The assumption of scarcity and the implication from this assumption is central to the controversy since the neoclassical approach's explanation of resource allocation is based on scarcity. In contrast, the post-Keynesian side emphasised reproducibility and how the capitalist economy must reproduce itself and expand via surplus production (Lavoie, 2014b,

---

[26]Capital is a central part of the post-Keynesian and Marxist critique of political economy, see Wolff and Resnick (2012).

p. 23). The same differentiation is found among CTI and ITC.

This leads to the question of what alternative modelling approaches must be reviewed to investigate whether CTI is limited to specific models based on PK or Marxian economics. An alternative modelling approach has gained recognition as a suitable alternative to DSGE models because of its capacity to generate complex systems and macroeconomic fluctuations due to simple behavioural rules (Haldane and Turrell, 2018). Dilaver et al. (2018) summarise the main criticism raised against DSGE models from this alternative perspective – Agent-based macroeconomics: the representative agent (vs *interacting* heterogeneous agents), general equilibrium (vs *multiple* equilibria), disequilibrium are only caused by stochastic exogenous shocks (vs *bottom-up emergent* complex dynamics) and rational expectations (vs *bounded* rationality). These points of contention are central to the discussion of how to model CTI and ITC and thereby combine CPE and macroeconomic research. A macroeconomic approach compatible with CTI has an explicit focus on the social conflict and power balance existing within the social interaction of the capitalist economic system. The institutional configuration comprises a set of mediators for the interaction among agents. This entails an evolutionary framework that is not reliant on market forces in the sense that the economy gravitates towards a unique and socially optimal equilibrium. In fact, the notion of equilibrium is disassociated with market clearing. The abovementioned critique resembles each criterion of CTI compared to ITC.

4.3 Agent based-stock flow consistent macroeconomic models

This section provides an overview of the scholarship on AB-SFC macroeconomic models. AB-SFC have been put forward as an alternative to other microfounded macroeconomics models such as DSGE models. AB-SFC is a synthesis of SFC models, mainly developed in PK economics and AB models, from Complexity Economics and Evolutionary Economics. AB-SFC macroeconomics is an alternative approach

to macroeconomic modelling according to Delli Gatti et al. (2010) because of its focus on processes and causal relationships to explain emergent outcomes at the aggregate level. There is no exogenously defined natural equilibrium that arises from the model's assumptions, nor is a unique equilibrium a feature of the model. Instead, the macroeconomic variables emerge from a simple aggregation process from the agents' interaction (Bruun, 1999). The agents' balance sheets are interconnected at the micro-level in the model, and their consistency implies a macroeconomic consistency due to the micro-macro relation (Seppecher et al., 2018). Since AB-SFC is the culmination of combining the two approaches to macroeconomics, it is worth considering some key features of AB and SFC modelling separately. Two tables will summarise the contrast between the different modelling approaches from mainstream macroeconomics and the alternative approaches.

4.3.1 Agent-based macroeconomic modelling

The purpose of introducing AB[27] models to macroeconomics is to investigate macro properties given a set of micro behaviours and the feedback effect from macro to micro (Bruun, 2016). Causality is given by the structure of interaction and the sequence of events, which also reflect the importance of historical contingency – path dependence – and the notion of time (Lengnick, 2013). The *interaction* among agents is essential for any microfounded approach since the decision-making and behaviour of individual agents is based upon behaviour that takes the form of social interaction (Bruun, 2016). AB modelling approach is a bottom-up technique where macro properties emerge from the interaction of heterogeneous micro entities[28]. This method, therefore, requires the model to 'grow it' rather than to 'prove it'. Agents in AB macroeconomic models are limited to locally constructive actions, i.e. constrained by their interaction networks, available information, beliefs and

---

[27]The AB macroeconomic approach has developed over a long period of time in the field of Complexity Economics and Agent-based Computational Economics before its uptake in contemporary macroeconomics, see Bergmann (1974), Eliasson (1977) and Schelling (1978) for early examples of AB approaches to macroeconomics.

[28]An overview of AB modelling can be found in *Handbook of Computational Economics vol. 2* (Tesfatsion and Judd, 2006)/ *vol. 3* (Schmedders and Judd, 2013) and *Computational Economics: Heterogeneous Agent Modeling* (Hommes and LeBaron, 2018) and the references therein.

physical states, as opposed to external constraints on coordination and optimality (Sinitskaya and Tesfatsion, 2015). The system is driven by agents' interaction and coordination in an open-ended system and the emergent behaviour shows that the whole is different from the sum of its parts. This approach allows us to investigate the relation between the micro- and macrostructure (Richiardi, 2012).

An open-ended system does not mean an open economy model, but rather that there are no impositions that ensure that microeconomic behaviour is consistent with aggregate patterns *beforehand* (Arthur, 2014, p. 4). Hence, once the system's initial state is set, agents interact within the set bands and produce an aggregate pattern in the model. This stand in contrast to modelling approaches with global market-clearing conditions, such as DSGE macroeconomic models (Sinitskaya and Tesfatsion, 2015). There are three criteria that ABMs should strive to satisfy in terms of a macroeconomic application: an appropriate empirical agent taxonomy, a suitable model scale for the purpose of the model, and specifications of the model should be subject to empirical validation in order to provide insights in the real-world (LeBaron and Tesfatsion, 2008). The ABM may not need to be empirically validated if its components are open to verification and assumptions are grounded in a realistic world rather than an optimal world. This illustrates an important methodological difference with mainstream macro because in mainstream macro frictions and imperfections are implemented into the model in order to fit the data retrospectively.

The agents are heterogeneous and can represent consumers, producers, entrepreneurs, workers, etc., and behave according to simple heuristic rules that generate complex systems (Tesfatsion, 2002). Thus, behaviour is based on simple rules as opposed to optimisation, i.e. behaviour is driven by habits, instinct, preferences, desire, etc. (Bruun, 2010, p. 448). These norms, habits and instincts are formed by social conventions in which the present is assumed to be a serviceable guide to the future, meaning that the present state of opinion and judgement is perceived as correct, a point stressed by Keynes (1937) and Institutionalists (see Veblen, 1899). The Ricardian Equivalence does, therefore, not apply to the AB models since agents

neither optimise nor consider their infinite or limited horizon.

Institutions play an important role in these models and can be understood as specific methods of life and social relations following Veblen (1899). Institutional changes reflect changes in rules, habits, and conventions, ranging from optimisation to rule-of-thumb. Therefore, the economy is described as a process rather than a self-equilibrating system[29] (Minsky, 1975, p. 58). Hence, the consistency between the microbehaviour and macro-level does *not* need to produce a general equilibrium in the sense of Arrow-Debreu rather the equilibrium state is a 'steady-state' at which the model stabilises. This means that the steady-state or equilibria are not necessarily an optimum social state, nor that such a state is obtainable in the model[30].

Agents reach decisions based on functions of current, past or expected states. Thus economic behaviour can be modelled in any preferable way, from fully optimising to strictly rule-based (Tesfatsion, 2017a). In general, AB modelling draws on recent evidence from Complexity and Experimental Economics that provide evidence on individual behaviour and how behaviour may deviate from rational optimising behaviour (Battiston et al., 2016). Therefore, in most AB macroeconomic models, heterogeneous agents interact through networks with a pre-determined set of heuristic behavioural rules (Richiardi, 2006). This rule-based behaviour of heterogeneous agents can produce counter-intuitive results and generate complex systems (Ruebeck et al., 2017). The simple rule-based behaviour has been shown to be adaptive and evolutionary, such as in the El Farol model (Arthur, 1994). Thus, AB models do not suffer from *situational determinism*, meaning that behaviour is explained or predicted based on an external situation alone (Leijonhufvud, 1993).

---

[29]It is important to note that the notion of natural equilibrium/equilibria is rejected. From a model perspective there must be one or multiple equilibria – otherwise the model would not be theoretically consistent; the real-world is often depicted as being in disequilibrium but this delineation is historical and better explored in the context of history of economic thought. Equilibrium used here should be understood as a steady-state and equilibrium is simply the state of the economy in a point of time – which could be anywhere in the business cycle – and is cumulative. Thus, there are no innate forces leading the economy to socially optimal equilibria.

[30]The features of the equilibrium or equilibria depends on the assumptions and conditions imposed in the model. Thus, an ABM could be built to produce a general social optimum equilibrium, however, it is unclear why one would adopt an ABM in the first place with that motivation.

The *holistic* feature of AB modelling is generated from the models' emergent properties due to agents' interaction (Di Guilmi, 2017). The term holistic used in AB modelling means that no agent or structure is independent of the whole system, so agents' action creates patterns and patterns influence actions (Arthur, 2006, p. 1552). The interaction is either *local* or *global*, which refers to interaction in a centralised or decentralised environment determined by specified criteria such as status, income, geographical proximity, or pure randomness (Kirman, 1999, pp. 12-26). The non-linear nature of the interaction gives rise to different dynamics due to feedback effects between the micro and macro level (Gaffeo et al., 2008). Such dynamics cause coordination problems such as over- or under-production/consumption and fluctuations in demand (Dosi et al., 2008). Coordination failures, therefore, arise endogenously in the model rather than being superimposed through rigidities. The issue of coordination failures has long existed in macroeconomic theory and is highlighted as an important explanatory factor of instability and crises, see Leijonhufvud (2000). AB macroeconomic models have therefore been highlighted as more equipped to provide a rigorous set of microfoundations to macroeconomic models than DSGE models (Haldane and Turrell, 2019).

Institutions comprise the meso-level in an ABM and can be fixed arenas with given rules or endogenously determined in the model. Depending on the purpose of the model, the qualitative features will vary, i.e. models focused on innovation incorporates 'institutional features' that affect the adoption and generation of new techniques or technologies. Labour market institutions can be endogenised with unions or bargaining settings that reflect the micro-macro relation akin to adaptive learning. In general, the interaction among agents reflects the institutional configuration because institutions 'set the scene' for market interactions.

4.3.1.1 Agent-based modelling principles

The modelling principles of AB or ACE modelling proposed by Tesfatsion (Tesfatsion, 2017b, p. 386) provides a helpful overview:

1. an agent is a "software entity" within a computational constructed world cap-

able of acting over time based on its own state

2. the agent scope includes, but is not limited to, individuals, social groups/ classes, institutions, biological entities and/or physical entities

3. agent's possible actions depend on the agent's own state at that time

4. agent coordination is not externally imposed, i.e. restrictions not embodied within agent states

5. the ensemble of agents' states determines the state of the computational constructed world at that time

6. given the initial state of agents, all subsequent events in the system are determined by agent interaction

7. the role of the modeller is limited to setting to initial agent states, and analysis and reporting of the model outcomes

The AB approach is also based on a microfoundational view – similar to the DSGE model – however, the transformation to the macro-level is through agent interaction rather than agent extrapolation. This means that the consistency of the model can be ensured despite a "freer" agent at the micro-level. Analysis of centralisation and decentralisation shows that AB models with centralised market structures return to the full-employment equilibrium as in the standard DSGE model, whereas a decentralised market structure shows persistent deviation from the initial equilibrium (Guerini et al., 2018). The issue of centralised vs decentralised markets is also important for the notion of market-clearing. The reliance on market-clearing prices in DSGE models, both the multi- and representative-agent type, reflect the condition of Walras' tâtonnement process of prices. Gintis (2007) uses an AB model to show that the tâtonnement process of prices based on public information causes instability in the Walrasian system. When prices are based on private information, a global steady state is obtained. The difference between public and private is the availability of individuals' reservation price for entering exchanges. The model is ergodic, meaning that the long-run average price equals the equilibrium price and,

therefore, the price faced by each individual (Gintis, 2007). Gintis (2007) argues that tâtonnement in the economic system does not exist because the dynamic properties of the Walrasian system suggest a complex adaptive system instead. His findings that using *public prices* in modelling a market economy is highly flawed illuminate the shaky foundation of DSGE models since the global clearing mechanism in DSGE ensure its consistency.

4.3.2 Contemporary agent-based macroeconomic models

Most AB models are theoretical and only a limited number are calibrated to empirical data. An exception is the *WorkSim* model by Goudet et al. (2017) which is based on the French labour market at a scale of 1/4700. The *EURACE* model is based on the European economy but not calibrated as the *WorkSim* model (Deissenberg et al., 2008). This remains an important challenge to the AB approach in terms of using this approach to forecast explicitly, although work is being done to close this gap by machine learning calibration and Bayesian estimation (Grazzini and Richiardi, 2015; Grazzini et al., 2017; Guerini and Moneta, 2017; Lamperti et al., 2018; Lux, 2018; Delli Gatti and Grazzini, 2020). Incorporating methods from Experimental Economics, allowing participants to make decisions in simulations that form the basis for the calibration of the model and further analysis is another emerging approach (Giulioni et al., 2017). The simulation of AB models is therefore important, but rarely explored in the initial papers on AB macroeconomic models (Caiani et al., 2016). Caiani et al. (2016) use an aggregate version of their AB model to obtain a steady state which is used to calibrate the AB model, i.e. the aggregate values in the firm sector are equally distributed among individual firms. However, there is no common standard for the calibration and simulation strategy (see for instance Dosi et al., 2010; Carvalho and Di Guilmi, 2019).

In a series of papers, Dosi et al. (2010; 2015; 2017; 2018b; 2018a; 2019; 2020) analyse labour market policies and institutional structures. The institutional regimes analysed are characterised by sensitivity to different economic relations that depending on aspects such as unemployment benefits, search intensity and firing

rules, productivity relations and innovation. These regimes are portrayed as *competitive* or *fordist* in-line with Régulation Theory (RT). Dosi et al. (2010; 2013; 2015) have combined Keynesian and Schumpeterian theories of demand and innovation to analyse drivers of economic growth and various effects from policies and economic structures. The development of the so-called "Keynes + Schumpeter" ($K+S$) model is demand-driven in line with Keynesian economics and evolutionary based on Schumpeterian economics. Their model uses heuristics for behavioural rules with adaptive expectations, and investment drives the economy, and unemployment occurs due to insufficient demand (Dosi et al., 2010). Innovation is modelled as a stochastic result from specific investment (workers doing research) to develop new technologies that firms then choose depending on their expected cost-savings (Dosi et al., 2010). This ensures that the creative destruction process exists in their model and gives their model an evolutionary character. In a series of papers, the $K+S$ model is applied to evaluate different research questions. Economic policy analysis is carried out as a series of shocks to innovation and demand in a credit-augmented $K+S$ model drawing on Minsky (Dosi, Napoletano, Roventini and Treibich, 2017).

In Dosi et al. (2017), they use the $K+S$ model to analyse flexible labour markets characterised by low labour protection, low productivity sharing and higher inter-firm reallocation of labour against more rigid labour markets, high labour protection, high productivity sharing and lower inter-firm reallocation of labour. These two structures are intended to represent two "archetypes of capitalism". Their paper draws on insights from RT on accumulation regimes explored in another paper (Dosi, Sodini and Virgillito, 2015). The effects on unemployment and income inequality from policy regime shifts, which mimic structural changes following a new economic policy, are investigated using the same $K+S$ model (Dosi et al., 2018b). Their results highlight the inherent instability associated with flexible labour markets due to systemic coordination failures that cause crises. Active and passive labour market policies are further explored in Dosi et al. (2019). In their model, assistance in job-searching and matching process through active labour market policies is compared

with the effect from passive labour market policies on the economy as a whole. In addition, expansive and contractive government policies are evaluated in conjunction with different labour market policies. The results suggest that flexible labour markets in combination with austerity policies are not a reasonable measure to get out of a deep recession (Dosi et al., 2019).

Another model, much smaller in scale, based on post-Keynesian economics by Setterfield and Kim (2020), analyses macroeconomic dynamics concerning the taxonomy of VoC in terms of distribution, monetary policy and economic growth. Their purpose is to provide some theoretical foundations for further research. The subsections of CME replace the equivalent in the LME and the stability of the model is evaluated, i.e. whether it is sustainable and robust. Their analysis indicates that radical reforms would be required to 'fully reform' LME archetypes such as the US to CMEs similar to Germany (Setterfield and Kim, 2020). This model focuses on the effect of policy and distinct institutional regimes. This serves the purpose of analysing effects from policy well, but it leaves a gap with respect to institutional complementarity and the implications from institutional characteristics on the institutional configuration and macroeconomy.

The new Keynesian Agent-based (NK-AB) model set out by Lengnick and Wohltmann has a financial and real economy sector, but "financial streams between the real and financial sector do not exist" (2013, p. 9). Instead, the heterogeneous agents within each sector interact at a centralised level, meaning that the real economy and financial sector interact once coordination in each sector is complete. The composition of agents within these sectors optimise their behaviour based on their expectations (Lengnick and Wohltmann, 2013). Ashraf et al. (2017) show how disruptions and business cycle fluctuations occur endogenously in a NK-AB model without strict optimising behaviour albeit firms coordinate their production and trading activities centrally. Their model departs somewhat from the standard NK macroeconomic model due to assumptions of firm turnover and non-contingent financial markets. Their model indicates that bank lending can have a stabilising effect on the macroeconomy, especially under so-called 'worst-case scenarios'. Their

results arise from the assumptions that the network of firms can coordinate among themselves, thus acting as the Walrasian auctioneer and the loanable funds theory of money (Ashraf et al., 2017).

Gobbi and Grazzini (2019) develop a NK-AB model that deviates from the standard model in Galí (2015) by assuming dispersed information and rationally bounded agents. They show the impact of heterogeneous beliefs among agents measured against the model outcome with homogenous beliefs. The effect suggests that different beliefs alter the aggregate behaviour of the economy and that monetary and fiscal policy becomes public signals for agents. Gobbi and Grazzini (2019) illustrate that the AB approach to economic modelling can incorporate DSGE features, thereby allowing for a more transparent comparison between DSGE and AB models.

The notion of rationality and economic behaviour are often central to AB models. Learning by doing, herd effects and social networks are frequently used to investigate the functioning of markets. Tedeschi et al. (2012) analyse the behaviour of uninformed noise traders who imitate agents within their network. Agents imitate by observing other agents' profitability from investments (in assets), so-called 'gurus' therefore rise and fall endogenously – a guru is an agent that other agents *imitate* – and help explain fluctuations in asset prices and wealth distribution. Their model shows that fat-tail wealth distributions arise when imitation among the traders is high. In their model, agents stand to gain more from revealing their expectations rather than hiding them from the rest, contrary to the economic rationale that agents must conceal their private information to profit from it (Tedeschi et al., 2012).

Flaschel et al. (2018) apply an approach in which agents choose between alternative heuristics based on perceived pessimism or optimism, determined by the aggregate sentiment among agents in the economy. This notion is very similar to the 'state of long-term expectations' described by Keynes (1936). The interaction between the real and financial market is unstable and the existence of multiple equilibria are confirmed in a framework in which agents' behaviour is determined by heterogeneous expectations and endogenous aggregate sentiment (Flaschel et al.,

2018). The study indicates that global stability can be attained if aggregate sentiment favours fundamentalist behaviour during booms and busts. This ensures upper and lower limits or turning points, but this does not hold for local stability (Flaschel et al., 2018). Fundamentalist behaviour in Flaschel et al. (2018) refers to a long-run steady-state value of capital gains and chartist behaviour follow the expected price based on past information. The adjustment to expectations is not instantaneous but depends on a parameter for the speed of adjustment. Studies like Tedeschi et al. (2012) and Flaschel et al. (2018) indicate that an alternative economic theory of behaviour that is not founded on the concept of fundamental value is useful to analyse social interaction and the functioning of markets.

4.3.3 Stock-flow consistent macroeconomic models

The approach of describing the economy through flow-of-funds was systematised by Morris A. Copeland's work on social accounting (Copeland, 1952). The flow-of-funds framework is based on the notion that the economy is a monetary economy and follows the 'main money circuit' to account for financial and non-financial transactions (Dillard, 1987; Graziani, 1989). Finance affects the capitalist order and regime because assets, production and payment commitments of financial contracts need to be financed (Minsky, 1980). Therefore, the separation between financial and non-financial flows is important because the sphere of the *financial* sector and the *real* economy are closely intertwined. The real economy is viewed as the productive sector, whereas the financial sector provides credit and regulates financial intermediation for agents in the real economy. Copeland's quadruple accounting method was elaborated by Tobin (1982) and is the origin of the Stock-Flow Consistent models for monetary macroeconomics (Godley and Lavoie, 2007). The SFC approach is based on the PK monetary economics that uses a balance-sheet approach and an endogenous theory of money for a dynamic analysis of a monetary production economy (dos Santos and Zezza, 2008), see Nikiforos and Zezza (2017) for a recent survey. SFC models are large-scale models containing multiple sectors, i.e. households, firms, commercial banks, shadow banks, central bank and the government

(van Treeck, 2009b; Sawyer and Passarella, 2017).

Although the SFC approach is mainly developed to describe the monetary economy, other aspects are implicitly included. Social conflict is encompassed through the distribution of income, i.e. the functional distribution between wages and profits and personal distribution via transfers (Lavoie and Godley, 2001). The approach can therefore be used to encapsulate capitalism in the money capital circuit through an emphasis on decisions of production, distribution, and trade (Passarella, 2017, p. 71). The industrial circulation of output and financial circulation of financial investment are interdependent; their dynamics drive the model. Since a majority of investment is financed by new debt and future revenue from investments are uncertain (Minsky, 1986b). These models have been used to illustrate Minskyian instability and crises (dos Santos, 2005). Thus, the model allows for an endogenous crisis which is a natural feature of any capitalist economy. SFC is closely associated with PK economics because of the endogenous treatment of money and the specific theoretical assumptions that the behavioural equations are based on (Caverzasi and Godin, 2014). The quadruple accounting method used in SFC models ensures that everything put into the model stays in the model and there are no *leakages*. It should be noted that accounting consistency is a premise most macroeconomists adhere to, albeit the SFC approach stands out because it makes it explicit and relies on the endogenous theory of money.

4.3.4 Agent based-stock flow consistent macroeconomic models

AB-SFC models differ from AB and SFC models due to the integration of clearly defined macrofoundations and microfoundations based on double-entry booking keeping rules and endogenous theory of money. The macrofoundations refer to the constraints imposed on the agents or class of agents in the system and is based on how the system is reproduced (Dymski, 1988). Hence, the aggregation from the microlevel cannot violate the macrofoundations, but neither does the macrofoundations determine the *behaviour* of agents. This means that macro-dynamics cannot

be reduced to the microeconomics of agents. The model is therefore not *atomistic* as in the case of representative agent macroeconomic models (Kirman, 1992). Consequently, the model abandons the use of axioms to determine microeconomic outcomes and intertemporal optimisation by agents (Leijonhufvud, 2009). Instead, individuals' decision-making is context dependent because individuals' preferences are not strictly *self-regarding defined over outcomes* but determined by situational cues, institutions and endogenous preferences (Bowles, 2004, pp. 96-98)[31].

The notion of microfoundations does not reflect a particular school of thought since the focus on individual decision-making and individual knowledge through the explicit formulation of microfoundations is an acknowledgement of the social composition of an economy (Arrow, 1994). Microeconomic behaviour is constrained by strict budget constraints and follows double-entry bookkeeping accounting rules – implying the quadruple entry principle – emphasised in PK macroeconomic models to ensure stock and flow consistency (Caverzasi and Godin, 2014). The feature of stock flow consistency refers to the monetary aspect of the system and ensures that feedback effects and endogenous processes are appropriately accounted for (Godley, 1999).

AB-SFC models are, therefore, stock-flow consistent at the macroeconomic level due to the constraint imposed at the microeconomic level (Caiani et al., 2016). Thus, consistency is ensured throughout the balance sheets and transactions flow matrices at the micro- *and* macro-level. The model is 'grown' from the micro-level, meaning that macroeconomic aggregates result from microeconomic interaction. Hence, microeconomic behaviour abides by the model's macro-foundations so that there are no leakages or exogenous inflow of goods, services, commodities, labour or credit. The consistency aspect of the quadruple entry principle is thereby upheld *while* the agent-based aspect brings in feedback effects from the social interaction of individuals with institutions acting as *mediators* of this interaction.

This does not mean that macroeconomic properties are necessarily reflected in microeconomic behaviour (Bruun, 1997). This is has been raised by critiques

---

[31]This is referred to as procedural rationality in the PK literature, see Lavoie (2014b, ch. 2).

of SFC whom argue that macroeconomic identities such as national income must always hold, but such identities do not describe the behavioural relations (Goodhart, 2008). An important objection which echoes Haavelmo's (2012)[32] discussion of equations and identities in macroeconomics. Haavelmo argues that identities can be analytically useful once "what the relation is an identity for" is clarified (Haavelmo, 2012, p. 6, emphasis added) and, thereby, provide valuable analytical information. When working with national account relations[33], one must pay attention to the transactions between sectors of the economy – households, firms, government, and sub-sectors such as capitalists, workers, industries – because in transactions one party is debited and another credited (Haavelmo, 2012)[34]. The delineation of transaction flows and balance sheets set out by Godley and Lavoie (2007, chaps 1 and 2) follows the reasoning of Haavelmo. The transaction flow matrix and the balance sheet matrix both provide important and valuable analytical information about relations and the stability of the system, respectively.

The paradox of thrift illustrates this – that more saving among individuals does not *cause* higher investment – which is an essential dynamic in PK macroeconomic models (Lavoie, 2014b, pp. 18, 352, 367). Thus, microeconomic investigations are important to understand the mechanisms underneath the surface of macroeconomics (Galbraith, 1978). The AB-(SFC) approach provides such an investigation of the micro- and macro-level in an interconnected system (Dosi and Roventini, 2019). Therefore, the AB-SFC approach can be used to analyse an economic system in the face of endogenously generated fluctuations of demand. This has allowed for an

---

[32]This article was originally written in Norwegian and published in 1956, it was translated into English much later (and long overdue according to Frisch): "Dear Trygve, This is just to tell you that a few days ago when I was looking for an article in the 1956-Festschrift to Erik Lindahl, I found (I don't know whether I should say fortunately or unfortunately) your article 'Equations vs. identities [...]. I was so 'absorbed' that I found myself reading your paper rather than completing some pressing work I was doing which had to be finished before I should go abroad. Yours Ragnar P.S. If this paper is not already translated to a 'language', you have to see that this is done immediately even though it should only appear as a memorandum" (Haavelmo, 2012, p. 1).

[33]The national accounting relations is referred to as 'eco-circ' by Frisch and his followers at the Oslo School of Economics and is the label of the central planning models produced at the Department of Economics at Oslo University (Bjerkholt, 1998).

[34]The modelling approach and *modus operandi* of the monetary system of the Macroeconomics of the Oslo School is similar in many aspects to the SFC approach in the PK School although there are stark differences with respect to some neoclassical economic assumptions, see Eriksen and Sæther (2010), Anundsen et al. (2012) and Chand (2012) for an introduction to the Oslo School.

increase in non-neoclassical macroeconomics on the emphasis of modelling the real economy and the financial sector as an integrated whole, see Di Guilmi (2017) and Caverzasi and Godin (2014).

Ciarli et al. (2010) develop an AB-SFC model showing that the pay structure, which is related to the functional distribution of income, is also affected by the organisational structure in terms of managerial layers in the firm and links this to different income-consumption classes. The effect on the type of worker and the internal structure of labour segments is analysed in a demand-driven model, much like the $K+S$ model. Ciarli et al. (2019) build on this further by investigating the effect on growth and inequality from firm size and economic structures in a model where the firm size is an emergent property. The structural determinants of the model are consumption and competition norms, meaning that different income classes have different propensities to consume out of income and different labour classes behave differently in terms of job-search and hiring. Their investigation is based on an analysis of two distinct regimes representing the Fordist and post-Fordist regimes in terms of institutional configuration. Thus their model is also influenced by RT in terms of institutions and growth regimes (Boyer, 1988; Petit, 1999; Coriat and Dosi, 2002). The work by Ciarli and co-authors can explain the increasing income inequality due to the greater concentration of firms following the growing size of firms. Thus, they argue that this concentration reduces creative destruction and subsequently market competition. This complements the empirical work on the polarisation of the labour market by income due to routinisation and automation of some tasks and the financialisation of non-financial firms (Lazonick and O'Sullivan, 2000; Lazonick and Mazzucato, 2013).

Caiani et al. (2016) set out a 'benchmark' model for agent based-stock-flow consistent macroeconomic models. The model draws on PK macroeconomic growth models and the *Financial Instability Hypothesis* (Minsky, 1982; 1986b), with key features such as inventories and mark-up pricing following SFC modelling (Godley and Lavoie, 2007). Caiani et al. (2019) combine some of the hierarchical organisational firm structure in Ciarli et al. (2010) and the different regimes in Dosi

et al. (2010) with the aim of analysing the effect on inequality and growth from innovation. With a segmented labour market, the process of creative destruction is determined by the consumption behaviour of different income classes as well as the competitive forces in the market. In addition, firms are affected differently by incentives to invest in labour-saving techniques due to the organisational hierarchy in the firm. These drivers are further investigated in Caiani et al. (2018) where the interaction between different hierarchical structures and economic regimes are analysed. This model simulates the interaction between inequality, investment behaviour and innovation dynamics associated with different wage regimes. Their results support the intuition established in similar models (Ciarli et al., 2019; Dosi et al., 2019). These issues have been further explored in multi-country AB-SFC models that build on this work (Caiani et al., 2018; Caiani, Catullo and Gallegati, 2019). These AB-SFC models developed by Caiani et al. are more parsimonious compared to the models developed by Dosi and co-authors. The models, therefore, resemble a suite of models as opposed to one big model albeit being similar in structure and demand-driven – following the principle of effective demand (Keynes, 1936) – with endogenous productivity growth driven by a process of firm-level innovation akin to creative destruction (Schumpeter, 1939; 1954).

Russo (2014) shows how different individual behaviour can give rise to *amplification of mechanisms* leading to persistent division over time among individual agents that support the notion of *power laws* for distribution. Institutions and social structures determine economic behaviour endogenously. Different behaviour associated with various social classes illustrates how wealth distribution is affected by *accumulation effects* that lead to greater concentration and more persistent division among individuals and their respective social classes (Russo, 2014). The dynamics in a monetary production economy with a specific focus on the interdependence between the financial sector and real economy, coordination and interaction by individual agents is investigated in Russo et al. (2016). The model shows how income inequality and consumer credit drive financial fragility in a macroeconomy in the short- to medium-run (Russo et al., 2016). Financial fragility and credit network

effects are further explored in a series of papers investigating the role of (financial) accelerators in the economy (Delli Gatti, Gallegati, Greenwald, Russo and Stiglitz, 2010; Bargigli et al., 2014; Caverzasi and Russo, 2018).

The nature of different accelerators in the financial sector has been modelled and analysed further by Riccetti et al. (2013; 2015; 2016a; 2016b). Riccetti et al. (2015) show how a complex system with volatility and endogenous crises may arise in a decentralised model with heterogeneous agents following heuristic behavioural rules. Riccetti et al. (2013; 2016b) have modelled how lending to firms from banks is affected by banks' risk models and valuations in the stock market. Feedback effects are shown to be important for the financial accelerator, firm leverage, the stock market and network effects. Initially, the market share is equal among firms and banks, but throughout the simulation the market share of firms and banks become increasingly concentrated (Riccetti et al., 2016b). The impact of finance on the real economy has been further investigated with AB models; increasing dividends payments and less growth in the rate of capital accumulation has been shown to increase the instability of a macroeconomic system (Riccetti et al., 2016a). The type of financialisation where non-financial corporations increase the proportion of distributed profits at the expense of investments in productive capital is modelled and shown to be instability inducing. Other models focusing on the role of finance have introduced capital goods, see Assenza et al. (2015) for a simpler example than Deissenberg et al. (2008) or Dosi et al. (2010). Assenza et al. (2015) show how capital accumulation and credit expansion cause crises and the extent of unequal accumulation has amplifying effects on the crisis.

Analysis using the Java Agent-based MacroEconomic Laboratory (JAMEL)[35] model developed by Seppecher has shown that a 'free market' will not necessarily lead to optimal outcomes (Seppecher et al., 2019). The AB-SFC model by Seppecher et al. (2019) indicates that free-market forces do not promote optimal behaviour by multiple heterogeneous agents. The endogeneity of agents' behaviour can either be independent of its environment, i.e. based on the agent's knowledge, or shaped

---

[35]JAMEL can be accessed and downloaded from: `http://p.seppecher.free.fr/jamel/` [accessed on: 21.01.2021].

by changing macrostructures or feedback effects from agents' behaviour (Seppecher et al., 2019). JAMEL is based on the AB model by Seppecher (2012) which illustrate how supply-side factors impact the minimum wage and flexible wage regimes in a demand-driven model. The JAMEL model has also shown the importance of *ex ante* and *ex post* for agent coordination in terms of firm pricing in a multisector model (Seppecher et al., 2018). Their model with an evolutionary mark-up and normal cost pricing is an important contribution as this remains an under-researched area in macroeconomics (Blanchard, 2009). It has become a convention to adopt cost-plus pricing behaviour in microfounded macroeconomic models when prices are determined endogenously (Seppecher et al., 2018). Pricing is an *ex ante* decision involving perceived or expected unit costs and sales with some profit margin added. This implies that *ex post* profits are not guaranteed. The mark-up is often treated as an exogenous parameter in macroeconomic models or as a supply-demand adjustment mechanism (Seppecher et al., 2018), i.e. that firms adjust their mark-up according to their sales-inventory target. Seppecher et al. (2018) model pricing and an evolutionary mark-up in a way that captures inter-sectoral coordination, driven by the technology used in production. Therefore, they can show how technology determines the interdependence between firms across different sectors and how the mark-up drives prices towards *real* labour values as theorised in classical political economy (Seppecher et al., 2018). Salle and Seppecher (2018) looked at the impact of monetary policy, specifically 'leaning-against-the-wind' interest policy intended to deleverage an economy, thereby investigating Minskyian boom-bust cycles. There are quite a few commonalities in AB-SFC models that illustrate the shared theoretical framework formalised in these models. They can be identified as:

1. an emphasis on income generation from production rather than the exchange of existing goods, i.e. M-C-M' instead of C-M-C' (Marx, 1867).

2. money at the centre of the economy and not reduced to a medium of exchange. This implies that production must be financed before production occurs, and retained earnings are previously issued credit (Graziani, 2003).

3. the starting point is always accounting identities rather than axioms for agents'

behaviour. This implies constraints are set by stocks and flows following the stock-flow approach developed by Godley (with Cripps 1983; with Lavoie 2007). The SFC approach illustrates that an equilibrium (steady-state) is not necessarily market-clearing or a general equilibrium (Kaldor, 1972).

4. social interaction since a system is composed of multiple agents that must interact with each other for the system to function. This is a fundamental characteristic of any AB model and resembles the organic-take of the economy as opposed to the 'axiomatic-take' (Kirman, 1999; Gaffeo et al., 2008; Delli Gatti, Gaffeo and Gallegati, 2010; Riccetti et al., 2015).

The first two propositions are concerned with the economic system itself, most importantly that a modern capitalist economy requires a monetary theory of production (Fontana and Realfonzo, 2017; Passarella, 2017). This means that one cannot start with a pure exchange economy and then introduce monetary features, but monetary features must be included from the beginning. The third postulate stresses that individual behaviour is not axiomatic and the necessity for a balance-sheet approach to economics. The fourth postulate argues that the economy is made up of multiple agents, both in terms of characteristics and numbers, and that no economy can exist if (some of) these agents do not interact, i.e. trade. This proposition follows the understanding that the economy is socially embedded (Granovetter, 2005; Granovetter and Swedberg, 2011, references herein)[36]. Table 4.1[37] summarises different microfounded macroeconomic models discussed so far. These models are reviewed with respect to macro structure, decision-making, interaction, driver of economic activity and crises. The main difference arises due to how agents are modelled in terms of interaction and decision-making. This is important for the model

---

[36]The literature on Economic Sociology draw heavily on institutionalists such as Thorstein Veblen and Karl Polanyi and sociologists such as Max Weber, Emilie Durkheim and Pierre Bourdieu as well as evolutionary economists most famously Joseph Schumpeter, see the edited volume by Granovetter and Swedberg (2011). The benefit of combining insight from economic theory with other social sciences was early highlighted and discussed by Schumpeter under the topic of socioeconomics (Swedberg, 1995).

[37]PA and OLP models are excluded from the table because key features from PA and OLP has been integrated into the HANK modelling framework via the Huggett-Aiyagari precautionary-savings model (Huggett, 1993; Aiyagari, 1994) – which is based on the incomplete markets proposition (Imrohoroğlu, 1989) – and heterogeneous life-cycle model (Bewley, 1977).

concerning how coordination failures occur, crises emerge and the system capacity to reproduce itself. The HANK model is based on the core features.

Table 4.1: Agent-based macroeconomic models[39]

	JAMEL	K+S	EURACE	Ancona	HANK
Core model	SFC	unspecified	SFC	SFC	DSGE
Macro structure	Java	LSD	FLAME[38]	Java	Matlab
Programming platform					
Decision-making	market-selection process; heuristics	adaptive expectations; market-selection process; heuristics	adaptive expectations; heuristics	adaptive expectations; heuristics	adaptive expectations; optimisation
Interaction/ coordination	decentralised	decentralised	decentralised	decentralised	centralised
Economic activity	demand-driven	demand-driven	demand-driven	demand-driven	supply-driven
Research topic	decision-making; credit/ debt; firms' leverage; monetary policy	growth regimes; R&D; economic policy	credit/ debt; firms' leverage	credit/ debt; inequality; fiscal policy; monetary policy; wage-structures	consumer credit; financial flows; monetary policy
Endogenous crisis	Yes	Yes	Yes	Yes	No

4.4 Modelling approaches in macroeconomics

The discussion of the appropriate 'modelling tools' rages in macroeconomic research both within and across various economic schools of thought as illustrated by the different views and arguments put forward by LeBaron and Tesfatsion (2008), Colander et al. (2008), Farmer and Foley (2009), Haldane and Turrell (2018) and Ghironi (2018). The dispute of the best path forward for macroeconomics boils down to dispositions about the workings of the economy and, therefore, which aspects deserve primary and secondary focus in macroeconomic modelling. Recent developments in macroeconomics illustrate that income and wealth inequality, credit and debt markets and the interconnection between the real and financial side of the economy are important. How these aspects are formalised and analysed with economic models are therefore under scrutiny (cf. McKibbin and Stoeckel, 2018). Hence, the pertinent issue is on the structure of the model, e.g. decentralised vs centralised, drivers of economic activity, and behavioural assumptions of agents, e.g. expectation formation (based on a rationality spectre), heuristics vs optimisation.

There is no assumption of market-clearing in the AB-SFC modelling approach, which reflects a rejection of Say's Law, that demand equals supply, which entails that prices may be reproductive rather than market-clearing (Bruun, 2016). This means that there is no self-organisation of resources in the market, i.e. the model is not 'market-driven'. Instead, the market is driven by social interaction subject to the institutional context. Agents' actions are determined by animal spirits and "the state of long-term expectation" (Keynes, 1936, p. 140). Agents' decision-making is therefore composed of conventions and sentiment reflected in the expression of adaptive expectations. Even if past expectations are fulfilled, agents' interactions must coincide in a specific manner for current expectations to be fulfilled consecutively. This would require the assumptions of complete information and a fully centralised market (global interaction).

In contrast, general equilibrium models assume that markets clear because the notion of equilibrium reflects a situation in which no individual will alter their

behaviour (Chiang and Wainwright, 2005, pp. 30-31). This means that the assumption of perfect knowledge in which all agents share the same 'model' of the world, the so-called 'pretense of knowledge' (Caballero, 2010). This also reflects the treatment of uncertainty as to the possibility of multiple *states of the world* with some probability based on the occurrence in the past (Arrow, 1974). It is important to note, modelling in this context *cannot* account for every aspect of the real world such as fundamental uncertainty (Keynes, 1936) or Knightian uncertainty (Knight, 1921). The necessary abstraction inhibits the modeller's capacity to account for all aspects and thereby lose analytical tractability. Hence, models must retreat to approximations (e.g. rules of thumb) or illustrations (e.g. ideal-type behaviour such as utility maximisation).

Table 4.2 gives an overview of the modelling approaches in modern macroeconomics that has been discussed. The complexity that arises in an AB model due to heterogeneity and interaction makes it infeasible for agents to rely on optimisation for their decision-making (Farmer and Foley, 2009). AB models, therefore, use procedural and adaptive rules so that agents' rationality is bounded, meaning that agents' information and knowledge are not only incomplete and imperfect, but their capacity to choose the optimal action available is constrained (Simon, 1955). Hence, agents' base decisions on feasibility and satisfaction where feasibility constrains the agents' possible choices and satisfaction are formed from previous aspirations and levels of attainment (Simon, 1955). This reflects an internal (cognitive) constraint and an external (environmental) constraint. Since there is not one correct set of behavioural rules in the 'wilderness of bounded rationality' (Sims, 1980). Considering (micro)economic behaviour then, the difference is not made on rationality per se since perfect rationality implies that the agent has the mental capacity and skill-set to follow any environmental constraint and reveal all that is hidden from him or her (Todd and Gigerenzer, 2003).

The problem with perfect rationality is, therefore, the consistency, meaning that modelling agents as perfectly rational (optimised behaviour) must imply perfect knowledge (omniscient) and complete information (omnipotent). A less strict

version is that agents still optimise, but their knowledge and information are limited. This is referred to as 'bounded optimisation' (Lavoie, 2014b, pp. 85-86). Procedural rationality is based on habits, conventions, norms and heuristic rules, meaning that agents act as they perceive best, but that may not be internally consistent (Lavoie, 2014b, pp. 73-79, 91-94). Hence, agents' behaviour is environmentally consistent meaning that the prevalent norms and conventions are followed. This include herd behaviour or mimicking others – mimetic behaviour means that agents follow the herd *even if* they disagree with the action choose (Orléan, 2014, pp. 50-61) – which illustrate that the perception of rationality is dependent on time and space. This means that agents do not follow so-called *fundamental values* but rather a *social sentiment*. The assumptions and conditions of agents' decision-making must therefore be clearly presented in AB models because the behaviour explains the intuition of the model.

Table 4.2: Modelling approaches in modern macroeconomics

	DSGE	3-ECS	KSM	AB-SFC	SFC
Macrofoundations	implicit consistency	implicit consistency	implicit consistency	explicit consistency	explicit consistency
Money & credit	loanable funds; implicit	supply-determined	implicit	demand-determined	demand-determined
Fluctuations	stochastic	exogenous	endogenous	accumulation effects	accumulation effects
Economy (long-run)	supply-driven	supply-driven	supply-driven	demand-driven	demand-driven
Institutions	efficiency generating	efficiency generating	efficiency generating	power determined	power determined
Microfoundations	top-down	unspecified	top-down	bottom-up	unspecified
Economic behaviour	perfect optimisation	bounded optimisation	recursive optimisation	procedural	procedural
Competition	(im)perfect	imperfect-monopolistic	imperfect markets	oligopolistic-monopsony	oligopolistic-monopsony
Interaction	market-clearing (centralised coordination)	market-clearing (centralised coordination)	market-participating (centralised coordination)	market-participating (decentralised coordination)	market-participating (centralised coordination)
Economic agents	multiple	single	multiple	multiple	single
Agent endowment	heterogeneous/ representative	representative	heterogeneous/ representative	heterogeneous/ class-based	sector-/ class-based

4.5 Discussion

The reviewed modelling approaches in macroeconomics exhibit both differences and commonalities. Evaluating these approaches in terms of the criteria of the CTI and ITC, this chapter bridges CPE and macroeconomics. A capitalist economic system is defined by the organisation of production – capitalist social relations of production – and the ownership of the means of production employed. The macroeconomic approaches reviewed so far do not indicate an incompatibility with this definition. However, the contention associated with capitalist social relation of production are rarely an explicit part of the analysis based on DSGE modelling. Although this contention is partly present in the 3-ECS model, it is not central to analysis as seen with AB-SFC and SFC approaches. A similar observation is made by Delli Gatti et al. (2010). From the undertaken review, one may categorise the modelling approaches as *open*, *semi-open* and *closed* macroeconomic modelling approaches. These categories signify the degree to which the modelling approach, i.e. the edifice of the model, is flexible and consequently open to theoretical concepts and principles. These categories, therefore, differ from the terminology of *open* and *closed* systems approach developed by Lawson (1997), Mearman (2006), Chick and Dow (2005). The key difference being that the *open* and *closed* systems approach refers to theories (Chick and Dow, 2005), whereas the categories in this discussion refer to macroeconomic *modelling* approaches. Hence, there is no focus on methodological or ontological grounds – although such factors might be indirectly present via theories – and the modelling approaches assessed are not systems in the sense used in the *critical realist* literature (cf. Chick, 2004; Chick and Dow, 2005).

Social conflict and power relations are explicitly discussed in 3-ECS, AB-SFC and SFC models, and the institutional configuration has a mediating effect on these relations and contentions in the economy. Considering the different applications of the New Consensus macroeconomic model by Setterfield (2009), Carlin and Soskice (2018) and Michl (2018), it can be amended to highlight different macroeconomic aspects. Nonetheless, these adaptations differ with respect to the treatment of money and credit, economic behaviour and coordination. The 3-ECS model

can therefore be characterised as a *semi-open macroeconomic modelling* approach because there are some aspects of the modelling which can be amended without reconfiguring the theory completely, e.g. the Phillips curve with an exogenously or endogenously determined NAIRU (see table 4.3). The (New) KSM is also characterised as *semi-open*, but this characterisation depends on the assumptions made about the institutions' role in the model. For example, the model presented by Farmer (1999) reflects a less open model than the 3-ECS model, but there is obviously scope to alter the search function in order to 'active' labour market institutions or develop the financial market with financial institutions.

The *open-macroeconomic modelling* approach is represented by AB-SFC and SFC models (see table 4.3). These models do not operate with optimisation, although this is possible in the framework, coordination occur via social interaction – implicitly or explicitly – and institutions represent the social structure and mediate the power relations among the different classes of agents. Since economic behaviour follows conventions and habits, the model evolves in an evolutionary sense. Meaning that multi equilibria are steady states of the model but remain distinct from the general or partial equilibrium frameworks. The transaction flow matrices and balance sheet approach of AB-SFC ensure that the model does not produce "uneconomical" results such as negative prices. These features are also useful when modelling a monetary production economy with many sectors that are interconnected. AB modelling has enabled a deeper integration of microeconomic features with macroeconomic structures (Gibson and Setterfield, 2018). Thereby enabling the formalisation of the economic system from the micro-level that generates macro-dynamics. The feasibility and consistency of agents' behaviour are 'checked' by using accounting identities set by the macro-foundations (Bruun, 1997).

The final category in table 4.3 is the *closed macroeconomic modelling* approach which cover methods such as the DGSE or HANK. These models are built on the notion of a general equilibrium which means that markets must clear. Frustrated demand or involuntary unemployment is generated with the implementation of frictions. Thus, these features are not part of the core model. Considering in-

ventories, the difference vis-à-vis. *open* macroeconomic modelling becomes apparent because there are never any stocks of inventories in *closed* macroeconomic models. All products of labour are consumed, meaning that frustrated demand is due to consumers wanting more commodities than available on the market since too few workers are employed – leading to involuntary unemployment or voluntary employed – as prices are too low or wages are too high due to frictions. This is caused by technological factors or inefficiencies imposed on the market, in other words they are artificially induced on the natural order.

Any unsold inventories represent capital in commodity form that awaits valorisation and therefore a cost in terms of money capital[40]. This may lead an economy to a crisis if capitalist fail to valorise their capital. The *closed* macroeconomic modelling approach thus entail a form of centralised coordination without endogenous crises. Agents base their choices on intertemporal optimisation and institutions are transaction cost minimising because institutions enable the transmission of information unless the economy has been shocked out of equilibrium.

The monetary system in the *closed* macroeconomic approach is either based on the loanable funds theory where money is determined exogenously in-line with the *Quantity Theory of Money*, or the view where money is pseudo-endogenous since the monetary actors – the central bank – set the short-run interest rates and consequently making money a residual, see Mankiw (2016) and Blanchard (2017) for textbook representations, and Arestis (2009) and Fontana et al. (2020) for a critical evaluation of the use of money. Money therefore moves endogenously (and often with large volatility) in the model, but this is reversed in the long-run. These models do not necessarily need money to work, hence, *closed* macroeconomic models are defined as exchange-based production economies as money or credit is demanded based on its price like other commodities. Compared to the *open* and *semi-open* approach, the treatment of money is exogenous in *closed* models. In the *semi-open* approach, money is produced by banks via the creation of loans following Wicksell, see Haavelmo (1978) for a unification of the Banking principle

---

[40]See Dymski (1990) for a discussion of money and credit in the circulation of capital.

and Wicksell's *Currency Theory*, reflecting a credit-economy. Business cycles occurs due to over- and under-production which follow from over- and under-investment and consequently regimes of full- or under-employment.

The *open* macroeconomic approach is based on an endogenous theory of money which follows logically from the monetary production economy. Hence, the economy is a credit-economy but there are intrinsic reasons that money is held due to its property as a store of value in addition to means of payment (Deleidi, 2019). Since prices are expressed in money terms, inflation represent an area of distributional conflict with respect to purchasing power and wealth (Rochon and Setterfield, 2012). The analytical role of money in the macroeconomic modelling approach is important because the treatment and features of money and credit has nominal, real and no effects on the model. If a capitalist economic system includes money and credit – and these affect the economy – an approach to macroeconomic modelling therefore must accommodate this. Thus, the *closed* macroeconomic modelling approach is exclusively associated with ITC and the *open* macroeconomic approach is exclusively associated with CTI when evaluation the monetary system and treatment of money. The *semi-open* approach is ambiguous because it can be associated with both ITC and CTI when considering the 3-ECS model presented by Carlin and Soskice (2015) and Setterfield (2009), respectively.

The modelling mechanism of the 3-ECS model rely on a partial equilibrium structure. Under this criterion, the 3-ECS model resemble ICT rather than CTI. There is no scope for endogenous instability as observed in the dynamic macroeconomic models, see Blatt (1983). Dynamic models here refer to models which generate fluctuations without stochastic shocks or propagation that can be found in DSGE models. AB and AB-SFC have been shown to produce endogenous business cycles which suggest that CTI and *open* macroeconomic modelling approaches can successfully be combined. The 3-ECS model is therefore not characterised as an approach fitting for CTI with respect to the research agenda set out by Baccaro and Pontusson (2016).

Table 4.3: Macroeconomic modelling and CPE[41]

	Coordination	Economic behaviour	Institutions	Model mechanism	Monetary system
Open macroeconomic modelling	decentralised social interaction	social conventions, norms and habits	social structure and power relations	evolutionary	monetary production economy
Semi-open macroeconomic modelling	decentralised coordination	simple constrained optimisation	social structure or transaction costs	recursive; partial equilibrium	endogenous money and credit-liability relations
Closed macroeconomic modelling	centralised coordination	intertemporal constrained optimisation	transaction costs	general equilibrium	loanable funds or endogenous money; exchange-based economy

[41]The categories *open*, *semi-open* and *closed* refers to the modelling approach in terms of minimum requirements such as how market clearing is modelled and understood, the possibility for implementing different assumptions without altering the modelling method and the range of mechanism that can be analysed using the modelling approach. Hence, *closed* means a very restrictive criteria for the modelling method and *open* means that the method allows the model builder to easily transform the model from one theoretical framework to another. The *semi-open* falls in the middle and is somewhat amendable but with unmovable restrictions.

4.6 Conclusion

This chapter has discussed different modelling approaches in macroeconomics and assessed these with respect to CPE. The assessment was conducted based on different theoretical approaches to CPE set out as CTI and ITC. The analysis has shown how the choice of models reflects the intuition of concepts and assumptions. These findings suggest that for institutions to be an integral part of an analysis of capitalist economies, the approach to macroeconomic modelling must be, to a large degree, *open*. The conclusion from this chapter is that the implications from the assumptions and concepts depends on the meaning and interpretation itself as well as their implementation. Hence, it is not that there is a correct and incorrect modelling approach *per se*, but that the opportunities and limitations of the approach must be fully recognised. The notion that *it takes a model to beat a model* is flawed because models operate with different premises. When analysing capitalist economies, the premise must reflect the laws of motion from the capitalist mode of production. Thus, the modelling approach must incorporate the theoretical framework without compromising the question asked.

The initial review provided an overview of assumptions and key concepts that provide the main intuition of the respective modelling approaches. The two contending (microfounded) approaches – AB and DSGE – represent two different views of the economy. DSGE – the mainstream view – provides a suite of models that are embedded in a set of assumptions and concepts that form a narrow view of the economy (*closed* macroeconomic modelling). AB models offers the most flexible framework in which to build a model based on a theory since it can incorporate assumptions of perfect knowledge and complete information to fundamental uncertainty by form of continuing stochastic elements in terms of economic behaviour, which can be optimising or heuristic (*open* macroeconomic modelling). There are several macroeconomics models in-between that can be considered *semi-open* macroeconomic modelling approaches where the framework is flexible, although restrictive assumptions are often applied.

AB-SFC models impose a certain theoretical view of money and finance – endogenous theory of money where credit is demand determined. This approach forces the finance sector and real economy to interact in the model since credit is demanded for production and consumption. This is not a necessary requirement in the DSGE model because the finance sector is not an integral part of the modelling approach. Hence, money and finance can be left out without significant alteration of the model. The AB-SFC modelling approach therefore do impose some theoretical constraint. However, it can be argued that this constraint is not a negative constraint because it ensures a depiction of a monetary production economy which is a core trait of a capitalist economy (Keynes, 1963).

An objection against the AB method is that parameters and economic behaviour becomes arbitrary. Optimisation and the rational expectation hypothesis reflect an ideal behaviour which some would argue is more objective. Thus, the distance from an optimal world is easily traced. This comes at the price of realism as no such world exists. The analytical benefit is therefore hypothetical in terms of policy application and analysis relevant to the real world, i.e. the distance from the optimal world indicate how far the real world is from such a world. This objection against the AB approach is therefore strictly speaking only relevant in terms of comparing AB models and specific aspects of the real world. The analysis provided is therefore specific to the conditions and assumption of the relevant model as opposed to general.

Considering the different features of these modelling approaches from the perspective of Baccaro and Pontusson (2016), the AB-SFC approach offers a fruitful avenue for integrating CPE and macroeconomic theory. The openness of AB-SFC means that multiple theoretical frameworks from CPE can be applied – both from CTI and ITC – and it is thereby only limited by the compatibility between the CPE and macroeconomic theory. The focus on institutions and different institutional configuration in CPE can, therefore, be materialised in all manner of ways with the AB-SFC approach[42]. This allows for an interesting vein of new research that extends

---

[42]It is also worth highlighting that NK theory has been formalised in an AB-SFC, something

the institutional aspects in macroeconomic theory via CPE in an *open* macroeconomic modelling approach. The clear benefit of adopting an *open* approach lies in its versatility, although this also means that comparing different *open* models becomes significantly harder due to the plurality. This is a methodological issue that remains to be solved and is left to be pursued elsewhere. Regardless, the notion that mathematical abstraction in the formalisation of economic concepts and assumptions is a straitjacket quelling pluralist approaches to economic research is misconceived. The findings here indicate that it is a matter of choosing the appropriate method for the analysis.

---

which is not possible to the same extent with DSGE models.

Chapter 5

An agent based-stock flow consistent approach

5.1 Introduction

In Comparative Political Economy (CPE) research, the role of institutions is as mediators in the economy (Shonfield, 1965; Esping-Andersen, 1990). The modelled developed in this chapter is used to analyse the effect on the functional distribution of income, real wages and employment from different wage formation structures. The wage formation structures reflect different bargaining strategies, i.e. contributing factors to workers' wage claim, at varying levels of bargaining power. The purpose is to investigate implications from labour market institutions in a microfounded macroeconomic model. Altering the institutions in the labour market in a microfounded model enables greater insight to the role of institutions as mediators.

The institutional configuration forms the structure of the economy and mediates agents' interaction, i.e. microeconomic behaviour, making it important to understand the effects from different institutional structures (Pasinetti, 2021). Agent Based-Stock Flow Consistent (AB-SFC) macroeconomic modelling is an obvious candidate to address this need as have been illustrated by papers investigating different regimes of accumulation through a bottom-up approach to macroeconomics

(cf. Dosi et al., 2010; Seppecher, 2012; Caiani et al., 2016). These types of models are demand-driven with dynamics due to financial flows, technological innovation and income distribution. Although these models emphasise the importance of the economic structure and labour market policies (Dosi et al., 2018b; 2019; Caiani et al., 2020), so-called supply-side features are given a secondary role in the analysis. This follows from a focus on demand-side policies but also means that supply-side issues are underdeveloped. Such a critique has recently been raised about post-Keynesian macroeconomic theory specifically (Skott, 2019).

This work contributes to research on macroeconomics and institutions set out by Baccro and Pontusson (2016) and discussed by Pasinetti (2021) and Skott (2019). The model follows the criteria of capitalist theories of institutions (CTI) and draws on the baseline AB-SFC model by Caiani et al. (2016). The model differs from the model by Caiani et al. in its focus on labour market institutions and analysis approach as different forms of wage formation is modelled and simulated rather than altering parameters in the model. This approach is inspired by Agent-Based (AB) macroeconomic models where economic relations are altered to reflect different regimes (Dosi, Sodini and Virgillito, 2015; Dosi, Pereira, Roventini and Virgillito, 2017; Caiani, Catullo and Gallegati, 2019).

The modelling approach addresses the separate institutional implications by analysing their effects on the labour separately and in conjunction. This enables a better understanding of the individual and *cumulative* effects when multiple institutional features are altered. Hence, one can analyse direct effects as well as indirect effects or feedback effects. The development model in this chapter draws on what has become a large body of literature during the 21st century. This chapter has four sections, the second section discusses the theoretical foundation of the developed AB-SFC macroeconomic model; the third presents the model and discusses the results from simulations of the model; while the fourth section discusses the results.

5.2 Theoretical foundations

The developed model represents a capitalist economy and draws on earlier work where Monetary Theory of Production (MTP) has been formalised with a SFC model to analyse New Capitalism, see Passarella (2012; 2014), so as embody the capitalist laws of motion. However, financial aspects are held to a minimum. The institutional configuration in the model reflects a *wage society*. Since labour market institutions are *supply-side* features and the model is demand-driven, the implications from different labour market institutions on wages are cumulative from the circular effects between demand- and supply-side forces. This generates feedback dynamics between wages and consumption, and therefore, consequently demand. However, the strength of such feedback effects depends on the pricing decision by firms (given that firms planned production of output is positively associated with past sales). Another important factor in this dynamic is that of employment, as wage growth is negatively associated with unemployment. As the decision to hire and set prices lies with producers, workers influence is regulated by their bargaining power.

The theoretical foundation of the model is composed of the post-Keynesian (PK) theory of the firm, the Italian-French MTP[1], the mode of régulation from Régulation Theory (RT) and the concept of Circular Cumulative Causation as set out in Institutional Economics (i.e. Veblen, Commons, Myrdal; and also by some PK economists such as Kaldor and Verdoorn), see table 5.1.

Table 5.1: A post-Keynesian-Régulation Approach to Comparative Political Economy

Post-Keynesian Theory of the firm	Graziani's Theory of the Monetary Circuit	Régulation Theory's concept of Mode of Régulation	The concept of Circular Cumulative Causation

These building blocks are interconnected but provide independent essential theoretical concepts that underpins the model:

1. The PK theory of the firm is based on three main characteristics: the competitive environment, the objective of the firm and price formation. Markets are

---

[1]Sometimes also referred to the *circuitist* monetary theory of production.

monopolistic and commodities are heterogeneous with product differentiation (Coutts and Norman, 2007). Firms' objectives are multidimensional but gaining power of its environment is the ultimate objective because this strengthens control in an uncertain environment (Lavoie, 2014b, p. 128). Thus, firms with greater power – economic, social and political – have higher survivability. To survive, firms must expand, and this means that profits are a means to end. The relation between profits and growth is therefore circular because expansion is costly but necessary to ensure future profitability (Lavoie, 2014b, p. 142). The price formation is based on the cost-plus pricing approach which reflect the notion of fundamental uncertainty – meaning that the demand function is unknown – and that prices are reproducible, not market clearing (Godley and Lavoie, 2007, pp. 263-264).

2. The theory of the monetary circuit provides the structure of events – the order of the model – and therefore explain the main causal relations in the modelled economy. The two main dynamics are represented by *initial finance*, which entails the creation of bank credit to finance production, and *final finance*, which describes how firms recuperate funding for production (Graziani, 2003).

3. The behaviour of agents in the labour market is affected by labour market institutions and social norms, i.e. wage formation (and employment conditions) are central in labour bargaining – individual or collective – and the frame of reference for any negotiating is represented by labour market institutions (Boyer, 2014). This includes the arena in which labourers and employers meet, the so-called search and matching process. The institutional configuration, from labour market institutions to financial institutions, in the model draws on the mode of régulation and explains the social relation of production in the regime of accumulation (Aglietta, 1979; Boyer and Saillard, 2002a).

4. The principle of circular cumulative causation (Myrdal, 1957; Kaldor, 1972) leads to an evolutionary model in which higher wages today causes more consumption tomorrow, greater sales boost sales expectations and increases demand for labour in production through the multiplier process (Kahn, 1931;

Keynes, 1936). The treatment of historical time, space and social relations in PK and RT means that the notion of a unique socially optimal equilibrium becomes nonsensical because the economy cannot *retrace* its steps back in time or space to the previous equilibrium (Robinson, 1972; 1974). Since outcomes from individuals' behaviour overlap and individuals constantly interact means that the equilibrium path alters continuously unless their behaviour have been following an equilibrium path for some period of time (Robinson, 1960, pp. 130-131).

A note on agents' expectations or rather, agents' behaviour based on anticipation, i.e. to act in a certain way based on an expectation (cf. Rowthorn, 1977). Agents rely on past experiences to inform their expectations and behaviour, these experiences either act as a reference point or component of *adaptive expectations*. Agents are not forward-looking in the sense that they form expectations for inflation in period $t+1$ rather use inflation in period $t-1$. Thus, agent behaviour is more affected by experiences than some perception of the (modelled) economy.

5.3   Model structure

The literature on AB and AB-SFC macroeconomic models illustrate how institutional features can be incorporated into a macroeconomic model with social interaction, social conflict, effective demand and increasing returns. The chosen approach, therefore, offers more flexibility regarding the combination of theoretical aspects from CPE and PK economics, than macroeconomic modelling approach such as Dynamic Stochastic General Equilibrium (DSGE) models (Broer et al., 2020; Ravn and Sterk, 2021)[2]. Such models are considered too *closed* for the purpose of this research. Namely, to integrate institutions *fully* into a macroeconomic model which entails *proper* social interaction among microeconomic entities. The debt-led, consumption-led or export-led growth regimes identified by Baccaro and Pontusson (2016) and discussed by Hein et al. (2020) can be formalised in the micro-founded

---

[2]See discussion in chapter IV on DSGE and New Keynesian models that are microfounded, so-called HANK models. These are also referred to as 'interacting heterogeneous'-agent models where the interaction is based on the Search-and-Matching (SAM) model.

macroeconomic modelling approach – AB-SFC – proposed in this study.

The model is inspired by the structure of the benchmark AB-SFC macroeconomic model set out in Caiani et al. (2016). The economy is composed of a collection of households (number of households, N, is 8000), banks (number of banks, B, is 10), firms (number of firms, NF, is 100), the government and the central bank. In each simulated period, households interact with firms in order to sell their labour-power and purchase homogenous consumption goods. Subscripts e represent expectation or desire, i, j and b represent households, firms and the banking sector, respectively, t denoted the time period and T target reflects a target variable. A bar over a variable signifies a simple average and a dot refers to a growth rate unless otherwise specified. The whole list of equations can be found in A section below. The numbers by the equations reflect their number in the list in A.

5.3.1 Macrofundamentals

The Stock-Flow Consistent framework makes use of matrices to follow the accounting of the model's 'national accounting' with the addition of financial stocks of assets and of debts (Godley and Lavoie, 2007, pp. 23-24). The balance sheet of this AB-SFC model is presented in table 5.2.

Table 5.2: Balance sheet of AB-SFC model

	Households	Firms	Government	Central bank	Banks	$\sum$
Inventories		$+Inv$				$+Inv$
Cash	$+H^h$			$-H^{CB}$		0
Money deposits	$+M^h$	$+M^f$			$-M^b$	0
Treasury bills			$-B$	$+B^{CB}$	$+B^b$	0
Long-term bonds	$+BL^h \cdot pbl$		$-BL \cdot pbl$			0
Loans		$-L^f$			$+L^b$	0
Share equities	$+pe \cdot esr$	$-pe \cdot esr$				0
Advances				$+Adv$	$-Adv$	0
Reserves				$-Res$	$+Res$	0
Balance	$-V^h$	$-V^f$	$-V^G$	0	0	$-Inv$
$\sum$	0	0	0	0	0	0

Note: The balance sheet gives an overview of the stocks in the model where assets are preceded by a plus sign and liabilities a minus sign.

The last two rows before the balance represents assets (reserves) and li-

abilities (advances) held by commercial banks with the central bank. Whenever, commercial banks liabilities (money deposits) exceed their assets (treasury bills and loans), these banks must obtain assets (by form of reserves) from the central bank to balance their books. The main feature to highlight is that the financial system is an overdraft-asset based hybrid meaning that commercial banks hold some proportion, ρ, of its liabilities (money deposits) as central bank reserves, or high-powered money, and based on its notional balance sheet – money deposits less loans and reserve requirement – has a demand for treasury bills and additional reserves or advances from the central bank. Hence, commercial banks hold asset, as in an asset-based system, as well as perform liability management, as in an overdraft system. In the model, interest rates on treasury bills, reserves (high powered money) and advances can be maintained at the levels deemed appropriate by the central bank since the balance sheet of the central bank contracts or expands as necessary from the balance sheets of the commercial banks.

The revaluation matrix illustrates the appreciation (depreciation) of assets in the model – share equities and long-term bonds – held by households (see table 5.3). Since the interest rate on bonds and dividends rate is set by the government and firms by convention, it is the price of assets that 'moves' according to demand for bonds and share equities. The demand for these assets is set out in the portfolio equations for households.

Table 5.3: Revaluation matrix

	Households	Firms	Government	Central bank	Banks	$\sum$
Long-term bonds	$+ \triangle B_{t-1}^{H} \cdot pbl$		$-BL_{t-1} \cdot pbl$			0
Share equities	$+ \triangle pe \cdot esr_{t-1}$	$- \triangle pe \cdot esr_{t-1}$				0

Where the balance sheet cover stocks, the transaction flow matrix shows the accounting flows of the model (see table 5.4). The transaction flow matrix illustrates where the counterparts to every transaction in assets come from, i.e. from where investment is financed (Godley and Lavoie, 2007, p. 6). The transaction flow matrix is a flow-of-funds table and therefore useful to understand how stocks changes from

one period to the next. Such as the distribution of entrepreneurial profits (ff) – dividends (fdf), retained profits (fuf) and interest rate on loans $(r^l \cdot L)$ – and households' expenditure (C) and income flows (wages, WB, and unemployment benefits, UBI). Money deposits (M) consists of current account (M^1) and savings account (M^2) deposits of which M^2 pays interest. The transaction flow matrix provides a formal overview and can be complemented with the intuitive structure of the model (see figure 5.1). The links between the sectors (households, firms, banks, central bank and government) have an arrow – which reflect the *sources* of funds – and the beginning of the arrow reflect the *uses* of funds, which is represented by a plus sign and minus sign in transaction flow matrix, respectively. The attached signs in the transaction flow matrix are counter-intuitive because the acquisition of financial assets or money deposits *add* to the existing stocks of the asset, in line with the intuition of the balance sheet matrix, but since an acquisition constitutes an outgoing transaction flow it is a *use* of funds (Godley and Lavoie, 2007, p. 40).

Table 5.4: Transaction flow matrix

	Households	Firms		Government	Central bank		Banks		$\sum$
		Current	Capital		Current	Capital	Current	Capital	
Consumption	$-C$	$+C$							0
Gov't expenditure		$+G$		$-G$					0
Inventories		$+\Delta Inv$	$-\Delta Inv$						0
Entrepreneurial profits	$+fdf$	$-ff$	$+fuf$				$+r^l_{t-1} \cdot L_{t-1}$		0
Wages	$+wb$	$-wb$							0
UBI	$+ubi$			$-ubi$					0
Taxes	$-\tau^Y$	$-\tau^Y$		$+\sum(\tau^Y + \tau^Y)$					0
Central bank profits				$+fcb$	$-fcb$				0
Bank profits	$+fdb$						$-fb$		0
– loans		$-r^l_{t-1} \cdot L_{t-1}$					$+r^l_{t-1} \cdot L_{t-1}$		0
– money deposits	$+r^m_{t-1} \cdot M^h_{t-1}$	$+r^m_{t-1} \cdot M^f_{t-1}$					$-(r^m_{t-1} \cdot M^h_{t-1} + r^m_{t-1} \cdot M^f_{t-1})$		0
– treasury bills				$-r^b_{t-1} \cdot B_{t-1}$	$+r^b_{t-1} \cdot B^C_{t-1}B$		$+r^b_{t-1} \cdot B^B_{t-1}$		0

Continued on the next page…

Table 5.4: transaction flow matrix (contd...)

	Households	Firms Current	Firms Capital	Government	Central bank Current	Central bank Capital	Banks Current	Banks Capital	Σ
– reserves					$+r^R \cdot Res$		$-r^R \cdot Res$		0
– advances					$-r^A \cdot Adv$		$+r^A \cdot Adv$		0
– long-term bonds	$+BL_{t-1}$			$-BL_{t-1}$					0
Change in the stocks of									0
– loans			$+\Delta L$					$-\Delta L$	0
– cash	$+\Delta H^H$					$-\Delta H^H$			0
– reserves						$+\Delta Res$		$-\Delta Res$	0
– advances						$-\Delta Adv$		$+\Delta Adv$	0
– money deposits	$-\Delta M$							$+\Delta M$	0
– treasury bills				$+\Delta B$		$-\Delta B^C B$		$-\Delta B^B$	0
– long-term bonds	$-\Delta BL \cdot pbl$			$+\Delta BL \cdot pbl$					0
– share equities	$-\Delta esr \cdot pe$		$+\Delta esr \cdot pe$						0
Σ	0	0	0	0	0	0	0	0	0

Figure 5.1: AB-SFC monetary production economy
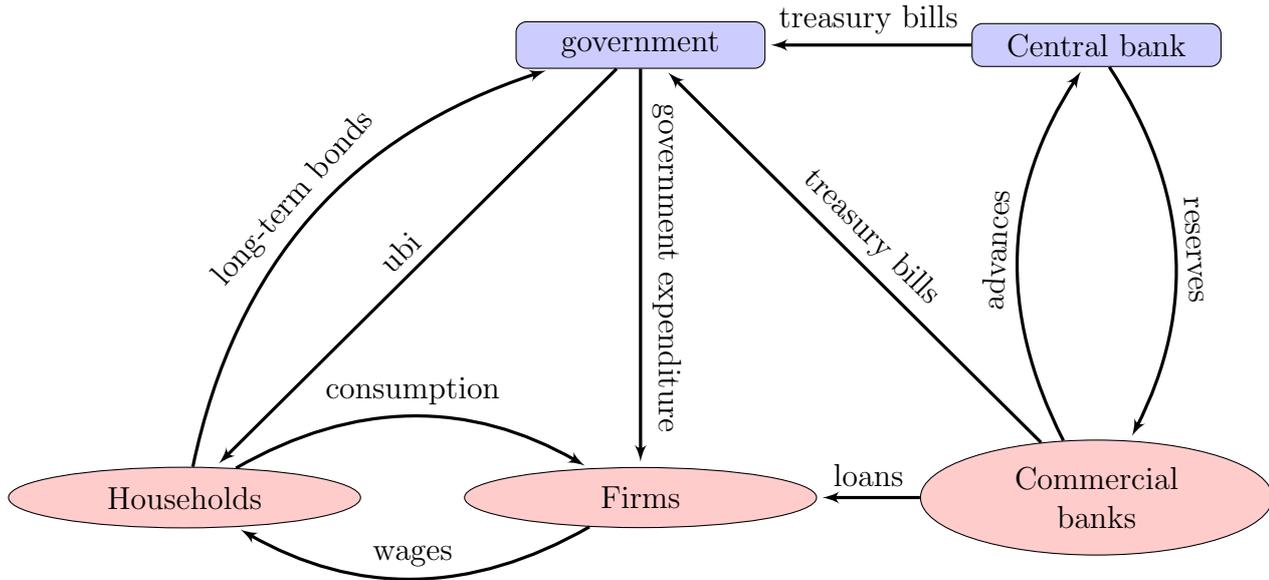
The overall structure of the model can be summarised in three main phases: i) anticipation – the decision-making process of agents made *ex ante*, ii) production – actual production is carried out with employed resources, and iii) sales – market coordination via agent interaction. These phases make up one period and each consecutive period illustrates the concept of time. The boundary of time is essential for analytical purposes because it helps clarify the causative direction of microeconomic decision-making and macroeconomic variables (Seccareccia, 2004, pp. 283-303). Usually, agents find themselves in different phases, but this is simplified for parsimonious and logical reasons. Parsimonious because the direction of causation becomes more transparent and logical because certain phases and decisions must be made before others, e.g. firms cannot start production before hiring labour.

The monetary circuit captured in figure 5.1 illustrates the role played by banks (non-financial corporations) and credit for a monetary production economy as stressed in MTP because firms must acquire initial financing before production can start – to pay for wages and other production costs – which occur prior to sales thus requiring firms to obtain credit or use retained earnings (Renaud, 2000). Hence, the model presents a capitalist economy in a *sequential* process where three types of agents, financial corporations (firms), non-financial corporations (banks) and workers (households) are *active* whilst the state (the government and the central

bank) are passive agents in the model. The relation between these active agent-types is crucial for the workings of the model since financial corporations provide credit to non-financial corporations and non-financial corporations employ factors of production (workers) to produce commodities and sell these on the market, and workers sell their labour-power to purchase commodities. This follows the logical structure of MTP (see Forges Davanzati and Realfonzo, 2004, p. 64).

The model reflects a sequential framework that accommodates the integration of the real economy and the monetary economy in line with MTP (see Dillard, 1980; Graziani, 2003). In each simulated period, t. The modelled sequence[3] is largely based on Caiani et al. (2016) with the notable differences, for this study, being that prices are set after workers have been hired/fired and production for the period has taken place; and, wages are paid just prior to production after credit has been obtained:

1. Firms plan their desired production for the period based on past sales.

2. Firms evaluate their demand for labour and workers set their reservation wage.

3. Labour market: firms fire surplus workers already employed and a portion of workers leave their job set by the turnover rate, an exogenous parameter. Firms with a positive demand for workers either because of expansion or natural turnover assess applicants based on their reservation wage and fill vacancies.

4. Firms calculate their demand for credit in the period.

5. The banking sector supply firms with their desired credit.

6. Firms pay wages to workers.

7. Production takes place and set prices.

8. Consumption good market: households choose their goods supplier based on price and calculate their desired consumption based on expected disposable

---

[3]The order of the sequence becomes important for the dynamic of the model because it represents the "decision-making process" of the economy.

income (wages plus interest on deposits and dividends).

9. Firms pay back a portion of their outstanding loans and interest to the banking sector. Banks calculate their profits and pay dividends to households. Firms that default on their principal repayment go bankrupt and start over as new firms.

10. Households alter their portfolio according to their preferences for deposits, equity shares and savings.

11. Firms receive funding for their outstanding credit via issued equities and sales revenue.

12. Firms take stock of inventories, sales and profits. The government assess its public sector borrowing requirement (PSBR).

13. Banks purchase bills (if necessary) and the central bank provides emergency liquidity to banks in the form of advances (on demand). The banking sector calculates interest rates on deposits and loans for the next period based on their liquidity ratio and firms' leverage, respectively.

5.3.2 Microfoundations

The interaction among agents in the markets for consumption and labour follows the same matching protocol of Riccetti et al. (2015) in which the choice of worker and commodity supplier is based on a subsample of which the choice is set to the cheapest supplier (of commodities or labour among the subsample). In the next period, the process is repeated, and a new subsample is drawn from the population. The preference for specific commodity goods depends on the price. These assumptions are strong, however, they are agreeable in a model with homogenous goods. This matching process has become fairly standard and can be found in various versions (cf. Delli Gatti, Gaffeo and Gallegati, 2010; Riccetti et al., 2015; Caiani et al., 2016).

The matching protocol in the labour market is further developed in three distinct versions of each model (baseline, profit-strategy, productivity-strategy and

leverage-strategy) where employment protection (EPL) is introduced. This entails that firms are unable to fire workers employed for more than 2 periods.

Households' demand for goods can be frustrated if firms have insufficient goods on stock, similarly firms supply of goods may be frustrated in the case of insufficient demand or if a firm has priced itself out of the market and therefore is not selected. Credit and deposits are supplied on demand by banks to firms and there is no credit rationing in the model. The matching protocol between firms and banks is stochastic. Hence, there are no circular cumulative effects enjoyed by banks as there is no consistent benefit from "better" clients.

5.3.2.1 Households' consumption and wage bargaining

Households' consumption depends on income and wealth as consumption is determined by the propensity to consume out of expected disposable income, α_1, and wealth, $\alpha_x{}^4$, respectively, which is exogenous. The key assumption is that households spend some proportion of their income and wealth on consumption where the propensity to consume out of income is greater than the propensity to consume out of wealth (i.e. past savings). Realised consumption, therefore, rely on the supply of goods by the firm chosen and the liquidity of the household, i.e. money held in the current account or as cash, by the agent. Hence, realised consumption does not necessarily equal the consumption demand (eq. 5.31) if there is a shortage of commodities commodities (sold by the chosen firm) or limited funds (available to the household). The rationale behind the consumption function is that households' decisions to consume follow a rule of thumb as opposed to utility maximisation subject to a budget constraint. For instance, if all prices increase drastically, households' real consumption fall unless income and wealth increase proportionally. Similarly, households' real consumption will increase when their income and wealth rise faster

---

[4] Here x is 2:6 and represents different assets which compose households' wealth.

than prices.

$$cDemand_{i,t} = \alpha_1 \frac{yd^e_{i,t}}{p_{j,t}} + \alpha_2 \frac{hh_{i,t-1}}{p_{j,t}} + \alpha_3 \frac{m^{1h}_{i,t-1}}{p_{j,t}} + \alpha_4 \frac{m^{2h}_{i,t-1}}{p_{j,t}}$$
$$+ \alpha_5 \frac{BL_{i,t-1}}{p_{j,t}} + \alpha_6 \frac{ehr_{i,t-1}}{p_{j,t}} \quad (5.31)$$

Firms sell their goods to households and the government. The government spread its total consumption equally among firms. Since households do not go back to the initial subsample of choosing suppliers, there can be excess demand and excess supply after a simulation period. Hence, in the model markets do not necessarily clear, in fact they rarely do until full employment is reached. The market-clearing condition is therefore discarded and no general equilibrium in that sense exists, which is similar to the SFC models developed in Godley and Lavoie (2007, p. 284).

Workers set their reservation wage, w, in the wage formation process. The wage growth, wg, represent the claim of the workers and depend on the employment rent ER, past price inflation, π, and a variable, BS, that represents the bargaining strategy, all adjusted by the degree of bargaining power, ω_W. Eq. 5.18 shows the wage growth, or the new wage claim, will be negative for those unemployed ($unemp = 1$) for more than two consecutive periods ($unempPeriod > 2$)[5] and positive for those in employment ($unemp = 0$) in period $t - 1$. Hence, unemployed workers reduce their wage claim leading to a lower reservation wage in period t, vis-à-vis the reservation wage in period $t - 1$, when unemployed for more than two periods. Those unemployed for one or two periods do not alter their reservation wage. For the employed, the claim leads to an increase in the reservation wage, except in the case where unemployment benefits would exceed the wage in period $t - 1$. Albeit this is never the case in the simulations. The bargaining power of workers is exogenous and greater bargaining power increases the positive factors (price inflation and the bargaining strategy) and reduces the negative factor (the

---

[5]If $unempPeriod >= 1$, then $unemp$ must equal 1, since $unemp$ is a binary variable. When $unemp$ equals 0, then $unempPeriod = 0$.

employment rent).

$$
\dot{w}_{i,t} = \begin{cases} \omega_W(BS_{t-1} + \pi_{t-1}) - (1 - \omega_W)\frac{ER_{i,t-1}}{w_{i,t-1}}, & \text{if } unemp_i = 0 \\ -FN_i, & unempPeriod_{i,t-1} > 2 \end{cases} \tag{5.17}
$$

$$
w_{i,t} = w_{i,t-1}(1 + \dot{w}_{i,t}) \tag{5.18}
$$

The bargaining strategy reflects the leading indicator – productivity growth, leverage ratio growth or profit rate growth – used by workers in their wage bargaining. The labour market institutions in the model vary between individual- and firm-level bargaining where for individual-bargaining, borrowed from Caiani et al. (2016), workers' wage growth is set by a stochastic element, FN[6], which is positive when employed and negative when unemployed (for more than two consecutive periods).

For firm-level bargaining, workers' collective claim for wage growth depends on one of three variables according to the bargaining strategy. This approach to modelling wage formation in AB-SFC differs from that of Caiani et al. The bargaining strategy is associated with the growth rate of either labour productivity or the leverage ratio or the profit rate. The growth rate is adopted because workers interpret the change in of one these factors as a strong indicator of the development of the firm. Thus, it forms agents' anticipation about their nominal wage. Unemployed workers reduce their wage demand by a proportion set by a stochastic element (in the same manner as with individual bargaining) since firms choose the worker with the lowest wage demand. The rule for when workers claim an increase or a decrease to wages is the same in both individual and firm-level bargaining, but the factors affecting the wage claim level differs.

Employment rent depends on the previous wage or income received less unemployment benefits multiplied by the average time in unemployment in the economy, $(\overline{unempPeriod})$. Employment rent is an alternative measure of job scarcity to that of labour market tightness (number of new vacancies over number of unem-

---

[6]The stochastic element is drawn from a folded-normal distribution with a mean zero and standard deviation of 0.0094 which follows that of Caiani et al. (2016).

ployed persons) or the unemployment rate which is based on the expected costs of job loss (Reich et al., 1973; Schor and Bowles, 1987). The emphasis on the cost of job loss reflects workers' risk aversiveness[7]. The ER is the expected cost that will be incurred if unemployed and negative effect on wage claims. The ER captures the effect from the *reserve army of labour* via the expected periods in unemployment.

The employment rent, ER, is shown in equation (henceforth eq.) 5.16 and is determined by the current wage or labour compensation, w, less income received in unemployment such as unemployment benefits or other social security payments, ubi, subject to the expected time in unemployment, $\overline{unempPeriod}$. It is the economic rent a worker receives if the value of the job exceeds the next best alternative, which is being unemployed.

$$ER_i = (w_{i,t-1} - ubi_t)\overline{unempPeriod} \tag{5.16}$$

Since employment rent is included in the wage formation of workers, it will restrain workers' demand for greater wage growth when the economic rent becomes larger. The measure emphasise the cost of job loss rather than new vacancies (and competition from other searching workers) as in labour market search theory (Shimer, 2005).

It is assumed that productivity is determined within the firm, i.e. all workers have the same capabilities and skills. The productivity growth is determined by increasing returns of scale, so as firm expands production the productivity level increases. Real wages are consequently determined in the product markets since it depends on the nominal wage and the price set. The real wage is therefore independent of employment decisions, both in terms of firms' demand and workers' supply.

---

[7]Juliet Schor and Samuel Bowles (1987) used this measure as a determinate of workplace conflict in their work on the effect from cost of job loss on strike incidence. David Gordon initially used the concept of cost of job loss in an analysis of welfare perks provided by firms (Reich et al., 1973).

5.3.2.2 Firms' production planning, investment and demand for labour

The planned production of firm j in period t depends on sales expectation and short-term inventory target, see equation 5.6 below. Firms ensure that production is larger than expected sales only, this "excess" is as an inventory buffer which allow firms to meet demand if it is higher than anticipated. Firms adjust production by a short-term inventory buffer target which depends on the long-term target. Equation 5.3 is the long-term inventories-to-sales ratio target that depends on the interest rate on loans, r^l, where σ_0 and σ_1 are exogenous parameters. Equation 5.5 is the short-term inventory target, inv^e, that considers firms' inventories from the previous period, inv_{t-1}, and the current long-term inventory target, inv_t^T, which are adapted by parameter γ. γ represents the adjustment speed to the long-term inventory target.

$$\sigma_{j,t}^T = \sigma_0 + \sigma_1 r_{b,t-1}^l \tag{5.3}$$

$$inv_{j,t}^e = inv_{j,t-1} + \gamma(inv_{j,t}^T - inv_{j,t-1}) \tag{5.5}$$

$$y_{j,t}^e = s_{j,t}^e + inv_{j,t}^e - inv_{j,t-1} \tag{5.6}$$

The target-level for labour, n^T, is determined by planned production, y^e, and the productivity of labour, x, see equation 5.9.

$$n_{j,t}^T = \frac{y_{j,t}^e}{x_{j,t-1}} \tag{5.9}$$

Firms set prices, p (see equation 5.26), using normal historical unit costs, $nhuc$, plus a non-negative mark-up, mup (Godley and Lavoie, 2007, pp. 269-271, 388-390). Firms therefore avoid perverse pricing and distribute normal historic costs based on sales of current and past output. There is an implied assumption that firms sell goods on a first in-first out basis.

$$p_{j,t} = (1 + mup_{j,t})nhuc_{j,t} \tag{5.26}$$

5.3.2.3 Case of bankruptcy among firms

Firms may go bankrupt within a period which entails that the equity shares become worthless (their net worth goes below zero), inventories are lost, workers are fired and any liquid means (i.e. deposits, m^{1f}, held with their bank) are used to repay remaining loan amounts. This follows Caiani et al. (2016). Firms are declared bankrupt if they cannot service their debt, i.e. pay the principal on their loan(s). Firms' productivity level is set back to the initial level when declared bankrupt. Losses due to outstanding loans are absorbed by the government, acting as a last resort lender to the banks. As the firm is "reset" to the initial level, except for expected sales, the process of keeping the same structure in terms of firms is simplified. The model differs from Caiani et al. since there is no starting capital. Firms can always borrow the funds they need to finance production. If firms were to start with some capital, there would have to be a mechanism to account for the origin of these funds to ensure the stock-flow consistency of the model. This feature is very important because bankruptcy reflects a key aspect of capitalistic competition, and it prevents firms from becoming "zombie"-like firms with unlimited debt levels. The consequences of this feature are that households can experience an equity loss as their shares become worthless within the simulation period and banks' liquidity ratio becomes pressured when their assets (credit) turn bad.

5.4   Model simulation

The model is based on the SFC premise that all stocks and flows must be accounted for. This is validated in the consistency check of the redundant equation, $\sum_{i=1}^{N}(H_{i,t}^{H}) = H_{t}^{C}B$ (demand for cash and supply of cash, respectively)[8]. 100 Monte Carlo simulations are run with each version of the model so that stochastic effects are reduced with respect to the qualitative results[9] in line with the literature (cf. Riccetti et al., 2015; Caiani et al., 2016; Teglio et al., 2019; Pedrosa and Lang, 2021). However, the model is not calibrated from an aggregate version. Instead, the model

---

[8]This condition is checked in all simulations.

[9]The simulation has been run on ARC3, part of the High Performance Computing (HPC) facilities at the University of Leeds, UK.

is grown from an "empty state" where government expenditure (an autonomous component) initiates the model and emergent properties of the model are grown from the bottom-up. As the model is run for 1000 periods, the first 100 are "discarded" as the model initialises. Real wages are set to 1, so prices and wages are equal, all workers are unemployed, and firms' have an equal market share (since there is no prior sales). Each version of the model, therefore, follows its own dynamics and there is no qualitative difference between the starting point for the models *per se*. The baseline model is used as a reference point for the qualitative comparison. It differs from the other models with respect to the wage formation and employment protection legislation (EPL), see table 5.5. The models with firm-level bargaining are simulated with high and low levels of bargaining power to labour and with/without EPL. The baseline model is also simulated with constant and variable labour productivity as well as with/without employment protection legislation, respectively. Thus, fifteen different versions of the model are run for comparisons of institutional features.

Table 5.5: Model overview

| Model	Description
Baseline (B)	stochastic wage formation; no EPL
B+constant productivity (BCP)	stochastic wage formation; no EPL
B+employment protection legislation (BEPL)	stochastic wage formation; EPL
Wage formation-Productivity (WProd)	wage formation linked with productivity; no EPL
WProd+employment protection legislation (WProdEPL)	wage formation linked with productivity; EPL
Wage formation-Leverage (WLev)	wage formation linked with leverage; no EPL
WLev+employment protection legislation (WLevEPL)	wage formation linked with leverage; EPL
Wage formation-Profit (WPro)	wage formation linked with profit rate; no EPL
WPro+employment protection legislation (WProEPL)	wage formation linked with profit rate; EPL

The different versions described in table 5.5 are run independently. There are four main scenarios where the baseline scenario (B) operates with individual bargaining and, therefore, has a different wage growth equation than the productivity (WProd), leverage (WLev) and profit (WPro) scenarios, who have the firm-level bargaining equation for wage growth. The baseline scenario is also simulated with two additional versions, with constant labour productivity (BCP) and employment protection legislation (BEPL). These additional versions differ from the baseline by constant productivity (in the case of BCP) and firms being unable to fire workers who have been employed for more than two periods (in the case of BEPL).

The firm-level bargaining versions are run with three different parameter values for labour's bargaining power, ω_W, low (ω_W=0.25), neutral (ω_W=0.50) and high (ω_W=0.75), to analyse the impact of varying bargaining power. In addition, a fourth version of these three scenarios are run with bargaining power (ω_W=0.50) and employment protection legislation (version WProd+EPL, WPro+EPL and WLev+EPL in table 5.5). This fourth scenario is used to compare a legislative approach where bargaining power is even, but workers job security is high because of the legislation.

The simulation results are indexed for ease of comparison, where the index 1 = the baseline scenario in period 101, i.e. with (ω_W=0.50). The wage share is fairly stable across the different versions of the baseline model with little deviation (comparing standard deviations) between baseline vs. BEPL and vs. BCP. When productivity is held constant, the wage share is higher compared to BEPL and the baseline. The dip seen in the comparison with the baseline is because of a change (an increase) due to full employment being reached. Figure 5.2 shows the results for the wage share compared with the different bargaining scenarios. Figure 5.2-a) shows that the bargaining strategy scenarios generally has a higher wage share than the baseline, with the exception of the last 200 periods; figure 5.2-b), -c) and -d) indicate that the development of the wage share varies across the bargaining strategies (here indexed to the respective bargaining strategy with ω_W=0.50. This is not unsurprising as the wage claim depend on the rate of change in the profit rate, productivity and leverage ratio, respectively, which are driven by different factors

and follow different trends. Varying the bargaining power, ω_W, alters the movement of the wage share within the different bargaining strategies. The variation also differs across the different bargaining strategies.

Figure 5.2: Wage share
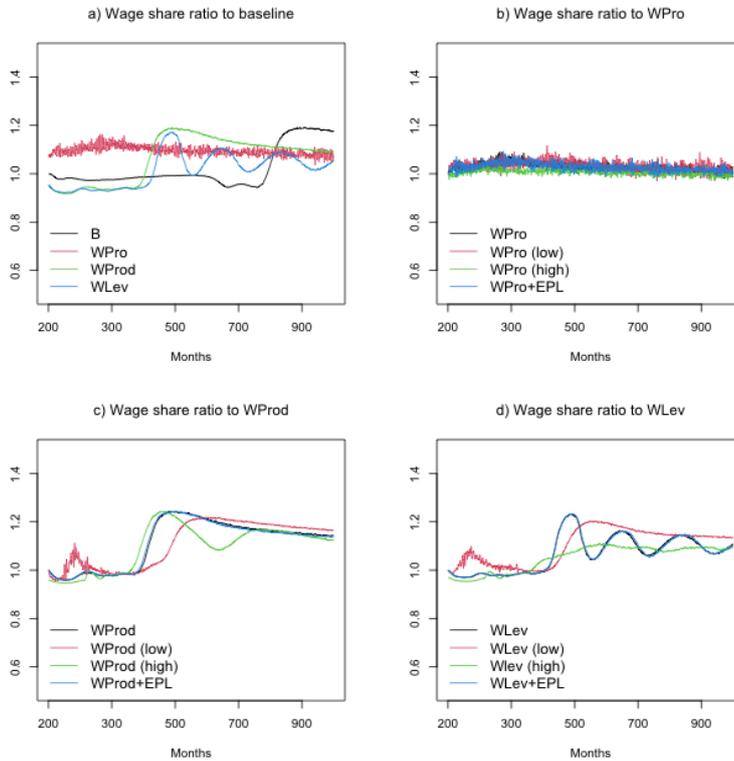
Considering real wages in figure 5.3, there is a clearer qualitative difference between the baseline and bargaining strategy scenarios (WPro, WProd and WLev). Again, the reduction in the last 200 periods is due to full employment being reached in baseline, initiating an increase. The difference across the bargaining strategies is more pronounced and have distinct dynamics. WProfit show a higher real wage when bargaining power is low compared to neutral and high. The addition of employment protection legislation has little impact compared to the neutral scenario. Conversely, the WProd scenario shows that greater bargaining power is related with a higher real wage, whilst low bargaining power leads to a distinct lower real wage. The WLev scenario is similar to WPro but with a more cyclical dynamic. Across the three bargaining strategies (WPro, WProd and WLev), when EPL is included, the real wage grows marginally faster.

The dividends-wage ratio (see figure 5.4) suggest that the bargaining strategy

Figure 5.3: Real wages
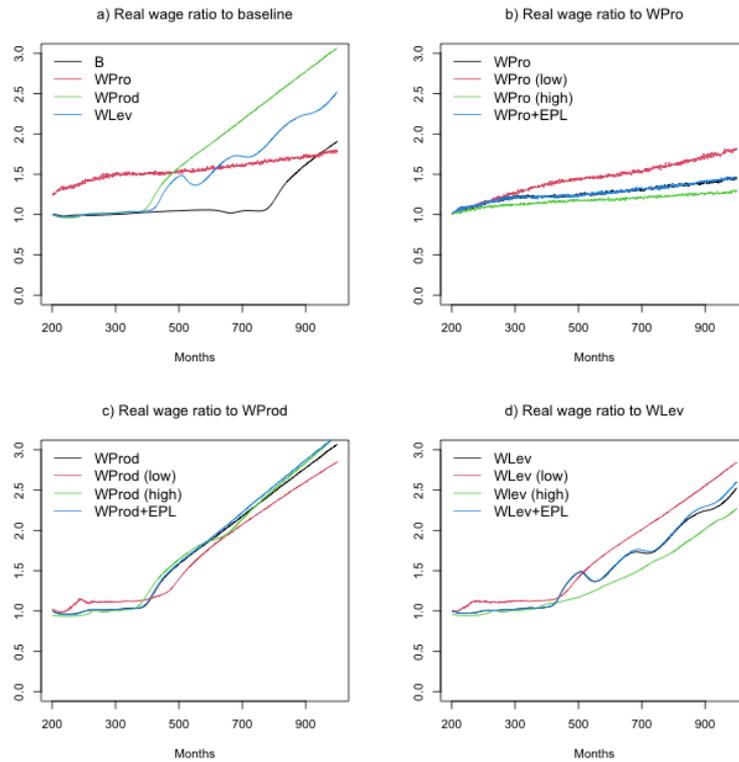
coupled with changes to the profit rate (WPro) results in a significantly lower dividends-wage ratio compared to the baseline scenario (figure 5.4-a). Figure 5.4-b, showing the results from variations in labour's bargaining power in the WPro scenario, is perplexing as WPro (high) has a lower ratio than WPro (low). This is, however, consistent with the higher real wage observed in figure ??b as well. The greater bargaining power of labour in WPro (high) generate a counter-intuitive result. Part of this can be explained by the higher unemployment ratio in the WPro scenario compared to WProd, WLev and Baseline as these three scenarios all experience a rise in real wages and the wage share once they come close to or obtain full employment (app. in period 500 for WProd and WLev and 800 for baseline).

Considering the price mark-up (see figure 5.5-a below), there is only small difference between the main scenarios (B, WPro, WProd and WLev). In fact, comparing the scenarios with respect to the wage share and price mark-up, one can observe that they are the mirror-image of each other. Furthermore, the dividends-wage ratio – shown in figure 5.4-b, -c and -d – resembles the results shown in figure 5.5-b, -c and -d.

Figure 5.4: Dividends-Wage ratio
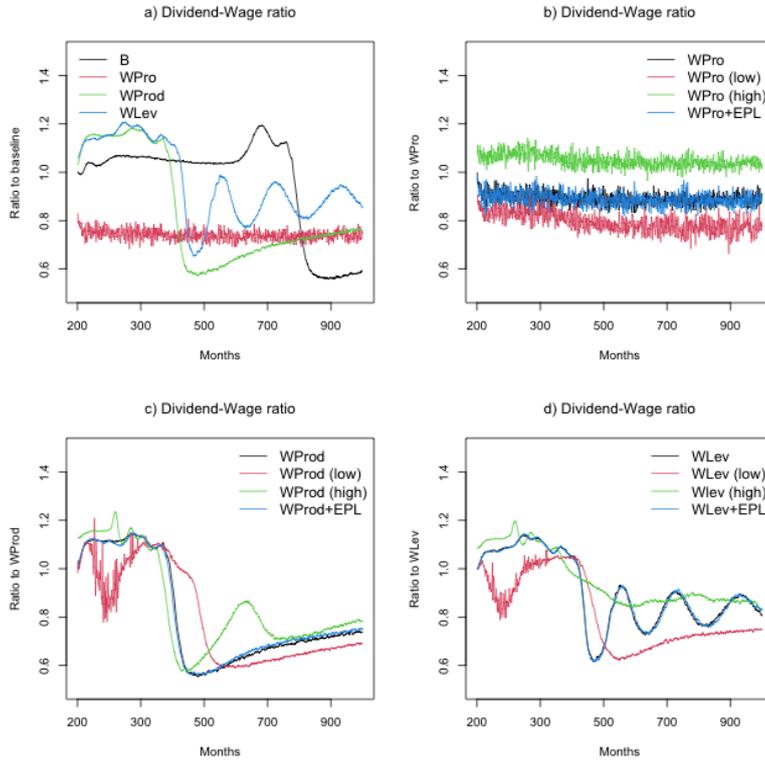
The price mark-up is an important indicator because it determines the real wage through its influence on prices and affects the income distribution (cf. Rima, 2003). This follows from the notion that firms are price setters and markets are oligopolistic or imperfect, i.e. firms have a degree of market power (see for instance studies by Nordhaus and Godley, 1972; Godley and Lavoie, 2007, pp.265–266; De Loecker et al., 2020; Eeckhout, 2021). The price mark-up is not constant, as shown in figure 5.6, thus the outcome on real wages and the wage share depends on the change in wages vis-à-vis changes in productivity and the price mark-up. The figures in figure 5.6 shows the average across the Monte Carlo simulations with two standard deviations. These figures show the different spreads generated in the different scenarios, i.e. b) versus a), and the different developments of the price mark-up, i.e. d) versus a).

The mark-up, mup_t, follows the mark-up target, mup_t^T, with respect to β and the mark-up in time $t-1$:

$$mup_{j,t} = mup_{j,t-1} + \beta(mup_{j,t}^T - mup_{j,t-1}) \tag{5.23}$$

Figure 5.5: Price mark-up
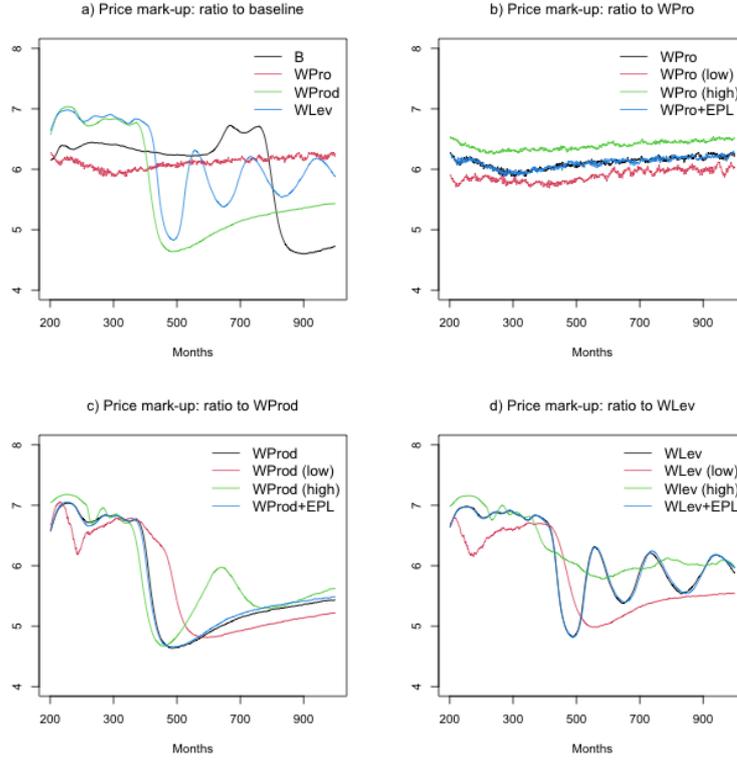
The price mark-up target (eq. 5.22) depends on wage costs (wb), firm's loan (lf), inventories (inv), unit costs (uc), dividends (fdf), expected sales (s^e), firms planned rate of retained earnings from wage costs (ψ_U) and interest rate on loans[10] (r^l) through the firms planned entrepreneurial profits (eq. 5.19), the opening inventories-to-expected sales ratio (eq. 5.20) and expected historical costs (eq. 5.22):

$$ff_{j,t}^T = \psi_U wb_{j,t} + r_{b,t-1}^l(lf_{j,t} - [inv_{j,t-1}uc_{j,t-1}]) + fdf_{j,t} \tag{5.19}$$

$$\sigma_{j,t}^e = \frac{inv_{j,t-1}}{s_{j,t}^e} \tag{5.20}$$

$$hc_{j,t}^e = (1 - \sigma_{j,t}^e)s_{j,t}^e uc_{j,t} + \sigma_{j,t}^e(1 + r_{b,t-1}^l)s_{j,t}^e uc_{j,t} \tag{5.21}$$

$$mup_{j,t}^T = \frac{ff_{j,t}^T}{hc_{j,t}^e} \tag{5.22}$$

The reported results illustrate the positive implication on real wages and the wage share from strengthening labour market institutions. This is uncontroversial among economists. The functional distribution of income (wage- and profit-share) reflect how all income from production is split between the two main classes, capital-

---

[10]The interest rate on loans is fixed.

Figure 5.6: Price mark-up – average and standard deviations
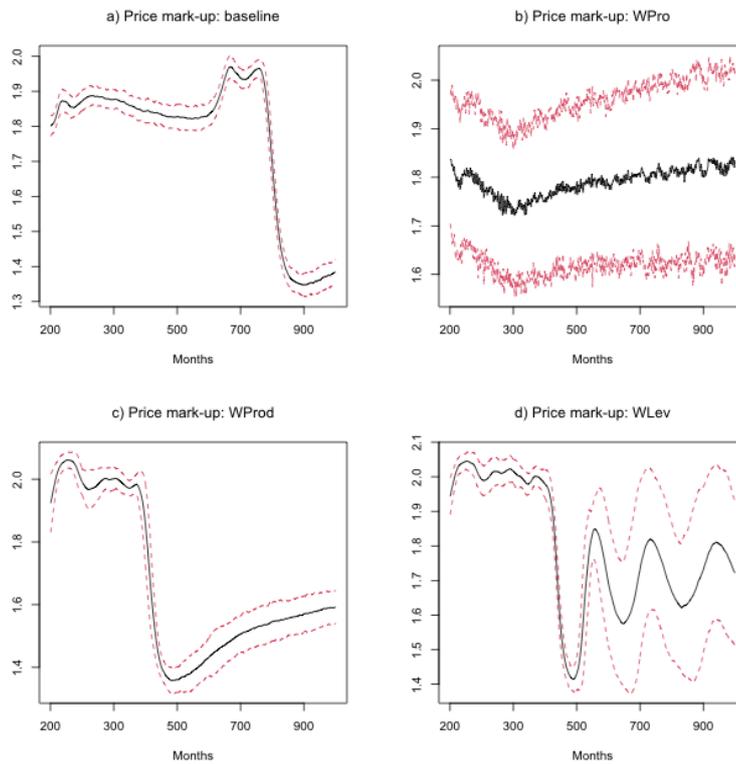
ists (the owners of the means of production) and workers (owners of labour-power). This distribution is important to understand the pure distribution of income in an economy and the bargaining power between these two classes. In the monetary production economy, capitalists must finance production through bank credit. Capitalists retrieve this credit through sales and the issue of equities. Hence, a capitalist can over time fund production with past sales and issued equity shares. The return on owning such equities is dividends paid and the ratio of dividends to wages indicate how profits are distributed versus compensation of employees. Although these scenarios with bargaining strategies generally yields a lower ratio than the baseline, the relation between this ratio and bargaining power to labour is ambiguous (see figure 5.4-b, -c and -d).

Considering some other key macroeconomic variables from the simulations (see figure 5.7), the bargaining strategies as a ratio to the baseline, show that the scenarios of WProd and WLev differ significantly from WPro. As a ratio to the baseline, WProd and WLev incur much a much higher public debt ratio of GDP and firm debt, compared to WPro. However, WProd and WLev also yield higher

output and a higher profit rate.

Figure 5.7: Macroeconomic variables
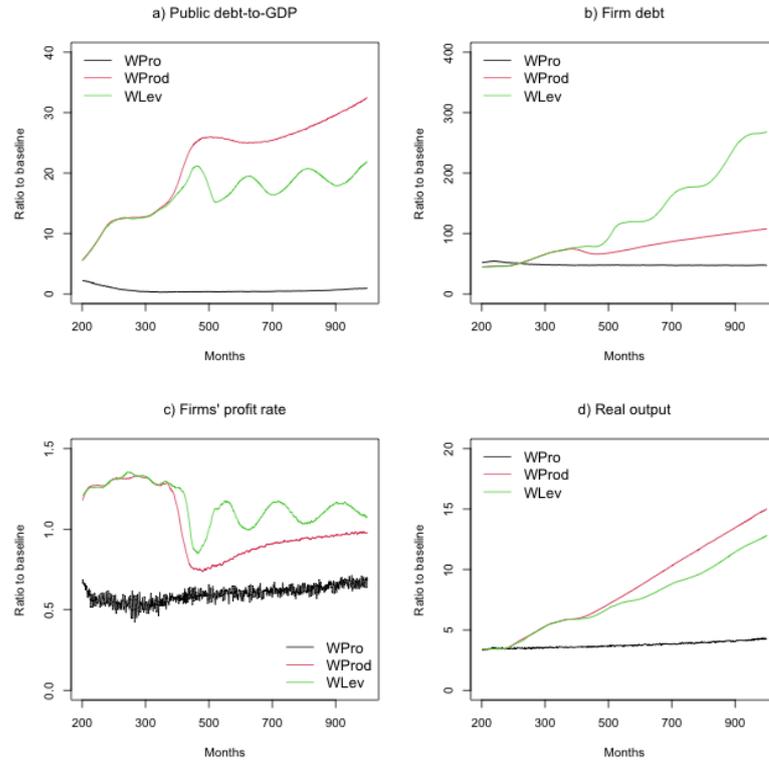
The WPro scenario produces a higher rate unemployment compared to the other scenarios (WProd and WLev) as well as the baseline. Still, WProd and WLev have a lower unemployment rate than baseline, an average of 6% and 7% compared to 22%, respectively. The relation between wage growth (bargaining strategy) and unemployment is negatively correlated for the bargaining strategies (WPro: -0.06; WProd: -0.59; WLev: -0.38), but positive for the baseline with individual-stochastic bargaining (0.83). Hence, the scenarios with active wage bargaining under labour market institutions follow the relationship of the (original) Phillips Curve (Phillips, 1958). The ambiguous results for unemployment suggest that the feedback effects from these supply-side features are not necessarily sufficient to raise aggregate demand. From a PK and RT perspective, such a conclusion is unsurprising.

5.5 Discussion

In this chapter, an AB-SFC model has been developed based on the combination of PK and RA to economic analysis. The theoretical building blocks highlight the intuition of the model, which is the antagonism between labour and capitalists in terms of the distribution of factor income (wages and profits). This conflict is captured in the wage formation where under three different bargaining strategies (WPro, WProd and WLev). The conflict mediated by labour market institutions has been analysed with different bargaining strategies that reflect the modelling approach's versatility in modelling capitalist systems and institutional configurations. The effect on wages, profits and dividends from labour market institutions indicate that labour's bargaining power is significant but that the factors informing the wage claim also matter. Moreover, the effect from demand for labour and economic activity is crucial for employment and, consequently, labour's bargaining position. The results that real wages and wage shares are increasing with bargaining power are uncontroversial (cf. Nickell, 1997), but the heterogeneity observed across different bargaining strategies suggests that labour market institutions do not necessarily *only* extract monopoly rents. Although labour market institutions facilitate the formation of wages and play a significant role in that outcome *nominal* wages, real wages and wage shares rely more on firms' pricing policy.

Whilst greater bargaining power among workers is positively associated with higher real wages and a greater share of income to labour, the effect on unemployment is ambiguous. The result from the simulations suggests that labour market institutions, even specific to employment such as employment protection legislation, play a minor role and that aggregate demand rule the roost. The computational method employed here demonstrate that feedback effects lead to different dynamics under different institutional set-ups and within the same set-up if behaviour is altered. This means that the system is *not* self-adjusting to some state of equilibrium, but rather spiralling in one or another direction which can end in crisis or steady-state (or steady fluctuations). The findings are supportive for stronger labour market institutions and greater bargaining power to labour, but also shows that

market power (by which firms determine price mark-ups) are an important aspect of labour market policies. This research, therefore, follows the previous literature on the concentration of market power amongst firms under the capitalist mode of production (Kalecki, 1938; Baran and Sweezy, 1978; Steindl, 1979). The issue of market power has been picked up among mainstream authors recently as well (see De Loecker et al., 2020; Eeckhout, 2021).

The model provides a basis for further research that can account for the developments of capitalism, i.e. New Capitalism and implications from different institutional configurations. This model provided a simulation environment in which different wage formations could be analysed. Hence, the framework is adept for qualitative analysis of the institutional features via alterations of labour market institution parameters such as bargaining power and different institutional configurations. The results illustrate how institutions can be integrated and become a more fundamental part of macroeconomics. However, it also indicates that the underlying economic system has a greater impact than the institutions. Thus, institutions are best served when considered mediators and cannot alter the laws of motion of the system.

The institutional configuration of New Capitalism includes a type of financialisation[11] in which there is a focus on maximising shareholder value by increasing the price of equities rather than expansion and generate greater revenue from 'real' activities such as sales of commodities (Aglietta, 2000). This entails that the return on equity (ROE) becomes increasingly important as an objective for the firm because shareholders have higher expectations of capital gains – from appreciation of share equity prices. The focus on institutions in the finance sector and labour market – independently and in conjunction – in research under the heading of New Capitalism suggest that there the implications from a finance-led regime on the income inequality and employment is complex (Amable et al., 2005).

The financial aspect will therefore have to be incorporated into this framework to analyse the financial aspects independently, but also interdependently with

---

[11]For a survey of 'financialisation' and the different aspects see van der Zwan (2014).

labour market institutions. Such an investigation of multiple institutional features and the institutional configuration overall draws on the notion of institutional complementarity and resemble the dichotomy set out by Hall and Soskice (2001a) of the market-based (in the Liberal Market Economy) and bank-based (in the Coordinated Market Economy). The former reflects a short-term perspective and its compatibility with decentralised labour markets which has a high degree of flexibility; and latter, reflects patient capital and a long-term perspective that favours specific-skill training and centralised labour market institutions to complement firms' long-term strategy. This delineation is misleading in terms of firms' financing of production but do represents different aspects of the financial system overall and institutional complementarities.

The compatibility among institutions within economic systems are explained by the concept of institutional complementarity which mean that institutions do not influence the outcome one at a time, but jointly (Amable, 2003, pp. 54-56). The *finance-led regime of accumulation* and focus on shareholder value relies on flexible employment relations and decentralised wage bargaining because the high mobility and short-term perspective of finance require firms to adapt to its changing circumstances from the financial market (Darcillon, 2015). Empirical investigations of the relation between financialisation and labour market institutions suggest that deregulation of finance – an increase in finance-led accumulation or maximisation of shareholder value – is positively correlated with more flexible employment relations and decentralised wage bargaining (Darcillon, 2015). Under *finance-dominated capitalism*, stagnating economic performance has been identified in several OECD countries in which greater labour market flexibility, financial deregulation and growing inequality and welfare retrenchment are common denominators (Pariboni et al., 2020). A study of financialisation and the labour market with a focus on working time and employment in France indicate that a failure to reduce working time sufficiently or increase labour compensation since mid-1980s allowed the profit share to increase without associated rises in the rate of investment (Husson, 2015). Based on the current literature, it will be useful to alter the institutional configuration as

well as the qualitative features of implemented institutions to enable further analysis and investigation of the institutional complementarity between labour market institutions and financial institutions. This is line of research questions is the focus for later work.

Appendix A

Model equations

This is an appendix including all equations of the model in chapter 5. The agents of the model are split by households (N), firms (NF), banks (B), the central bank (CB) and the government (gov). There are 8,000 households, 100 firms and 10 banks, and the model runs for 500 periods, a period signifies a month and 100 Monte Carlo simulations are run. Firms, banks and households are signified by j, b and i, respectively.

A.1 Firms' production decisions

Firms revise their expectations of sales in period t, eq. 5.2, based on sales and expected sales in period $t-1$. Eq. 5.3 show the long-term inventories-to-sales ratio target (σ^T), i.e. the buffer stock, firms set based on a fixed (exogenous) parameter (σ_0) and the interest rate on loans adjusted by parameter (σ_1). The buffer stock determines the target inventory stock (eq. 5.4) based on sales expectation, or the long-term inventory target. Firms slowly adjust to the long-term inventory stock target in planned production (eq. 5.6) through the expected short-term inventory stock and inventory stock from the last period (eq. 5.5). Firms produce commodities using labour, and the productivity of labour depends on entrepreneurs' choice of production technique (eq. 5.8). It is assumed that firms operate with a first-in first-out policy, so that commodities held in inventory from previous periods are

sold first. Government demand for firms' commodities is equally distributed among firms (eq. 5.1) where $govExp$ is constant and exogenous. Eq. 5.7 show the growth rate of labour productivity at each firm which depends on the actual production and market share in the last period. This means that labour productivity follows a principle of increasing returns, but this is policed by an exogenous parameter, ξ. The dot over the variable $\dot{y}$ indicate the growth rate ($\dot{y}_{j,t} = \frac{y_{j,t} - y_{j,t-1}}{y_{j,t-1}}$).

$$g_{j,t}^D = \frac{govExp}{NF} \tag{5.1}$$

$$s_{j,t}^e = \beta s_{j,t-1} + (1-\beta)s_{j,t-1}^e + g_{j,t-1}^D \tag{5.2}$$

$$\sigma_{j,t}^T = \sigma_0 - \sigma_1 r_{b,t-1}^l \tag{5.3}$$

$$inv_{j,t}^T = \sigma_{j,t}^T s_{j,t}^e \tag{5.4}$$

$$inv_{j,t}^e = inv_{j,t-1} + \gamma(inv_{j,t}^T - inv_{j,t-1}) \tag{5.5}$$

$$y_{j,t}^e = s_{j,t}^e + inv_{j,t}^e - inv_{j,t-1} \tag{5.6}$$

$$x_{j,t} = x_{j,t-1} + (\xi \dot{y}_{j,t-1}) \tag{5.7}$$

$$y_{j,t} = n_{j,t} x_{j,t-1} \tag{5.8}$$

A.2 Firms' demand for labour

Firms' planned production determines required labour for the period t (eq. 5.9), The required labour by firms rounds up because hired labour from households is standardised to units and households do not offer partial labour units[1]. Firms' demand for new labour in period t depends on the labour employed in period $t-1$ (eq. 5.10). Hence, new vacancies are the difference between required labour and current employed labour. If this difference becomes negative, firms have an excess of employed labour and will fire workers to equalise $n_{j,t}^T$ and $n_{j,t-1}$. θ_t and e_t are the labour market tightness and employment rate, eq. 5.12 and 5.13, respectively. Actual labour employed depends on the available pool of unemployed workers and firms' demand for new labour (eq. 5.11). ubi_t in eq. 5.14 is unemployment benefits

---

[1]This is a simplifying assumption and obviously a correct depiction of labour being employed for working hours.

and is adjusted by inflation and the growth rate of labour compensation (actual paid nominal wage). The total cost to the government from unemployment benefits depends on the proportion of unemployed households (eq. 5.15.

$$n_{j,t}^T = \frac{y_{j,t}^e}{x_{j,t-1}} \tag{5.9}$$

$$n_{j,t}^D = n_{j,t}^T - n_{j,t-1} \tag{5.10}$$

$$n_{j,t} = \min(\sum_{i \in N}(unemp_i), n_{j,t}^D) \tag{5.11}$$

$$\theta_t = \frac{(n_{j,t}^D - n_{j,t-1})}{N} \tag{5.12}$$

$$e_t = \frac{n_{j,t}}{N} \tag{5.13}$$

$$ubi_t = (1 + \chi\pi_{t-1} + (1-\chi)lcg_{t-1})minW \tag{5.14}$$

$$ubiBill_t = ubi_t(N(1-e_t)) \tag{5.15}$$

A.3 Wage formation

Employment rent (eq. 5.16) is the difference between wages (paid) and the current level of unemployment benefits adjusted by the expected period of unemployment. ω_W which is an exogenous parameter which is constant throughout the simulation of the model. Workers' desired wage growth is determined by the bargaining power of labour and macroeconomic variables, denoted by BS representing $\dot{x}, \dot{r} and \dot{lev}$, productivity growth, profit rate growth and leverage growth, respectively (eq. 5.17). Workers' reservation wage (eq. 5.18) is the wage they will be paid if employed in the period, otherwise workers reduce their reservation wage according to their time in unemployment.

$$ER_i = (w_{i,t-1} - ubi_t)\overline{unempPeriod} \tag{5.16}$$

$$\dot{w}_{i,t} = \begin{cases} \omega_W(BS_{t-1} + \pi_{t-1}) - (1-\omega_W)\frac{ER_{i,t-1}}{w_{i,t-1}}, & \text{if } unemp_i = 0 \\ -FN_i, & unempPeriod_{i,t-1} > 2 \end{cases} \tag{5.17}$$

$$w_{i,t} = w_{i,t-1}(1 + \dot{w}_{i,t}) \tag{5.18}$$

A.4 Price formation

Firms base prices (eq. 5.26) on normal historical unit costs (eq. 5.25) and a price mark-up (eq. 5.23). Normal historical unit costs are based on normal unit costs, inventories-to-sales ratio target and the interest rate on loans (eq. 5.24). The mark-up is determined by the entrepreneurial profit target (eq. 5.19) and expected historical costs (eq. 5.21), where $\sigma_{j,t}^e$ is the expected opening inventories-to-sales ratio (eq. 5.20). Firms cannot know the inventories-to-sales ratio until the end of the period, $inv_{j,t}/s_{j,t}$, and must therefore base their decision on expected sales. The expected entrepreneurial profits illustrate the required profit needed to cover dividends based on previous realised entrepreneurial profits, $fdf_{j,t}$, new loans (financing) and outstanding credit from previous financing less the value of inventory stock held from the last period. Thus, the pricing formation is not driven by profit *maximising* behaviour but profit *generating* behaviour. From eq. 5.19, firms that build up inventory stock or see their unit costs increase – due to a decreasing market share or reducing production – reduce their expected entrepreneurial profits and consequently their mark-up target (eq. 5.22). Price inflation (eq. 5.27) is calculated from the average price weighted by market share.

$$ff_{j,t}^T = \psi_U wb_{j,t} + r_{j,t-1}^l(lf_{j,t} - [inv_{j,t-1}uc_{j,t-1}]) + fdf_{j,t} \tag{5.19}$$

$$\sigma_{j,t}^e = \frac{inv_{j,t-1}}{s_{j,t}^e} \tag{5.20}$$

$$hc_{j,t}^e = (1 - \sigma_{j,t}^e)s_{j,t}^e uc_{j,t} + \sigma_{j,t}^e(1 + r_{j,t-1}^l)s_{j,t}^e uc_{j,t-1} \tag{5.21}$$

$$mup_{j,t}^T = \frac{ff_{j,t}^T}{hc_{j,t}^e} \tag{5.22}$$

$$mup_{j,t} = mup_{j,t-1} + \beta(mup_{j,t}^T - mup_{j,t-1}) \tag{5.23}$$

$$nuc_{j,t} = \frac{(wb_{j,t}/n_{j,t})}{x_{j,t-1}} \tag{5.24}$$

$$nhuc_{j,t} = (1 - \sigma_{j,t}^T)nuc_{j,t} + \sigma_{j,t}^T(1 + r_{j,t-1}^l nuc_{j,t-1}) \tag{5.25}$$

$$p_{j,t} = (1 + mup_{j,t})nhuc_{j,t} \tag{5.26}$$

$$\pi_t = \frac{\bar{p}_t - \bar{p}_{t-1}}{\bar{p}_{t-1}} \tag{5.27}$$

A.5 Commodity market

Firms sell commodities to households and the government (eq. 5.28), households and firms interact first, and the government purchases unsold commodities after. Households choose their supplier of commodities based on the lowest price. Since households do not change supplier within a period, households' demand for commodities can be frustrated and firms can end up with inventory stocks higher than anticipated despite excess effective demand because government demand is not 'transferable'. The nominal value of sales (eq. 5.29) reflects real sales and prices. The nominal value of household consumption, C, and government consumption, G, is the real consumption, c and g, respectively multiplied with the price of the chosen firm. There is no effective demand constraint for government demand (eq. 5.30), but there is for households – their budget constraint depends on cash and checking account holdings – so households demand for commodities may be higher than their effective demand (eq. 5.31) and 5.33). Depending on households' expected income (eq. 5.32) and wealth allocation, $cDemand_{i,t} \leq c_{i,t}$, the converse may also be true.

$$s_{j,t} = c_{i,t} + g_t \tag{5.28}$$

$$S_{j,t} = p_{j,t}s_{j,t} = C_{i,t} + G_t = c_{i,t}p_{j,t} + g_t p_{j,t} \tag{5.29}$$

$$g_t = \min(g_{j,t}^D, inv_{j,t-1} + y_{j,t} - c_{i,t}) \tag{5.30}$$

$$cDemand_{i,t} = \alpha_1 \frac{yd_{i,t}^e}{p_{j,t}} + \alpha_2 \frac{hh_{i,t-1}}{p_{j,t}} + \alpha_3 \frac{m_{i,t-1}^{1h}}{p_{j,t}} + \alpha_4 \frac{m_{i,t-1}^{2h}}{p_{j,t}} \\ + \alpha_5 \frac{BL_{i,t-1}}{p_{j,t}} + \alpha_6 \frac{ehr_{i,t-1}}{p_{j,t}} \tag{5.31}$$

$$yd_{i,t}^e = yd_{i,t-1}^e + \beta(yd_{i,t-1} - yd_{i,t-1}^e) \tag{5.32}$$

$$c_{i,t} = \min(cDemand_{i,t}, \frac{(m_{i,t-1}^{1h} + hh_{i,t-1})}{p_{j,t}}) \tag{5.33}$$

A.6 Credit Market

Firms financing production with new credit and a portion of liquid capital (eq. 5.36). Firms borrow to cover current costs of production (i.e. the wage bill) and administrative costs due from the previous period (i.e. dividends to shareholders

and profit taxes). The simplifying assumption that banks are accommodative is made so that demand for loans equal supply of loans (eq. 5.37). Firms pay out a proportion of last period's profits less tax on business income (eq. 5.34) and issued equity shares (eq. 5.42). The return on equity (RoE), re, is based on dividends paid out in period t calculated from profits in period $t-1$, hence the equity shares issued, esr, and price of equity, pe, in period $t-1$ is used. The amount of equity shares issued is fixed, meaning that firms do not raise new funds via new equity releases, and set exogenously[2]. Firms' loans continuously rollover (eq. 5.38) and pay interest (eq. 5.40) and principal (eq. 5.39) on the total amount of outstanding loans. Banks' amount outstanding loans may change because firms change bank and refinance their outstanding loans and new demand for credit (eq. 5.41). Firms' leverage ratio indicates the firms' exposure to debt compared to its equity (equity shares issued and liquid capital) (eq. 5.43). Firms' valuation ratio – the Tobin's q or Kaldor's valuation ratio – market value of capital over the capital's replacement cost (eq. 5.44).

$$fdf_{j,t} = \psi_D ff_{j,t-1}(1 - \tau_{t-1}^Y) \tag{5.34}$$

$$re_{j,t} = \frac{fdf_{j,t}}{esr_{j,t-1}pe_{j,t-1}} \tag{5.35}$$

$$lf_{j,t}^D = wb_{j,t} + fdf_{j,t} + ff_{j,t-1}\tau_{t-1}^Y - OCF_{j,t-1} \tag{5.36}$$

$$lf_{b,t}^S = lf_{j,t}^D \tag{5.37}$$

$$lf_{j,t} = lf_{j,t-1} + lf_{b,t}^S \tag{5.38}$$

$$Principal\,Repayment f_{j,t} = lf_{j,t}\Big(\frac{1}{Amortization\,Periods}\Big) \tag{5.39}$$

$$Interest\,Repayment f_{j,t} = lf_{j,t}r_{b,t-1}^l \tag{5.40}$$

$$lb_{b,t} = lb_{b,t-1} + lf_{b,t}^S - Loan\,Repayment_{j,t} \tag{5.41}$$

$$esr_{j,t} = esr \tag{5.42}$$

---

[2]This is a simplifying assumption since a continuous flow of new equity shares will dilute the price of shares unless the flow of accumulated wealth of households are greater. In reality, firms are careful not to "flood" the market with new shares, and new issues or consolidation of shares are part of strategic decisions, such as mergers and acquisitions, debt-restructuring and large expansions.

$$lev_{j,t} = \frac{lf_{j,t}}{lf_{j,t} + efr_{j,t} + m_{j,t}^{1f}} \tag{5.43}$$

$$q_{j,t} = \frac{(efr_{j,t} + lf_{j,t})}{INV_{j,t}} \tag{5.44}$$

A.7 Worker compensation

Employed workers receive a wage, which is equal to their reservation wage or wage claim (eq. 5.45). These employed workers are employed by firms which is captured in the *unemp* variable (0 for unemployed and $0 \le$ for employed). Unemployed workers receive unemployment benefits, *ubi*. Firms' total wage bill (eq. 5.46) is determined by the demand for labour (from firms' output decisions) and workers' wage. Households' gross income (eq. 5.47) include paid wages, yHw, interest received on savings, r^{m2}, dividends paid by firms (weighted by wealth), fdf, and banks and government bond coupon payment, BL. It is assumed that banks pay out all profits in dividends and that households own an equal share in all banks. The wealth weighting reflects household's ownership of equity shares issued by firms. Disposable income (eq. 5.48) is gross income less income taxes paid to the government. The tax is a flat tax on all income streams including government bond coupons.

$$yHw_{i,t} = \begin{cases} ubi_t, & \text{if } unemp_i = 0 \\ w_{i,t}, & unemp_i = 1 \end{cases} \tag{5.45}$$

$$wb_{j,t} = n_{j,t}w_{i,t} \text{if } unemp_i = 1 \tag{5.46}$$

$$yp_{i,t} = yHw_{i,t} + r_{b,t-1}^{m2}m_{i,t-1}^{2h} + wealthDist_i fdf_{j,t}$$
$$+ \frac{fb_{b,t}}{N} + BL_{i,t-1} \tag{5.47}$$

$$yd_{i,t} = yp_{i,t}(1 - \tau_{t-1}^Y) \tag{5.48}$$

A.8 Loan repayments and interest

Firms' actual loans (eq. 5.49) and interest (eq. 5.50) repayments depend on the available means of firms. Since interest payment on loans is the main source of banks' profits, interest on loans is received in full by households which spend part of banks' profits in the next period. Hence, interest payments are returned to firms via consumption. Firms that fails to service their debt-commitments default giving rise to losses – 'loss given default' (LGD) shown in eq. 5.52 – that are absorbed by the government (see eq. 5.78). Eq. 5.51 shows the threshold for when firms default on their outstanding debts.

$$
LoanRepayment_{j,t} = \min(PrincipalRepaymentf_{j,t}, m_{j,t-1}^{1f} + lf_{j,t} + S_{j,t}
$$
$$
- lf_{j,t-1}r_{b,t-1}^{l}) \tag{5.49}
$$

$$
InterestRepayment_{j,t} = \min(lf_{j,t-1}r_{b,t-1}^{l}, m_{j,t-1}^{1f} + lf_{j,t} + S_{j,t}) \tag{5.50}
$$

$$
defaultF_{j,t} = \begin{cases} 1, & \text{if } PrincipalRepaymentf_{j,t} < LoanRepayment_{j,t} \\ \text{else } 0 \end{cases}
$$
$$
\tag{5.51}
$$

$$
LGD_{b,t} = lf_{j,t}defaultF_{j,t} \tag{5.52}
$$

A.9 Inventories and profits

Firms' unsold commodities and previous inventory stock (eq. 5.53) and the actual unit cost of current produced commodities (eq. 5.54) make up the nominal value of the current inventory stock (eq. 5.55). The nominal value of inventory changes from the previous period is added to nominal sales value less production costs and interest payments made on outstanding loans – entrepreneurial profits (eq. 5.56). Firms' net entrepreneurial profits (entrepreneurial profits less taxes) are given in eq. 5.57). Firms' total business profits and operating cash flow are calculated in eq. 5.58 and eq. 5.59. Firms has a checking account for receipts and expenditures in which $\triangle efr_{j,t}$ is new raised financial capital from new equity shares issued (eq.

5.60)[3]. Total business profits are used to calculate the profit share of income (eq. 5.62). The profit rate is based on the entrepreneurial profits over sales (eq. 5.61). Banks earn profits from interest payments on loans, treasury bills and reserves held less interest paid to households and firms, it is assumed that firms do not have a savings account, and advances demanded from the central bank (eq. 5.63). The central bank profits are the difference between interest payment on treasury bills and advances and reserves (eq. 5.64).

$$inv_{j,t} = inv_{j,t-1} + (y_{j,t} - s_{j,t}) \tag{5.53}$$

$$uc_{j,t} = \frac{wb_{j,t}}{y_{j,t}} \tag{5.54}$$

$$INV_{j,t} = inv_{j,t}uc_{j,t} \tag{5.55}$$

$$ff_{j,t} = S_{j,t} - wb_{j,t} + \triangle INV_{j,t} - InterestRepayment_{j,t} + r_{b,t-1}^{m2}m_{j,t-1}^{2f} \tag{5.56}$$

$$nff_{j,t} = ff_{j,t}(1 - \tau_{t-1}^{Y}) \tag{5.57}$$

$$fft_{j,t} = S_{j,t} - wb_{j,t} + \triangle INV_{j,t} \tag{5.58}$$

$$OCF_{j,t} = nff_{j,t} - \triangle INV_{j,t} - LoanRepayment_{j,t} \tag{5.59}$$

$$m_{j,t}^{1f} = S_{j,t} + lf_{b,t}^{S} - wb_{j,t} - InterestRepayment_{j,t} - LoanRepayment_{j,t} +$$
$$\triangle efr_{j,t} + r_{b,t-1}^{m2}m_{j,t-1}^{2f}$$
$$\tag{5.60}$$

$$r_{j,t} = \frac{ff_{j,t}}{S_{j,t}} \tag{5.61}$$

---

[3]Due to the abovementioned assumption of a fixed amount of equity shares, $\triangle efr$ is zero. Its inclusion is still important because if the assumption were to be dropped, then this will have consequences for the firms' capital structure and funding.

$$fs_{j,t} = \frac{fft_{j,t}}{S_{j,t}} \tag{5.62}$$

$$fb_{b,t} = InterestRepayment_{j,t-1} + r^b_{t-1}bb^D_{b,t-1} - r^a_{t-1}Adv^D_{b,t-1}$$

$$- m^{2f}_{j,t-1}r^{m2}_{b,t-1} - m^{2h}_{i,t-1}r^{m2}_{b,t-1} \tag{5.63}$$

$$r^h_{t-1}(hb^D_{b,t-1} + hb^{*D}_{b,t-1})$$

$$fcb_t = r^b_{t-1}bcb^S_{t-1} + r^a_{t-1}Adv^S_{t-1} - r^h_{t-1}hb^S_{t-1} + hb^{*S}_{t-1} \tag{5.64}$$

A.10 Household wealth and portfolio allocation

Households' portfolio allocation is set out in eqs. 5.66-5.69, however, in the simulated model eq. 5.79 is used instead of eq. 5.66. Notice that the return on equity shares is not for individual firms but the firm sector overall, this simplification can be interpreted as an index fund consisting of all equity shares (eq. 5.69). The RoE is calculated as in eq. 5.35 but aggregated, see eq. 5.107 below. The distribution of shares in this fund depends on the wealth distribution (eq. 5.64). Households capital gains from equity shares and price increases on long-term government bonds (eq. 5.74) and the nominal value of held equity shares (eq. 5.71) therefore use the aggregate amount of equity shares issued. Once firms issue equity shares, financial capital is raised (eq. 5.70) from households (i.e. investors), but firms do not reap additional benefits from capital gains, besides its impact on their financial ratios. Households net wealth (eq. 5.75), gross wealth (eq. 5.77) and investible wealth (eq. 5.78) are all equal except for the households' demand for cash (eq. 5.76) is subtracted from their investible wealth. $equityLoss_{i,t}$ refers to the loss which materialises when a firm goes bankrupt and consequently, the associated equity shares become worthless. This loss account for the nominal value obtained from the previous period, i.e. $(esr_{j,t-1}pe_{j,t-1})WealthDist_i$, which become worthless during the current period due to the occurrence of a bankruptcy[4].

---

[4]This feature is important in terms of the sequential aspect of the model because it allows the model to circumvent the challenge of integrating multiple overlapping periods, in sense that one period starts before another begins, whilst retaining key aspect, such as a bankruptcy and its effect

$$wealthDist_i = \frac{vfma_{i,t-1}}{\sum_{i=\in N} vfma_{i,t-1}} \tag{5.65}$$

$$m_{i,t}^{1h} = \lambda_{10}vfma_{i,t-1} + \lambda_{11}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{12}r_{b,t-1}^{m2}vfma_{i,t-1} +$$
$$\lambda_{13}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{14}re_{t-1}vfma_{i,t-1} + \lambda_{15}yd_{i,t-1} \tag{5.66}$$

$$m_{i,t}^{2h} = \lambda_{20}vfma_{i,t-1} + \lambda_{21}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{22}r_{b,t-1}^{m2}vfma_{i,t-1} +$$
$$\lambda_{23}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{24}re_{t-1}vfma_{i,t-1} + \lambda_{25}yd_{i,t-1} \tag{5.67}$$

$$\frac{BL_{i,t}}{pbl_t} = (\lambda_{30}vfma_{i,t-1} + \lambda_{31}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{32}r_{b,t-1}^{m2}vfma_{i,t-1} +$$
$$\lambda_{33}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{34}re_{t-1}vfma_{i,t-1} + \lambda_{35}yd_{i,t-1}) \tag{5.68}$$

$$\frac{pe_t}{esr_{j,t}} = \lambda_{40}vfma_{i,t-1} + \lambda_{41}r_{b,t-1}^{m1}vfma_{i,t-1}$$
$$+ \lambda_{42}r_{b,t-1}^{m2}vfma_{i,t-1} + \lambda_{43}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{44}re_{t-1}vfma_{i,t-1}$$
$$+ \lambda_{45}yd_{i,t-1} \tag{5.69}$$

$$\triangle\, ehr_i = (esr_{j,t-1} \triangle pe_t)wealthWeight_i \tag{5.70}$$

$$ehr_{i,t} = esr_{j,t}pe_t wealthWeight_i \tag{5.71}$$

$$\triangle\, efr_{j,t} = (esr_{j,t} - esr_{j,t-1})pe_t \tag{5.72}$$

$$efr_{j,t} = esr_{j,t}pe_t \tag{5.73}$$

$$CG_{i,t} = \triangle\, ehr_{i,t} + (pbl_t - pbl_{t-1})BL_{i,t-1} \tag{5.74}$$

$$nvh_{i,t} = nvh_{i,t-1} + yd_{i,t} + CG_{i,t} - C_{i,t} - equityLoss_{i,t} \tag{5.75}$$

$$hh_{i,t} = \lambda_C C_{i,t} \tag{5.76}$$

$$vh_{i,t} = nvh_{i,t} \tag{5.77}$$

$$vfma_{i,t} = vh_{i,t} - hh_{i,t} \tag{5.78}$$

$$m_{i,t}^{1h} = vfma_{i,t} - m_{i,t}^{2h} - pbl_t BL_{i,t} - pe_t esr_{j,t}wealthWeight_i \tag{5.79}$$

in the period.

184

A.11 Government finances

Government issue treasury bills (eq. 5.83) based on previous issued treasury bills and Public Sector Borrowing Requirement ($PSBR$). $PSBR$ is summation of government purchases from firms, G, interest due on existing bills, r^b, coupon payments due from government bonds BL^S less profits from the central bank, fcb, tax revenue from household income, yHw, and firms' profits, ff, determined by the tax rate, τ^Y; in addition, the cost of unemployment benefits, $N|_{unemp=0}\, ubi$, and banks' loss given default, LGD, is added to $PBSR$ (eq. 5.80). The loss given default – outstanding loans at the time of bankruptcy – is absorbed by the government by assumption. This is a parsimonious assumption and prevents banks' risk of bankruptcy since the loss is recorded on the public's balance sheet rather than the individual[5]. $PSBR$ is the public deficit, and the government debt – government bills and government bonds in nominal terms (eq. 5.81) – plus the net worth of firms will balance households' net worth or the public sector debt equals the private sector net worth. The government supply long-term bonds on demand (eq. 5.84); banks supply deposits on demand (eq. 5.85). Banks' notional balance sheet (eq. 5.87) is composed of loans, deposits and reserves held due to deposits supplied (eq. 5.86). In order to balance the books, banks demand either treasury bills and additional reserves or advances from the government and central bank, respectively (eqs. 5.88, 5.89 and 5.90), where 5.89 are additional reserves; reserves, treasury bills and advances are supplied on demand (eqs. 5.91-5.94). The central bank facilitates the government finances by holding any excess supply of treasury bills (eq. 5.95). Cash supplied by the central must ensure that central bank assets and liabilities balance (eq. 5.96). The redundant equation is therefore cash demanded by households and cash supplied by the central

---

[5]As all profits are distributed to households, a sufficiently large loss to a bank would cause it to fail and the central bank would be expected to act – as a lender of last resort – which would require a government funded bail-out. Hence, this assumption should not be controversial except on the grounds that it is technically incorrect or neglects aspects such as reputational risk, solvency risk among banks in the inter-bank market and a banking crisis spreading to the real economy. However, these aspects are beyond the scope of the model, albeit still compatible with its core structure.

bank (eq. 5.112).

$$PSBR_t = G_t + r_{t-1}^b B_{t-1} + BL_{t-1}^S - fcb_t - (yp_{i,t}\tau_{t-1}^Y)$$
$$- (ff_{j,t-1}\tau_{t-2}^Y) - (m_{i,t}^{1h}\tau_{t-1}^W) - (m_{i,t}^{2h}\tau_{t-1}^W) \tag{5.80}$$
$$+ LGD_{b,t} + ubiBill_t$$

$$GovDebt_t = nvh_{i,t} - INV_{j,t} + (INV_{j,t} + m_{j,t}^{1f} - lf_{j,t} - efr_{j,t})$$
$$= B_t + BL_t^S pbl_t \tag{5.81}$$

$$pbl_t = \frac{1}{r_t^{bl}} \tag{5.82}$$

$$B_t = B_{t-1} + PSBR_t - (BL_t^S - BL_{t-1}^S)pbl_t \tag{5.83}$$

$$BL_t^S = BL_{i,t} \tag{5.84}$$

$$mb_{b,t} = m_{i,t}^{1h} + m_{i,t}^{2h} + m_{j,t}^{1f} + m_{j,t}^{2f} \tag{5.85}$$

$$hb_{b,t}^D = \rho mb_{b,t} \tag{5.86}$$

$$Bbdn_{b,t} = mb_{b,t} - lb_{b,t} - hb_{b,t}^D \tag{5.87}$$

$$bb_{b,t}^D = Bbdn_{b,t}\varsigma, \text{if } Bbdn_{b,t} > 0 \text{ else } bb_{b,t}^D = 0 \tag{5.88}$$

$$bb_{b,t}^{*D} = -Bbdn_{b,t}(1-\varsigma), \text{if } Bbdn_{b,t} < 0 \text{ else } bb_{b,t}^{*D} = 0 \tag{5.89}$$

$$Adv_{b,t}^D = -Bbdn_{b,t}, \text{if } Bbdn_{b,t} \leq 0 \text{ else } Adv_{b,t}^D = 0 \tag{5.90}$$

$$Adv_t^S = \sum_{b=\in NB} Adv_{b,t}^D \tag{5.91}$$

$$hb_t^S = \sum_{b=\in NB} hb_{b,t}^D \tag{5.92}$$

$$hb_t^{*S} = \sum_{b=\in NB} hb_{b,t}^{*D} \tag{5.93}$$

$$bb_t^S = \sum_{b=\in NB} bb_{b,t}^D \tag{5.94}$$

$$bcb_t^S = B_t - bb_t^S \tag{5.95}$$

$$hs_t = bcb_t^S + Adv_t^S - (hb_t^S + hb_t^{*S}) \tag{5.96}$$

A.12 Interest rates

The government adjusts the mark-up on treasury bills from the proportion of treasury bills held by commercial banks (eqs. 5.97 and 5.98). The adjustment parameter of the mark-up of bills, mub_1, is set to zero in the model, so that the mark-up is constant. Banks' liquidity ratio, BLR, (eq. 5.99) determines if the mark-up on interest paid on saving accounts is adjusted up or down (eq. 5.100). This adjustment depends on the BLR and if it is greater than or less than the threshold, top and bot, respectively. If BLR is in between bot and top, then the mark-up remains unchanged. The mechanism therefore states that on one hand, banks with a liquidity ratio below some threshold will increase the mark-up to increase the interest paid on deposits (i.e. savings in the model) and thereby improve their competitiveness in the deposit market; on the other hand, banks with a liquidity ratio above some threshold will reduce their mark-up in order to improve liquidity ratio by paying less interest on deposits. This mechanism reflects the liabilities (by form of savings held with the bank) and additional assets required by the bank, i.e. government bills, due to a "shortage" of loans (assets) on their balance sheet. The adjustment parameter, FN^B, of banks' mark-up follows a folded normal distribution 0, 0.0094. The mark-up on interest charged on loans depends on firms' leverage ratio and market share (eq. 5.101)[6]. The return on equity shares depends on dividends, i.e. entrepreneurial profits, and the market value of issued equity shares (eq. 5.106). Interest rates are adjusted by mark-ups, advances and reserves are held constant, r^* is the policy rate (eqs. 5.102-5.106). National income is summarised in eq. 5.108. Eq. 5.109 reflect the rule from which the government revise the tax rate on income with the purpose of balance the budget. def_1, def_0 and rev_0 are exogenous parameters representing trigger points for fiscal policy and the adjustment respectively. The tax rate moves according to the revision made due to the fiscal policy rule (eq. 5.110 and 5.111). The tax rates are not revised in the actual model simulation, but this mechanism is included to enable the possibility for government policy scenarios aimed at balancing

---

[6]In the model, there is no mark-up on loans – this is a simplifying assumption adopted – to downplay effects from the financial sector. The interest rate is also restricted to not exceed the interest rate charged on loans. The assumption adopted for the interest rate on loans can be dropped in future work on bringing the finance sector more into play in the model.

the budget or keeping the budget within some range of national income. This can also be supplemented with revisions of *ubi* or government expenditure. Eq. 5.112 is the redundant equation, i.e. both sides of the equation has already been determined in the model, which shows that the model is consistent. This equation is only used to check the consistency of the model since its inclusion would mean that the model is overdetermined.

$$bpr_t = \frac{bb_t^S}{B_t} \tag{5.97}$$

$$mub_t = mub_0 + mub_1(bpr_t - bpr_{t-1}) \tag{5.98}$$

$$BLR_{b,t} = \frac{bb_{b,t}^D}{mb_{b,t}} \tag{5.99}$$

$$mum_{b,t} = \begin{cases} mum_{b,t-1}(1 + FN_{b,t}^B), & \text{if } BLR_{b,t} < bot \\ \\ mum_{b,t-1}(1 - FN_{b,t}^B), & \text{if } BLR_{b,t} > top \end{cases} \tag{5.100}$$

$$mul_{b,t} = mul_0 + mul_1(lev_{j,t}mkt_{j,t}) \tag{5.101}$$

$$r_t^b = r_t^* + mub_t \tag{5.102}$$

$$r_t^a = r_t^* + mua_t \tag{5.103}$$

$$r_t^h = r_t^* + muh_t \tag{5.104}$$

$$r_{b,t}^l = r_t^* + mul_{b,t} \tag{5.105}$$

$$r_{b,t}^m = r_t^* + mum_{b,t} = r_{b,t}^{m1} = r_{b,t}^{m2} \tag{5.106}$$

$$re_{j,t} = \frac{fdf_{j,t}}{(esr_{j,t}pe_t)} \tag{5.107}$$

$$Y_t = C_{i,t} + G_t + (INV_{j,t} - INV_{j,t-1}) - ([uc_{j,t} - uc_{j,t-1}]inv_{j,t}) \tag{5.108}$$

$$rev_t = \begin{cases} rev_{t-1}(1 + rev_0), & \text{if } \frac{GovDef_t}{Y_t} > def_1 \text{ or } \left(\frac{GovDebt_t}{Y_t} - \frac{GovDebt_{t-1}}{Y_{t-1}}\right) > 0 \\ \\ rev_{t-1}(1 - rev_0), & \text{if } \frac{GovDef_t}{Y_t} < def_1 \text{ or } \left(\frac{GovDebt_t}{Y_t} - \frac{GovDebt_{t-1}}{Y_{t-1}}\right) \leq 0 \end{cases}$$
$$\tag{5.109}$$

$$\tau_t^Y = \tau_{t-1}^Y + rev_t \tag{5.110}$$

$$\tau_t^W = \tau_{t-1}^W + rev_t \tag{5.111}$$

$$hh_{i,t} = hs_t \text{ [redundant equation]} \tag{5.112}$$

Appendix B

Model parameters

Table B.1: Model parameters

Symbol	Description	Baseline	Sensitivity
α_1	propensity to consume out of disposable income	0.75	same
α_2	propensity to consume out of wealth: cash	0.20	same
α_3	propensity to consume out of wealth: checking deposits	0.10	same
α_4	propensity to consume out of wealth: saving deposits	0.05	same
α_5	propensity to consume out of wealth: government bonds	0.01	same
α_6	propensity to consume out of wealth: firm equity	0.01	same
$amortPeriods$	amortization periods of bank loans	20	same
prL	labour productivity	2	same
r^*	monetary base rate	0.02	same
N	number of households	8000	same
NF	number of firms	100	same
NB	number of commercial banks	10	same
β	adaptive expectations	0.25	same
σ_0	constant target inventories-to-sales ratio	0.3612	same

Table B.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
σ_1	target inventories-to-sales ratio adjustment speed to nominal interest rates	3	same
γ	entrepreneurs' adjustment speed with respect to inventories	0.15	same
min_W	minimum wage	5	same
max_W	maximum wage	55	same
ω_W	nominal wage adjustment	0.50	0.25; 0.50; 0.75
χ	unemployment weight given to price inflation	0	same
EPL	'karens' period (firms unable to fire employees)	0	2
$turnover$	turnover rate of labour	0.05	same
ψ_D	firms' dividends rate	0.3	same
ψ_U	firms' desired rate of retained earnings from investment	0.6	same
ξ	coefficient for increasing returns to production	0.046	same
$parMatchingConsumption$	range of consumption goods seller households compare	2	same
$parMatchingLabour$	subsample of workers seeking employment	10	same
$govExpenditure$	government expenditure	2000	same
def_0	lower threshold for deficit-to-gdp ratio	0.02	same

Continued on the next page...

191

Table B.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
def_1	upper threshold for deficit-to-gdp ratio	0.05	same
rev_0	tax revision parameter	0.05	same
min_τ	floor on tax rate	0.05	same
max_τ	ceiling on tax rate	0.95	same
τ^Y	tax rate on income	0.35	same
τ^w	tax rate on wealth	0.0	same
ρ	reserve requirement for banks set by the central bank	0.08	same
ζ	share of notional bills held as bills by banks	0.5	same
top	top value of notional bank liquidity ratio	0.04	same
bot	bottom value of notional bank liquidity ratio	0.02	same
λ_C	households' cash to consumption ratio	0.18	same
λ_{10}	parameter in portfolio equation of checking deposits	0.35	same
λ_{11}	parameter in portfolio equation of checking deposits	0.40	same
λ_{12}	parameter in portfolio equation of checking deposits	-0.15	same
λ_{13}	parameter in portfolio equation of checking deposits	-0.10	same

Continued on the next page...

Table B.1: Model parameters (contd…)

Symbol	Description	Baseline	Sensitivity
λ_{14}	parameter in portfolio equation of checking deposits	-0.15	same
λ_{15}	parameter in portfolio equation of checking deposits	-0.10	same
λ_{20}	parameter in portfolio equation of saving deposits	0.25	same
λ_{21}	parameter in portfolio equation of saving deposits	-0.15	same
λ_{22}	parameter in portfolio equation of saving deposits	0.35	same
λ_{23}	parameter in portfolio equation of saving deposits	-0.15	same
λ_{24}	parameter in portfolio equation of saving deposits	-0.05	same
λ_{25}	parameter in portfolio equation of saving deposits	0.15	same
λ_{30}	parameter in portfolio equation of firms' equity securities	0.20	same
λ_{31}	parameter in portfolio equation of firms' equity securities	-0.10	same
λ_{32}	parameter in portfolio equation of firms' equity securities	-0.15	same
λ_{33}	parameter in portfolio equation of firms' equity securities	0.45	same
λ_{34}	parameter in portfolio equation of firms' equity securities	-0.20	same
λ_{35}	parameter in portfolio equation of firms' equity securities	0.05	same
λ_{40}	parameter in portfolio equation of government (long-term) bonds	0.20	same

Table B.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
λ_{41}	parameter in portfolio equation of government (long-term) bonds	-0.15	same
λ_{42}	parameter in portfolio equation of government (long-term) bonds	-0.05	same
λ_{43}	parameter in portfolio equation of government (long-term) bonds	-0.20	same
λ_{44}	parameter in portfolio equation of government (long-term) bonds	0.40	same
λ_{45}	parameter in portfolio equation of government (long-term) bonds	-0.10	same
FN_i	folded normal distribution (for households)	(0, 0.0094)	same
FN_b	folded normal distribution (for banks)	(0, 0.0094)	same
esr_j	number of equity securities issued	1000	same

Chapter 6

An agent based-stock flow consistent model of a finance-dominated economy

6.1 Introduction

The development of capitalism and the variegated form of capitalist economies is central to the research programme of economic theory and institutional economics. This focus is common to both Comparative Political Economy (see, for instance, Lazonick, 2010; Roberts and Kwon, 2017; Hay, 2020) and post-Keynesian economics (see Crotty, 2009; Setterfield and Kim, 2020; Toporowski, 2020b). This chapter focuses on the institutional configuration of New Capitalism[1] by developing an Agent Based-Stock Flow Consistent (AB-SFC) model to analyse the consequences on wages and employment from labour market institutions under a finance-dominated economic system. The transition from the Fordist era to New Capitalism reflects a development from a *wage society* to a *finance-dominated society*. This has altered the institutional hierarchy where labour market institutions no longer have the same implications on macroeconomic outcomes. The model developed focuses on three aspects of New Capitalism, a higher dividends rate and non-financial corporations' pur-

---

[1]The 'New Economy' and 'New Capitalism' will be used interchangeably.

chase of financial assets in addition to credit rationing by banks. Higher dividends rates and a greater share of financial investment in financial assets put pressure on firms' profit margins and undermines labour's bargaining position. Whilst labour market institutions are essential for facilitating wage bargaining and an important part of the institutional configuration under New Capitalism, financial institutions diminish their effect. The purpose of the model is to investigate firms' behaviour with regards to their balance sheet composition, production and distribution of income and wage bargaining outcomes under the financial nexus.

Under finance-dominated capitalism, non-financial corporations accumulate a greater share of financial assets on their balance sheets, and the firms' managers favour shareholder value maximisation over productive expansion. This is a divergence of funds away from labour-requiring activities. The developed model draws on theories from post-Keynesian (PK) economics, the Theory of the Monetary Circuit (TMC) and Régulation Theory (RT). The simulation results show that the institutional configuration under New Capitalism affects the wage share, real wages and employment when a larger proportion of profits are being distributed to shareholders rather than being re-invested. The wage share is negatively affected by a larger dividend rate, whilst the dividend-to-wage rate is positively affected, whilst the effect on employment is mixed across the wage bargaining strategies.

The model represents a complex socio-economic environment with a strong presence of circular cumulative causation (see Myrdal, 1978). The developed model addresses a gap in the literature by explicitly formalising how the bargaining power of labour is affected by mechanisms dominating New Capitalism. The model is demand-driven, and through its institutional forms, the supply-side is constrained to varying degrees mimicking the mechanism of New Capitalism. The model is closely related to earlier work in macroeconomic analysis of capitalist systems (Passarella, 2012; Caiani et al., 2016; Dosi, Pereira, Roventini and Virgillito, 2017, and references therein).

The model is applied to study the nexus of the labour market and credit market in the tradition of Michel Aglietta (1998), Augusto Graziani (2003) and

Andrew Glyn (2006)[2]. Their perspective differs as they focus on aspects of accumulation regime and institutional forms (Aglietta, 1998), the working of a monetary production economy and circulation of money capital (Graziani, 2003) and the implications for labour under long-term developments of capitalism (Glyn, 2006). These perspectives are synthesised in the presented model and economic analysis. There are three contributions to the research programme of economic theory and institutional economic analysis in this chapter: 1) how AB-SFC models can be used to analyse the role of institutions and the institutional effect on agents in a macroeconomic model, 2) how economic theory and institutional analysis can be combined to investigate aspects of New Capitalism, and 3) proposes a direct channel of how wage bargaining may be affected by institutional forms specific to a finance-led regime. Section 6.2 reviews finance-led or finance-dominated capitalism and relevant models applied to analyse the New Capitalism regime. In section 6.3, the AB-SFC model is presented, and the results are analysed in section 6.4. Section 6.5 concludes.

6.2 The economics of New Capitalism

The literature on the finance-led regime of accumulation tends to focus on aspects that often overlap with the *financialisation* research (Pariboni and Tridico, 2019; Fontana et al., 2019; Toporowski, 2020b). This study focuses on the implications of finance-dominated capitalism on the institutions and behaviour of non-financial corporations[3]. Thus, financialisation itself is not the focus and will therefore not be explored[4]. Key characteristics of New Capitalism are the maximisation of shareholder value via capital asset price inflation and distribution of profits (Lazonick and O'Sullivan, 2000; Aglietta, 2000), and a reduction of the bargaining power of labour leading to a lower share of income to labour as well as a new organisation

---

[2]Their research shares a common economic tradition found in Marx, Keynes and Kalecki, and to some extent in the Swedish tradition of Wicksell.

[3]This focus is part of a wider explanation given by Cordonnier et al. (2019, p. 407) that financialisation "refers to the increasing role of finance in shaping institutions, behaviours, and objectives of economic actors (households, nonfinancial and financial corporations, governments). Financialization is thus both a *process* and an *outcome*: it may refer to the institutional evolution of the financial system itself and/or to its consequences on the economic system".

[4]The interested reader is directed to Michell and Toporowski (2013), van der Zwan (2014) and Epstein (2019) for a focused discussion on financialisation.

of production (Dallery and van Treeck, 2011; Caiani et al., 2014). The capitalist development since the 1980s reflects a period of volatile and radical changes to the institutional configuration and economic structure (see Glyn, 2006). These changes in the finance sector and the transformation of the economy are particularly pertinent to consumption and investment (Magdoff and Sweezy, 1987; Bellofiore et al., 2010). This development has further commodified labour (Esping-Andersen, 1987; 1990) and increased the subsumption of labour to finance (Bellofiore and Halevi, 2010). The higher dividends rates mean an alteration to firms balance sheet as retained earnings is reduced so that expansion of economic activity requires a greater share of new credit – the so-called *downsize and distribute* model (Lazonick and O'Sullivan, 2000). The financial costs to a firm will be relatively greater if borrowing increases, and *if* dividends payments is assumed factored into the pricing policy as well, this will put pressure on real wages and the affect functional distribution of income. Firms may also hold financial assets that yield a return that can cover financial costs such as interest payments (Rabinovich, 2019). Financial assets have the additional feature that it may be used as collateral to obtain new credit (cf. Ramskogler, 2011). The flip-side of this trait is a greater volatility in the value of capital assets, including financial assets (cf. Passarella, 2012). The supply of credit to firms is crucial in a monetary production economy and credit rationing is negatively associated with economic activities (and therefore output and employment). Under New Capitalism, the relation between the labour market and the credit market is altered because financial factors increasingly affect real wages, the functional distribution of income and employment. The next subsection discusses work on the finance-led regime and New Capitalism.

6.2.1 Finance-led regime

The finance-led regime reflects the 'engine of growth' in an economy and indicates the institutional configuration of the economy. The institutional configuration is composed of the institutional forms in different markets. The concept of *institutional form* is a central theoretical component of RT (Boyer and Saillard, 2002a) and

Comparative Political Economy (CPE) (Esping-Andersen, 1990; Albert, 1993; Hall and Soskice, 2001a). Institutions are also crucial for PK economic analysis (Arestis and Eichner, 1988; Crotty, 1990; Minsky, 1996), but not as *active* in the formal analysis as in RT and CPE research. Therefore, the finance-led regime signifies the logic dominating the institutional configuration, which informs how institutions contribute to the finance-led regime of accumulation through its effect on economic behaviour.

6.2.1.1 Models of finance-led regime of accumulation

One of the first models on the finance-led regime of accumulation is provided by Stockhammer (2004; 2008b), who uses the term 'finance-dominated accumulation regime' in contrast to Boyer's (2000) 'finance-led growth regime'. Stockhammer's term stresses the emphasis that financialisation is "shaping the pattern of accumulation" (Stockhammer, 2008b, p. 185) and focuses on the investment behaviour of firms (Stockhammer, 2004). This definition of finance-dominated accumulation regime fits the régulationist framework focusing on macroeconomic dynamics (the accumulation regime) embedded in a particular institutional configuration, i.e. the mode of régulation (Stockhammer, 2008b). Boyer (2000), on the other hand, defined the finance-led regime (in his language 'the fully financialised system') as one where the 'financial norm' has a direct effect on economic activity. Boyer's (simplified) model shows that financialisation can have positive *and* negative effects depending on the institutional configuration of the economy. The sign of the effect is determined by which channel that dominates. If equity markets work well, then higher profitability norms among firms have a positive effect on aggregate demand, whilst in an economy dominated by the wage-labour nexus (i.e. consumption depends mainly on wages and income), then the effect on demand is negative due to a negative effect on wages as firms favour equity prices (Boyer, 2000). The notion of the New Capitalism is vocal in Boyer's analysis because of the emphasis given to the distribution of productivity gains (Stockhammer, 2004).

Stockhammer (2004; 2008b) uses the finance-dominated accumulation re-

gime to highlight that there might be a situation where the economy is fundamentally shaped by financialisation *without* the possibility for a positive association between financial emphasis and demand. Thus, as Stockhammer describes it, financialisation has only negative implications on the economy, i.e. generating stagnation or increasing volatility in the level of economic activity, because firms' investment behaviour is altered away from productive investment towards financial investment and shareholder remuneration. Hence, the growth regime is not finance-led in Boyer's sense where firms' investment norms follow changes in the profitability criteria of investment.

Stockhammer's point is that the degree of financialisation ought to be defined independently of economic activity but concerning the structure of the economy. Thus, the macroeconomy might not be finance-led, although it might be shaped by changes in the financial system (Stockhammer, 2008b). Stockhammer's (2008b) point is not unreconcilable with Boyer (2000) as financial crises are preventable if the mode of régulation is efficient in regulating finance. The difference depends on the perception that regulation can be *sufficiently* efficient to prevent financial crises from erupting. Hence, it depends on the institutional configuration's qualitative effect on firms' investment behaviour (i.e. corporate governance).

If one abstracts from these qualitative issues and focuses on the pure form of a capitalist system, they share the view that the capitalist system is credit-based and consequently a finance-based system (Schumpeter, 1911, pp. 69–73; Ferri and Minsky, 1992). Thus, it is not a question of the functioning of the economy as such that is the main issue, but what implications finance has on the economy and, consequently, how financialisation should be addressed. The disagreement between Stockhammer (2004) and Boyer (2000) thus reflects the complexity of analysing finance-led regimes of accumulation since the financial sector and the real economy are always inseparable, and feedback effects are continuously in the mix.

Considering their chosen approach and analytical framework, Boyer and Stockhammer both agree on the usefulness of adopting the neo-Kaleckian model with wage- and profit-led regimes to analyse capitalist economies. There are no

issues of compatibility of the neo-Kaleckian model and RT (see Boyer, 2011b)[5].

The PK approach allows Stockhammer (2004; 2008b) to base his argument on factors that are not totally dependent on financialisation whilst maintaining that financialisation is a contributing factor albeit not a strictly necessary one (to increase economic activity). The identification of debt-led and export-led regimes illustrates how this line of argument can be used with the concept of financialisation because consumption is funded by household debt rather than wages, and profits stem mainly from exports instead of domestic consumption. The recent adoption of this approach in CPE have seen the emergence of a new stream of research combining macroeconomics and CPE, see Baccaro and Pontusson (2016) and Behringer and van Treeck (2019), which is central for the motivation of the study presented here.

Stockhammer (2004; 2008b) focuses on the respective effect from the aims of managers and shareholders with respect to the growth of capital and profit. The latter have no specific interest in the enterprises they partly own but rather in the dividends rate and share price (capital asset inflation). Whilst, the former seek to increase their power and reputation by expanding production and capital accumulation – building or maintaining a *megacorp* – in accordance with the PK theory of the firm (Eichner, 1976; Lavoie, 2014b, chap. 3). According to Stockhammer (2004), financialisation alters the power struggle between managers and shareholders in favour of shareholders leading to less investment in new capital and distributing a higher share of profits (dividends) to shareholders.

The focus on maximising shareholder value is also central to the régulationist perspective of Boyer (2000) and Aglietta (2000). Aglietta (2000) argues that firms' objectives and consequently means of meeting their objectives have changed from revenue generated through production and sales (the Fordist regime) to dividends and shareholder value (post-Fordist regime). This development has led managers to divert firms' financing away from non-financial assets (i.e. productive investments) towards share buybacks and acquisitions of other firms (financial assets). By explaining firms' 'new behaviour' – maximising shareholder value – it becomes easier

---

[5]Setterfield (2011) provides a PK perspective on the compatibility of the RT and PK economics.

to ask questions of how this affects the firm beyond share prices and dividends. However, his analysis is micro-oriented and does not consider the macroeconomic dynamics in detail.

Another micro-level perspective that lies in-between the régulationist approach and the PK perspective is provided by Dallery (2009). He draws on the PK theory of the firm to study financialisation, building on Stockhammer (2004), and RT via the shift from 'managerial capitalism' to 'shareholder capitalism' (i.e. New Capitalism), which represent the transition from the Fordist to the post-Fordist era, drawing on Boyer (2000) and Aglietta (2000).

In Dallery's model, financialisation acts as a constraint for managers since the new financial environment increases the pressure of the firm to maintain or increase the price of its equity shares (i.e. its share price), increase distributed profits and reduce the firm's indebtedness (Dallery, 2009). Dallery argues that managers are not necessarily operating with a constant expansion frontier but reorganise the firm to inflate the expansion frontier. Financial fragility is increased by transferring financial risk into real risk through rising indebtedness, but a higher expansion frontier is attained.

The strategy where managers raise productivity and lower wages means that the economic burden is transferred to workers (Dallery, 2009). Thus, Dallery explores the investment channel (stressed in PK economics) and the distribution of productivity gains (stressed in RT). From these analyses (of Boyer, Aglietta, Stockhammer and Dallery), the finance-led regime is characterised by cost-cutting, i.e. lower wages, and less investment in real production because an essential part of maximising shareholder value is to increase shareholders return on equity.

These studies start from the firms' perspective and do not consider macroeconomic dynamics explicitly. These three approaches, the neo-Kaleckian model (Stockhammer), PK theory of the firm model (Dallery) and RT corporate governance-institutional form model (Aglietta and Boyer), show multiple aspects that overlap and converge whilst maintaining distinct analytical features and compose a core of

what can be called the first generation of 'finance-led regime of accumulation models' (see figure 6.1).

These studies focus on the trade-off between the profit rate and growth rate (cf. Stockhammer, 2004) or managers' objectives under financialisation (cf. Dallery, 2009). However, these studies are based on managers' behaviour and objectives, with little attention to the wage formation process itself. This means that potential feedback mechanisms are unaccounted for, and the complexity associated with the interaction of agents in an economy is abstracted out of the analysis. This is not considered a failure of the previous studies but reveals the gap this study intends to fill.

Figure 6.1: Finance-led regime of accumulation models (first generation)
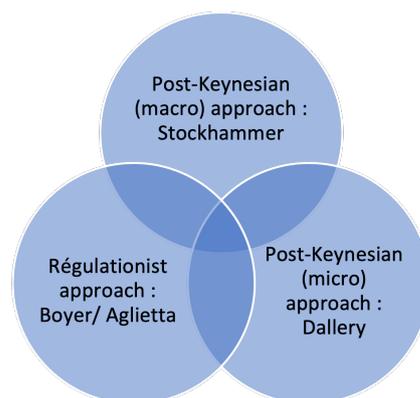
The second generation of 'finance-led regime of accumulation models' is not necessarily so much of a later historical generation but reflects the use of SFC macroeconomic models in analysing finance-dominated accumulation. An early survey on the mechanism of finance-led accumulation dynamics provides a systematic discussion of macroeconomic dynamics in a regime of finance dominated capitalism (Hein and van Treeck, 2010b). That survey, and its companion paper (Hein and van Treeck, 2010a), helps understand the exploration of shareholder maximisation mechanism in a SFC model, such as that of van Treeck (2009b) and Dallery and van Treeck (Dallery and van Treeck, 2011).

The former paper discusses three different cases: 'contractionary', 'intermediate' and 'expansionary', that can be generated with the model. These cases

depend on the effect on investment, via Tobin's q, and consumption from wealth which is linked to firms issue of equity shares and distributed profits (van Treeck, 2009b). These results illustrate 'stock-flow elastic' and 'stock-flow inelastic' systems where the former is debt-led and the latter debt-burden. These systems reflect the accumulation of 'virtual' wealth through capital asset inflation that can only be realised at the micro-level, not the macro-level because it requires a purchaser of the asset at a higher price (van Treeck, 2009b)[6]. Furthermore, the simulations illustrate the finance-led regime as set out by Boyer (2000) and indicate the importance of the institutional structure for the trajectory of an economy.

The model by van Treeck (2009b) does not consider the conflict in the firm between workers and managers and the potential implications that conflict can have. However, a later paper addresses this and focuses on the conflict between employees and employers; and employers and shareholders by studying the target return pricing and the rate of capacity utilisation effects (Dallery and van Treeck, 2011). In that paper, managers are negotiating with shareholders in terms of the growth-profit nexus and workers in the wage-labour nexus since nominal wages is a function of the target rate of profit (incorporated into the price formation via cost-plus pricing) and workers' wage share aspiration (stated in terms of a target profit rate). Hence, social conflict emerges when the target profit rate of shareholders exceeds that of managers whose target exceed that of workers (Dallery and van Treeck, 2011).

Their model is important for this chapter because it illustrates how the financial nexus can come to dominate the wage-labour nexus (Aglietta, 1998; Dallery and van Treeck, 2011). However, the analysis is of two distinct models as opposed to the dynamics transforming one into the other, and in the finance-led case firms operate without any financial constraints. In both papers labour market institutions are put in the background.

The second generation also include models that expand the financial sector and introduce effects from capital asset inflation. Passarella (2012; 2014) focuses on

---

[6]These concepts stem from earlier work by Taylor (2004), Bhaduri et al. (2006) and Skott and Ryoo (2008).

the economy's financial side, dropping the details of the trade-off between investment and dividends. Hence, leverage and debt dynamics come into the fray. Passarella shows how capital-asset price inflation can initially be stable but will eventually lead to a crisis – thereby illustrating macro-level effects from the maximisation of shareholder value logic – in accordance with Minsky's *Financial Instability Hypothesis* (FIH) and *Money Manager Capitalism* (Passarella, 2014).

This work follows from an earlier paper in which this notion of New Capitalism is analysed in a SFC model that uses Minsky's FIH to analyse the financial structure of capitalist economies (Passarella, 2012). These models provide insight into how the New Capitalism regime causes an increase in financial fragility due to capital-asset price inflation. The increase in financial fragility is explained with Minsky's FIH (Minsky, 1982; 1986b) and the argument that the leverage ratio will rise during an economic boom because investment in fixed capital is debt-financed. As such, the leverage ratio is taken to describe the increase in the financial fragility of the macroeconomy.

Passarella's work expounds on the importance of a sound monetary theory of the economy as the basis for analysing the financial system and the *real* economy in a macroeconomic framework. The integration and co-dependence of the financial side and *real* economy are portrayed with the theoretical framework of Graziani and TMC[7].

The approach of combining SFC and TMC can be found in Zezza (2012) in addition to the work by Passarella abovementioned. With the focus on the shadow banking sector, the SFC-TMC approach has been extended with a shadow banking sector (Botta et al., 2015; Sawyer and Passarella, 2017). This is a SFC model with a financial 'shadow banking' sector and the conventional banking sector. In the shadow banking sector, securitised loans supplied by conventional banks are bought and sold, inflating capital asset prices and the financial sector, destabilising the

---

[7]The compatibility of SFC and TMC is discussed in Zezza (2012) with a TMC inspired SFC model. The similarity and complementarity of SFC and TMC can be found in discussion by Godley (2004) and Lavoie (2004; 2021).

economy[8].

A recent study by Duwicquet (2021), based on financialised capitalism in France, investigates the paths of de-financialisation using an SFC model. The analysis indicates that reducing the rate of distributed profits (i.e. dividend rate) is not sufficient to increase productive investment and employment by a significant amount. The model shows the structural effects of financialised capitalism as greater retained earnings raises the accumulation of financial assets such as share buybacks and mergers and acquisitions. The structural effect has reduced the purchasing power of labour. Employment remains largely unaffected unless the recipients of capital income and capital asset gains are associated with more consumption and thereby stimulating productive investment. Therefore, financialised capitalism and its associated regime of accumulation are a significant obstacle to productive investment and employment (Duwicquet, 2021). That model thus combines the capital asset inflation effect and the dividend paid effect of Passarella and Dallery and van Treeck, respectively. It can, therefore, be situated in the overlapping circles of 'dividend'-focused SFC models and 'capital asset'-focused SFC models in figure 6.2 that depicts the second generation of 'finance-led regime of accumulation' models.

Figure 6.2: Finance-led regime of accumulation models (second generation)
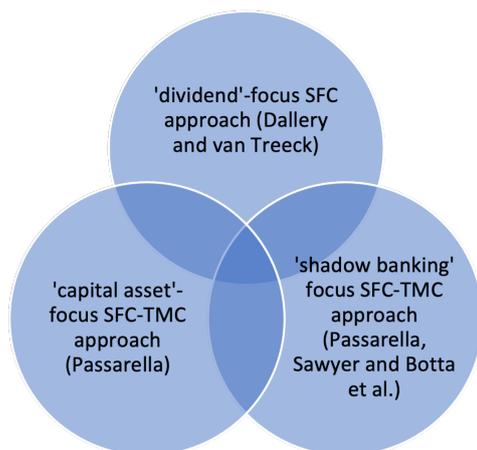
Common to these studies is the view that deregulated financial markets and a high velocity of financial transactions increase the financial sector's size and

[8]The link between the shadow banking sector and the economy as well as the role of the shadow banking sector is discussed in Michell (2017), and recent contributions to the TMC are summarised in a special issue in honour of Augusto Graziani published in 2017 in Metroeconomica (volume 68, issue 2) for the interested reader.

activity. Part of this explanation is that financial assets are easily transformed to money capital which has a higher velocity *in general* than labour and commodities that are neither equally transformable nor mobile relative to money capital (Marx, 1885, Volume II). Thus, the finance sector has a greater degree of *laissez faire* than the labour market or commodity market.

From a shareholder's point of view, real capital formation is considered riskier because its valorisation is associated with higher uncertainty and the value of capital as collateral depends on (financial) capital markets. In contrast, money capital is directly accessible and with portfolio diversification, the return on equities held by shareholders is not dependent on a handful of firms. The mobility of financial capital – money capital – allows the firm to reap returns from 'different' financial activities (assets) in a shorter time than from real capital investments (Lazonick and O'Sullivan, 2000).

The associated change in the economic structure of production and finance under the finance-led regime, in which finance has superseded production reflect a dialectic relation between finance and production (Toporowski, 2020a, p. 6). Hence, finance which purpose is to enable production and had a secondary role in the economy in the Fordist era has eroded its own foundation, i.e. production, in the post-Fordist era. The development has increased the need to address issues such as financial fragility, due to capital asset inflation which is disconnected from the real economy, and economic inequality, due to stagnating wages and a falling labour share of income (Lin and Tomaskovic-Devey, 2013; Alvarez, 2015). These aspects will be investigated further in the discussion below.

6.3 The model

The AB-SFC model presented here is built to investigate effects via wage formation from different strategies with three additions (from the model presented in chapter 5): i) varying dividends rates, ii) credit rationing and iii) non-financial corporations' procurement of financial assets. The model differs from the previous model in

chapter 5 with respect to the credit market (firms offer collateral for new loans) and firms' allocation of retained earnings (banks securitise loans to sell them to firms). The economy is composed of:

- A collection of households selling their labour in exchange for wages, consume goods and save income in bank deposits; households receive a proportion of firms and banks profits as dividends.

- A collection of firms producing consumption goods and procuring financial assets; firms retain earnings and apply for loans to finance production.

- A collection of banks supply deposits to households and firms; loans and financial assets (securitised loans) to firms.

- A central bank which issues legal tender, holds commercial banks' reserve accounts and the government account; buys government bonds which have not been purchased by commercial banks.

The model has three phases. In the first phase, firms decide on planned production levels, seek out banks and bargain with workers over wages. Workers are hired (fired) if the required labour, n^T, is higher (lower) than the current labour force, n. Banks' supply loans to firms in the second phase and enabling production. In the second phase firms also determine prices based on their production costs and costs related to credit borrowed from banks. If firms cannot obtain the credit necessary to finance production, they can sell financial assets (given they have any) to pay workers. The final phase starts with households (workers) purchasing commodities from firms and firms pay interest and principal on loans owed to banks. Since firms can go bankrupt, they will sell financial assets if they are short of liquid means to fund their credit obligations. Firms are declared bankrupt if their net worth turns negative or they are unable to service their debt obligations to banks. Bankruptcy results in losses via defaulted loans for banks and equity value losses for households.

The link between credit-markets and the wage-labour nexus is made through the financing costs of production and, therefore, firms' financing requirements. Higher wage demands lead to a higher demand for credit (unless the firm can find

alternative sources of finance). Therefore, firms' balance sheet composition of assets undermines labour bargaining, not necessarily because firms' financial income increases and provides an alternative source, but because lower retained earnings (irrespectively of the dividend rate) mean less financing means available to cover wages and ultimately vacancies. The agents interact in the labour market, product market, credit market, capital market and deposit market. In each simulation period the following sequence occurs:

1. Firms' production and procurement for financial assets decisions; determine their demand for labour.

2. Households and firms interact in the labour market.

3. Firms acquire finance and price produced goods.

4. Firms set prices and pay wages, and unemployment benefits are paid.

5. Firms sell goods on the product market and repay loans (if firms equity becomes negative or they fail to repay their loans firms are declared bankrupt).

6. Households allocate their savings.

7. Government collects taxes.

8. Banks and the central bank purchase government bonds.

6.3.1 Firms' production planning, labour market interaction and production

Firms plan their production, y^e, based on their expected sales, s^e, and expected inventories, inv^e. Firms' demand for labour depends on their planned production and labour productivity as well as labour hired in period $t-1$. This is following with the model developed in chapter 11 with the alteration of that excess government demand in the previous period is added and there is no growth rate component in the expected sales equation (Godley and Lavoie, 2007, 378-444). Expected sales are formed by adaptive expectations between actual sales and expected sales in the previous period, regulated by β. Unfulfilled government demand (an autonomous demand

component) indicates to the firm that they could sell more as the government place their order well in advance.

$$s_{j,t}^e = \beta s_{j,t-1} + (1 - \beta) s_{j,t-1}^e + g_{j,t-1}^D \tag{6.1}$$

$$y_{j,t}^e = s_{j,t}^e + inv_{j,t}^e - inv_{j,t-1} \tag{6.5}$$

$$n_{j,t}^T = fracy_{j,t}^e x_{j,t-1} \tag{6.6}$$

$$n_{j,t}^D = n_{j,t}^T - n_{j,t-1} \tag{6.7}$$

6.3.2 Wage formation

Workers bargaining with employers over nominal wages. Wage growth depends on the worker's employment situation (employed: $unemp = 0$ and unemployed: $unemp = 1$; length of unemployment, $unempPeriod$). In the baseline scenarios, with a normal and a high dividend rate, wage growth is set by a stochastic variable at the individual level[9], whereas in the other scenarios workers pursue different collective bargaining strategies. These collective bargaining strategies depend on price inflation in period $t - 1$, a ratio of the employment rent, ER, and wage in period $t - 1$ and a variable, BS, representing the growth rate of the profit rate (WPro), of the leverage ratio (WLev) or of labour productivity (WProd). The previous period rate is used as a proxy for the expected rate in the current period. Workers adjust their wage growth demand according to their employment situation in the same way as in the baseline scenario. If unemployed for more than two consecutive periods, the worker will adjust their wage growth downward by a stochastic amount. This is because it is difficult to know how much an individual worker will be willing to lower their wage to obtain new employment, not to mention the multitude of factors affecting this process in the real world. Agents' behaviour relies on past experiences to inform their anticipation for decision-making about wages, consumption and allocation of savings. In the case of wages experiences form anticipations under norms,

---

[9]
$$\dot{w}_{i,t} = \begin{cases} FN_{t-1}, & \text{if } unemp_{i,t-1} = 0 \\ -FN_{i,t}, & \text{if } unempPeriod_{i,t-1} > 2 \end{cases}$$

i.e. that nominal wages should be positively related with price inflation.

$$ER_{i,t} = (w_{i,t-1} - ubi_t)\overline{unempPeriod} \tag{6.10}$$

$$\dot{w}_{i,t} = \begin{cases} \omega_W(BS_{t-1} + \pi_{t-1}) - (1 - \omega_W)\frac{ER_{i,t}}{w_{i,t-1}}, & \text{if } unemp_{i,t-1} = 0 \\ -FN_{i,t}, & if unempPeriod_{i,t-1} > 2 \end{cases} \tag{6.11}$$

$$w_{i,t} = w_{i,t-1}(1 + \dot{w}_{i,t}) \tag{6.13}$$

Firms fill their vacancies by hiring the workers with the lowest reservation wage since labour is considered homogenous in the model. Workers already employed are "rehired" first, although there is a "natural" turnover of employees, meaning that some proportion of the employees quit and look for new employment elsewhere. If the firm has insufficient funds to pay the whole wage bill, a proportion is paid. Workers stay with the firm if they are paid something, only workers that do not receive payment leave.

6.3.3 Credit market, financial assets and pricing

Firms are assumed to hold financial assets to cover financial payments such as interest on outstanding loans. Firms set their target share of financial assets, xf^T, based on an exogenous component, θ, and the ratio of the return on financial assets, r^{fa} over the interest on loans, r^l. This reflects an exogenous component complementary to the institutional form of New Capitalism and an endogenous component representing the desire to fund liabilities with financial assets along the lines argued by Rabinovich (2019). Firms' desired share of financial assets follows an adjustment where the speed of adjustment, γ, determines the change.

$$xf^T_{j,t} = frac11 + \theta + fracr^{fa}_{loanbank,t-1}r^l_{loanbank,t-1} \tag{6.30}$$

$$xf^D_{j,t} = xf_{j,t-1} + \gamma(xf^T_{j,t} - xf_{j,t-1}) \tag{6.31}$$

Firms' demand for new loans, lf^D, depends on their expected wage bill, wb^e, expected costs of holding inventories, dividend payments due, fdf, taxes on profits due,

$ff \times \tau^Y$, and operating cash flow, OCF. Supply of loans, lf^S, equals demand for loans given that the collateral, *coll*, offered is sufficient. Collateral is a proxy for the firm's size and its history of servicing its debt as collateral comprises financial assets and inventories that depend on past earnings and production capacity, respectively. The first right-hand term represents non-financial (assets) and the second right-hand term represents financial (assets). Banks consider firms' creditworthiness to determine their supply of new credit. Collateral offered is the expected value of planned output (by costs), $y^e \times uc^e$, and financial assets, fa, less any outstanding loans, lf, net of inventories, $inv \times uc$, held.

$$lf_{j,t}^D = wb_{j,t}^e + (inv_{j,t}^e - inv_{j,t-1})uc_{j,t}^e + fdf_{j,t} + ff_{j,t-1}\tau_{t-1}^Y - OCF_{j,t-1} \qquad (6.32)$$

$$coll_{j,t} = y_{j,t}^e uc_{j,t}^e - (lf_{j,t-1} - inv_{j,t-1}uc_{j,t-1}) + fa_{j,t-1} \qquad (6.33)$$

$$lp_{j,t} = fraccoll_{j,t}lf_{j,t}^D \qquad (6.34)$$

$$lf_{j,t}^S = \min\left(lp_{j,t} \times lf_{j,t}^D, lf_{j,t}^D\right) \qquad (6.35)$$

These features allow the model to simulate a finance-led regime with firms procuring financial assets to generate an alternative cash flow and use as collateral to obtain bank credit and analyse the implications on the wage share and employment under different wage formation regimes[10]. If firms are faced with credit rationing, they will be unable to finance their planned production unless they have financial assets which can be liquidated to obtain the required means of settlement. Firms, therefore, rely on internal and external means of financing. Firm's creditworthiness is determined by the available collateral the firm can offer. The higher value of offered collateral, the larger amount of credit is available to the firm. This reflects that banks are not constrained to issue new credit but that credit rationing depends on their assessment of the would-be borrower (Forges Davanzati, 2018).

---

[10]Since firms are vertically integrated and capital formation is abstracted out of the model, the model does not cover effects associated with the capacity utilisation and capital formation. This would be interesting extensions of the model.

6.4   Simulation results

The model is simulated with R software. Each model scenario is run for 100 Monte Carlo simulations from which an average is computed that provides the results for the analysis. Two standard deviations are calculated to assess the volatility of the results in the sensitivity analysis[11].

The model is simulated with different wage formations to investigate the effects from altering parameters for the dividend rate, sf_D, and labour's bargaining power, ω_W. The simulation results indicate that a higher dividends rate has a negative effect on the wage-share and a positive effect on the dividend-wage ratio. The effect from higher bargaining power across the different bargaining strategies vary as shown in figure 6.3-b, -c and -d where high bargaining power indicate a greater wage share and lower dividend-wage ratio under the WProd strategy, but both the WLev and WPro strategies show ambiguous effects on the wage share.

The simulation results indicate that the wage share does not change significantly according to the different wage formation settings (figure 6.3). All types of wage bargaining show some volatility, observed as spikes, in the simulation results. However, figure 6.4 shows that a higher dividend rate is associated with a lower wage share (compared to figure 6.3) with a similar cyclicality, but a downward trend in general for bargaining strategies WPro-D and WLev-D.

A higher dividend rate increases the dividend-wage ratio and lowers the wage share. The bargaining strategies – WPro, WProd and WLev – all have higher dividend-wage ratios than the baseline (see figure 6.5). The dividend-wage ratio, approximately 0.25 across the different bargaining strategies, only show minuscule differences as the bargaining power of labour is altered. The exception is the WProd strategy, which indicate that high bargaining power has a consequently lower dividend-wage ratio. In WPro, WProd and WLev, the dividend-wage ratio shows sharp drops caused by a relatively larger drop in dividends than the compensation of employees (i.e. the wage bill). Under the WLev strategy when bargaining power

---

[11]The simulation has been run on ARC3, part of the High Performance Computing (HPC) facilities at the University of Leeds, UK.

Figure 6.3: Wage share (dividends rate=0.3)

a) Wage share: baseline

b) Wage share: WPro strategy

c) Wage share: WProd strategy

d) Wage share: WLev strategy
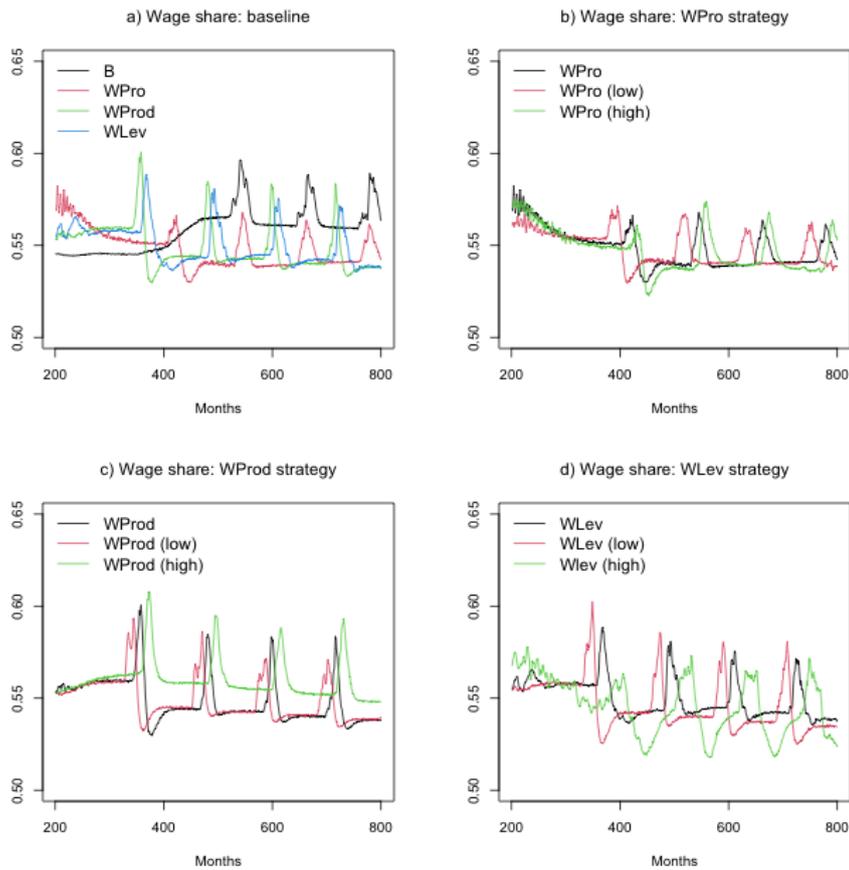
of labour is high, the drop is followed by a spike due to a relatively faster recovery of dividends paid than wages paid.

The dividend-wage ratio increases substantially when the dividend rate is raised from 0.3 to 0.7 (see figure 6.6). This is clearly apparent when comparing figure 6.5 and 6.6 where the dividend-wage ratio is above 1, between 1.10 and 1.20, for the three bargaining strategies (compared to 0.25 in figure 6.5). There is an upward trend in the dividend-wage ratio for all strategies. The dividend-wage ratio for the baseline model with a high dividend rate is, as expected, significantly higher than the baseline (with a lower dividend rate), but the dividend-wage ratio is also more volatile with spikes and drops (compared to the initial baseline model). Higher bargaining power under model WPro and WProd indicate a lower dividend-wage ratio than the initial and low bargaining power versions. The results from WLev are more ambiguous as the dividend-wage ratio seem to be below the initial and low bargaining power scenarios, but there are sharper drops and spikes under the

214

Figure 6.4: Wage share (dividends rate=0.7)
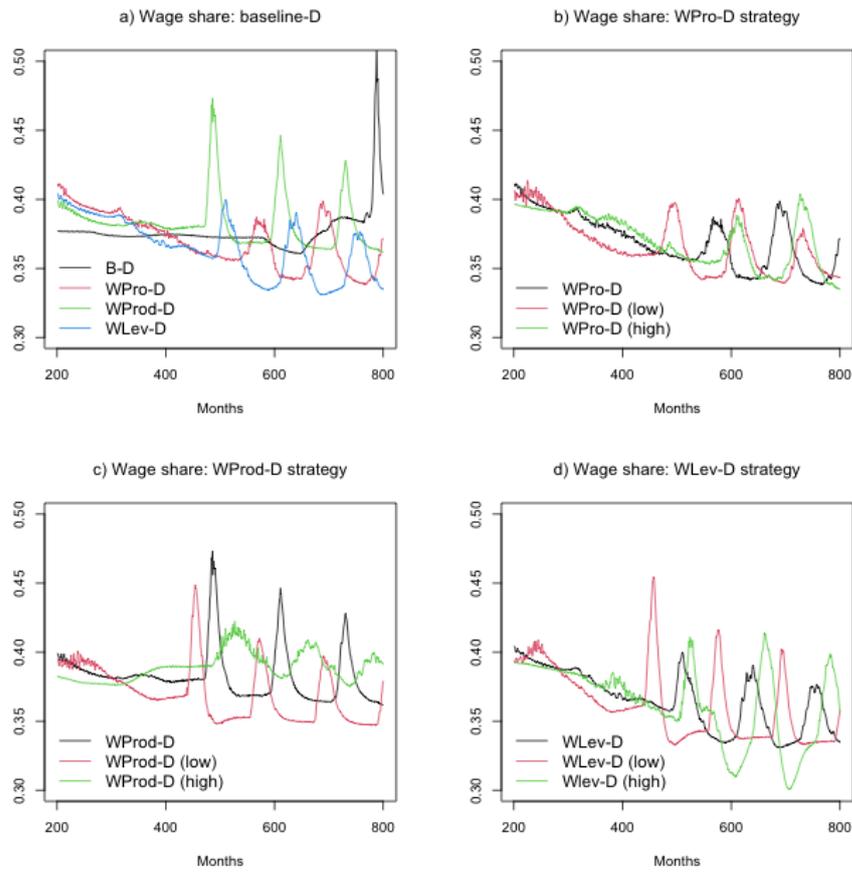
high bargaining power scenario that exceeds the other scenarios (with respect to bargaining power).

Figure 6.7 shows that the share of financial income from total income is larger under the different bargaining strategies compared to the baseline version of the model. Financial income originates with firms' interest payments on loan, but firms' outstanding debt is relatively lower under WPro, WProd and WLev than under the baseline scenario. In addition, firms' profit rate is higher and real output is greater compared to the baseline. Comparing figure 6.7 to figure 6.8, firms' debt is relatively larger for the different bargaining strategies with respect to the baseline version when the dividend rate is higher, and the profit rate is generally lower. Financial income's share of total income and real output do not change as much when the dividend rate is increased.

The employment rate (and conversely the unemployment rate since all households are part of the labour force) is higher under the bargaining strategies of

Figure 6.5: Dividend-wage ratio (dividend rate = 0.3)
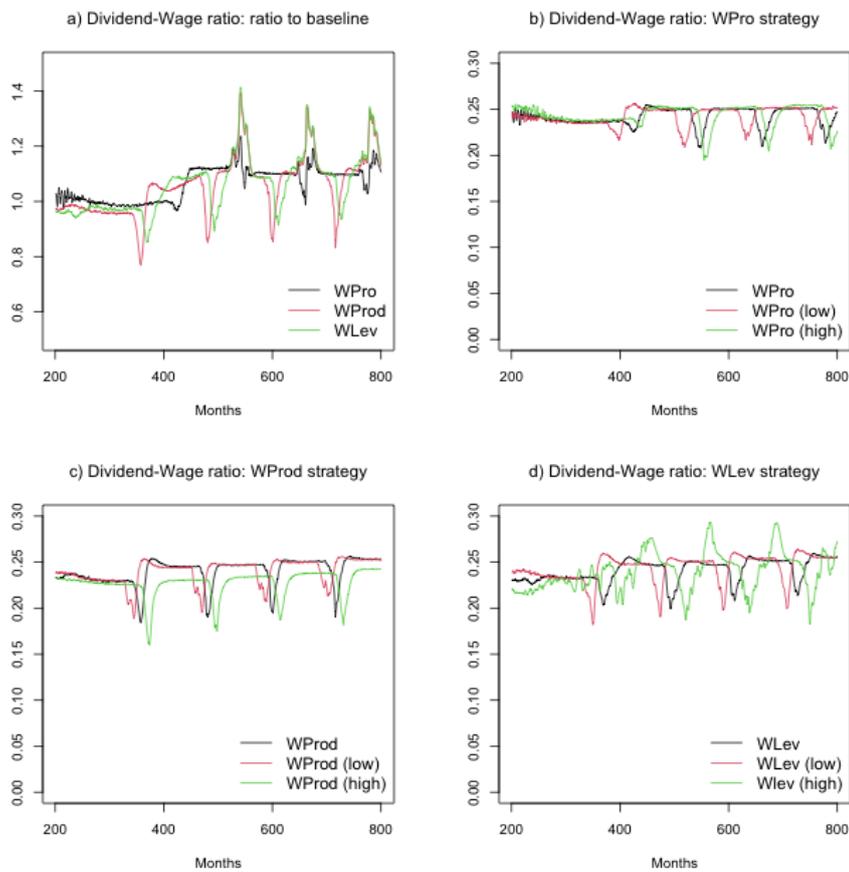
WPro, WProd and WLev than baseline, but there are sharper dips in the employment rate. The magnitude of such dips and spikes under WPro, WProd and WLev reflects that the wage formation in these scenarios cause greater fluctuations than in the baseline.

The implications for employment reflect feedback effects that are contradictory in that there are positive effects from higher production as higher dividends payments increase effective demand, whilst the employment (output) varies along with the real wage rate and the wage share. However, the relation between the nominal wage growth rate and the unemployment rate varies in the simulated models, see table 6.1. The correlation coefficient for the US in the period from 1960 to 2021 is -0.34. Figure 6.10 shows the nominal wage growth rate plotted against the unemployment rate (both variables are seasonally adjusted). Although, splitting up the data into intervals reveal that the correlation changes in magnitude, albeit not direction. This could suggest that the relation is more horizontal– akin to PK

Figure 6.6: Dividend-wage ratio (dividend rate = 0.7)
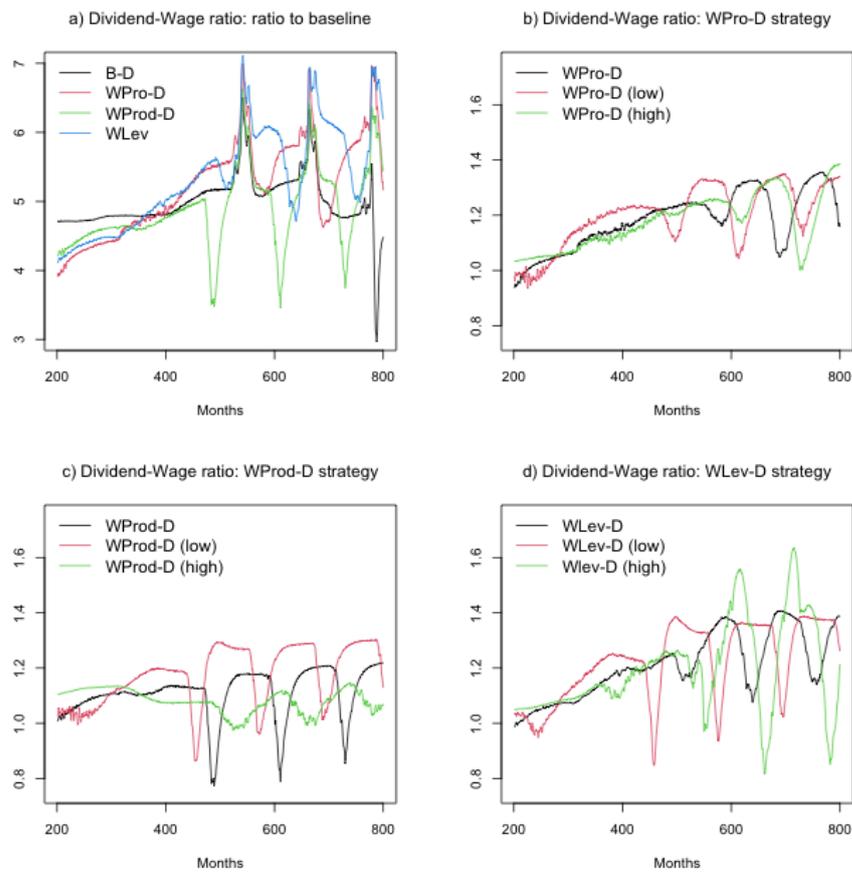
economic theory (Lavoie, 2014b, p. 599) – as opposed to vertical and the Phillips curve is *not* associated with an exogenous determined NAIRU as criticised by several studies (Gordon, 1988; Galbraith, 1997; Storm and Naastepad, 2012; Lang et al., 2020).

6.5   Conclusion

The existing research on maximising shareholder logic under New Capitalism reflects a broad research area with many different approaches, albeit with a common core: the capitalist mode of production coupled with finance capital. The institutional configuration has been altered under *finance-dominated capitalism* compared to the Fordist era's *wage society*. The role of labour market institutions seems diminished due to the lesser effect on the distribution of income and employment. However, this reflects the symptom of New Capitalism, not the actual disease. This study shows that the role of labour market institutions is relatively unchanged, but its scope has

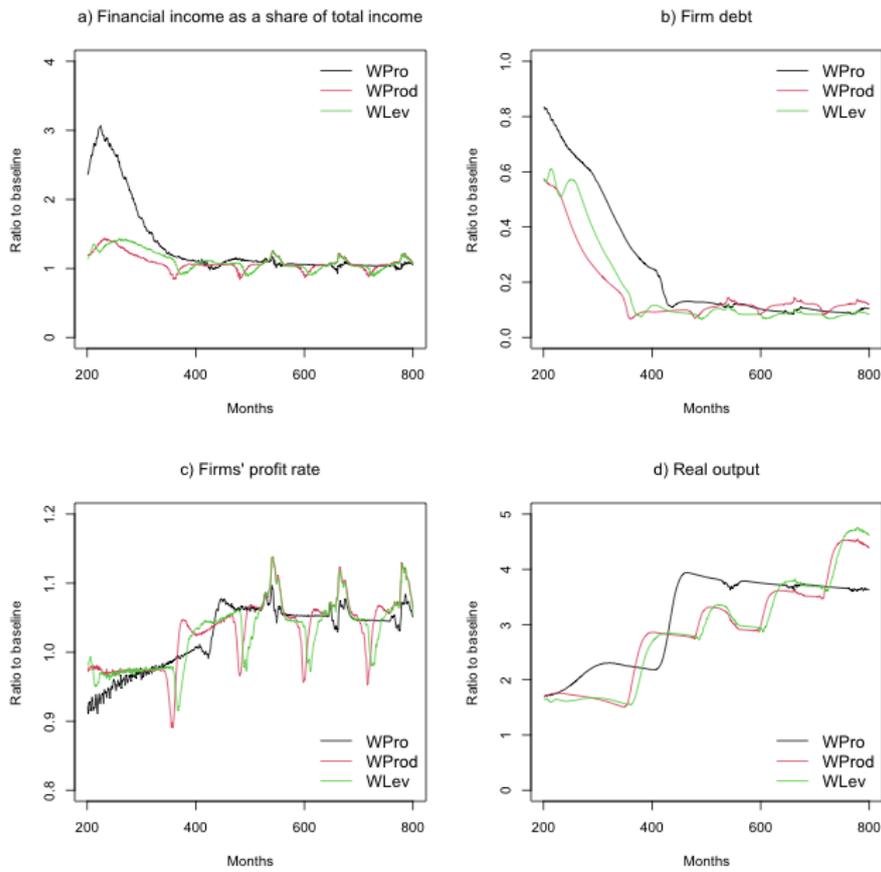Figure 6.7: Diverse variables (dividend rate = 0.3)

Table 6.1: Wage growth and unemployment rate correlation

Simulated model	correlation coefficient
$(sf_D = 0.3)$	
Baseline	0.63
Leverage ($\omega_W = 0.25; 0.5; 0.75$)	0.14; 0.24; 0.41
Profit ($\omega_W = 0.25; 0.5; 0.75$)	-0.26; -0.19; -0.16
Productivity ($\omega_W = 0.25; 0.5; 0.75$)	0.10; -0.01; -0.05
$sf_D = 0.7$	
Baseline	0.58
Leverage ($\omega_W = 0.25; 0.5; 0.75$)	0.25; 0.08; 0.07
Profit ($\omega_W = 0.25; 0.5; 0.75$)	0.23; -0.01; 0.00
Productivity ($\omega_W = 0.25; 0.5; 0.75$)	0.28; 0.24; 0.02

diminished under more profound financial forces. The consequence is that increasing bargaining power of labour or strengthening the institutions will be necessary but

Figure 6.8: Diverse variables (dividend rate = 0.7)
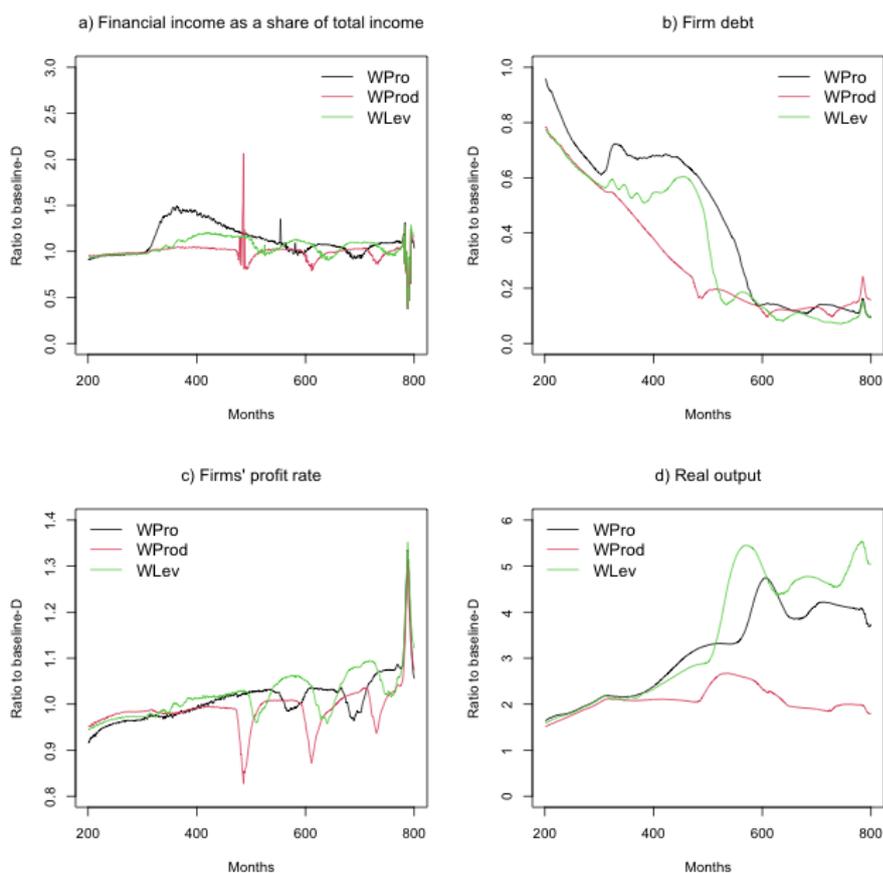
not sufficient to reverse the trend under New Capitalism.

What has been dubbed the *first generation* models sought to explain the varied implications of the capitalist development since the 1980s – the trade-off between growth and profits – with static analysis. The second generation of finance-led models applied SFC models and could analyse different parameters concerning the maximising shareholder logic and the implications from capital asset gains in a dynamic analysis. The emergence of the AB modelling approach and increasing use of computational methods have given rise to a more significant consolidation of aspects from the previous generation of models. Generating a greater affinity for analysing complex adaptive systems and investigating the evolutionary notion of capitalism and the institutional configuration of economic systems.

The developed model focuses on the implications from a higher dividend rate, in the following of the first generation, in a stock-flow consistent framework to capture structural dynamics and feedback effects, in line with the second gener-
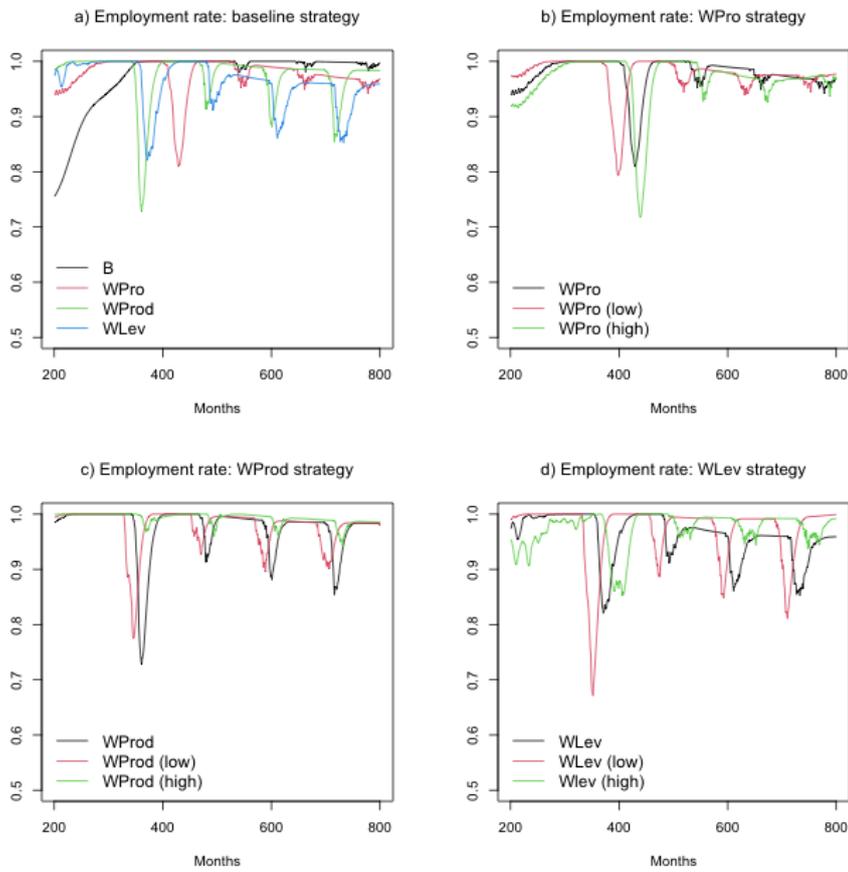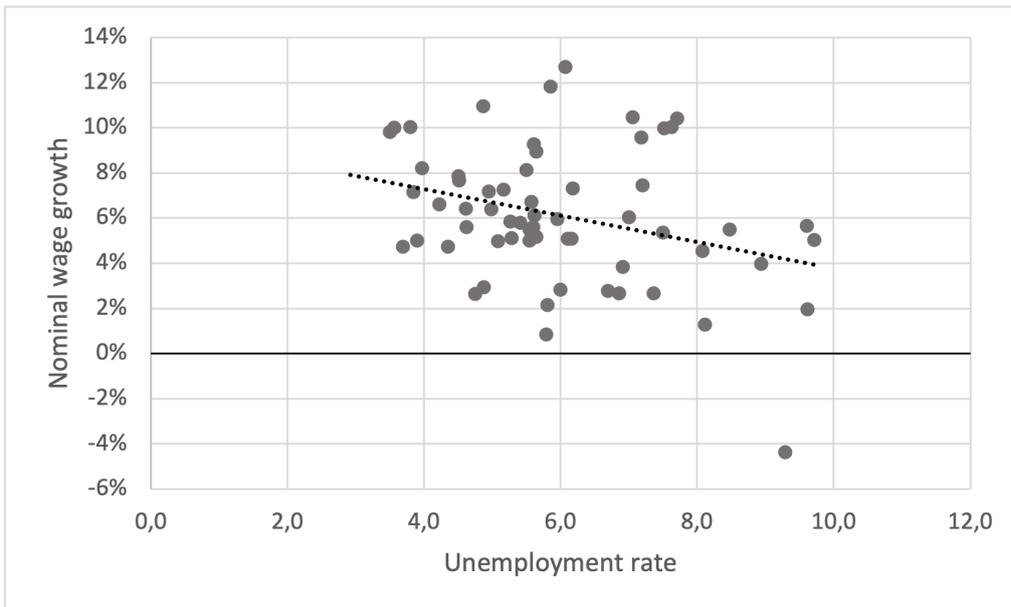
Figure 6.9: Employment rate (dividend = 0.3)

Figure 6.10: Phillips curve (US 1960-2020)

ation. The model is microfounded and includes a goods market, labour market and credit market as the state-of-the-art AB and AB-SFC models but contributes to the development of this field by further extending the aspects of the wage formation. The simulation results indicate that the shareholder maximisation characteristic of high dividend remuneration means a lower wage share and, unsurprisingly, a higher dividends-to-wage ratio. However, the model also yielded more surprising results. The effect on employment is somewhat mixed because the higher dividends increased consumption, which positively affected effective demand. That meant that although firms had fewer internal funds available, the increase in consumption caused a positive "animal spirits"-effect on planned production for future periods. This shows the intricacies and complexity of a socio-economic system, but a caveat must be considered. The unequal distribution of wealth and income in the model do not affect the propensities to consume. Hence, the overall effect would change if alterations were made to reflect social characteristics of economic inequality. Thus, one would expect different channels for this effect if the recipients of dividends payments were altered.

This study has provided an example of how the CPE research programme can be integrated with macroeconomic theory and formalised in an AB-SFC macroeconomic model. The role of institutions is important in this work, but there is scope for greater institutional heterogeneity within a regime, in this case a finance-led regime. The AB-SFC method has been shown to be well suited for accommodating further research in the intersection between CPE and macroeconomics where the institutional layer plays a significant role.

Appendix C

Model equations

Expected sales:

$$s_{j,t}^e = \beta s_{j,t-1} + (1-\beta)s_{j,t-1}^e + g_{j,t-1}^D \tag{6.1}$$

Long-run inventories-to-sale target:

$$\sigma_{j,t}^T = \sigma_0 - \sigma_1 r_{b,t-1}^l \tag{6.2}$$

Long-run inventory target:

$$inv_{j,t}^T = \sigma_{j,t}^T s_{j,t}^e \tag{6.3}$$

Planned short-run inventory stock:

$$inv_{j,t}^e = inv_{j,t-1} + \gamma(inv_{j,t}^T - inv_{j,t-1}) \tag{6.4}$$

Planned production:

$$y_{j,t}^e = s_{j,t}^e + (inv_{j,t}^e - inv_{j,t-1}) \tag{6.5}$$

Required labour

$$n_{j,t}^T = \frac{y_{j,t}^e}{x_{j,t-1}} \qquad (6.6)$$

Demand for labour:

$$n_{j,t}^D = n_{j,t}^T - n_{j,t-1} \qquad (6.7)$$

Employed labour:

$$n_{j,t} = \min(\sum_{i \in N}(unemp_i), n_{j,t}^D) \qquad (6.8)$$

Employment rate:

$$e_t = \frac{n_{j,t}}{N} \qquad (6.9)$$

Employment rent:

$$ER_{i,t} = (w_{i,t-1} - ubi_t)\overline{unempPeriod} \qquad (6.10)$$

$$(C.1)$$

Demanded wage growth[1]:

$$\dot{w}_{j,t} = \begin{cases} \omega_W(BS_{t-1} + \pi_{t-1}) - (1 - \omega_W)\frac{ER_{i,t}}{w_{i,t-1}}, & \text{if } unemp_{i,t-1} = 0 \\ -FN_{i,t}, & if unempPeriod_{i,t-1} > 2 \end{cases} \qquad (6.11)$$

---

[1]The function for wages in the baseline model:

$$\dot{w}_{i,t} = \begin{cases} FN_{t-1}, & \text{if } unemp_{i,t-1} = 0 \\ -FN_{i,t}, & \text{if } unempPeriod_{i,t-1} > 2 \end{cases}$$

Wage bargaining strategy:

$$
BS = \begin{cases} \dot{x}_{j,t-1}, & \text{in productivity scenario} \\ \dot{lev}_{j,t-1}, & \text{in leverage scenario} \\ \dot{r}_{j,t-1}, & \text{in profit scenario} \end{cases}
\tag{6.12}
$$

Nominal wage:

$$
w_{i,t} = w_{i,t-1}(1 + \dot{w}_{i,t})
\tag{6.13}
$$

Employers' offered wage:

$$
w_t^T = e_{t-1}\bar{w} + (1 + e_{t-1}(\frac{p_{j,t-1}x_{j,t-1}}{1 + mup_{j,t-1}^T})
\tag{6.14}
$$

Expected wage bill:

$$
wb_{j,t}^e = n_{j,t}^T w_t^T
\tag{6.15}
$$

Expected unit costs:

$$
uc_{j,t}^e = \frac{wb_{j,t}^e}{y_{j,t}^e}
\tag{6.16}
$$

Unemployment benefits:

$$
ubi_t = (1 + \chi\pi_{t-1} + (1 - \chi)lcg_{t-1})minW
\tag{6.17}
$$

Nominal wage earnings:

$$
yHw_{i,t} = \begin{cases} w_{i,t}, & \text{if } unemp_{i,t} = 0 \\ ubi_t, & \text{if } unemp_{i,t} = 1 \end{cases}
\tag{6.18}
$$

Actual wage bill:

$$wb_{j,t} = n_{j,t}w_{i,t} \qquad (6.19)$$

Real production:

$$y_{j,t} = n_{j,t}x_{j,t-1} \qquad (6.20)$$

Growth of real production:

$$\dot{y}_{j,t} = \frac{(y_{j,t} - y_{j,t-1})}{y_{j,t-1}} \qquad (6.21)$$

Real inventory stock:

$$inv_{j,t} = inv_{j,t-1} + y_{j,t} - s_{j,t} \qquad (6.22)$$

Actual unit cost:

$$uc_{j,t} = \frac{wb_{j,t}}{y_{j,t}} \qquad (6.23)$$

Real wage:

$$rw_t = \frac{\bar{w}_t}{\bar{p}_t} \qquad (6.24)$$

Real wage growth:

$$\dot{rw}_t = \frac{rw_t - rw_{t-1}}{rw_{t-1}} \qquad (6.25)$$

Productivity growth rate:

$$\dot{x}_{j,t} = \xi_1 \dot{y}_{j,t} + \xi_2 \dot{rw}_t \qquad (6.26)$$

Productivity per worker:

$$x_{j,t} = x_{j,t-1}(1 + \dot{x}_{j,t}) \tag{6.27}$$

Firms' retained earnings:

$$fdf_{j,t} = (1 - sfd)nff_{j,t-1} \tag{6.28}$$

Banks' retained earnings:

$$fdb_{b,t} = (1 - sb)fb_{b,t-1} \tag{6.29}$$

Target share of financial assets:

$$xf_{j,t}^T = frac11 + \theta + fracr_{loanbank,t-1}^{fa} r_{loanbank,t-1}^l \tag{6.30}$$

Demand share of financial assets:

$$xf_{j,t}^D = xf_{j,t-1} + \gamma(xf^T - xf_{j,t-1}) \tag{6.31}$$

Firms' demand for credit:

$$lf_{j,t}^D = wb_{j,t}^e + (inv_{j,t}^e - inv_{j,t-1})uc_{j,t}^e + fdf_{j,t} + ff_{j,t-1}\tau_{t-1}^Y - OCF_{j,t-1} \tag{6.32}$$

Firm's collateral:

$$coll_{j,t} = y_{j,t}^e uc_{j,t}^e - (lf_{j,t-1} - inv_{j,t-1}uc_{j,t-1}) + fa_{j,t-1} \tag{6.33}$$

New loan-to-collateral value:

$$lp_{j,t} = \frac{coll_{j,t}}{lf_{j,t}^D} \tag{6.34}$$

Supplied new credit:

$$lf_{j,t}^S = \min \left(lp_{j,t} \times lf_{j,t}^D, lf_{j,t}^D \right) \tag{6.35}$$

Outstanding loans:

$$lf_{j,t} = lf_{j,t-1} + (lf_{b,t}^S - LoanRepayment_{j,t}) \tag{6.36}$$

Banks' total lending:

$$lb_{b,t} = lb_{b,t-1} + (lf_{b,t}^S - LoanRepayment_{j,t} - NPL_{b,t}) \tag{6.37}$$

Own funds target:

$$OF_{b,t}^T = NCAR \, lb_{b,t} \tag{6.38}$$

Expected own funds:

$$OF_{b,t}^e = OF_{b,t-1} + \beta(OF_{b,t}^T - OF_{b,t-1}) \tag{6.39}$$

Expected share of non-performing loans:

$$npl_{b,t}^e = npl_{b,t-1}^e \epsilon + (1 - \epsilon)npl_{b,t-1} \tag{6.40}$$

Banks' retained earnings target:

$$fub_{b,t}^T = OF_{b,t}^e - OF_{b,t-1} + npl_{b,t}^e lb_{b,t} \tag{6.41}$$

Banks' planned profit:

$$fb_{b,t}^T = fub_{b,t}^T + fdb_{b,t} \tag{6.42}$$

Firms' planned profit:

$$ff_{j,t}^T = (sfiwb_{j,t}) + r_{b,t-1}^l(lf_{j,t-1} - inv_{j,t-1}uc_{j,t-1}) + fdf_{j,t} \tag{6.43}$$

Opening inventories-to-expected sales ratio:

$$\sigma_{j,t}^{se} = \frac{inv_{j,t-1}}{s_{j,t}^e} \tag{6.44}$$

Expected historical costs:

$$hc_{j,t}^e = (1 - \sigma_{j,t}^{se})s_{j,t}^e uc_{j,t} + \sigma_{j,t}^{se}(1 + r_{b,t-1}^l s_{j,t}^e uc_{j,t-1}) \tag{6.45}$$

Price mark-up target:

$$mup_{j,t}^T = \frac{ff_{j,t}^T}{hc_{j,t}^e} \tag{6.46}$$

Price mark-up:

$$mup_{j,t} = mup_{j,t-1} + \beta(mup_{j,t}^T - mup_{j,t-1}) \tag{6.47}$$

Normal unit costs:

$$nuc_{j,t} = \frac{wb_{j,t}/n_{j,t}}{x_{j,t}} \tag{6.48}$$

Normal historical unit costs:

$$nhuc_{j,t} = (1 - \sigma_{j,t}^T)nuc_{j,t} + \sigma_{j,t}^T(1 + r_{b,t-1}^l)nuc_{j,t-1} \tag{6.49}$$

Price:

$$p_{j,t} = (1 + mup_{j,t})nhuc_{j,t} \tag{6.50}$$

Issued equity shares:

$$esf_{j,t} = esf_{j,t-1} + xe\frac{wb_{j,t}}{pe_{t-1}} \tag{6.51}$$

Expected disposable household income:

$$yd_{i,t}^e = yd_{i,t-1}^e + \beta(yd_{j,t-1} - yd_{i,t-1}^e) \tag{6.52}$$

Consumption demand:

$$\begin{aligned}
c_{i,t}^D = (\alpha_1\frac{yd_{i,t}^e}{p_{j,t}} + \alpha_2\frac{hh_{i,t-1}}{p_{j,t}} + \alpha_3\frac{m_{i,t-1}^{1h}}{p_{j,t}} + \alpha_4\frac{m_{i,t-1}^{2h}}{p_{j,t}} \\
+ \alpha_5\frac{BL_{i,t-1}^h}{p_{j,t}} + \alpha_6\frac{ehr_{i,t-1}}{p_{j,t}} + \alpha_7\frac{OF_{b,t-1}wealthDist_{i,t-1}}{p_{j,t}}
\end{aligned} \tag{6.53}$$

Real sales:

$$s_{j,t} = \min\left(inv_{j,t}, \frac{c_{i,t}^D}{p_{j,t}} + g_t\right) \tag{6.54}$$

Nominal sales value:

$$S_{j,t} = s_{j,t}p_{j,t} \tag{6.55}$$

Government real demand:

$$g_{j,t}^D = \frac{(1 - e_{t-1})govExpenditure}{NF} \tag{6.56}$$

Government real consumption:

$$g_t = \sum_{j\in NF} g_{j,t}^D \tag{6.57}$$

Government expenditure:

$$G_t = g_t p_{j,t} \tag{6.58}$$

Market share:

$$mkt_{j,t} = \frac{s_{j,t}}{\sum_{j \in NF} s_{j,t}} \tag{6.59}$$

Price inflation:

$$\pi_t = \frac{p_{j,t} - p_{j,t-1}}{p_{j,t-1}} \tag{6.60}$$

Principal repayment of outstanding loan:

$$PrincipalRepayment f_{j,t} = lf_{j,t}\left(\frac{1}{AmortizationPeriods}\right) \tag{6.61}$$

Interest payment due on outstanding loans:

$$InterestRepayment f_{j,t} = lf_{j,t} r^l_{b,t-1} \tag{6.62}$$

Loan repayment paid:

$$LoanRepayment_{j,t} = \min(PrincipalRepayment f_{j,t}, m^{1f}_{j,t-1} + lf_{j,t} + S_{j,t}$$
$$- lf_{j,t-1} r^l_{b,t-1}) \tag{6.63}$$

Interest repayment on loans:

$$InterestRepayment_{j,t} = \min(lf_{j,t-1} r^l_{b,t-1}, m^{1f}_{j,t-1} + lf_{j,t} + S_{j,t}) \tag{6.64}$$

Firms' arrears on outstanding loans:

$$arrears_{j,t} = PrincipalRepayment f_{j,t} - LoanRepayment_{j,t} \tag{6.65}$$

Firms' deposits:

$$m_{j,t}^{1f} = m_{j,t-1}^{1f} + S_{j,t} - wb_{j,t} + (\triangle esf_j pe_t)$$
$$+ (lf_{b,t}^S - LoanRepayment_{j,t} - InterestRepayment_{j,t}) - (fa_{j,t}^D - fa_{j,t}^{Sold})$$

$$(6.66)$$

Firms' net value:

$$fvh_{j,t} = INV_{j,t} + m_{j,t}^{1f} + fa_{j,t} - lf_{j,t} - pe_t esf_{j,t} \tag{6.67}$$

Firm default:

$$defaultF_{j,t} = \begin{cases} 1, & \text{if } arrears_{j,t} > 0 \text{ or } fvh_{j,t} < 0 \\ \\ \text{else } 0 \end{cases} \tag{6.68}$$

Loss Given Default (LGD):

$$LGD_{j,t} = defaultF_{j,t}(lf_{j,t} - m_{j,t}^{1f} - fa_{j,t}) \tag{6.69}$$

Shareholders' equity loss due to firm default:

$$equityLoss_{i,t} = wealthDist_{i,t}(defaultF_{j,t}(esf_{j,t}pe_t - \max(0, -LGD_{j,t}))) \tag{6.70}$$

Non-performing loans:

$$NPL_{b,t} = defaultF_{j,t}lf_{j,t} \tag{6.71}$$

Share of non-performing loans:

$$npl_{b,t} = \frac{NPL_{b,t}}{lb_{b,t}} \tag{6.72}$$

Banks' actual profits:

$$fb_{b,t} = InterestRepayment_{j,t-1} + r^b_{t-1} bb^D_{b,t-1} - r^a_{t-1} Adv^D_{b,t-1} - r^{m2}_{b,t-1} m^{2f}_{j,t-1}$$
$$- r^{m2}_{b,t-1} m^{2h}_{i,t-1} + r^h_{t-1}(hb^D_{b,t-1} + hb^{*D}_{b,t-1}) - fa^S_{b,t-1} r^{fa}_{b,t-1} \tag{6.73}$$

Banks' retained earnings:

$$fub_{b,t} = fb_{b,t} - fdb_{b,t} \tag{6.74}$$

Firms' actual profits:

$$ff_{j,t} = S_{j,t} - wb_{j,t} + (INV_{j,t} - INV_{j,t-1}) - InterestRepayment_{j,t} + (fa_{j,t} r^{fa}_{b,t-1}) \tag{6.75}$$

Firms' net profits:

$$nff_{j,t} = ff_{j,t}(1 - \tau^Y_{t-1}) \tag{6.76}$$

Firms' retained earnings:

$$fuf_{j,t} = nff_{j,t}(1 - sfd) \tag{6.77}$$

Firms' profit rate:

$$r_{j,t} = \frac{ff_{j,t}}{S_{j,t}} \tag{6.78}$$

Firms' profit rate growth:

$$\dot{r}_{j,t} = \frac{r_{j,t} - r_{j,t-1}}{r_{j,t-1}} \tag{6.79}$$

Firms' demand for financial assets:

$$fa^D_{j,t} = \min(m^{1f}_{j,t-1}, xf^D_{j,t} fuf_{j,t-1}) \tag{6.80}$$

supply of financial assets:

$$fa_{b,t}^S = fa_{j,t}^D - fa_{j,t}^{Sold} \tag{6.81}$$

Firms accumulated financial assets:

$$fa_{j,t} = fa_{j,t-1} + fa_{b,t}^S \tag{6.82}$$

Firms' share of financial assets:

$$xf_{j,t} = \frac{fa_{j,t}}{(fa_{j,t} + m_{j,t}^{1f} + INV_{j,t})} \tag{6.83}$$

Firms' leverage ratio:

$$lev_{j,t} = \frac{lf_{j,t}}{lf_{j,t} + esr_{j,t}pe_t + m_{j,t}^{1f} + fa_{j,t}} \tag{6.84}$$

Banks' own funds:

$$OF_{b,t} = OF_{b,t-1} + fub_{b,t} - NPL_{b,t} + fa_{j,t} + m_{j,t}^{1f} \tag{6.85}$$

Banks' capital adequacy ratio:

$$CAR_{b,t} = \frac{OF_{b,t}}{lb_{b,t}} \tag{6.86}$$

Households distribution of (net) wealth:

$$wealthDist_{i,t} = \frac{nvh_{i,t-1}}{\sum_{i \in N} nvh_{i,t-1}} \tag{6.87}$$

Households' portfolio allocation:

Deposits:

$$m_{i,t}^{1h} = \lambda_{10}vfma_{i,t-1} + \lambda_{11}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{12}r_{b,t-1}^{m2}vfma_{i,t-1}$$
$$+ \lambda_{13}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{14}re_{t-1}vfma_{i,t-1} + \lambda_{15}yd_{i,t-1} \tag{6.88}$$

Savings:

$$m_{i,t}^{2h} = \lambda_{20}vfma_{i,t-1} + \lambda_{21}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{22}r_{b,t-1}^{m2}vfma_{i,t-1}$$
$$+ \lambda_{23}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{24}re_{t-1}vfma_{i,t-1} + \lambda_{25}yd_{i,t-1} \tag{6.89}$$

Government issued bonds:

$$BL_{i,t} = (\lambda_{30}vfma_{i,t-1} + \lambda_{31}r_{b,t-1}^{m1}vfma_{i,t-1} + \lambda_{32}r_{b,t-1}^{m2}vfma_{i,t-1}$$
$$+ \lambda_{33}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{34}re_{t-1}vfma_{i,t-1} + \lambda_{35}yd_{i,t-1} \tag{6.90}$$

Demand for equity shares

$$ehr_{i,t} = \lambda_{40}vfma_{i,t-1} + \lambda_{41}(r_{b,t-1}^{m1}vfma_{i,t-1}) + \lambda_{42}(r_{b,t-1}^{m2}vfma_{i,t-1})$$
$$+ \lambda_{43}r_{t-1}^{bl}vfma_{i,t-1} + \lambda_{44}re_{t-1}vfma_{i,t-1} + \lambda_{45}yd_{i,t-1} \tag{6.91}$$

Price on equity shares:

$$pe_t = \frac{ehr_{i,t}}{esf_{j,t}} \tag{6.92}$$

Change in nominal value of equity shares:

$$\triangle ehr = ehr_{i,t}(pe_t - pe_{t-1}) \tag{6.93}$$

Nominal value of newly issued equity shares:

$$\triangle efr_{j,t} = (esf_{j,t} - esf_{j,t-1})pe_t \tag{6.94}$$

Household distribution of equity shares ownership:

$$ehrDist_{i,t} = \frac{ehr_{i,t}}{\sum_{i=\in N} ehr_{i,t}} \tag{6.95}$$

Household received dividends:

$$fdh_{i,t} = fdb_{b,t}wealthDist_{i,t} + fdf_{j,t}ehrDist_{i,t-1} \tag{6.96}$$

Households' personal income:

$$yp_{i,t} = yHw_{i,t} + r^{m2}_{b,t-1}m^{2h}_{i,t-1} + fdh_{i,t} + \frac{BL_{i,t-1}}{pbl_{t-1}} \tag{6.97}$$

Households' disposable income:

$$yd_{j,t} = yp_{i,t}(1 - \tau^{Y}_{t-1}) \tag{6.98}$$

Nominal value of equity shares:

$$efr_{j,t} = esf_{j,t}pe_t \tag{6.99}$$

Households' capital gains:

$$CG_{i,t} = \frac{ehr_{i,t-1}}{pe_{t-1}}\triangle pe + \triangle pbl\frac{BL_{i,t-1}}{pbl_{t-1}} + \triangle OF_b wealthDist_{i,t} \tag{6.100}$$

Households net wealth:

$$nvh_{i,t} = nvh_{i,t-1} + yd_{i,t} + CG_{i,t} - C_{i,t} - equityLoss_{i,t} \tag{6.101}$$

Households' cash holdings:

$$hh_{i,t} = \lambda_C C_{i,t} \tag{6.102}$$

Households' investible wealth:

$$vfma_{i,t} = nvh_{i,t} - hh_{i,t} - OF_{b,t}wealthDist_{i,t} \tag{6.103}$$

Households' actual deposits:

$$m^{1h}_{i,t} = vfma_{i,t} - m^{2h}_{i,t} - BL_{i,t} - ehr_{i,t} \tag{6.104}$$

Public Sector Borrowing Requirement:

$$PSBR_t = G_t + r^b_{t-1}B_{t-1} + BL^S_{t-1} - fcb_t - yp_{i,t}\tau^Y_{t-1} - ff_{j,t-1}\tau^R_{t-1} + ubi_t(N[1 - e_t])$$

(6.105)

Government debt:

$$GovDebt_t = nvh_{i,t} - INV_{j,t} + \left(INV_{j,t} + m^{1f}_{j,t} - lf_{j,t} - efr_{j,t}\right)$$

(6.106)

$$= B_t + BL^S_t pbl_t$$

Price of government bonds:

$$pbl_t = \frac{1}{r^{bl}_{t-1}}$$

(6.107)

Government issued bills:

$$B_t = B_{t-1} + PSBR_t - \triangle BL^S pbl_t$$

(6.108)

Government issued bonds:

$$BL^S_t = \frac{BL_{i,t}}{pbl_t}$$

(6.109)

Banks' issued money:

$$m^b_t = m^{1h}_{i,t} + m^{2h}_{i,t} + m^{1f}_{j,t} + m^{2f}_{j,t}$$

(6.110)

Banks' reserve requirement (demand for reserves):

$$hb^D_{b,t} = \rho m^b_t$$

(6.111)

Banks' notional balance sheet:

$$Bbdn_{b,t} = mb_{b,t} - lb_{b,t} - hb^D_{b,t} + OF_{b,t} + fa^S_{b,t}$$

(6.112)

Banks' demand for T-bills:

$$bb_{b,t}^D = Bbdn_{b,t}\zeta \text{ if } Bbdn_{b,t} > 0 \text{ else } bb_{b,t}^D = 0 \tag{6.113}$$

Extra reserves held by banks:

$$hb_{b,t}^{*D} = Bbdn_{b,t}(1 - \zeta) \text{ if } Bbdn_{b,t} > 0 \text{ else } hb_{b,t}^{*D} = 0 \tag{6.114}$$

Banks' demand for advances:

$$Adv_{b,t}^D = -Bbdn_{b,t} \text{ if } Bbdn_{b,t} \leqslant 0 \text{ else } ADV_{b,t}^D = 0 \tag{6.115}$$

Supply of advances:

$$Adv_t^S = \sum_{b=\in B} Adv_{b,t}^D \tag{6.116}$$

Supply of reserves:

$$hb_t^S = \sum_{b=\in B} hb_{b,t}^D \tag{6.117}$$

Supply of additional reserves:

$$hb_t^{*S} = \sum_{b=\in B} hb_{b,t}^{*D} \tag{6.118}$$

Supply of T-bills:

$$bb_t^S = \sum_{b=\in B} bb_{b,t}^D \tag{6.119}$$

Share of T-bills:

$$bpr_t = \frac{bb_{b,t}^D}{B_t} \tag{6.120}$$

Mark-up on T-bills yield:

$$mub_t = mub_0 - mub_1 \triangle bpr \tag{6.121}$$

Interest rate on T-bills:

$$r_t^b = r^* + mub_t \tag{6.122}$$

Interest rate on government bonds:

$$r_t^{bl} = r^* + mubl_t \tag{6.123}$$

Interest rate on advances:

$$r_t^a = r^* + mua_t \tag{6.124}$$

Interest rate on reserves:

$$r_t^h = r^* + muh_t \tag{6.125}$$

Interest rate on savings:

$$r_{b,t}^{m2} = r^* + mum_{b,t} \tag{6.126}$$

Interest rate on loans:

$$r_{b,t}^l = r_{b,t}^{m2} + mul_{b,t} \tag{6.127}$$

Banks' liquidity ratio:

$$BLR_{b,t} = \frac{bb_{b,t}^D}{mb_{b,t} + fa_{b,t}^S} \tag{6.128}$$

Mark-up on savings deposits:

$$
mum_{b,t} = \begin{cases} \overline{mum}(1 + FNb_b) \text{ if } BLR_{b,t} < bot \\ \overline{mum}(1 - FNb_b) \text{ if } BLR_{b,t} > top \\ \\ mum_{b,t-1} \end{cases} \tag{6.129}
$$

Mark-up on loans:

$$
mul_{b,t} = \begin{cases} \overline{mul}(1 + FNb_b) \text{ if } CAR_{b,t} \leqslant NCAR \\ \overline{mul}(1 - FNb_b) \text{ if } CAR_{b,t} > NCAR \end{cases} \tag{6.130}
$$

Supply of T-bills to the central bank:

$$
bcb_t^S = B_t - bb_t^S \tag{6.131}
$$

Central bank supplied reserves:

$$
hs_t = bcb_t^S + Adv_t^S - (hb_t^S + hb_t^{*S}) \tag{6.132}
$$

Supply of cash equals demand for cash (redundant equation)

$$
hh_{i,t} = hs_t \tag{6.133}
$$

Appendix D

Model parameters

Table D.1: Model parameters

Symbol	Description	Baseline	Sensitivity
α_1	propensity to consume out of disposable income	0.75	same
α_2	propensity to consume out of wealth: cash	0.20	same
α_3	propensity to consume out of wealth: checking deposits	0.10	same
α_4	propensity to consume out of wealth: saving deposits	0.05	same
α_5	propensity to consume out of wealth: government bonds	0.01	same
α_6	propensity to consume out of wealth: firm equity	0.01	same
α_7	propensity to consume out of wealth: bank equity	0.01	same
$amortPeriods$	amortization periods of bank loans	5	same
prL	labour productivity	2	same
ξ_1	coefficient of Kaldor-Verdoorn effect	0.046	same
ξ_2	coefficient of Webb effect	0.38	same
r^*	monetary base rate	0.0035	same
N	number of households	8000	same
NF	number of firms	100	same

Continued on the next page...

Table D.1: Model parameters (contd. . .)

Symbol	Description	Baseline	Sensitivity
NB	number of commercial banks	10	same
β	adaptive expectations	0.25	same
σ_0	constant target inventories-to-sales ratio	0.3612	same
σ_1	target inventories-to-sales ratio adjustment speed to nominal interest rates	3	same
γ	entrepreneurs' adjustment speed with respect to inventories	0.15	same
min_W	minimum wage	5	same
max_W	maximum wage	35	same
ω_W	nominal wage adjustment	0.50	0.25; 0.50; 0.75
χ	unemployment weight given to price inflation	0.6	same
EPL	'karens' period (firms unable to fire employees)	0	same
$turnover$	turnover rate of labour	0.05	same
sf_D	firms' dividends rate	0.3	0.7
sf_I	firms' rate of retained earnings from financial investments	0.4	same
θ	target share of cash and financial investments	0.1	same
$NCAR$	normal capital adequacy ratio	0.08	same

Continued on the next page. . .

242

Table D.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
sb	banks' retention rate	0.15	same
add_1	parameter of asset backed commercial paper return rate function	0.1	same
xe	share of investment that is funded by equities issue	0.05	same
ϵ	confidence level of banks	0.5	same
$parMatchingConsumption$	range of consumption goods seller households compare	2	same
$parMatchingLabour$	subsample of workers seeking employment	10	same
$govExpenditure$	government expenditure	2000	same
$debtG$	threshold for government debt-to-gdp ratio	0.6	same
rev_0	tax revision parameter	0.05	same
min_τ	floor on tax rate	0.05	same
max_τ	ceiling on tax rate	0.95	same
τ^Y	tax rate on income	0.40	same
τ^R	tax rate on profits	0.20	same
ρ	reserve requirement for banks set by the central bank	0.08	same
ζ	share of notional bills held as bills by banks	0.5	same

Table D.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
top	top value of notional bank liquidity ratio	0.04	same
bot	bottom value of notional bank liquidity ratio	0.02	same
λ_C	households' cash to consumption ratio	0.18	same
λ_{10}	parameter in portfolio equation of checking deposits	0.35	same
λ_{11}	parameter in portfolio equation of checking deposits	0.40	same
λ_{12}	parameter in portfolio equation of checking deposits	-0.15	same
λ_{13}	parameter in portfolio equation of checking deposits	-0.10	same
λ_{14}	parameter in portfolio equation of checking deposits	-0.15	same
λ_{15}	parameter in portfolio equation of checking deposits	-0.10	same
λ_{20}	parameter in portfolio equation of saving deposits	0.25	same
λ_{21}	parameter in portfolio equation of saving deposits	-0.15	same
λ_{22}	parameter in portfolio equation of saving deposits	0.35	same
λ_{23}	parameter in portfolio equation of saving deposits	-0.15	same
λ_{24}	parameter in portfolio equation of saving deposits	-0.05	same
λ_{25}	parameter in portfolio equation of saving deposits	0.15	same

Table D.1: Model parameters (contd...)

Symbol	Description	Baseline	Sensitivity
λ_{30}	parameter in portfolio equation of firms' equity securities	0.20	same
λ_{31}	parameter in portfolio equation of firms' equity securities	-0.10	same
λ_{32}	parameter in portfolio equation of firms' equity securities	-0.15	same
λ_{33}	parameter in portfolio equation of firms' equity securities	0.45	same
λ_{34}	parameter in portfolio equation of firms' equity securities	-0.20	same
λ_{35}	parameter in portfolio equation of firms' equity securities	0.05	same
λ_{40}	parameter in portfolio equation of government (long-term) bonds	0.20	same
λ_{41}	parameter in portfolio equation of government (long-term) bonds	-0.15	same
λ_{42}	parameter in portfolio equation of government (long-term) bonds	-0.05	same
λ_{43}	parameter in portfolio equation of government (long-term) bonds	-0.20	same
λ_{44}	parameter in portfolio equation of government (long-term) bonds	0.40	same
λ_{45}	parameter in portfolio equation of government (long-term) bonds	-0.10	same
ubi	unemployment benefits level	0	same
FN_i	folded normal distribution (for households)	(0, 0.0094)	same

Continued on the next page...

245

Table D.1: Model parameters (contd. . .)

Symbol	Description	Baseline	Sensitivity
FN_b	folded normal distribution (for banks)	(0, 0.094)	same

Chapter 7

An analysis of labour market institutions during capitalist development

7.1 Introduction

The institutional configuration is dictated by the institutional hierarchy and so determines the mode of capitalism. This chapter analyses the long-run development of labour market institutions empirically and considers long-run developments of the dividend-wage and dividend-surplus ratios among US non-financial corporations. Finance-dominated capitalism reflects the latest transformation of the institutional configuration of capitalist economies that centres around the financial nexus (cf. Aglietta, 1998; 2000). The study's premise is on the *institutional forms* in macroeconomic models under the regime of New Capitalism. The development of many advanced capitalist economies since the 1950s reflect a transformation of the institutional configuration characterised as a *wage society* to a configuration of a *finance-dominated* regime. Studies suggest that some institutions dominate the institutional configuration through a reconstruction of the institutional hierarchy (Hall and Gingerich, 2009; Boyer, 2011a; Amable, 2016).

The analysis is motivated by the trends in capitalist development and rising inequality due to a falling wage share (Autor et al., 2020) and a shift from productive investments to financial asset accumulation and distribution of profits to shareholders (Lazonick, 2014; Durand, 2017). Finance has replaced the wage-labour nexus as the focal point for the accumulation regime and this is reflected in the institutional forms associated with New Capitalism. Labour relations have become more flexible and insecure; competition is settled in financial markets with a tendency towards *superstar* firms[1] rather than by price-quantity or market regulation (i.e. privatisation and deregulation); and corporate governance is increasingly focused on maximising shareholder value as opposed to production value (Aglietta, 1998; Boyer, 2000; Glyn, 2006).

The financial balance sheet of non-financial corporations is investigated to shed light on the asset composition and costs associated with operations. In this regime, the valorisation process increasingly depends on financial activities rather than production (Caiani et al., 2014). These developments have linear effects, but the macroeconomic outcomes are also affected by feedback effects that give rise to a Myrdalian process of circular cumulative causation (cf. Myrdal, 1978). Thus, the observed outcome results from feedback effects and a complex socio-economic system with specific institutions. The institutional configuration is affected by, but also affects corporations' behaviour and operational activities (Forges Davanzati, 2018). This chapter contributes to the post-Keynesian work on the *investment-profit puzzle* which reflects a conundrum of high profits without high capital accumulation, i.e. investment. However, PK focus on capital accumulation and tend to leave the mechanisms in which labour bargaining and wage formation is affected by and contributes to this puzzle unexplored and under-researched. This chapter provides insights that help to fill this gap in the literature.

Research on the investment-profit puzzle has provided theoretical explanations for how the finance-dominated regime of New Capitalism has caused a fall in the wage share. Empirical work, mostly based on the US economy, indicate that

---

[1]See Autor et al. (2020) for a discussion of greater concentration among employers and its effect on the labour share.

the shareholder value orientation and corporate short-termism has depressing effects on physical investment (Davis, 2017). The following section reviews the theoretical channels identified in the work on the finance-led regime of accumulation with respect to the wage share (section 7.2). Section 7.3 provides an empirical analysis of the development of labour market institutions for countries representing different models of capitalism. The balance sheets of non-financial corporations in the US and their profits are investigated in section 7.4. Section 7.5 discusses the findings of section 7.3 and 7.4, and concluding remarks are provided in section 7.6.

7.2 Theoretical mechanisms in finance-led regimes

7.2.1 Implications for the wage share

The finance-dominated regime of accumulation is multifaceted, representing a transformation of the whole economy. Most studies tend to focus on a particular side or aspect of financialisation (see Davis, 2017) – this tends to be driven by data availability and theoretical perspective – and therefore neglect total effects due to positive feedback from multiple factors that operate simultaneously (Köhler et al., 2019). In the literature covered by Köhler and co-authors, five main channels are identified concerning the implications on wage bargaining and the wage share. These channels are directly or indirectly linked to labour market institutions. These five channels are

1) a viable exit option for firms,

2) shareholder maximisation,

3) market capitalisation of firms,

4) higher share of financial income, and

5) changes to the sectoral composition in the economy.

Considering these channels, two observations are worth highlighting at the onset: firstly, all these channels feed into the conflict between workers and employers.

Secondly, these channels have different implications for the balance sheet composition of non-financial firms. The associated effects are summarised in table 7.1.

The first channel states that financialisation extends firms' exit options – specifically the exit option of capital – which reduces the bargaining power of labour. Darcillon (2015) calls this the 'internationalisation of production'. This is similar to the explanation presented by Jayadev (2007) in an analysis of the effect of capital account openness on the wage share. Jayadev states that labour's bargaining power is reduced due to capital's increased ability to relocate production. Stockhammer (2004) argues that this fluidity can induce firms to shift investment from real investments (for production) to financial investments. Whereas it is clear for Darcillon and Jayadev that firms are moving their supply-chains (the location of production), the profit motive of financial investments in Stockhammer is more ambiguous. It begs the question, are they reasonable substitutes? The fourth channel offers partial answers to this question.

According to the second channel – shareholder value maximisation – firms increase the share of distributed profits to shareholders, leaving less internal funds available for further (*real*) investment (Lazonick and O'Sullivan, 2000). This reflects a shift in the emphasis given to the different stakeholders of the firm, namely from workers to shareholders. The higher financial payments by non-financial corporations constitute a higher financial overhead cost which increases the mark-up added on unit costs (Hein, 2015). The positive association between the overhead costs and the mark-up is based on the assumption that the mark-up is elastic with respect to interest and dividend payments (Kalecki, 1954, pp. 17–18; Hein, 2015). In other words, higher interest payments on outstanding loans or dividends payments are factored into mark-ups. This is because financial overheads (interest and dividends payments) are not included in unit costs (or costs of production) but determines the planned profits (Lavoie, 2014b, p. 174).

The increase in firms' holdings of financial assets (especially in terms of their total assets) represents the third channel in which the rise of securitisation and market capitalisation have altered firms organisation of production (Crotty, 2003).

This development includes cost-cutting and wage suppression which is rewarded by shareholders (financial investors) in the form of higher share prices (Lapavitsas, 2009). This explanation has similarities with the shareholder maximisation channel in the sense that management is satisfying shareholders at the expense of workers. This channel highlights the role of capital gains through capital asset inflation[2] as an important driver and the rise in mergers and acquisitions as an important factor for this development (Crotty, 2009).

The fourth channel point to the "pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production" (Greta Krippner, 2005, p. 174). The key mechanism is the share of financial payments by non-financial corporations in the form of dividends and interest payments from their holdings of financial assets (Alvarez, 2015). It reflects that finance does not produce goods in a conventional sense and the pattern of accumulation is a 'accumulation-centred' view as opposed to an 'activity-centred' one (Krippner, 2005). This has close affinities with the third channel, but mergers and acquisitions and capital gains are not seen as an alternative to 'conventional' income-generating activities. Krippner computes financial income as a share of profits plus depreciation allowances (Krippner, 2005).

Krippner's method compares income with a net of cost measures and is, therefore, problematic because profits can decrease while financial activities rise due to the associated cost of financial activities (Rabinovich, 2019). Rabinovich states that this channel remains ambiguous due to the lack of data availability and, therefore, use 'second-best options'. Computing the share of financial income out of total income, he finds that the financial share of income averaged 2.5% since the 1980s with a peak in 2005. This suggests that financial and physical investments are not reasonable substitutes. According to Rabinovich (2019), the motive also differs as firms seem to match their financial commitments with financial income.

There are other studies supporting Krippner's view that the financial-dominated

---

[2]For an interesting discussion on what determines share prices or prices of capital assets, see Orléan (2014).

regime has increased the decoupling of surplus generating activities from production and sales of commodities, with the consequence of undermining workers' bargaining power vis-à-vis employers (Lin and Tomaskovic-Devey, 2013; Alvarez, 2015). A firm-level analysis indicates that an increase in financial income is associated with a decrease in the wage share of non-financial corporations due to a re-composition of the organisation of production (Alvarez, 2015). Although the effect on the wage share might be ambiguous concerning the magnitude, the notion that the composition of the balance sheet affects the bargaining position of labour is stronger because it captures an effect that is unavailable due to data limitations. Thus, a decrease of non-financial assets relative to total assets can be expected to have a negative association with workers' bargaining power and, therefore, their nominal wages.

The fifth channel is arguably the simplest and refers to the change in the composition of employment across sectors in the economy. The shift from sectors with stronger labour movements and high wage shares to sectors with lower wage shares and weaker bargaining power translates into a fall in the wage share on aggregate (Hein, 2015). Hein (2015) also mentions rising overhead costs and profit claims that have raised prices (via a higher mark-up) or compressed wage compensation. This channel is convincing when considering descriptive statistics on employment distribution across sectors and their associated wage shares. Nevertheless, econometric analysis has not found statistically significant relationships in the data (Köhler et al., 2019).

Table 7.1: Effects on wage formation under a finance-led regime

	Investment	Price mark-up	Share equity price	Wage share	Wage bargaining
Capital mobility	↓	→	→	↓	↓
Shareholder value	↓	↑	↑	↓	↓
Market capitalisation	↓	→	↑	↓	↓
Financial income	↓	↑	↑	↓	↓
Sectoral composition	↓	→	→	↓	↓

Common to these channels is the reduced bargaining power of labour due to its lower weight within the firm and outside following changes in labour market institutions. The role of labour market institutions with respect to the adverse

effects on the wage share is stressed in all the studies mentioned in relation to the channels (see table 7.1).

The importance of institutions has been highlighted in studies akin to Roberts and Kwon (2017), who explicitly investigate the differences due to the institutional configuration. Their study draws on the *Varieties of Capitalism* taxonomy in CPE and considers the arch-types of *Liberal Market Economies* (LMEs) and *Coordinated Market Economies* (CMEs) with respect to the magnitude of effects from *financialisation*. They find that the associated effect (from more employment in the financial sector and growth of the financial sector on income inequality and wage dispersion) was amplified under LME-type institutional configuration compared to CME-types (Roberts and Kwon, 2017).

Similar conclusions from studies analysing different sectoral compositions and institutional configurations argue that different institutional configurations and sectoral compositions may give rise to *variegated* financialisation (Jessop, 2014; Brown et al., 2017; Karwowski et al., 2019). Hence, the literature on finance-dominated capitalism and its effects on the labour market and the economy, in general, supports the notion that *institutions matter*.

The transformation from the Fordist to the post-Fordist era reflects a shift in power away from labour to (the benefit of) finance. The underlying logic of this transformation can be described as a *financial* model in which value creation, extraction, allocation and distribution is increasingly being determined in the financial market (Appelbaum, 2017). In Régulation Theory, this reflects a change in the focus from the wage-labour nexus to the financial nexus (Durand and Gueuder, 2018; Boyer, 2018b). In Marxian terms, it reflects a rise of fictitious capital and unproductive labour (Rotta and Teixeira, 2016). Post-Keynesians have stressed the role of credit and debt-led consumption (Kapeller and Schütz, 2014; Hein, 2018; Kim et al., 2019). However, as seen in the discussion of the channels analysed within these economic schools of thought, no attempts have been made to formalise the mechanism from finance-led regimes – or effects from financialisation – to the bargaining power of labour and wage formation. This has been alluded to by Stirati (Stirati, 2018),

but her point focused on how these channels focus on the interest aspect. Hence, this study builds on her observation and probes deeper, first by reviewing the channels systematically (summarised in table 7.1) and secondly by providing an alternative to how the mechanism can be formalised.

Central to these channels and to finance-dominated capitalism is the macroeconomic puzzle – the so-called *investment-profit* puzzle – following a decrease in the accumulation of (productive) capital whilst profit rates and shares are increasing (Stockhammer, 2005). The investment-profit puzzle runs counter to the PK postulate that profit rates and rates of capital accumulation are positively associated (Robinson, 1962, p.12). The empirical evidence for this puzzle is important for the *maximising shareholder valuation* notion under New Capitalism (van Treeck, 2008). Especially the shift among non-financial corporations towards a shareholder value orientation with higher dividend rates since the 1970s underpin a the new hierarchy and institutional configuration under finance-dominated capitalism (see Davis, 2018, for an empirical study of US firms). Such firm-level analyses argue that firms' objective has shifted from growth (economic expansion) towards profits, meaning that an increasing share of earnings are distributed rather than invested in capital equipment. If the PK postulate holds, then this change in corporate governance should entail some additional pressure on costs or profit margins to generate rising profit rates. The former warrants a focus on wage bargaining since employee compensation is a significant post on must firms' budget, and the latter suggest that real wages will fall.

7.2.2 The investment-profit puzzle

There are different explanations to the investment-profit puzzle in the literature: the 'expansive' case – finance-led growth – identified by Boyer (2000), the 'contractive' case set out by Stockhammer (2004), and finally 'profits without accumulation' (Cordonnier and Van de Velde, 2015). In the contractive case, higher dividends are paid, but the propensity to save is high and the associated consumption is insufficient to offset the weaker investment. Thus, the rate of capital accumulation falls resulting

in a decrease in the rate of capacity utilisation and the profit rate. In the expansive case, the decline in investment is limited because consumption out of dividends is high, which means that the additional consumption offsets the weaker investment. Thus, as the capital accumulation slows down, both the rate of capacity utilisation and profit rate rise.

The profits without accumulation is not significantly different from the expansive case. However, the profits without accumulation case differs from the expansive case because the consumption out of dividends is insufficient to increase new investment at a higher level (captured in the accelerator effect). Hence, there is not necessarily a contraction from the higher dividend payments, but there is no increase due to higher consumption out of dividends either. Profits without accumulation, therefore, falls in-between the contractive and expansive case, and the key difference being the accelerator effect which is sufficient to generate new investment at *a higher level* and subsequently higher economic activity in the expansive case (Cordonnier and Van de Velde, 2015).

Cordonnier and Van de Velde (2015) argue that the different cases, *contractive*, *expansive* and *profits without accumulation*, reflect different choices made by firms with respect to dividends payments, financial accumulation and external financing in the same system. This means that the mechanism and dynamics are similar (even close to the same at times), but the different outcomes are explained by the value of the parameters (in the model). Hence, there is no deep disagreement in these perspectives on finance-led regimes *per se*. The argument made by Cordonnier and Van de Velde (2015) stresses the importance of the mode of régulation because it shapes the economic behaviour which generates different outcomes – contractive, expansive or profits without accumulation – in the finance-led regime. Their study also indicates that firms' indebtedness is the enabling factor for profits beyond accumulation, despite that a large part of profits are not used for the accumulation of capital, but for remunerating shareholders with dividend payments, purchasing its own equity shares or financing financial asset procurements (Cordonnier and Van de Velde, 2015). These different subtypes of finance-led regimes reflect different

institutional forms that are compatible with New Capitalism. Hence, they have deep-reaching commonalities on the institutional plane, but key differences lead to varying degrees of contradiction within the regime. The study by Cordonnier and Van de Velde (2015) suggests that the institutional configuration plays an important role for which *type* is most prevalent (contractive, expansive or profits without accumulation).

7.2.3 The wage-labour and finance nexus

The investment-profit puzzle is a salient feature of finance-dominated capitalism, and the low rate of capital accumulation has a negative effect on effective demand. A higher propensity to consume out of capital rent (e.g. dividends) has been suggested as one possible explanation (see the previous section). However, another aspect is related to firms' bottom line, namely, costs; and firms' pricing policy. Thus, by introducing the wage-labour nexus and the finance nexus, the investment-profit puzzle can be utilised in an alternative way for analysing finance-dominated capitalism. The wage-labour nexus and finance nexus are interconnected since workers are key for production and production depend on financing. The Theory of the Monetary Circuit (TMC) offers a useful lens for purposes set out.

The TMC combines the Marxian notion of the production circuit and Keynes' finance motive of which a theory of the monetary production economy is founded (Rochon, 1997). The 'finance motive' of the entrepreneur in the Keynesian sense is the demand for money due to the expenditure arising in the period between planning and executing production (Bellofiore, 2012, p. 105). Finance and the financial sector are in many ways a nexus in itself due to the multifaceted use of finance and the vast web of the financial sector[3]. Firms that have issued securities have two payment obligations associated with the financial system, interest on loans to banks, in the money market, and dividends or interest on securities to asset shareholders, in the financial market) (Graziani, 2003, p. 115). In which market financial oblig-

---

[3] The interested reader is referred to Toporowski (2020b) for a discussion on financial processes, Temin (2020) for a discussion on capturing finance in the national accounts and Mian and Sufi (2018) for a mainstream perspective on finance and macroeconomic fluctuations.

ations are negotiated depends on the nature of the contract. Generally, short-term obligations are made in the money market, and long-term obligations are made in the financial market (Graziani, 2003, p. 115). The financial and the money market are not independent of each other because firms' payments to (shareholders and creditors) depend on the profits generated. Since creditors can declare their borrowers bankrupt, credit obligations take precedence over dividend payments. However, suppose firms are unable to meet expectations (from shareholders). In that case, they will not be able to attract funding (via the financial market) to repay the outstanding loan and see their market capitalisation fall as share prices fall. Thus, firms balance their presence in the financial and money markets by servicing their debt obligations (towards their creditors) and nurturing demand (among prospective and current shareholders).

The production circuit set out in Marx's *Capital* is integrated in TMC providing an explanation of *where* money enters the capitalist process and the nature of money in the context of the capitalist mode of production (Bellofiore, 2002, pp. 121-122). TMC, therefore, offers a macroeconomic approach to Marx where money is the commanding means over living labour in production (Realfonzo, 2006, p. 105). The theoretical framework provided by TMC represents a social macroeconomic analysis where credit money is granted by banks, which are financial capitalists, and this bank credit is always granted to industrial capitalists so that workers – wage-earners – receive their income via wage-labour (Graziani, 2003, p. 19). The capitalists, both the industrial and financial, determine the quantity of production and the functional distribution of income (Graziani, 2003, p. 26), which means that the capitalists decide not only the income of workers but also their own income, a formulation also found in Kalecki (1971). This provides the foundational link between the financial system and the real economy, namely the so-called labour market. Through the payment to labour, production is influenced by finance, and finance is influenced by production via consumption and investment that relies on hired labour to produce commodities (used in production) and consumption (out of

wages). This reflects the feedback effects present in the circular flow[4]. The credit mechanism in TMC depends on the bank's credit policy, but this has (surprisingly given the role of banks) received limited attention compared to the banking sector as a whole (Bossone, 2001).

These mechanisms represent economic behaviour that is mediated by institutions. The role of institutions and the institutional configuration was central to prominent research for the topic of this chapter, namely Hyman Minsky (cf. Minsky, 1986b; Ferri and Minsky, 1992; Minsky, 1996). The following subsection shows how the wage-labour nexus and finance-nexus are related by drawing on Minsky's work on institutions and economic systems, which represent similar concepts captured within the notion of the mode of régulation in RT.

7.2.3.1 Institutional configuration under finance-dominated capitalism

The institutional configuration affects social relations and for money and credit, these relations are organised under the monetary and credit regime (Boyer, 2018b). The role of institutions and interventions is to constrain capitalist market processes to produce acceptable outcomes; Minsky calls institutions and intervention *thwarting systems* (Ferri and Minsky, 1992). These thwarting systems, in combination with market behaviour, "contain and dominate the endogenous economic reactions that, if left alone, breed instability" (Ferri and Minsky, 1992, p. 80). Thwarting mechanisms are determined by the institutions and regulations in place that affect and influence agent interaction, the organisation of production and the institutional configuration of the economy – what the Régulation School refers to as régulation (Ferri and Minsky, 1992, p. 84, fn. 19). The parallel to the mode of régulation is even more apparent from the examples of thwarting systems mentioned by Ferri and Minsky (1992): labour market institutions, lender-of-last-resort, and market power and industry structures. Thwarting systems are essential to regulate capitalism and prevent the inherent instability of capitalism from unfolding in the forms of financial crises during the credit cycle – the periodical rise and fall of the demand

---

[4]The notion of circular flow is found in Marx (1894 [Volume III]) and Schumpeter (1911)

for, supply of and price of credit in an economy (Bezemer, 2012, p. 66). This is a similar point stressed by Boyer (2000). The functioning of the institutional configuration – or mode of régulation (thwarting system) – depends on the coherence and complementarity of the institutions in place and in terms of the regime of accumulation. It is interesting to note that the thwarting system described by Minsky can be understood as the mode of régulation in RT and show a theoretical overlap. Thus, the basis for joining economic theory and institutional economic analysis is very strong in PK economics and RT.

The finance-dominated regime is accompanied by – or does include since it is difficult to determine the precise relation – labour market reforms that seek to increase flexibility, i.e. increase the velocity in the labour market in the sense that it is easier to fire and hire workers (Glyn, 2006). Furthermore, the notion of market value has increasingly been adopted, so that collective bargaining and agreements are seen as market distortions that make the labour market less liquid (Amable et al., 2011; Appelbaum et al., 2013). This development reflects institutional complementary and is associated with a structural change in the economy (Pariboni and Tridico, 2019). When considering research on wage share implications from finance-dominated regimes (Hein, 2019; Köhler et al., 2019), this reduction of wage bargaining is mentioned in passing but without a predominant role. The fall in the wage share is linked to a higher mark-up (the explicit channels have been discussed above). However, the link to lower bargaining power is under-analysed despite its role as a determining factor on the *degree of monopoly* on which the mark-up depends (Kalecki, 1954, p. 17). The institutional analysis emphasised in CPE and institutional-oriented macroeconomic analysis, such as Amable and his co-authors (2005; 2011), is disconnected from the macroeconomic analysis of macro variables.

7.3 Labour market institutions under New Capitalism

The stable level of the labour share of income was long considered a stylised fact (cf. Kaldor, 1957). However, recent research indicates that the labour share of income has been falling over time (Autor et al., 2020). Theoretical explanations for the negative effect have been summarised above. However, these explanations have not covered the long-term developments of the labour market institutions. This section seeks to address that weakness.

The analysis draws mainly on the database Institutional Characteristics of Trade Unions, Wage Setting, State Intervention and Social Pacts (ICTWSS) maintained by Jelle Visser at Amsterdam Institute for Advanced Labour Studies (AIAS), the University of Amsterdam. The ICTWSS database provides a long-term view on the development of labour market institutions, wage formation and collective agreements from the 1960s to 2018 (Visser, 2019). Thus, this database is particularly suitable for this analysis. The analysis considers three broad groups of countries based on the taxonomy set out by Esping-Andersen (1990) with four countries from each group. The analysis focuses on the labour market institutions affecting the wage formation and the collective agreements and their coverage.

7.3.1 Wage setting institutions

The analysis focuses on the role of labour market institutions for the wage-setting in the respective countries. An initial observation is that the taxonomy of Esping-Andersen (1990) seem to still hold, at least with respect to labour market institution. A recent study on capitalist models focusing on the institutional configuration finds that the clusters similar to Esping-Andersen's study (see Amable, 2003) still holds, albeit with some modifications (Antonelli et al., 2019). Nevertheless, the assessment of the contemporary validity of the taxonomy is outside the scope of this study. The ICTWSS database organises the data which enables a comparative analysis across countries. This is useful to understand similarities between countries as well as

differences.

      table 7.2 show the coordination of wage-setting in three time periods, 1960-1979, 1980-1999 and 2000-2018, reflecting the post-World War II period, the beginning of the finance-led regime of accumulation and the 21st century, respectively. The movement across these three time periods reflects an increasing lax wage-setting coordination, e.g. the Nordic countries moved from a binding wide-reaching system between 1960 and 1979 to a non-binding wide-reaching system since 1980. A more extreme case is that the UK which moved from category 4 to category 1 between the 1960s to 2018.

Another important aspect is that of the type of coordination. France and Italy

Table 7.2: Wage-setting coordination in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
1 – fragmented wage bargaining at the firm- or plant-level, no coordination	France; Italy	Italy**; New Zealand****; UK; US	New Zealand; UK; US
2 – some coordination based on pattern setting by large firms, sectors , gov. wage policies or minimum wage policies	US	Australia***; France; Spain	Australia; France
3 – procedural negotiations by the central trade union and employer's organisation; or from a regularised pattern coupled with a high degree of union concentration and authority	Australia; New Zealand	Sweden	Italy; Sweden
4 – non-binding centralised bargaining by central trade union and employer's organisation	Finland; Germany; UK*	Denmark; Finland; Germany	Denmark; Norway; Sweden; Finland; Germany
5 – binding centralised bargaining by central trade union and employer's organisation	Denmark; Norway; Sweden	Norway	

Source: AIAS (Visser, 2019), wage-setting variable 7: coordination of wage-setting. * UK is categorised as 3, 4 and 5, respectively 7, 4 and 7 times. Spain is not included in the first period due to a lack of data . ** Italy falls in category 1 and 3, respectively 7 and 6 times. *** Australia is categorised as 2 and 4 both 8 times. **** New Zealand is categorised as 1 and 3, respectively, 9 and 8 times.

were the only countries from 1960 to 1979 with no specific mechanism, although wage bargaining is set at the industry level. The UK and US have firm-level wage

bargaining without any specific coordination mechanism, see table 7.3 and table 7.7. In contrast, the Nordic countries with industry-level wage bargaining coordinate the wage-setting with pattern bargaining, i.e. systematic bargaining according to industries, see table 7.3 and table 7.7.

In table 7.4, most countries are either influenced by the government (in)directly

Table 7.3: Type of coordination of wage setting in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
0 – no specific mechanism	France; Italy	Italy; New Zealand UK; US	New Zealand; UK; US
1 – government set signals		France	Australia; France
2 – pattern bargaining	Australia; Germany; US	Denmark; Germany; Sweden**	Denmark; Germany; Norway; Sweden
3 – intra-associational (informal centralisation)		Spain	Italy
4 – inter-associational by peak associations	Denmark; Norway; Sweden	Norway***	Spain
5 – government-sponsored bargaining	Finland; UK*	Australia****; Finland	Finland
6 – government-imposed bargaining	New Zealand		

Source: AIAS (Visser, 2019), wage-setting variable 8: type of coordination of wage setting. * UK is counted in categories 1, 5 and 6, respectively 5, 6 and 5 times during this period. ** Sweden is categorised in groups 2, 3 and 4 respectively 8, 4 and 6 times. *** Norway is categorised as 4, 5 and 6, respectively 8, 6 and 5 times. **** Australia is categorised as 1, 2 and 5, respectively 4, 5 and 8 times.

or not. However, the distribution of countries is more mixed than in the other variables. For example, Sweden, Germany, Australia, New Zealand, UK and the US have no (in)direct influences from the government, while Denmark, Norway, France and Italy are (in)directly influenced by the government. The wage-setting with respect to sectoral agreements defines the minimum level of wages or the minimum level as well as the actual wage level (see table 7.6). The exception is Denmark which set the framework that includes the default for the wage negotiations.

Although the countries considered (except for Denmark), Australia, France, New Zealand, Spain, the UK and the US have statutory minimum wage set (see table

Table 7.4: Government intervention in wage bargaining in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
1 – none of the below	Germany***; Sweden; US	Germany; New Zealand; Sweden; UK; US	Germany; New Zealand; Spain; Sweden; UK; US
2 – government influences wage bargaining directly	Denmark; Norway*	Denmark; Norway; Spain******	Australia; Denmark; Norway
3 – government influences wage bargaining indirectly	Australia; Finland** France; Italy; New Zealand*****; UK****	France; Italy	France; Italy
4 – tripartite bargaining		Australia; Finland	Finland
5 – government imposes private sector wage settlements			

Source: AIAS (Visser, 2019), wage-setting variable 9: government intervention in wage bargaining. * Norway is categorised as 2 and 5, respectively 11 and 7 times. ** Finland is categorised as 3 and 4, respectively 11 and 8 times. *** Germany is categorised as 1 and 3, respectively 11 and 9 times. **** UK is categorised as 3, 4 and 5, respectively 7, 4 and 7 times. ***** New Zealand is categorised as 3 and 5, both ten times. ****** Spain is categorised 2 and 4, respectively 8 and 7 times.

Table 7.5: National minimum wage in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
0 – no statutory minimum wage	Denmark; Finland; Germany; Italy; Norway; Sweden	Denmark; Finland; Germany; Italy; Norway; Sweden	Denmark; Finland; Germany; Italy; Norway; Sweden
1 – statutory minimum wage in some sectors/ regions/ states	New Zealand; UK	UK	
2 – statutory minimum wage nationally	Australia; France; Spain; US	Australia; France; New Zealand; Spain; US	Australia; France; New Zealand; Spain; UK; US

Source: AIAS (Visser, 2019), wage-setting variable 26: national minimum wage.

7.5). This determines a minimum wage level that becomes a floor for any wage bargaining. New Zealand and the UK had a hybrid version between the 1960s and 1990s, but today minimum wage has become a binary institutional characteristic (for the data sample in table 7.5). However, for those countries where the sectoral

agreements only set the minimum level, a minimum wage level is essentially set in each agreement on wages (see table 7.6). The shift from a minimum level and the actual level to *only* a minimum level occurred between 1980 and 1999 for the Nordic countries (except Norway). It has remained unchanged for Australia, France, Italy, New Zealand[5] and the UK in the same period.

The labour market institutions for the wage formation reflect a reduction in co-

Table 7.6: Wage setting in sectoral agreements in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
0 – define minimum and actual wage levels	Australia; Denmark; Finland; Germany; Sweden; US	Denmark*; Finland; Germany; Spain; Sweden**; US	Germany; Spain; US
1 – define the minimum wage levels	France; Italy; New Zealand; Norway; UK	Australia***; France; Italy; New Zealand; Norway; UK	Australia; Finland; France; Italy; Norway; Sweden; UK
2 – set framework or define a default for enterprise bargaining			Denmark

Source: AIAS (Visser, 2019), wage-setting variable 20: wage setting in sectoral agreements. * Denmark is categorised as 0 and 1, respectively ten times each. ** Sweden is categorised as 0 and 1, respectively 13 and 7 times. *** Australia is categorised as 0 and 1, respectively, nine and eleven times.

ordination – from binding to non-binding – which means that the effect of wage bargaining is decreased. In 1960-1979, only three countries had some or fragmented wage-setting coordination. Whilst, in 1980-1999 the total number increased to seven countries and since 2000 five countries fall into these categories. Hence, wage coordination has become more fragmented across the sample, whilst there remain stark differences. Moreover, the characteristic of wage bargaining coordination has developed from inter- or intra-associational to pattern bargaining or no specific mechanism (at all). In the first period, six out of eleven countries were categorised as inter- or intra-associational, or governmental sponsored/ influenced bargaining, in the period of 1980 to 1999. Then 2000 to 2018, 4 and 3, respectively, out of twelve countries fell into the same categories. This reflects that bargaining is increasingly becoming less structured as well as more fragmented.

These developments have implications on the bargaining power of labour vs

---

[5]There is no available for New Zealand since 1991.

the monopsony power of employers. Monopsony power reflects the capacity of employers to pay a wage rate below the productivity level of the employee and thereby increase the profit margin (Robinson, 1933). The institutional configuration and labour market institutions, in particular, are important for mediating this power relation between employees and employers (Stelzner and Paul, forthcoming). Recent labour economic studies have highlighted the importance of monopsony power and provided a contemporary view on the implications of labour exploitation as a consequence of monopsony power in modern labour markets (cf. Manning, 2003; Ashenfelter et al., 2010; Azar et al., 2020).

7.3.2 Trade unions and collective agreements

Trade unions negotiate national or regional collective agreements on wages and nonwage matters in Nordic countries, continental European countries, but not in Australia, New Zealand and the US (Visser, 2019). There has not been a change in this variable in data available, but for the UK in which trade unions negotiated collective agreements on a national level up to 1984, since 1895, the UK has been categorised alongside the other Anglo-Saxon countries reviewed in this paper.

Based on Iversen's (1999) methodology, the measure of union concentration combines data on the degree of concentration of trade unions with information on the division of authority in the unions (Visser, 2019). A Herfindahl-Hirschman index (HHI) is calculated over membership shares of confederations and union affiliation, respectively. At the confederation level, the membership levels have fallen in the Nordic countries (see figure 7.1), close to European Continental levels (see figure 7.2) except for Germany. However, the wage bargaining coverage in the Nordic countries has remained steady at app. 75-89% (see table 7.8). Interestingly, the membership concentration among Anglo-Saxon countries (albeit fragmented) indicates a slight upward trend above current Nordic and European Continental levels (see figure 7.3).

Figure 7.1: Membership concentration Figure 7.2: Membership concentration at at confederation level - Nordic countries confederation level - continental European (1960-2018) countries (1960-2018)

Figure 7.3: Membership concentration at confederation level - Anglo-Saxon countries (1960-2018)
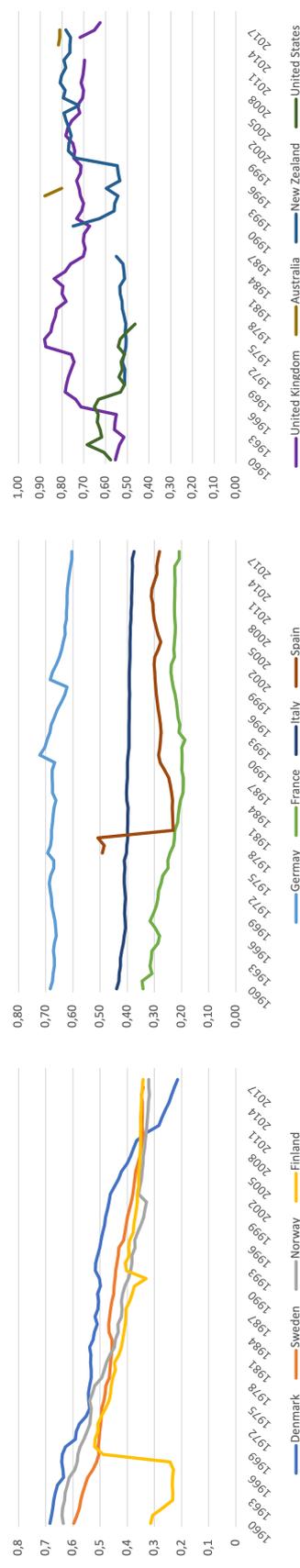
Source: AIAS (Visser, 2019), variable 150: membership concentration at confederation level (HHI calculated over membership shares of confederations or peak associations).

Figure 7.4: Membership concentration at union level - Nordic countries (1960-2018)

Figure 7.5: Membership concentration at union level - continental European countries (1960-2018)

Figure 7.6: Membership concentration at union level - Anglo-Saxon countries (1960-2018)
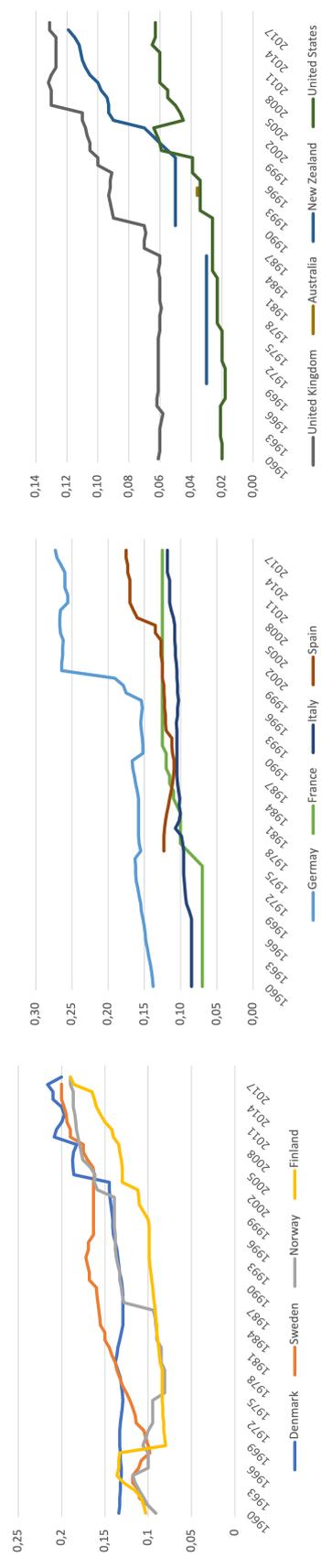
Source: AIAS (Visser, 2019), variable 151: membership concentration at union level (HHI calculated over membership shares of affiliated within the main confederation).

Table 7.7: Wage bargaining level in developed countries from 1960 to 2018

	1960-1979	1980-1999	2000-2018
1 – local-/ firm-level	US	New Zealand**; US	New Zealand; UK; US
2 – between sector- and firm-level		UK*	Australia
3 – sector- or industry-level	France; Germany; Italy; UK	Denmark; France; Germany; Italy; Spain; Sweden	Denmark; France; Germany; Italy; Norway; Spain; Sweden
4 – between central and industry-level	Australia; Finland; New Zealand	Australia; Finland	Finland
5 – central or cross-industry level	Denmark; Norway; Sweden	Norway	

Source: AIAS (Visser, 2019), variable 13: the predominant level at which wage bargaining takes place (in terms of coverage of employees). * UK is categorised as 1, 2 and 3, respectively 6, 7 and 7 times. ** New Zealand is categorised as 1, 3 and 4, respectively 8, 7 and 5 times.

At the union level, the membership trend is rising. These levels reflect the HHI calculated over membership shares within the main confederation for the respective union affiliation (see figure 7.5). The significant jump in Germany between 1999 and 2002 occurred in the run-up to the introduction of the Hartz reform, which was implemented between 2003 and 2005. The adjusted wage bargaining coverage fell from 85% in the 1990s to 67.8% in the 2000s in Germany (see table 7.8). The level of wage bargaining has been at the industry level in Germany since the end of World War II (see table 7.7).

Table 7.7 shows that there has been a significant institutional shift for the Nordic countries in the three time periods from 1960-1979 to 1980-1999 and 2000-2018. These shifts reflect a steady decentralisation in terms of the wage bargaining level. Coupled with the high proportion of coverage in the Nordic countries (see table 7.8), the insider-outsider problem (cf. Lindbeck and Snower, 1987) is accommodated by generous social security benefits (Moene and Wallerstein, 2005; Barth and Moene, 2016). In the European Continental countries, the wage bargaining level has historically been at the industry level with few changes to that institutional feature

Table 7.8: Adjusted bargaining coverage in developed countries from 1960 to 2018

	1960	1970	1980	1990	2000	2010
Australia	92.0	88.3*	85.4*	77.3	60.0	58.6
Denmark	79.0	80.0	81.0	82.8	77.7	76.5
Finland	63.0	73.0	77.0*	85.0*	85.0	87.5*
France	50.0	70.0	70.0	94.6	96.0*	95.0
Germany	85.0	85.0	85.0	85.0	67.8	59.8
Italy	91.0	88.0	85.0	83.0	80.0	80.0
New Zealand	70.0	70.0	70.0	60.0	30.7	17.4
Norway	70.0	70.0	70.0	75.0	77.0*	74.0*
Spain	-	-	-	77.8	75.0	69.7
Sweden	75.0	78.0	85.0	91.0	94.0	89.0
UK	72.1	78.0	85.0	58.0	36.4	30.9
US	34.0	30.0	26.0	17.6	14.2	12.6

Source: AIAS (Visser, 2019), variable 111: adjusted bargaining (or union) coverage rate. Employees covered by valid collective wage bargaining agreements as a proportion of all wage and salary earners in employment with the right to bargaining. * if data for the year is missing, the closest available data between date and previous date is used.

(see table 7.7). Germany saw a considerable reduction in its bargaining coverage in the 21st century, whilst the coverage has remained relatively stable for France, Italy and Spain in the same period table 7.8). In contrast, the Anglo-Saxon countries have all seen considerable drops in the coverage rate (see table 7.8) and increasing decentralisation in the wage bargaining level (see table 7.7). Only the US has kept wage bargaining at the firm-level with less than 50% coverage since the 1960s.

7.4 Non-financial corporations under New Capitalism

This analysis focuses on non-financial corporations (NFCs) in the United States. The analysis is based on balance sheet data and seeks to investigate the implications on the employee compensations from finance-dominated capitalism as indicated by the balance sheet composition between financial and non-financial assets of NFCs (see figure 7.20). The analysis starts with a quick overview of the liability side of the balance sheet. Private pension schemes have become a large portion of NFCs liabilities. Figure 7.7 shows the proportion of NFC in the US since 1945 where 'Misc. liabilities' is computed from private pension funds, pension funds contributes receivable, private defined benefit pension funds, claims of pension funds on sponsor and unidentified miscellaneous liabilities. Pensions and foreign direct investment in the US now make up more than 50% of NFCs' liabilities (not considering the net wealth of NFCs). This development follows from a greater burden of pensions being allocated to the private sector, as it historically was under public provision (Sweeney, 2019).

Figure 7.7: Liabilities (by proportion) of non-financial corporations in the US from 1945 to 2020
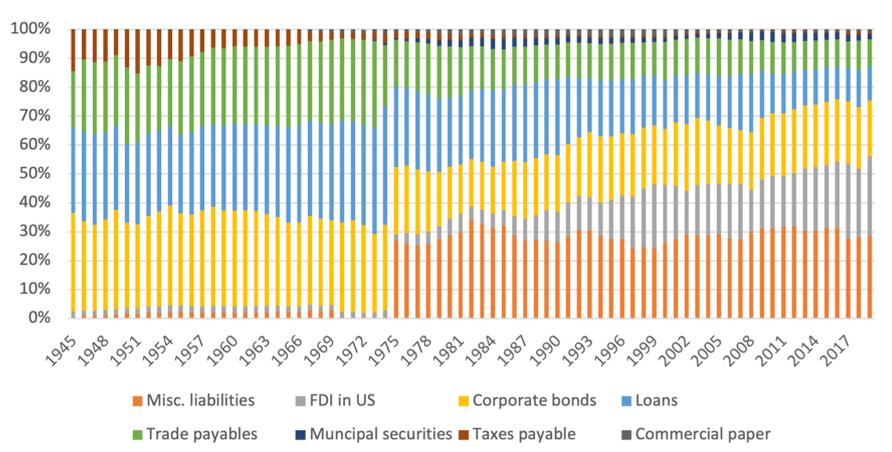
This expansion of exchange contracts based on future outcomes (of prices of capital-assets) and income beyond its initial use as a hedging tool (against future

risk) has altered its nature towards a more speculative instrument intending to make profits on future incomes, bypassing production altogether (Bellofiore and Halevi, 2011, pp. 13-14)[6]. In other words, firms' (future) financial obligations are increasingly dealt with through financial assets rather than non-financial assets (i.e. production activities). Another feature of this development is firms' leverage buyout operations and debt-financed mergers and acquisitions (Bellofiore and Halevi, 2011, pp. 17-18). By obtaining short-term debt, firms can acquire other firms which can be split and resold. This is known as 'originate and distribute' and leaves the acquiring firm with some profits after repaying the debt (ibid.). This means that cost-cutting is important for competitiveness in the commodity markets (i.e. for the market power) and for the firm's existence (i.e. for the bottom line). Such strategic "moves" reflect the alignment of managers and shareholders under New Capitalism.

This focus has fuelled outsourcing and widespread use of temporary contracts, giving rise to the notion of *precarious* jobs, as labour costs greatly impacts the bottom line (Appelbaum, 2017). The precarious nature of work means that workers are becoming more dependent on credit to increase or maintain consumption levels (Cynamon and Fazzari, 2008; Barba and Pivetti, 2009). It also makes workers increasingly dependent on holding a job to fund their debt commitments and procure additional debt. This might diminish workers' willingness to challenge their employers in wage negotiations (Wood, 2017).

The transformation of firms' objectives, via changes to the corporate governance, has altered the balance sheets of NFC in the US (see figure 7.20). Since the beginning of the 1980s – as described in Magdoff and Sweezy (1987) – NFC assets are increasingly made up of financial assets, app. 20% in the 1950s slowly increasing to 30% throughout the 1960s and 1970s and exploding in the 1980s to 40% and almost 50% around 2000.

A recent study points to an increase in intangible assets (especially patents) as the explanation for this increase in financial assets (Rabinovich, 2019). Intangible

---

[6]This process of financialisation was already discussed in a series of articles published in the Monthly Review Press during the 1980s, see Magdoff and Sweezy (1987).

assets are classified in the national accounts as financial assets as opposed to non-financial assets. Rabinovich investigates the share of financial income and finds that it is low (on average 2.5%) and has been falling since 2005 for NFCs in the US (Rabinovich, 2019). Using firm-level data, he investigates the composition of NFCs balance sheet and concludes that NFC is not expanding their stock of financial assets (e.g. equity stocks, financial derivatives and other financial instruments), but the value of intangible assets have grown (Rabinovich, 2019). This is supported by another study on intangible assets, which suggests that intangible assets contribute to the reduction in *real* investment *and* raises profits (Orhangazi, 2019). Therefore, it can be maintained that larger holdings of financial assets have not contributed to an expansion of productive activities. Part of firms shift towards financial assets, except for liquidity reasons, are due to the increase in intangible assets booked on the balance sheet, and it suggests that such patents and licensing are becoming larger streams of revenue (Orhangazi, 2019; Rabinovich, 2019).

NFCs financial assets, in terms of deposits, short-term financial investment and equities, are held to generate revenue which can cover costs associated with liabilities such as debts or owed to customers (Rabinovich, 2019). The associated financial income from these financial assets is intended to cover the costs of circulating capital. This concept is highlighted in *Volume III* of *Capital* in the discussion of the turnover of merchant's capital and the circulation of money-capital (Marx, 1894, chaps 18, 27, 30-32). The role of financial assets and income *might* therefore not be such a central component in the finance dominated capitalism system as sometimes suggested. However, the reduction of the proportion of non-financial assets of NFCs does reflect the financialised system of New Capitalism. According to Rabinovich (2021), despite the low level of capital accumulation, the high profit level reflects a price-quantity effect in which NFCs have increased their profit margins or reduced their unit costs or a combination of both. NFCs market power in both the goods and labour market is central to this hypothesis.

The non-financial corporate business 'sector' includes various markets in which some corporations may operate in more than one, making it difficult to com-

pute the degree of market power. However, some work indicates that market power has become more concentrated among corporations (Durand and Gueuder, 2018; Durand and Milberg, 2020) and in the labour market especially (Autor et al., 2020; Azar et al., 2020). Azar et al. (2020) look at online vacancy data for 2016 and find that 60% of US labour markets are highly concentrated, which, when weighted by employment shares using employment data from the Bureau of Labor Statistics, translates to 16% of workers in the US work in a highly concentrated labour market and another 7% in work in a moderately concentrated labour market.

The associated implications for the wage-labour nexus from the asset composition changes among NFCs and their profit-generating activities must therefore include the market power factor as labour markets operate, to some extent, as a monopsony. Another perspective is to look at NFCs profits per unit as higher (lower) profits per unit could entail higher (lower) profits despite the lower (higher) accumulation of capital. The data on unit profits, total unit costs and output for NFCs in the US show a relatively unchanged correlation, except for unit profit-total unit costs and unit profits-output that become negatively correlated after 2010 up to 2020 (see figure 7.8).

Figure 7.8: Correlation among quantity, unit profits and total unit costs for non-financial corporations from 1947 to 2020
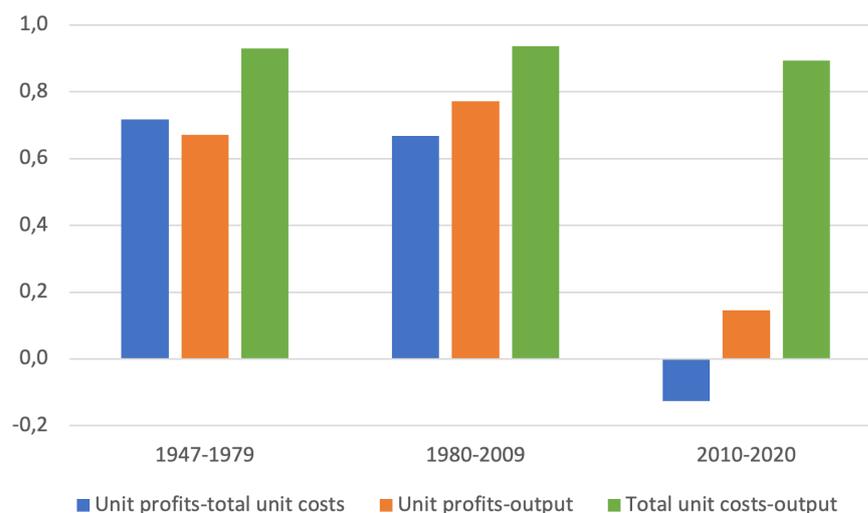
Over time total unit costs grew faster than unit profits since the beginning

of the 1970s and accelerated at the start of the 1980s. In the 1980s, up until the millennium, total unit costs increased the distance to output. Unit profits have seen significant fluctuations since the 1990s that reflects deep crises such as the dot-com crisis in the early 2000s and the Great Financial Crisis of 2007 hitting the floor in 2009 (see figure 7.9). The negative correlation since 2010 parallels an increasingly volatile unit profits rate. This is not caused by volatility in productivity which follows a smooth trajectory that follows output (see figure 7.9), nor large fluctuations in the labour unit costs (figure 7.13) or employee compensation (figure 7.15).

The 1980s also marks a reduction in the ratio of NFCs profits (before taxes)-to-assets. This ratio had arguably already a downward trend, beginning in the mid-1960s. However, the ratio remains below the latest highpoint in 1979 (see figure 7.12). Profits before taxes were almost four times greater than financial assets for NFCs after World War II but have steadily been falling since then (see left-hand axis in figure 7.12). During the same period, profits as a ratio of non-financial assets have been fluctuating around 0.4. Profits before taxes have increased in this period, but non-financial assets have risen faster than profits, and the increase in profits seems to follow the rise in financial assets more so than non-financial assets (see figure 7.10 and 7.11).

Figure 7.9: Quantity, total cost and profit per unit for non-financial corporations (indexed 2012=100) from 1947 to 2020
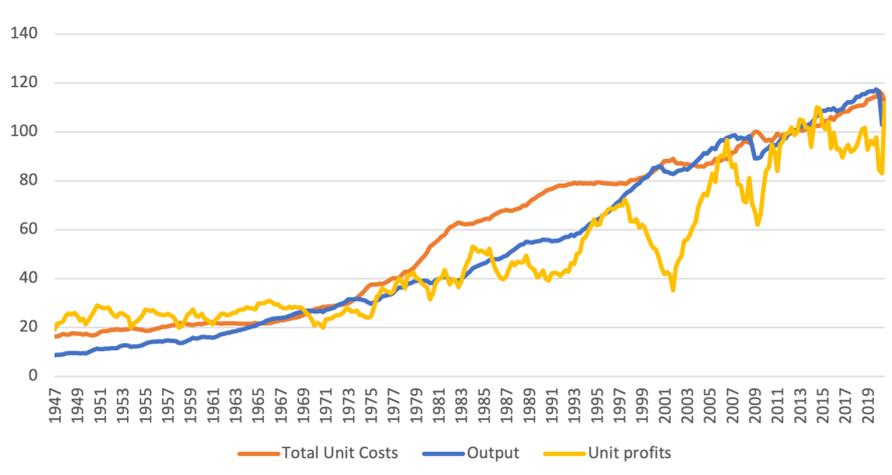
Looking at unit costs decomposed between labour unit costs, nonlabour

Figure 7.10: Profits and non-financial assets (indexed 2012=100) from 1947 to 2020
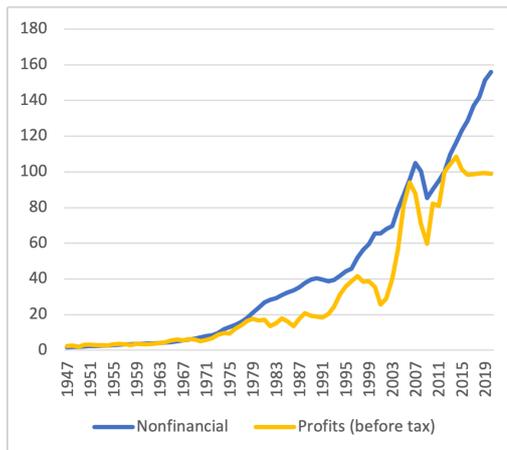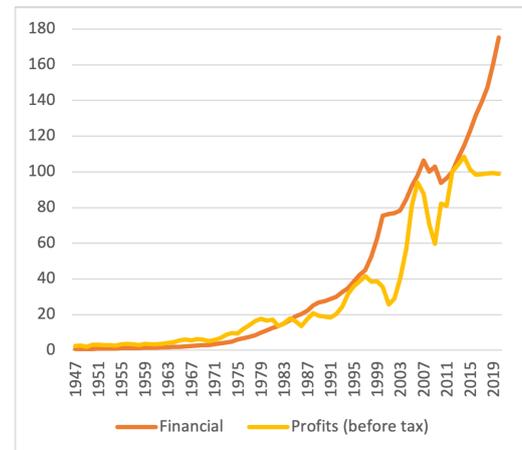
Figure 7.11: Profits and financial assets (indexed 2012=100) from 1947 to 2020

Source: author's calculation based on data from non-financial corporations' profits before tax (without IVA – inventory valuation adjustment – and CCadj – capital consumption adjustment) and NFCs financial accounts (Z.1) B.103 balance sheet of non-financial corporate business, retrieved from the Federal Reserve Economic Data: `https://fred.stlouisfed.org` [accessed on 29.04.2021].

Figure 7.12: Non-financial corporations' profits-to-assets from 1947 to 2020
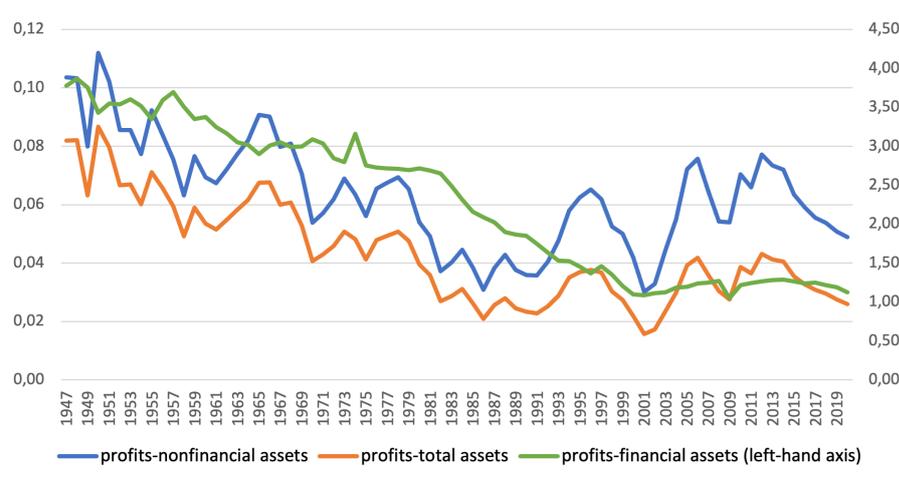

Source: author's computations based on non-financial corporations' profits before tax (without IVA – inventory valuation adjustment – and CCadj – capital consumption adjustment) and NFCs financial accounts (Z.1) B.103 balance sheet of non-financial corporate business, retrieved from the Federal Reserve Economic Data: `https://fred.stlouisfed.org` [accessed on 28.04.2021].

unit costs and nonlabour payments in figure 7.13, two observations are interesting for the discussion so far. The negative correlation seen between unit profits and total unit costs coincides with the period in which labour unit costs have been caught up by nonlabour unit costs and nonlabour payments, i.e. since 2009-2010. Nonlabour costs include NFCs consumption of fixed capital, taxes on production and imports less subsidies, net interest and miscellaneous payments and business current transfer

275

payments (Bureau of Labor Statistics, 2008, p. 4). Nonlabour payments is the excess of current output measured in dollars over corresponding labour compensation and include nonlabour costs plus corporate profits and profit-type income of proprietors (Bureau of Labor Statistics, 2008, p. 4).

Figure 7.13: Unit nonlabour costs and payments and unit labour costs (indexed 2012=100) from 1947 to 2020
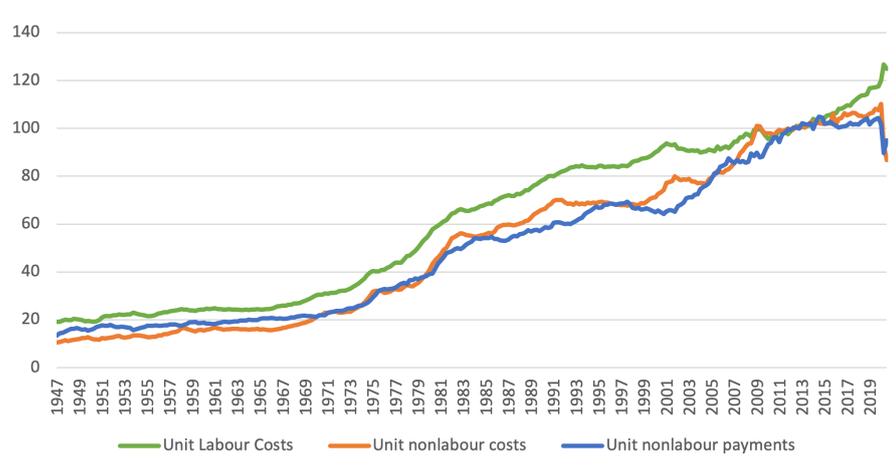
Source: US Bureau of Labor Statistics, retrieved from: `https://beta.bls.gov/dataQuery/search` [accessed on 28.04.2021].

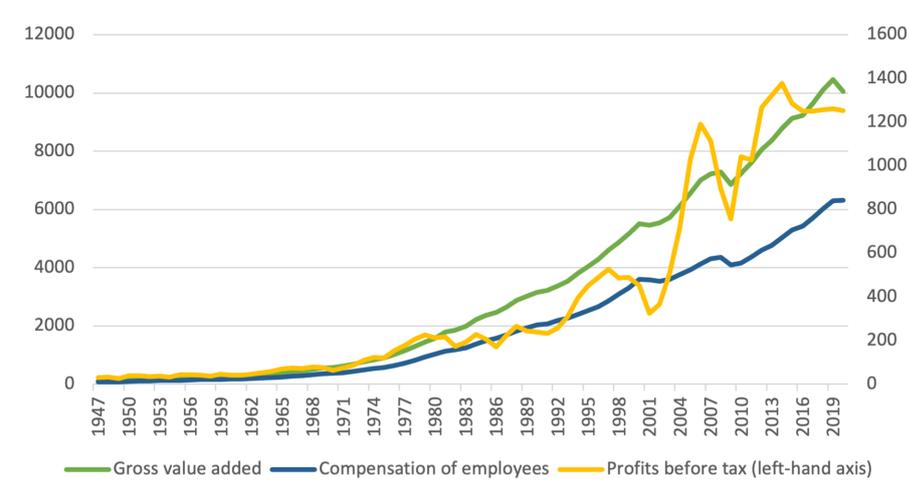Figure 7.14: Unit labour costs as a share of total unit costs from 1947 to 2020
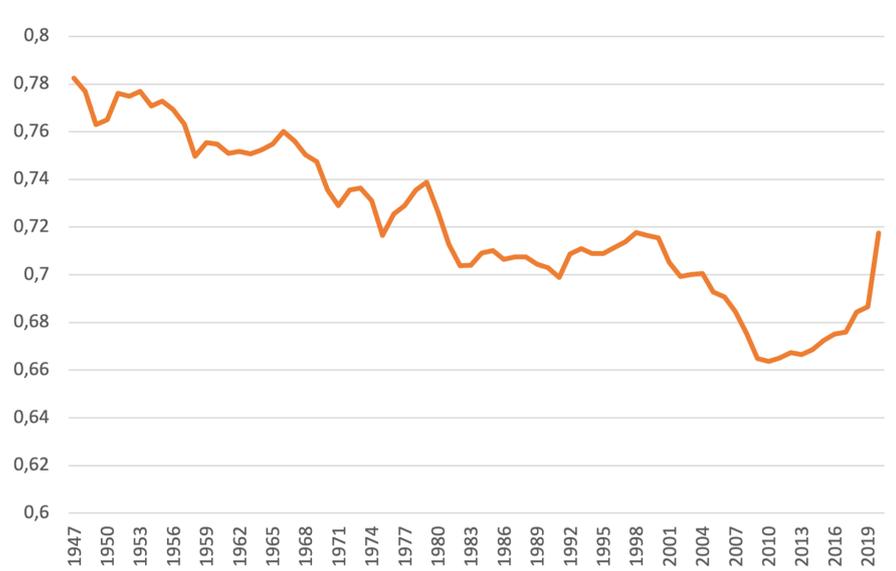
Source: author's calculations based on data from US Bureau of Economic Analysis, costs per unit of real gross value added of non-financial corporate business: compensation of employees (unit labor cost) [A460RD3Q052SBEA] and costs per unit of real gross value added of non-financial corporate business: unit nonlabor cost [A467RD3Q052SBEA], retrieved from FRED, Federal Reserve Bank of St. Louis `https://fred.stlouisfed.org` [accessed on 04.05.2021].

In figure 7.15, the widening gap between employee compensation and gross value added for NFCs points to nonlabour costs. However, by looking at NFCs

net operating surplus (see figure 7.16), the increase in nonlabour costs relative to nonlabour payments are not associated with productive operations by NFCs as this would have a dampening effect on operating surplus. Employee compensation in the non-financial corporate business sector started to diverge from gross value added in the 1970s already. However, the labour share of income in the non-financial corporation sector remained steady until the start of the 21st century (see figure 7.17). The fall in the share of employee compensation to gross value added (labour share of income) supports the reasoning that NFCs profits have seemingly reduced due to a higher proportion of value-added is paid to labour. The crux of the argument above – the implications on the wage-labour nexus under finance dominated capitalism – is illustrated in figure 7.20 where the proportion of assets for NFCs has steadily shifted from being dominated by non-financial assets towards a fifty-fifty split. The accumulation of financial assets instead of capital reflects the characteristics of corporations in New Capitalism. Under the finance-led regime, NFCs are relatively less affected by real factors in the economy but have still maintained flows of profits from their operations (as seen in the net operating surplus).
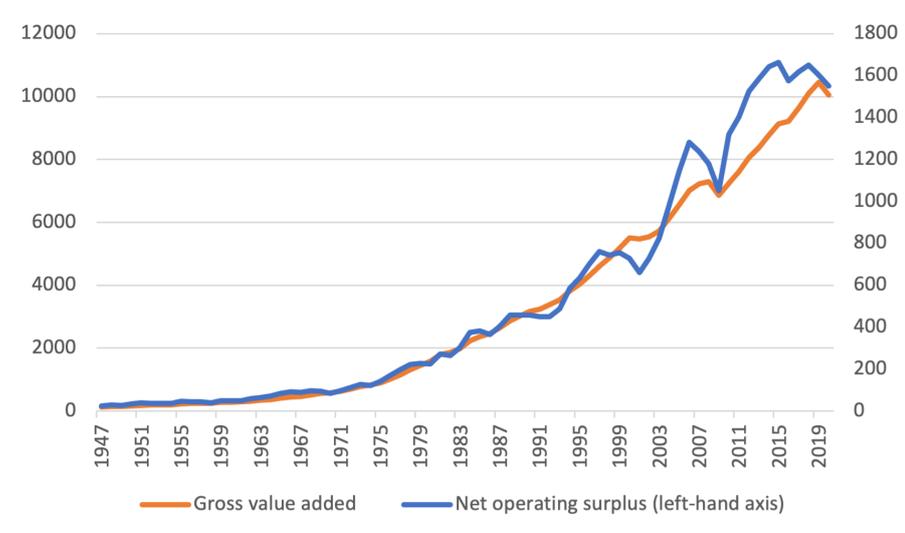
Figure 7.15: Gross value-added, labour compensation and profits (billions $) from 1947 to 2020

The distribution of dividends is a much-discussed feature of New Capitalism. The ratio of dividends paid-to-gross profits has increased significantly since the late

Figure 7.16: Net operating surplus and gross value added (billions $) from 1947 to 2020

Figure 7.17: Employee compensation to gross value added and dividends from 1947 to 2020
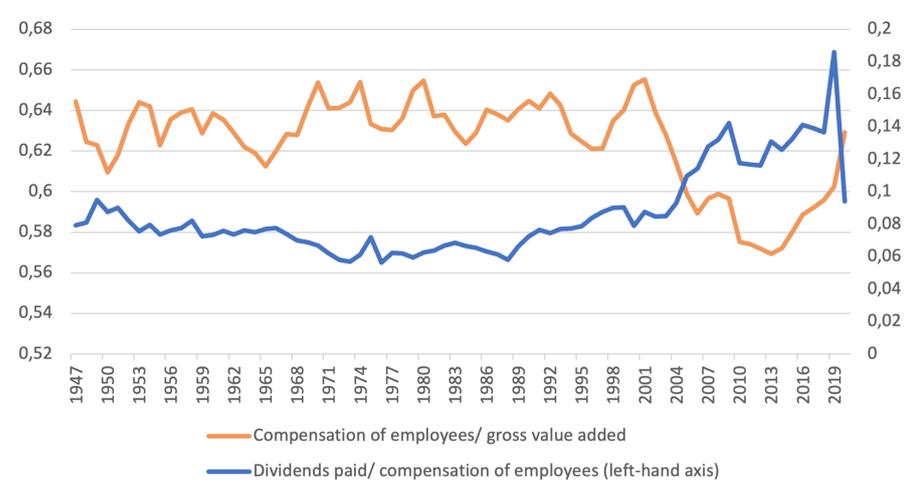
1980s. In the same period, gross profits-to-gross value-added has remained stable (see figure 7.18). As the share of labour income in the non-financial corporation sector was stable until it drastically fell in the early 2000s supports the argument that workers' bargaining power has been undermined vis-à-vis the bargaining power of shareholders. The fall in employee compensation relative to gross value added

278

Figure 7.18: Distribution of value-added from 1947 to 2020
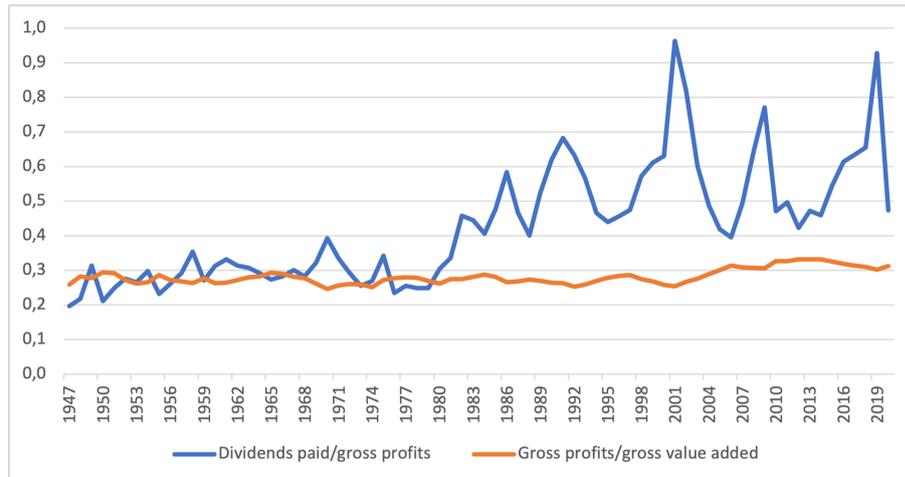
is paralleled by a sharp increase in the dividends paid relative to employee compensation (see figure 7.17). This trade-off is not direct as dividends are paid out of profits, which is a residual from operations in some periods (cf. Kalecki, 1942). Nevertheless, a larger proportion of profits or surplus means that the enterprise must obtain more external financing than otherwise needed and it could also have negative (positive) consequences for the labour share (profit share), as shown by Sasaki and Fujita (2014) in a post-Keynesian model with labour supply constraints.

Figure 7.19: Non-financial corporations' profit rates from 1947 to 2020
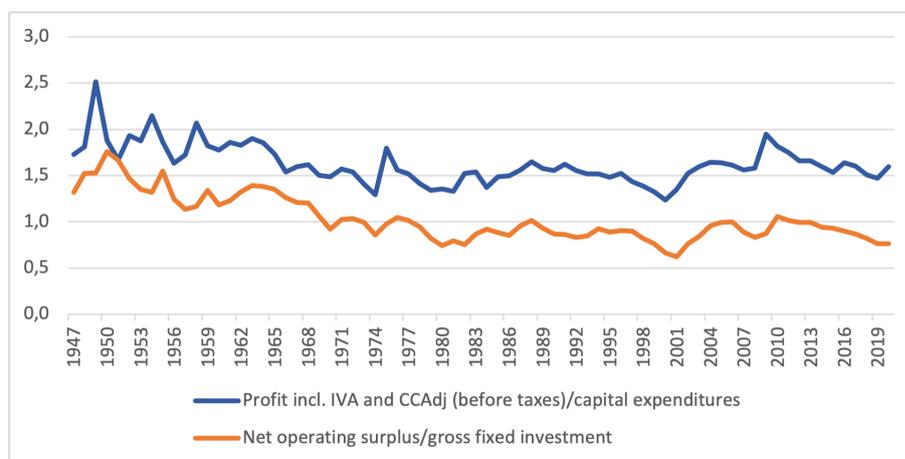
Finally, one can observe a falling trend when considering the profit rate – calculated as surplus over investment or profits over capital expenditure[7]. Profits include inventory value adjustment (IVA) and capital consumption adjustment (CCAdj), meaning that capital consumption allowance and IVA are accounted for. This is necessary to make it comparable to total capital expenditure, which includes gross fixed investment (which include nonresidential structures, equipment and intellectual property products and residential equipment and structures) plus inventories inclusive of IVA and acquisition of nonproduced non-financial assets (net). Looking at profits without IVA and CCAdj and gross fixed investment, the fall is steeper, but this would not account for net interest and miscellaneous payments. This underpins the investment-profit puzzle, but more importantly for the argument of this chapter, these developments – as discussed above – highlights a structural change in the economy and the institutional configuration. The ratio of paid dividends-to-total capital expenditure was fairly constant when comparing the period from 1947-1979 and 1980-2009, 0.2956 and 0.2861, respectively, but has since 2010 increased, being on average 0.3867 for the period 2010-2020. This, of course, validates the 'originate and distribute' thesis of New Capitalism. However, it also indicates the argument made – that shareholders are increasingly remunerated compared to workers under this new production regime whilst workers' bargaining power have deteriorated. New Capitalism is identifiable by looking at NFCs balance sheets (see figure 7.20) reflecting an increasing accumulation of financial assets.

The balance sheets of NFCs also illustrate how assets are funded. The relative reduction in non-financial assets (due to relatively lower capital investment and inventory holdings) reflect a change in the organisation of production. This follows from the transformation of the balance sheet since financial and non-financial assets are used very differently in the operations of the firm. The composition of assets on NFC balance sheets is interesting because it shows the consequences of New Capitalism and the corporate governance structure. Hence, the conditions under which labour is employed must adapt to the activities of firms. Under this new

---

[7]This entails a support for Marx's proposed hypothesis of the tendency of the rate of profit to fall (Marx, 1894, chap. 13).

Figure 7.20: Proportion of financial and non-financial assets of non-financial corporations in the US from 1945 to 2020
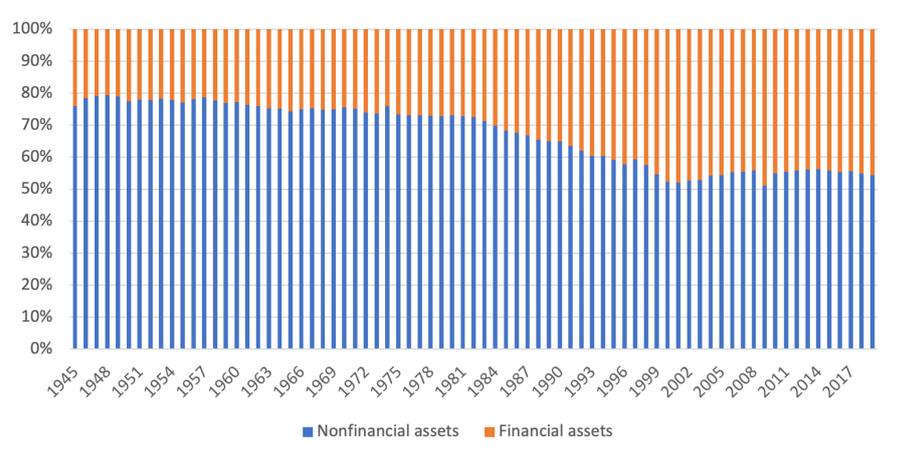
regime, the share of value-added going to labour is falling, and this downward trend has been investigated from different theoretical perspectives (cf. Perugini et al., 2017; Köhler et al., 2019; Beqiraj et al., 2019; Autor et al., 2020; Atkeson, 2020). However, the conclusion from this broad body of research is so far inconclusive beyond the notion that financialisation and labour market concentration has negatively affected the wage share (Köhler et al., 2019; Beqiraj et al., 2019; Autor et al., 2020). This downward trend is most apparent in capital-intensive sectors such as manufacturing, construction and transportation (see figure 7.21).

Figure 7.21: Labour share of income in the US from 1987 to 2015
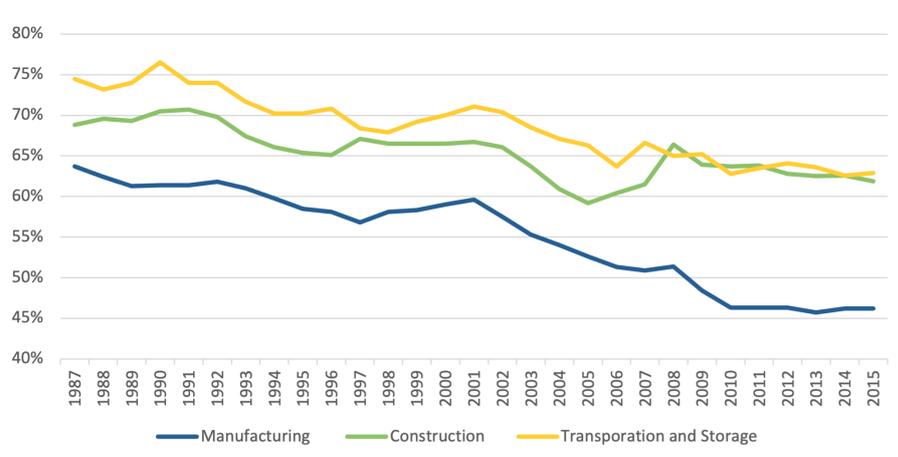
7.5   Discussion

The nature of finance in a monetary production economy is a source of instability in terms of the credit cycle *and* consequently a destabilising factor for the economy (Fisher, 1933). However, finance also plays an essential role that enables the monetary production economy to function. This dialectic relation – identified Marx (1867) and elaborated by Hilferding (1910) – lies at the crux of any analysis of finance-dominated capitalist economies. The possibility of eruption or crisis is due to credit creation becoming de-linked from real production since it is demanded for expenditure and payments (Bezemer, 2012, p. 69). Such payments and expenditures can be for financial and productive transactions and, therefore, seemingly disconnected from the real or financial sector. However, this separation is artificial because the real and financial sectors are always connected.

The development from 'Fordist Capitalism' to New Capitalism involves an increasing tendency to privilege financial undertakings over productive investments. In the circuitist framework, this development is explained by analysing the evolution of the balance sheet structures of financial and non-financial corporations (Caiani et al., 2014). This entails that firms' profits are earned not only in kind, but in the form of money (i.e. the valorisation process of activities), and that debt is partly repaid through new debt (i.e. debt is repaid or replaced by debt towards someone else) (Caiani et al., 2014). This means that the individual firm has become less dependent on wage-labour to generate income[8] and exert more resources to increase the equity share price. Two propositions arise:

1. that firms' balance sheet composition also reflects a new composition of the employed labour force and affect bargaining over wages and remuneration; and

2. that the firms' altered organisation of production reflects the dominance of the financial nexus over the wage-labour nexus

These two propositions state that the bargaining power of labour is diminished un-

---

[8]The source of this alternative can be thought of as income generated by 'financial merchants' which trade in financial capital that is made of positive net payments and rentier income from financial assets held.

der finance-dominated capitalism. The first proposition points to changes at an individual firm level, whereas the second reflects a macro-effect. They are interdependent because the former starts as a tendency at individual firms, but it spreads and becomes more common. The process of how this tendency emerges reflects competition among firms and their profitability. More profitable firms have greater access to credit and can utilise retained profits and credit to expand and further outcompete competitors (Forges Davanzati and Pacella, 2014).

The composition of their balance sheet becomes crucial for the firm's survival, not only in terms of its net worth, but concerning its capacity to defend against a hostile takeover or utilise the opportunity of acquiring a competitor (Forges Davanzati and Pacella, 2014). As firms grow due to larger stocks of financial assets, their monopsony power increase, in the goods market this allow them to control prices better and adjust their price mark-up; and workers' bargaining power is consequently reduced due to the power of the firm (Forges Davanzati and Pacella, 2014). Monopsony powers have conventional effects in terms of wage bargaining and include broader organisational effects on labour through the firm's capacity to control its labour force (cf. Zuboff, 2019; Montalban et al., 2019).

Thus, there is a tipping point at which the wage-labour nexus is no longer a dominant force in the macroeconomy, and the financial nexus has taken over (through a process of competition). The structural change under New Capitalism includes the emergence of a new institutional configuration due to institutional complementarity. The dominance of the financial nexus (over the wage-labour nexus) reflects a new valorisation process of profits by firms. The "pecuniary" side – reflecting the management of liabilities and financial assets controlled by the firms' businessmen – grows, diminishing the reliance on real production and its associated workers (Forges Davanzati, 2018)[9].

The literature discussed suggests that labour and the organisation of production have been altered under New Capitalism. In addition, the economic analysis

---

[9]Firms are still a *locus of conflict*, but with stronger emphasis on Veblenian features (Veblen, 1904; Forges Davanzati, 2014).

of the NFCs balance sheets and flows illustrate that firms are increasingly remunerating their shareholders, albeit despite slightly falling profit rates. However, the argument is complicated because the capitalist mode of production is unchanged, and the exploitative relationship between labour (workers) and capital (managers) remains intact. Simultaneous with this turn towards finance, workers' capacity to withstand pure capitalist forces is undermined in the contemporary institutional framework. The flexicurity model of Denmark or the Hartz IV reform in Germany, at one end, to the flexible labour market reforms in the Anglo-Saxon world, on the other (Bernal-Verdugo et al., 2012; 2013), workers are becoming increasingly less organised and subject to greater control by employers (Appelbaum, 2011).

7.6   Conclusion

These studies illustrate the implications for wage bargaining due to labour market institutions under *finance-dominated* capitalism. The long-term perspective follows previous work by Glyn and others (see Howell et al., 2007; Howell and Azizoglu, 2011). However, this analysis has used some innovative measures to assess the implications on the wage formation and the effects on the distribution of income. The wage-to-dividend ratio and dividend-operating surplus ratio of non-financial corporations show a faster increase since the turn of the century. These ratios reflect the distribution of income to labour and the degree to which shareholders obtain a share of operating surplus. This development along with the stability of the functional distribution of income, until recent years at least, and the rising share of financial assets on non-financial corporations' balance sheets illustrate the extent to which finance and financial institutions have come to affect industrial relations.

Considering developments on the side of labour, workers' bargaining power and the institutional configuration in the labour market have deteriorated compared to employers and shareholders since the 1980s. This development is especially apparent among 'frontrunners' such as the Scandinavian countries. Wage formation has become more fragmented with respect to coordination; the bargaining level is

moved from central or association-level to the firm- or industry-level and bargaining are pattern-based. Hence, the bargaining limit is set by the bargaining in the leading sector (pattern based). Industries and firms must then follow the framework set up with little or no inter- or intra-associational coordination.

On the firm side, the proportion of non-financial assets has grown in the same period, and the proportion of labour unit costs has fallen steadily. Unit profits have also fallen, but dividends as a share of operating surplus and wage compensation have risen and exploded in the last decade. The observations analysed here must be considered along with the long-term developments of capitalism and reflect a transformation of the institutional configuration. From the Fordist to the post-Fordist era, this transformation represents a convergence on the financial nexus that previously was centred on the wage-labour nexus (cf. Aglietta, 1998; 2000).

Chapter 8

Concluding remarks

This thesis analysed the relation between labour market institutions and the wage share, employment and dividends-wage ratio under different capitalist regimes. The analytical framework combined economic theory and institutional economics to investigate the hypothesis. The main hypothesis in this work states that labour market institutions positively affect wages and employment and could to some degree compensate for a system in which financial institutions dominate. This is investigated by applying a new theoretical framework based on post-Keynesian (PK) economic theory, Régulation Theory (RT) and Institutional economics (mainly the principle of Circular Cumulative Causation) in a computational method of Agent Based-Stock Flow Consistent (AB-SFC) modelling. The principle of Circular Cumulative Causation (CCC) enforces a continuous shift between the micro- and macro-level mediated by institutions or the meso-level. The computational method is particularly suitable for this conceptualisation because it enables a dynamic model with feedback effects.

Each chapter sheds light on crucial aspects for this investigation, starting with the role and implications of institutions for the economic system and setting out a theoretical framework to employ in the analysis of capitalist systems, to the formalisation of and analysis of different institutional configurations. This work has shown the benefits of applying a computational method when analysing a complex adaptive system. The main hypothesis is supported by sub-questions that

investigate the important role of institutions for economic analysis, understanding the implications of different modelling techniques, and the consequences of different institutional configurations in the labour market for wages, distribution and employment.

The findings support the hypothesis as the institutional configuration is shown to be central in the formation of wages and labour market institutions provide a necessary function in this respect. However, the findings also indicate that labour market institutions are insufficient to determine the wage share, employment and the dividends-wage ratio in a complex adaptive system. The variety of capitalism depends on the institutional configuration and evolution, but the institutional configuration is not pure. The use of ideal types illuminates mechanisms and qualitative effects in the simulations, enabling a robust analysis of wage formation under and wage society and finance-dominated capitalism. The hypothesis was investigated through four specific research questions:

1. How can economic theory and institutional economic analysis be combined to analyse capitalism?

2. How to formalise a framework consisting of macroeconomic theory and institutional economics for the analysis of capitalism?

3. What are the consequences on the functional distribution of income and employment from labour market institutions?

4. How does a finance-dominated regime alter the effects from labour market institutions on the functional distribution of income and employment?

The analysed findings from these questions indicate that the cohesion of the institutional configuration affects the distributional outcome and employment, which is subject to the institutional and historical context in the labour market and the macroeconomy. The combination of economic theory and institutional economic analysis was decisive for the analysis of these research findings.

8.1 Theoretical contributions

This thesis contributes to the literature on Comparative Political Economy (CPE) and critical approaches to macroeconomics by developing an AB-SFC macroeconomic model based on the combination of the PK economic theory and institutional economic analysis of the Régulation Approach. The novelty of the developed approach is the integration of evolutionary economic concepts to macroeconomics on a cost-based approach to economic theory.

The critical evolutionary aspect utilised, *circular cumulative causation*, provides additional insight to macroeconomic modelling and analysis via the exploration of institutions. CCC links the micro- and macro-level so that the interaction of microeconomic behaviour and macroeconomic outcomes can be analysed holistically. This link between the micro- and macro-level is not limited to the different levels of analysis (micro, meso and macro), but also include the feedback effects at the same level. For instance, the amplifying level effect of a more equal functional distribution of income on consumption and investment. Institutional economics à la Veblen and his followers provide a suitable building block for bridging PK economics and the more Marxian influenced RT as well as other Marxian Political approaches within CPE.

The thesis has shown a new way that PK economics and RT can be combined to analyse capitalism in a consistent analytical framework. These two approaches are compatible at a profound level. Aspects from these approaches have been combined in previous work (see the seminal work by Bowles and Boyer, 1988; 1990; 1995), but less attention has been given to the common fundamental basis of these approaches. This contributes to the CPE literature in its critique of Varieties of Capitalism (VoC) and the proposed alternative approach of a PK-RT synthesis by building an institutional approach to an economic analysis of capitalism based on capitalist theories of institutions. Thus, allowing the analysis to understand the characteristics of and implications from the institutions in the *context* of capitalism. This means that the classification of capitalist types has a common understanding

of capitalism as a focal point, and institutions determine variations in the variety of capitalism. In contrast, VoC analyses institutions in a general framework without an explicit notion of *any* economic system, in other words, capitalism. Hence, it is unclear and difficult to distinguish between the characteristics and implications from institutions and the capitalist mode of production.

The proposed approach illustrates the need to understand the institutional and historical context for macroeconomic analysis and the functional distribution and fluctuations in economic activities. The constructed argument in this thesis points to a lack of economic explanations and the need for combining perspectives that sometimes may seem in conflict. The focus on *only* demand or supply reflects a polarised field of research and a dogmatic one.

8.2   Main findings

This thesis has provided a synthesis of CPE and PK macroeconomic theory based on a research critique of the proposal by Baccaro and Pontusson (2016) in chapter 2 and the construction of a theoretical framework in chapter 3 consisting of PK economics and RT. The framework set out in chapter 3 contributes to the debate initiated by Baccaro and Pontusson. Not only is an alternative framework presented, but a taxonomy for capitalist theories of institutions and institutional theories of capitalism is constructed. In addition, the review of macroeconomic modelling approaches provides a categorisation in terms of this taxonomy and the flexibility of macroeconomic modelling approaches in terms of CPE.

Chapter 4 illustrate the importance of modelling and the weaknesses and strengths different approaches to economic modelling entail. The findings of chapter 4 are important for the research programme that seeks to combine economic theory and institutional economic analysis. The analytical benefit and added strength from combining economic theory and institutional analysis are illustrated in the model developed in chapter 5. The AB-SFC model generates new insight into the complex relation of the institutional configuration and the economy. This is exemplified by

analysing the consequences on macroeconomic outcomes such as employment, wage share and real wages from labour market institutions under a capitalist (demand-driven) economy. The results of the model(s) are validated in the empirical analysis in the final chapter. The capitalist development from a *wage society* to *finance-dominated* capitalism reflects a change in the institutional hierarchy dominated by a financial logic of markets.

Labour's bargaining power has decreased due to weaker labour market institutions whilst non-financial corporations have become increasingly *financialised* and distributed a higher share of their surplus as dividends instead of reinvestment into the corporation. Although the analysis cannot state what the key driver for these developments is if finance has eroded the labour market or labour market institution dismantlement triggered financialisation. The analysis does show how the evolution of this process is connected and complementary. Hence, the results from the model simulation in chapter 5 are vindicated as strengthening labour market institutions or regulating the finance sector are unlikely to be sufficient as independent steps. Instead, a combined effort is necessary to reverse the declining trend of the wage share and real wages.

8.2.1   Chapter 2

The research critique in chapter 2 discussed the benefits to the CPE approach from adopting PK macroeconomic foundations and clarified the necessary foundational assumptions for potential CPE approaches to be compatible with PK economics. That chapter identified a gap in the literature as current responses by PK authors (see, for instance, Stockhammer, forthcoming) had not adequately discussed the compatibility between PK economics and the dominating theoretical framework in CPE, namely Varieties of Capitalism (Hall and Soskice, 2001b). Hence, the contemporary discussion in this emerging literature runs the risk of building a research paradigm 'on quicksand'. Some have attempted to draw on an 'older' strand of CPE literature such as the welfare capitalism work by Esping-Andersen (1990). However, Hein et al. (2020) offer only a partial analytical framework that does not fully account

for the institutional configuration and accumulation regimes. Stockhammer (forthcoming) and Köhler and Stockhammer (2021) focuses on the neo-Kaleckian model and neglects key components in CPE. Although their approach highlights finance's essential function and role in capitalist economies, there is insufficient attention to institutions for a proper CPE analysis. The findings of chapter 2 contribute to the contemporary discussion of the benefits of combining CPE and PK economics and the necessity of understanding commonalities and differences across capitalist economies. Therefore, the chapter also underpins the criticism raised against combining PK with VoC and makes room for the reconsideration of RT as an alternative framework to VoC. The concluding remarks stress the importance of institutions and the institutional configuration for the analysis of capitalist economies.

Furthermore, the bank- and market-based taxonomy in VoC reveals the need for a thorough theoretical basis for a PK and CPE synthesis. Thus, Graziani's (2003) Theory of the Monetary Circuit is highlighted as an important theoretical building block. Chapter 3 continues from the concluding remarks of chapter 2 and presents a synthesis of CPE and PK economics. The institutional configuration and the accumulation regime are central to the constructed theoretical framework.

8.2.2 Chapter 3

The second chapter identifies an alternative approach within CPE – the Régulation Approach (RA) – based on *capitalist theories of institutions* (CTI) and *institutional theories of capitalism* (ITC) in an institutional economic analysis of capitalist economies. These notions reflect sets of assumptions that underpin the view on economic structures and dynamics of capitalist economies. These assumptions lead to differences in the role of prices (as market-clearing or reproductive), the analysis of economic behaviour (utility-based or cost-based) and the notion of market interaction (optimisation among individuals or social interaction). Thus, the CTI and ITC constitute a taxonomy for identifying two different approaches to institutional economic analysis of capitalist economies that reflects two distinct perspectives of how the economy works. This taxonomy contributes to the evaluation of compatible

theories in CPE and macroeconomics that could be combined for analysing national models of capitalism.

The chapter explains why PK economics RT belongs to the CTI category and VoC and the 3-ECS model are characterised as ITC. This alternative theoretical framework of PK-RT demarcates the microfoundations and macrofundamentals representing the *object of analysis* and the *mode of production*, respectively. The object of analysis sets out the classes, sectors and institutions necessary to study the social interaction embedded in the mode of régulation and regime of accumulation that is characterised from the mode of production. The theoretical framework is built for studying *monetary production economies* with attention to the mode of régulation. The mode of régulation is an important concept in the RA, which resembles a PK concept developed by Minsky and Ferri (1992) dubbed *thwarting systems* that describe institutions and the social interaction given by an institutional configuration (the meso-level). The development of thwarting systems and the regime of accumulation through the institutional concept of *circular cumulative causation* explains the notion of equilibrium or steady-state in the analysis and the historical process of the economy under investigation.

8.2.3 Chapter 4

The financial crisis of 2008 and the global recession that ensued altered the political scene in much of the developed world (cf. Tooze, 2018). The economic crisis looked to macroeconomics for answers for ailing the crisis and its explanatory factors. However, the macroeconomic debate remains closed to alternative theories and approaches with a few exceptions (e.g. *Rebuilding Macroeconomics* and *Rebuilding Macroeconomic Theory* projects both in the UK[1]). Chapter 4 classifies contemporary macroeconomic modelling approaches – as *open, semi-open* and *closed* – based

---

[1]The former project is led by Dr. Angus Armstrong and is funded by the Economic and Social Research Council, see `https://www.rebuildingmacroeconomics.ac.uk`, and the latter is a project at the University of Oxford led by The balance sheet approach adopted in this thesis is that of Godley and Lavoie (2007) – known as the Stock-Flow Consistent (SFC) approach – coupled with the complexity approach of Agent-Based (AB) modelling for the social interaction among the individuals of the cpe classes. Professor of Economics David Vines, see Vines and Wills (2018; 2020) for an overview of the project.

on a discussion of recent macroeconomic debates and the CPE research agenda set out by Baccaro and Pontusson (2016; 2020). This classification is based on assumptions and conditions associated with each type of modelling approach. The aim is to identify modelling approaches compatible with capitalist theories of institutions and thereby applicable to the alternative theoretical framework set out in chapter 3. This chapter provides a bridge between the theoretical framework discussed at the beginning of this thesis and the formalisation of the macroeconomic model based on the analytical framework set out. The AB-SFC modelling approach is defined as an open macroeconomic modelling approach because there are relatively few restrictions on the assumptions and conditions that must be enabled to solve the model. In contrast, the Dynamic Stochastic General Equilibrium (DSGE) model must adhere to a strict set of assumptions about coordination, decision-making and the mechanism for closing the model which effectively excludes the theoretical framework constructed in chapter 3. Thus, DSGE is not only a stringent modelling approach, but its form also limits theoretical pluralism due to its fundamental framework of unique general equilibriums.

8.2.4 Chapter 5

The AB-SFC model developed and simulated in chapter 5 is based on the theoretical framework set out in chapter 3. The model focuses on wage formation and labour market institutions so that the effects on employment, wages and income inequality from different institutional configurations can be studied in a controlled environment. The model showed that bargaining power and the qualitative characteristics of labour market institutions significantly affect wage formation, the labour share of income and employment. It also showed that aggregate demand is important for the fundamental demand for labour and thereby the premise for the bargaining between employees and employers over wages. The notion of job loss costs illustrates how aggregate factors such as the unemployment rate in the economy affects the wage formation. This reflects, to some degree, the presence of the *reserve army of labour*. Therefore, the strategy – the factors affecting the wage bargaining – are important

since a strong bargaining position with a significant degree of power matters less if the cost of job loss is high. Those factors come in addition to individual aspects, such as the firms' financial position. The findings are in line with the main economic principles of PK economics (cf. Lavoie, 2014b).

The model draws on an Agent-Based approach for the social interaction and coordination among individuals and the Stock-Flow Consistent approach for the overall structure of the economy (balance sheets and transaction flow matrices). Nine different versions of the model (inclusive of the baseline) are simulated, and each version has qualitatively different institutional configurations while the demand-side of the model is unaltered. The simulation results illustrate the effects of the circular cumulative causation, also called feedback effects and the counter-intuitive dynamics that emerge in such a bottom-up approach. The interaction among the agents causes coordination failures that can drive large fluctuations in the economy. A part of this 'miscoordination' is due to structural features or the institutional configuration, while another is due to the complexity in socio-economic systems. Therefore, the results generated by the model show that institutions are important for both the micro- and macro-level. The findings suggest that the relationship between supply-side and demand-side factors should be further investigated as these forces work in conjunction. The findings conclude that institutions are mediators in the economic system and, therefore, an integral part of the economic phenomena studied.

Furthermore, the dynamic nature of capitalism can be captured with a computational method. Feedback effects continuously amplify or counteract forces in the system, seen as employment and higher wages are positively associated, but the level effect varies across the different scenarios. It is important to note that although the AB approach facilitates complexity in the modelling environment, the rules and decision-making process is simplistic and procedural. Hence, the complexity is due to interaction and the heterogeneity of the model, not necessarily the economic actions themselves.

8.2.5 Chapter 6

This chapter builds on the model of chapter 5 by elaborating on the finance features of the modelled economy. This chapter draws on research on New Capitalism – the post-Fordist era of finance-dominated capitalism – in which finance rules the institutional configuration. This development is important since chapter 5 was restricted to mechanisms in the labour market without detailed dynamics from the financial sector. Chapter 6 thereby brings that model into the current form of capitalism – *finance-dominated capitalism* or New Capitalism. In New Capitalism, the system is driven by finance, and the status of the market is reinforced through finance, summarised as "capitalism instead of the state" (Michel Albert, 1993, p. 257). The focus in Baccaro and Pontusson (2016) on different forms of contemporary growth regimes and Hein et al. (2020) and Stockhammer (forthcoming), which highlights finance-dominated capitalist economies, is combined in the developed model. Hence, this chapter provides a general model of finance-dominated capitalism in the CPE context set out by Baccaro and Pontusson. In the model developed in chapter 6, financial investment and the notion of shareholder maximisation affect the financial position of firms and their pricing decisions; in addition, the supply of finance by banks to firms can be constrained. These features give rise to new dynamics in the model that undermine the effect of labour market institutions as the effects from the higher bargaining power of labour are dampened.

The results vindicate the presence of feedback effects and circular cumulative causation in economies. The institutional configuration of the model showed that labour market institutions are less effective in contributing to employment and higher wages and wage shares under finance-dominated regimes. The lesser effectiveness is due to the altered institutional configuration of the whole economy. Financial interests and their institutional features take priority over the interest of labour and labour market institutions. A fundamental tendency in the finance-led regime is the explosion in shareholder dividends at the cost of labours' wage remuneration. This tendency is relatively immune to alterations in the labour market institutions, reflecting the driving force of aggregate demand in capitalist economies. The effect of

higher dividends on the dividend-to-wage ratio illustrates the negative impact that this regime has on income inequality and the remuneration of labour-power vis-à-vis ownership of capital titles. Although the effect of higher bargaining power of labour has a positive effect on the functional distribution of income, it cannot compensate for the inequality that higher dividend rates generate.

8.2.6 Chapter 7

The penultimate chapter combines the balance sheet approach with the institutional analysis to investigate the long-term development of capitalism that help explain the transformation of the model in chapter 5 (*wage society*) to the model in chapter 6 (*finance-dominated regime*). The balance sheets of non-financial corporations in the US have become increasingly finance-dominated as a larger share of the assets are financial assets. Even though studies indicate some ambiguity of whether these financial assets are income-generating alternatives to other activities (see Davis, 2016; Rabinovich, 2019), it does reflect a change in the organisation of the firm. The same studies indicate that income generated from financial assets are driven by payments for interests and dividends. Hence, the New Capitalism literature (cf. Glyn, 2006) remains very much central to the discussion in addition to the theoretical framework employed in the model simulations of PK and RT synthesis. The balance sheets of non-financial corporations are extracted from the national accounts.

The other part of the analysis focuses on labour market institutions across advanced capitalist economies between the 1960s and 2018. The observed long-term development also reflects the literature associated with New Capitalism and changes in accumulation regimes (see Boyer, 2004; Glyn, 2006). The analysis shows how labour market institutions have become weaker from the perspectives of workers across most of these countries. The wage bargaining level has become more decentralised, confederation membership concentration is lower (by historical standards despite rising union affiliation membership concentration), and the coverage rate is lower since the 1980s. Although this development is not equally distributed among countries, there is an increasing degree of heterogeneity in countries' institutional

configurations (see Antonelli et al., 2019). In a nutshell, strong labour institutions have become weaker than weak labour institutions have become stronger.

This analysis shows that the findings of chapter 6 can be qualified in observations of actual economies, in this case, the US. The US is an interesting example because its labour market institutions are hollow seen from the perspective of workers and the general trend is a gravitation towards US conditions. Another interesting finding of chapter 7 is the stagnating/ declining tendency of the rate of profits. This finding aligns with the work on *profits without accumulation* by PKs (cf. Hein and van Treeck, 2010b; Cordonnier and Van de Velde, 2015). In the period since the 1980s, the dividends-to-net operating surplus has increased and become more volatile. Moreover, the dividends-to-employee compensation and the ratio of profits-to-financial assets both fell in the same period.

The findings conclude that bolstering labour market institutions in favour of workers will not necessarily cause increases in economic activity and employment directly but is still likely to contribute positively to the existing purchasing power. Furthermore, following chapters 5 and 6, reversing the trend among labour market institutions does entail a potential shift in the thwarting system overall, which could directly lead to higher economic activity and wages if shareholder preferences gave way to workers. However, such a shift requires a change to the finance-dominated institutional hierarchy. Considering the development across the analysed countries, it is remarkable how much Scandinavian countries have altered their labour market institutions. This development reflects the pressure from finance (and probably to some extent globalisation as these countries are all small open economies). In this sense, a reversal or re-direction would seemingly require a radical approach to economic policy and institution building.

8.3   Policy implications

Given the findings of this research, the main hypothesis is vindicated – that labour market institutions are important for boosting wages and employment and

can compensate (to some degree) for the dominance of finance – but also reflect the complexity of the problem faced by many advanced capitalist economies today. The problem of inequality (of both income and wealth) is a *wicked problem*[2] as income and wealth inequality have different determining factors at both the micro- and macro-level. The analysis has shown that stronger labour market institutions are beneficial but not sufficient to solve the problem. Strengthen labour market institutions is an important aspect of economic policy. However, there is also a need for re-configuring institutions in other sectors of the economy, notably the finance sector, for an "optimal" effect. This reflects that the social conflict between wage-earners (employees) and owners of capital (mainly employers and shareholders) is inherent in *any* capitalist system and must be part of the policy conversation. The conflict between workers and employers is a critical problem that must be addressed for all capitalist economies.

This thesis argues that the institutional configuration is vital for determining income distribution and economic activity. However, the regulation that can tame the volatile forces caused in the *real* economy by finance is also crucial for the long-term development of these advanced capitalist economies. Such policies accompany actions that support an alternative dominating logic in the institutional hierarchy. Focusing solely on finance will be insufficient for the aim of strengthening the economic structure as well. Given the precarious state of employment, policies that strengthen employment and improve the quality of work-life would be beneficial.

Nevertheless, any potential policies would benefit from a holistic view similar to that promoted by Myrdal (1954) that considers economics in conjunction with sociological and psychological aspects (cf. Myrdal, 1944). The notion of CCC is central to the analysis and prescription of economic policy from this perspective since it incorporates the social aspects of relations. In a capitalistic economy, the labour market signifies a place of conflict between workers and capitalists (in the traditional sense). This conflict is over working conditions and work remuneration,

---

[2]This concept originates from social policy and encapsulates problems with a social complexity making a simple one-size fit all solution unsatisfactory.

but the result has much broader implications in society.

Proposals such as a *job-guarantee* or *universal basic income* (cf. Standing, 2011; Hahnel and Wright, 2016; Tcherneva, 2020) promote job and income security, but it is unsure how this will evolve under capitalism or whether an alternative economic system is required. These policies would eliminate (or at least significantly reduce) the effect of a *reserve army of labour* on workers' cost of job loss which is intolerable for the capitalist and rentier class, according to Kalecki (1943). Thus, this would dissolve an essential piece of leverage held by employers over workers. This leads to another discussion of alternative systems to capitalism which is outside the aim of this thesis. Instead, what has become clearer from this study is the need to develop an institutional configuration that can facilitate policies for the incentive structure for employees and employers. Such an institutional configuration (of the labour market) includes a complementary re-configuration of the financial markets, perhaps also the product market. The main point being that addressing solely the supply-side or demand-side is insufficient to strengthen workers' job and income prospects under finance-dominated capitalism.

8.4 Implications for future research

The scope of this thesis was to analyse the effect on the wage share and employment from labour market institutions under different forms of capitalism. The implications from this study can be summarised in four points: i) a dynamic and evolutionary system such as capitalism must be analysed as one[3], ii) social conflict is inherent in capitalism, and economic policy should address this explicitly, iii) institutions and history are not only important to understand an economic system, but essential for the development of such a system, and iv) how one chooses to formalise theoretical abstractions should be rigorously accounted for. These implications represent different aspects from the main argument presented in this thesis. The argument is based on a theoretical analysis of which the qualitative results are strongly supported in

---

[3]This should not be understood as a reject of partial analyses, but rather stress the difference between analysing a system *as a whole* and a specific economic phenomenon.

the empirical analysis of chapter 7. The relations investigated are conditioned on a specific set of institutions and historical context.

The analysis has focused on closed economic systems, meaning that imports and exports have been excluded from the analytical framework. Extending the analysis to account for international economic theory would be an important step to gain further insight into the effect of the institutional configuration in an international setting. This would entail an elaboration of the effects from different labour market institutions when workers compete across economies. Some literature suggests that this adds another dimension to the leverage held by employers over employees due to the threat of moving production abroad. The international flows of finance and capital would also be expected to have interesting direct and indirect effects via feedback mechanisms.

The complexity and intricacies of the financial system, especially its relation to households, is also aspects that can be extended and developed further to increase the resemblance of the real world. Securitisation and a more complete money market funds would provide additional insight into how the financial sector affects the economy and, ultimately, industrial relations. The cost of job loss is arguably also affected by households' debt obligations, which would add multiple dimensions to the analysis of balance sheets and economic behaviour and social relations of production. Debt-led consumption is a source of demand, giving an additional mechanism of fluctuations at the macro-level. There exists some research on this already, but the complexities and intricate relations due to the multitude of the *purpose* of finance (for housing, car or transport, services and commodities) mean that this area remains unexhausted.

Finally, perhaps the most pressing issue faced – the climate crisis – has been left out of this investigation. This should not be taken to mean that climate change is unimportant. It is probably the most important area for which this kind of work need to develop. Climate change not only reflects an existential issue for humans on earth but also include challenges of migration, finance and political institutions. These challenges touch on many aspects that could be integrated into the model

or similar models, e.g. geography, natural resources, migration flows, taxes and regulation, to mention a few.

The potential additions and important aspects just mentioned pose a trade-off since a higher level of detail in all or several sectors reduces the tractability of the model and therefore diminishes the analytical capacity. Thus, increasing the detail in one place is often accompanied by reducing the level elsewhere in the model. Therefore, having a plurality of models is necessary for gaining the necessary insight from which future policies and institutions can be based.

References

Acemoglu, D. and Robinson, A., J. (2015). The Rise and Decline of General Laws of Capitalism, *Journal of Economic Perspectives* **29**(1): 3–28.

Acharya, S. and Dogra, K. (2020). Understanding HANK: Insights From a PRANK, *Econometrica* **88**(3): 1113–1158.

Aglietta, M. (1979). *A Theory of Capitalist Regulation: The US Experience*, [2015] reprint edn, Verso Books, London.

Aglietta, M. (1998). Capitalism at the Turn of the Century: Regulation Theory and the Challenge of Social Change, *New Left Review* **232**: 41–90.

Aglietta, M. (2000). Shareholder value and corporate governance: Some tricky questions, *Economy and Society* **29**(1): 146–159.

Aglietta, M. and Breton, R. (2001). Financial systems, corporate control and capital accumulation, *Economy and Society* **30**(4): 433–466.

Aiyagari, S. R. (1994). Uninsured Idiosyncratic Risk and Aggregate Saving, *The Quarterly Journal of Economics* **109**(3): 659–684.

Akerlof, A., G. (2020). Sins of Omission and the Practice of Economics, *Journal of Economic Literature* **58**(2): 405–18.

Akerlof, A., G. and Yellen, L., J. (eds) (1986). *Efficiency Wage Models of the Labor Market*, Cambridge University Press, Cambridge.

Albert, M. (1993). *Capitalism against Capitalism*, Whurr, London.

Allen, F. and Gale, D. (2000). *Comparing Financial Systems*, MIT Press, Cambridge, Mass.

Alt, J. and Iversen, T. (2017). Inequality, Labor Market Segmentation, and Preferences for Redistribution, *American Journal of Political Science* **61**(1): 21–36.

Alvarez, I. (2015). Financialization, non-financial corporations and income inequality: The case of France, *Socio-Economic Review* **13**(3): 449–475.

Amable, B. (2002). Régulation theory and technical change, *in* R. Boyer and Y. Saillard (eds), *Régulation Theory: The State of the Art*, Routledge, London, pp. 161–167.

Amable, B. (2003). *The Diversity of Modern Capitalism*, Oxford University Press, Oxford.

Amable, B. (2009). Structural reforms in Europe and the (in)coherence of institutions, *Oxford Review of Economic Policy* **25**(1): 17–39.

Amable, B. (2016). Institutional complementarities in the dynamic comparative analysis of capitalism, *Journal of Institutional Economics* **12**(1): 79–103.

Amable, B. (2018a). Diversity and the dynamics of capitalism, *European Journal of Economics and Economic Policies* **15**(2): 238–248.

Amable, B. (2018b). Economic Policy, *in* I. Cardinale and R. Scazzieri (eds), *The Palgrave Handbook of Political Economy*, Palgrave Macmillan, London, pp. 441–461.

Amable, B., Demmou, L. and Gatti, D. (2011). The effect of employment protection and product market regulation on labour market performance: Substitution or complementarity?, *Applied Economics* **43**(4): 449–464.

Amable, B., Ernst, E. and Palombarini, S. (2005). How do financial markets affect industrial relations: An institutional complementarity approach, *Socio-Economic Review* **3**(2): 311–330.

Amable, B., Guillaud, E. and Palombarini, S. (2012). Changing French capital-

ism: Political and systemic crises in France, *Journal of European Public Policy*
19(8): 1168–1187.

Amable, B. and Palombarini, S. (2009). A neorealist approach to institutional
change and the diversity of capitalism, *Socio-Economic Review* **7**(1): 123–143.

Andrews, W. S., P. (1949). A reconsideration of the theory of the individual business,
Oxford Economic Papers **1**(1): 54–89.

Angrist, J. D. and Pischke, J.-S. (2010). The Credibility Revolution in Empirical
Economics: How Better Research Design Is Taking the Con out of Econometrics,
Journal of Economic Perspectives **24**(2): 3–30.

Antonelli, G., Calia, P., P. and Guidetti, G. (2019). Institutions, Models of Capit-
alism and Inequality in Income Distribution: An Empirical Investigation, *Socio-
Economic Review* **17**(3): 651–685.

Anundsen, K., A., Krogh, S., T., Nymoen, R. and Vislie, J. (2012). The macroe-
conomics of Trygve Haavelmo, *Nordic Journal of Political Economy* **37**(article
2).

Appelbaum, E. (1979). The Labor Market, *in* A. Eichner, S. (ed.), *A Guide to
Post-Keynesian Economics*, Macmillan, London, pp. 100–119.

Appelbaum, E. (2011). Macroeconomic policy, labour market institutions and em-
ployment outcomes, *Work, Employment and Society* **25**(4): 596–610.

Appelbaum, E. (2017). Domestic Outsourcing, Rent Seeking, and Increasing In-
equality, *Review of Radical Political Economics* **49**(4): 513–528.

Appelbaum, E., Batt, R. and Clark, I. (2013). Implications of Financial Capitalism
for Employment Relations Research: Evidence from Breach of Trust and Impli-
cit Contracts in Private Equity Buyouts, *British Journal of Industrial Relations*
51(3): 498–518.

Arestis, P. (2009). The New Consensus in Macroeconomics: A Critical Appraisal, *in*

G. Fontana and M. Setterfield (eds), *Macroeconomic Theory and Macroeconomic Pedagogy*, Palgrave Macmillan, London, pp. 100–117.

Arestis, P. and Eichner, A. S. (1988). The Post-Keynesian and Institutionalist Theory of Money and Credit, *Journal of Economic Issues* **22**(4): 1003–1021.

Arestis, P. and Sawyer, C., M. (2005). Aggregate demand, conflict and capacity in the inflationary process, *Cambridge Journal of Economics* **29**(6): 959–974.

Argyrous, G. (2001). Setterfield on cumulative causation and interrelatedness: A comment, *Cambridge Journal of Economics* **25**(1): 103–106.

Arrow, J., K. (1974). General Economic Equilibrium: Purpose, Analytic Techniques, Collective Choice, *The American Economic Review* **64**(3): 253–272.

Arrow, J., K. (1994). Methodological Individualism and Social Knowledge, *The American Economic Review* **84**(2): 1–9.

Arthur, W. B. (1989). Competing Technologies, Increasing Returns, and Lock-In by Historical Events, *The Economic Journal* **99**(394): 116–131.

Arthur, W. B. (1994). Inductive Reasoning and Bounded Rationality, *The American Economic Review* **84**(2): 406–411.

Arthur, W. B. (2006). Out-of-equilibrium Economics and Agent-based Modeling, *in* L. Tesfatsion and K. Judd, L. (eds), *Handbook of Computational Economics: Vol 2. Agent-based Computational Economics*, North-Holland Elsevir, Amsterdam, pp. 1551–1564.

Arthur, W. B. (2014). *Complexity and the Economy*, Oxford University Press, New York.

Ashenfelter, C., O., Farber, H. and Ransom, R., M. (2010). Labor Market Monopsony, *Journal of Labor Economics* **28**(2): 203–210.

Ashraf, Q., Gershman, B. and Howitt, P. (2017). Banks, market organization, and macroeconomic performance: An agent-based computational analysis, *Journal of Economic Behavior & Organization* **135**: 143–180.

Asimakopulos, A. (1980). Themes in a Post Keynesian Theory of Income Distribution, *Journal of Post Keynesian Economics* **3**(2): 158–169.

Assenza, T., Delli Gatti, D. and Grazzini, J. (2015). Emergent dynamics of a macroeconomic agent based model with capital and credit, *Journal of Economic Dynamics and Control* **50**: 5–28.

Atkeson, A. (2020). Alternative facts regarding the labor share, *Review of Economic Dynamics* **37**: S167–S180.

Atkinson, B., A. (2015). *Inequality: What Can Be Done?*, Harvard University Press, London.

Autor, H., D., Dorn, D., Katz, F., L., Patterson, C. and Van Reenen, J. (2020). The Fall of the Labor Share and the Rise of Superstar Firms, *The Quarterly Journal of Economics* **135**(2): 645–709.

Azar, J., Marinescu, I., Steinbaum, M. and Taska, B. (2020). Concentration in US labor markets: Evidence from online vacancy data, *Labour Economics* **66**: 101886.

Azariadis, C. and Guesnerie, R. (1986). Sunspots and Cycles, *The Review of Economic Studies* **53**(5): 725–737.

Baccaro, L. and Pontusson, J. (2016). Rethinking Comparative Political Economy: The Growth Model Perspective, *Politics & Society* **44**(2): 175–207.

Baccaro, L. and Pontusson, J. (2018). Comparative Political Economy and Varieties of Macroeconomics, *Technical Report 18/10*, Max Planck Institute for the Study of Societies, Cologne.

Backhouse, E., R. and Cherrier, B. (2017). The Age of the Applied Economist: The Transformation of Economics since the 1970s, *History of Political Economy* **49**(Supplement): 1–33.

Bakas, D. and Makhlouf, Y. (2020). Can the insider–outsider theory explain unemployment hysteresis in OECD countries?, *Oxford Economic Papers* **72**(1): 149–163.

Ball, L. and Mankiw, N. G. (2002). The NAIRU in Theory and Practice, *Journal of Economic Perspectives* **16**(4): 115–136.

Ban, C. and Patenaude, B. (2019). The professional politics of the austerity debate: A comparative field analysis of the European Central Bank and the International Monetary Fund, *Public Administration* **97**(3): 530–545.

Baqaee, D. R. and Farhi, E. (2019). JEEA-FBBVA Lecture 2018: The Microeconomic Foundations of Aggregate Production Functions, *Journal of the European Economic Association* **17**(5): 1337–1392.

Baran, A., P. and Sweezy, M., P. (1978). Competition among Monopoly Capitalists, *in* R. Edwards, C., M. Reich and T. Weisskopf, E. (eds), *The Capitalist System: A Radical Analysis of American Society*, second edn, Prentice-Hall, Englewood Cliffs, N. J., pp. 134–147.

Barba, A. and Pivetti, M. (2009). Rising household debt: Its causes and macroeconomic implications—a long-period analysis, *Cambridge Journal of Economics* **33**(1): 113–137.

Bargigli, L., Gallegati, M., Riccetti, L. and Russo, A. (2014). Network analysis and calibration of the "leveraged network-based financial accelerator", *Journal of Economic Behavior & Organization* **99**: 109–125.

Barth, E., Bryson, A., Davis, J. C. and Freeman, R. (2016). It's Where You Work: Increases in the Dispersion of Earnings across Establishments and Individuals in the United States, *Journal of Labor Economics* **34**(S2): S67–S97.

Barth, E. and Moene, K. O. (2016). The Equality Multiplier: How Wage Compression and Welfare Empowerment Interact, *Journal of the European Economic Association* **14**(5): 1011–1037.

Battiston, S., Farmer, J. D., Flache, A., Garlaschelli, D., Haldane, G., A., Heesterbeek, H., Hommes, C., Jaeger, C., May, R. and Scheffer, M. (2016). Complexity theory and financial regulation, *Science* **351**(6275): 818.

Beaudry, P., Galizia, D. and Portier, F. (2020). Putting the Cycle Back into Business Cycle Analysis, *American Economic Review* **110**(1): 1–47.

Becker, J. and Jäger, J. (2012). Integration in Crisis: A Regulationist Perspective on the Interaction of European Varieties of Capitalism, *Competition & Change* **16**(3): 169–187.

Behringer, J. and van Treeck, T. (2017). Varieties of capitalism and growth regimes, *Technical report*, IMK at the Hans Boeckler Foundation, Macroeconomic Policy Institute.

Behringer, J. and van Treeck, T. (2019). Income Distribution and Growth Models: A Sectoral Balances Approach, *Politics & Society* **47**(3): 303–332.

Bellofiore, R. (2002). 'Transformation' and the Monetary Circuit: Marx as a monetary theorist of production, *in* M. Campbell and G. Reuten (eds), *The Culmination of Capital: Essays on Volume III of Marx's Capital*, Palgrave Macmillan, London, pp. 102–127.

Bellofiore, R. (2012). Financial Keynesianism, *in* J. Toporowski and J. Michell (eds), *Handbook of Critical Issues in Finance*, Edward Elgar, Cheltenham, pp. 105–112.

Bellofiore, R. and Halevi, J. (2010). Magdoff-Sweezy, Minsky and the Real Subsumption of Labour to Finance, *in* D. Tavasci and J. Toporowski (eds), *Minsky, Crisis and Development*, Palgrave Macmillan, London, pp. 77–89.

Bellofiore, R. and Halevi, J. (2011). A Minsky moment? The subprime crisis and the 'new' capitalism, *in* C. Gnos and L.-P. Rochon (eds), *Credit, Money and Macroeconomic Policy: A Post-Keynesian Approach*, New Directions in Modern Economics, Edward Elgar, Cheltenham, pp. 13–32.

Bellofiore, R., Halevi, J. and Passarella, M. V. (2010). Minsky in the 'new' capitalism: The new clothes of the financial instability hypothesis, *in* D. Papadimitriou, B. and L. R. Wray (eds), *The Elgar Companion to Hyman Minsky*, Edward Elgar, Cheltenham, pp. 84–99.

Benes, J. and Kumhof, M. (2015). Risky bank lending and countercyclical capital buffers, *Journal of Economic Dynamics and Control* **58**: 58–80.

Beqiraj, E., Fanti, L. and Zamparelli, L. (2019). Sectoral composition of output and the wage share: The role of the service sector, *Structural Change and Economic Dynamics* **51**: 1–10.

Berger, S. (2008). Circular Cumulative Causation (CCC) à la Myrdal and Kapp: "Political" Institutionalism for Minimizing Social Costs, *Journal of Economic Issues* **42**(2): 357–365.

Bergmann, R., B. (1974). A Microsimulation of the Macroeconomy with Explicitly Represented Money Flows, *Annals of Economic and Social Measurement, Volume 3, Number 3*, National Bureau of Economic Research, Inc, Cambridge, Mass., pp. 475–489.

Bernal-Verdugo, E., L., Furceri, D. and Guillaume, D. (2012). Labor Market Flexibility and Unemployment: New Empirical Evidence of Static and Dynamic Effects, *Comparative Economic Studies* **54**(2): 251–273.

Bernal-Verdugo, E., L., Furceri, D. and Guillaume, D. (2013). Banking crises, labor reforms, and unemployment, *Journal of Comparative Economics* **41**(4): 1202–1219.

Bewley, F., T. (1977). The permanent income hypothesis: A theoretical formulation, *Journal of Economic Theory* **16**(2): 252–292.

Bezemer, D. J. (2021). Minsky's legacy: Two strands, *Cambridge Journal of Economics* **45**(2): 391–409.

Bezemer, J., D. (2012). Credit cycles, *in* J. Toporowski and J. Michell (eds), *Handbook of Critical Issues in Finance*, Edward Elgar, Cheltenham, pp. 66–76.

Bhaduri, A., Laski, K. and Riese, M. (2006). A model of interaction between the virtual and the real economy, *Metroeconomica* **57**(3): 412–427.

Bhaduri, A. and Marglin, A., S. (1990). Unemployment and the real wage: The

economic basis for contesting political ideologies, *Cambridge Journal of Economics* **14**(4): 375–393.

Bilbiie, O., F. (2020). The New Keynesian cross, *Journal of Monetary Economics* **114**: 90–108.

Billaudot, B. (2002). Institutional forms and macroeconomics, *in* R. Boyer and Y. Saillard (eds), *Régulation Theory: The State of the Art*, Routledge, London, pp. 139–143.

Bjerkholt, O. (1998). Interaction between model builders and policy makers in the Norwegian tradition, *Economic Modelling* **15**(3): 317–339.

Blanchard, J., O. (2000). What Do We Know about Macroeconomics that Fisher and Wicksell Did Not?, *The Quarterly Journal of Economics* **115**(4): 1375–1409.

Blanchard, J., O. (2009). The State of Macro, *Annual Review of Economics* **1**(1): 209–228.

Blanchard, J., O. (2016). The Phillips Curve: Back to the '60s?, *The American Economic Review* **106**(5): 31–34.

Blanchard, J., O. (2017). *Macroeconomics*, seventh edn, Pearson, London.

Blanchard, J., O. (2018a). On the future of macroeconomic models, *Oxford Review of Economic Policy* **34**(1-2): 43–54.

Blanchard, J., O. (2018b). Should We Reject the Natural Rate Hypothesis?, *Journal of Economic Perspectives* **32**(1): 97–120.

Blanchard, J., O. and Giavazzi, F. (2003). Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets, *The Quarterly Journal of Economics* **118**(3): 879–907.

Blanchard, J., O. and Wolfers, J. (2000). The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence, *The Economic Journal* **110**(462): 1–33.

Blatt, M., J. (1983). *Dynamic Economic Systems: A Post-Keynesian Approach*, M.E. Sharpe, Armonk, NY.

Blecker, A., R. (1989). International competition, income distribution and economic growth, *Cambridge Journal of Economics* **13**(3): 395–412.

Blecker, A., R. (2016). Wage-led versus profit-led demand regimes: The long and the short of it, *Review of Keynesian Economics* **4**(4): 373–390.

Blyth, M. (1997). "Any More Bright Ideas?" The Ideational Turn of Comparative Political Economy, *Comparative Politics* **29**(2): 229–250.

Blyth, M. (2003). Same as it Never Was: Temporality and Typology in the Varieties of Capitalism, *Comparative European Politics* **1**(2): 215–225.

Blyth, M. and Matthijs, M. (2017). Black Swans, Lame Ducks, and the mystery of IPE's missing macroeconomy, *Review of International Political Economy* **24**(2): 203–231.

Boppart, T., Krusell, P. and Mitman, K. (2018). Exploiting MIT shocks in heterogeneous-agent economies: The impulse response as a numerical derivative, *Journal of Economic Dynamics and Control* **89**: 68–92.

Bortz, P. G. (2017). The road they share: The social conflict element in Marx, Keynes and Kalecki, *Review of Keynesian Economics* **5**(4): 563–575.

Bossone, B. (2001). Circuit theory of banking and finance, *Journal of Banking & Finance* **25**(5): 857–890.

Botta, A., Caverzasi, E. and Tori, D. (2015). Financial–Real-Side Interactions in an Extended Monetary Circuit with Shadow Banking: Loving or Dangerous Hugs?, *International Journal of Political Economy* **44**(3): 196–227.

Bowles, S. (2004). *Microeconomics: Behavior, Institutions, and Evolution*, Russell Sage Foundation, New York.

Bowles, S. and Boyer, R. (1988). Labor Discipline and Aggregate Demand: A Macroeconomic Model, *The American Economic Review* **78**(2): 395–400.

Bowles, S. and Boyer, R. (1990). A Wage-Led Employment Regime: Income Distribution, Labour Discipline, and Aggregate Demand in Welfare Capitalism, *in* S. Marglin, A. and J. Schor, B. (eds), *The Golden Age of Capitalism: Reinterpreting the Postwar Experience*, Oxford University Press, Oxford, pp. 188–213.

Bowles, S. and Boyer, R. (1995). Wages, aggregate demand, and employment in an open economy: An empirical investigation, *in* G. Epstein, A. and H. Gintis (eds), *Macroeconomic Policy after the Conservative Era*, Cambridge University Press, Cambridge, Mass., pp. 143–171.

Bowles, S. and Carlin, W. (2020). What Students Learn in Economics 101: Time for a Change, *Journal of Economic Literature* **58**(1): 176–214.

Bowles, S., Gordon, M., D. and Weisskopf, E., T. (1986). Power and Profits: The Social Structure of Accumulation and the Profitability of the Postwar U.S. Economy, *Review of Radical Political Economics* **18**(1-2): 132–167.

Boyer, R. (1988). Formalizing growth regimes, *in* G. Dosi, C. Freeman, R. Nelson, G. Silverberg and L. Soete (eds), *Technical Change and Economic Theory*, Pinter Publishers, London, pp. 608–330.

Boyer, R. (1990). *The Regulation School: A Critical Introduction*, Columbia University Press, New York.

Boyer, R. (2000). Is a Finance-led growth regime a viable alternative to Fordism? A preliminary analysis, *Economy and Society* **29**(1): 111–145.

Boyer, R. (2002). The origins of régulation theory, *in* R. Boyer and Y. Saillard (eds), *Régulation Theory: The State of the Art*, Routledge, London, pp. 13–20.

Boyer, R. (2004). New growth regimes, but still institutional diversity, *Socio-Economic Review* **2**(1): 1–32.

Boyer, R. (2005). Coherence, Diversity, and the Evolution of Capitalisms—The Institutional Complementarity Hypothesis, *Evolutionary and Institutional Economics Review* **2**(1): 43–80.

Boyer, R. (2011a). Are there laws of motion of capitalism?, *Socio-Economic Review* **9**(1): 59–81.

Boyer, R. (2011b). Post-keynesian and Regulationnist: a theoretical alternative to the crisis of standard economics thought, *Revue de la régulation* **10**.

Boyer, R. (2014). Developments and extensions of 'Régulation Theory' and Employment Relations, *in* A. Wilkinson, G. Wood and R. Deeg (eds), *The Oxford Handbook of Employment Relations: Comparative Employment Systems*, Oxford University Press, Oxford, pp. 114–155.

Boyer, R. (2018a). Comparative Political Economy, *in* I. Cardinale and R. Scazzieri (eds), *The Palgrave Handbook of Political Economy*, Palgrave Macmillan, London, pp. 543–603.

Boyer, R. (2018b). Marx's Legacy, Régulation Theory and Contemporary Capitalism, *Review of Political Economy* **30**(3): 284–316.

Boyer, R. and Saillard, Y. (2002a). A summary of régulation theory, *in* R. Boyer and Y. Saillard (eds), *Régulation Theory: The State of the Art*, Routledge, London, pp. 36–44.

Boyer, R. and Saillard, Y. (eds) (2002b). *Régulation Theory: The State of the Art*, Routledge, London.

Brancaccio, E., Garbellini, N. and Giammetti, R. (2018). Structural labour market reforms, GDP growth and the functional distribution of income, *Structural Change and Economic Dynamics* **44**: 34–45.

Braun, B. and Deeg, R. (2019). Strong Firms, Weak Banks: The Financial Consequences of Germany's Export-Led Growth Model, *German Politics* pp. 1–24.

Broer, T., Harbo Hansen, N.-J., Krusell, P. and Öberg, E. (2020). The New Keynesian Transmission Mechanism: A Heterogeneous-Agent Perspective, *The Review of Economic Studies* **87**(1): 77–101.

Brown, A., Spencer, A., D. and Passarella, M. V. (2017). The extent and variega-

tion of financialisation in Europe: a preliminiary analysis, *Revista de Economía Mundial* **46**: 49–69.

Bruff, I. (2011). What about the Elephant in the Room? Varieties of Capitalism, Varieties in Capitalism, *New Political Economy* **16**(4): 481–500.

Bruff, I. and Horn, L. (2012). Varieties of Capitalism in Crisis?, *Competition & Change* **16**(3): 161–168.

Bruun, C. (1997). Agent-Based Keynesian Economics, *in* R. Conte, R. Hegselmann and P. Terna (eds), *Simulating Social Phenomena*, Vol. 456 of *Lecure Notes in Economics and Mathematical Systems*, Springer Berlin Heidelberg, pp. 279–285.

Bruun, C. (1999). *Agent-Based Keynesian Economics: Simulating a Monetary Production System Bottom-Up*, Aalborg University Press, Aalborg.

Bruun, C. (2010). The economics of Keynes in an almost stock-flow consistent agent-based setting, *in* S. Zambelli (ed.), *Computable, Constructive and Behavioural Economic Dynamics: Essays in Honour of Kumaraswamy (Vela) Velupillai*, Routledge Ltd, Abingdon, pp. 442–461.

Bruun, C. (2016). Rediscovering the Economics of Keynes in an Agent-Based Computational Setting, *New Mathematics and Natural Computation* **12**(02): 77–96.

Buchanan, M., J., Wagner, E., R. and Burton, J. (eds) (1978). *The Consequences of Mr Keynes: An Analysis of the Misuse of Economic Theory for Political Profiteering, with Proposals for Constitutional Disciplines*, number 78 in *Hobart Paper*, Institute of Economic Affairs, London.

Bureau of Labor Statistics (2008). Technical Information About the BLS Major Sector Productivity and Costs Measures.

Caballero, J., R. (2010). Macroeconomics after the Crisis: Time to Deal with the Pretense-of-Knowledge Syndrome, *Journal of Economic Perspectives* **24**(4): 85–102.

Caballero, J., R. and Farhi, E. (2017). The Safety Trap, *The Review of Economic Studies* **85**(1): 223–274.

Caiani, A., Catullo, E. and Gallegati, M. (2018). The effects of fiscal targets in a monetary union: A multi-country agent-based stock flow consistent model, *Industrial and Corporate Change* **27**(6): 1123–1154.

Caiani, A., Catullo, E. and Gallegati, M. (2019). The effects of alternative wage regimes in a monetary union: A multi-country agent based-stock flow consistent model, *Journal of Economic Behavior & Organization* **162**: 389–416.

Caiani, A., Fumagalli, A. and Lucarelli, S. (2014). Contemporary Capitalism as a New Monetary Economy of Production: The Logic of Conventions, M&A, and LBOs, *Forum for Social Economics* **43**(3): 223–253.

Caiani, A., Godin, A., Caverzasi, E., Gallegati, M., Kinsella, S. and Stiglitz, E., J. (2016). Agent based-stock flow consistent macroeconomics: Towards a benchmark model, *Journal of Economic Dynamics and Control* **69**: 375–408.

Caiani, A., Russo, A. and Gallegati, M. (2019). Does inequality hamper innovation and growth? An AB-SFC analysis, *Journal of Evolutionary Economics* **29**(1): 177–228.

Caiani, A., Russo, A. and Gallegati, M. (2020). Are higher wages good for business? An assessment under alternative innovation and investment scenarios, *Macroeconomic Dynamics* **24**(1): 191–230.

Carlin, W. and Soskice, W., D. (2006). *Macroeconomics: Imperfections, Institutions, and Policies*, first edn, Oxford University Press, Oxford.

Carlin, W. and Soskice, W., D. (2015). *Macroeconomics: Institutions, Instability, and the Financial System*, Oxford University Press, Oxford.

Carlin, W. and Soskice, W., D. (2018). Stagnant productivity and low unemployment: Stuck in a Keynesian equilibrium, *Oxford Review of Economic Policy* **34**(1-2): 169–194.

Carnevali, E., Fontana, G. and Passarella, M. V. (2020). Assessing the Marshall–Lerner condition within a stock-flow consistent model, *Cambridge Journal of Economics* **44**(4): 891–918.

Carnevali, E., Godin, A., Lucarelli, S. and Passarella, M. V. (2019). Productivity growth, Smith effects and Ricardo effects in Euro Area's manufacturing industries, *Metroeconomica* **71**(1): 129–155.

Carvalho, L. and Di Guilmi, C. (2019). Technological unemployment and income inequality: A stock-flow consistent agent-based approach, *Journal of Evolutionary Economics* .

Case, A. and Deaton, A. (2020). *Deaths of Despair and the Future of Capitalism*, Princeton University Press, Oxford.

Caverzasi, E. and Godin, A. (2014). Post-Keynesian stock-flow-consistent modelling: A survey, *Cambridge Journal of Economics* **39**(1): 157–187.

Caverzasi, E. and Russo, A. (2018). Toward a new microfounded macroeconomics in the wake of the crisis, *Industrial and Corporate Change* **27**(6): 999–1014.

Chadha, S., J. (2014). Financial frictions and macroeconomic models: A tour d'horizon, *European Journal of Economics and Economic Policies* **11**(1): 80–98.

Chakraborty, S. and Ray, T. (2006). Bank-based versus market-based financial systems: A growth-theoretic analysis, *Journal of Monetary Economics* **53**(2): 329–350.

Chand, K., S. (2012). The Relevance of Haavelmo's Macroeconomic Theorizing for Contemporary Macro Policy Making, *Nordic Journal of Political Economy* **37**(Article 3): 1–21.

Cherrier, B. (2017). Classifying Economics: A History of the JEL Codes, *Journal of Economic Literature* **55**(2): 545–79.

Chiang, A. and Wainwright, K. (2005). *Fundamental Methods of Mathematical Economics*, fourth edn, McGraw-Hill, New York.

Chick, V. (2004). On Open Systems, *Brazilian Journal of Political Economy* **24**(1): 3–17.

Chick, V. and Dow, C., S. (2005). The meaning of open systems, *Journal of Economic Methodology* **12**(3): 363–381.

Christiano, J., L., Eichenbaum, S., M. and Trabandt, M. (2016). Unemployment and Business Cycles, *Econometrica* **84**(4): 1523–1569.

Christiano, J., L., Eichenbaum, S., M. and Trabandt, M. (2018). On DSGE Models, *Journal of Economic Perspectives* **32**(3): 113–40.

Ciarli, T., Lorentz, A., Savona, M. and Valente, M. (2010). The effect of consumption and production structure on growth and distribution: A micro to macro model, *Metroeconomica* **61**(1): 180–218.

Ciarli, T., Lorentz, A., Valente, M. and Savona, M. (2019). Structural changes and growth regimes, *Journal of Evolutionary Economics* **29**(1): 119–176.

Coase, H., R. (1960). The Problem of Social Cost, *The Journal of Law & Economics* **3**(4): 1–44.

Coates, D. (2005a). Paradigms of Explanation, *in* D. Coates (ed.), *Varieties of Capitalism, Varieties of Approaches*, Palgrave Macmillan, New York, pp. 1–25.

Coates, D. (ed.) (2005b). *Varieties of Capitalism, Varieties of Approaches*, Palgrave Macmillan, New York.

Cohen, J., A. (2014). Veblen Contra Clark and Fisher: Veblen-Robinson-Harcourt lineages in capital controversies and beyond, *Cambridge Journal of Economics* **38**(6): 1493–1515.

Cohen, J., A. and Harcourt, C., G. (2003). Retrospectives: Whatever Happened to the Cambridge Capital Theory Controversies?, *Journal of Economic Perspectives* **17**(1): 199–214.

Colander, D., Howitt, P., Kirman, P., A., Leijonhufvud, A. and Mehrling, P. (2008).

Beyond DSGE Models: Toward an Empirically Based Macroeconomics, *American Economic Review* **98**(2): 236–40.

Commons, R., J. (1934). *Institutional Economics: Its Place in Political Economy*, Macmillan, New York.

Copeland, A., M. (1952). *A Study of Moneyflows in the United States*, Vol. no. 54, National Bureau of Economic Research, New York.

Cordonnier, L., Dallery, T., Duwicquet, V., Melmies, J. and Van de velde, F. (2019). The (Over)Cost of Capital: Financialization and Nonfinancial Corporations in France (1961–2011), *Review of Political Economy* **31**(3): 407–429.

Cordonnier, L. and Van de Velde, F. (2015). The demands of finance and the glass ceiling of profit without investment, *Cambridge Journal of Economics* **39**(3): 871–885.

Coriat, B. and Dosi, G. (2002). The institutional embeddedness of economic change: An appraisal of the 'evolutionary' and 'regulationist' research programmes, *in* G. Hodgson, M. (ed.), *A Modern Reader in Institutional and Evolutionary Economics: Key Concepts*, Edward Elgar Publishing, Cheltenham, pp. 95–123.

Cornwall, J. (1979). Macrodynamics, *in* A. Eichner, S. (ed.), *A Guide to Post-Keynesian Economics*, Macmillan, London, pp. 19–33.

Cottrell, F., A. (1994). Post-Keynesian monetary economics, *Cambridge Journal of Economics* **18**(6): 587–605.

Coutts, K. and Norman, R., N. (2007). Global influences on UK manufacturing prices: 1970–2000, *European Economic Review* **51**(5): 1205–1221.

Crotty, R., J. (1990). Keynes on the Stages of Development of the Capitalist Economy: The Institutional Foundation of Keynes's Methodology, *Journal of Economic Issues* **24**(3): 761–780.

Crotty, R., J. (2003). The Neoliberal Paradox: The Impact of Destructive Product

Market Competition and Impatient Finance on Nonfinancial Corporations in the Neoliberal Era, *Review of Radical Political Economics* **35**(3): 271–279.

Crotty, R., J. (2009). Structural causes of the global financial crisis: A critical assessment of the 'new financial architecture', *Cambridge Journal of Economics* **33**(4): 563–580.

Crouch, C. (2009). Privatised Keynesianism: An Unacknowledged Policy Regime, *The British Journal of Politics & International Relations* **11**(3): 382–399.

Cynamon, Z., B. and Fazzari, M., S. (2008). Household Debt in the Consumer Age: Source of Growth–Risk of Collapse, *Capitalism and Society* **3**(2).

Cynamon, Z., B. and Fazzari, M., S. (2016). Inequality, the Great Recession and slow recovery, *Cambridge Journal of Economics* **40**(2): 373–399.

Dallery, T. (2009). Post-Keynesian Theories of the Firm under Financialization, *Review of Radical Political Economics* **41**(4): 492–515.

Dallery, T. and van Treeck, T. (2011). Conflicting Claims and Equilibrium Adjustment Processes in a Stock-flow Consistent Macroeconomic Model, *Review of Political Economy* **23**(2): 189–211.

Darcillon, T. (2015). How does finance affect labor market institutions? An empirical analysis in 16 OECD countries, *Socio-Economic Review* **13**(3): 477–504.

Davidson, P. (1978). Why Money Matters: Lessons from a Half-Century of Monetary Theory, *Journal of Post Keynesian Economics* **1**(1): 46–70.

Davis, E., L. (2016). Identifying the "financialization" of the nonfinancial corporation in the U.S. economy: A decomposition of firm-level balance sheets, *Journal of Post Keynesian Economics* **39**(1): 115–141.

Davis, E., L. (2017). Financialization and investment: A survey of the empirical literature, *Journal of Economic Surveys* **31**(5): 1332–1358.

Davis, E., L. (2018). Financialization and the non-financial corporation: An invest-

igation of firm-level investment behavior in the United States, *Metroeconomica* **69**(1): 270–307.

De Grauwe, P. and Ji, Y. (2019). Inflation Targets and the Zero Lower Bound in a Behavioural Macroeconomic Model, *Economica* **86**(342): 262–299.

De Loecker, J., Eeckhout, J. and Unger, G. (2020). The Rise of Market Power and the Macroeconomic Implications, *The Quarterly Journal of Economics* **135**(2): 561–644.

De Vroey, M. (1984). A regulation approach interpretation of contemporary crisis, *Capital & Class* **8**(2): 45–66.

De Vroey, M. (2004). *Involuntary Unemployment: The Elusive Quest for a Theory*, Routledge, London.

Deeg, R. (2012). The limits of Liberalization? American capitalism at the crossroads, *Journal of European Public Policy* **19**(8): 1249–1268.

Deissenberg, C., van der Hoog, S. and Dawid, H. (2008). EURACE: A massively parallel agent-based model of the European economy, *Applied Mathematics and Computation* **204**(2): 541–552.

Delaunay, J.-C. (1988). Questions Raised by the Theory of "Monopolistic Regulation", *International Journal of Political Economy* **18**(2): 68–84.

Deleidi, M. (2019). Post-Keynesian endogenous money theory: Horizontalists, structuralists and the paradox of illiquidity, *Metroeconomica* **71**(1): 156–175.

Delli Gatti, D., Gaffeo, E. and Gallegati, M. (2010). Complex agent-based macroeconomics: A manifesto for a new paradigm, *Journal of Economic Interaction and Coordination* **5**(2): 111–135.

Delli Gatti, D., Gallegati, M., Greenwald, B., Russo, A. and Stiglitz, E., J. (2010). The financial accelerator in an evolving credit network, *Journal of Economic Dynamics and Control* **34**(9): 1627–1650.

Delli Gatti, D. and Grazzini, J. (2020). Rising to the challenge: Bayesian estimation

and forecasting techniques for macroeconomic Agent Based Models, *Journal of Economic Behavior & Organization* **178**: 875–902.

Di Guilmi, C. (2017). The Agent-based approach to Post-Keynesian Macro-modeling, *Journal of Economic Surveys* **31**(5): 1183–1203.

Diamond, A., P. (1982a). Aggregate Demand Management in Search Equilibrium, *Journal of Political Economy* **90**(5): 881–894.

Diamond, A., P. (1982b). Wage Determination and Efficiency in Search Equilibrium, *The Review of Economic Studies* **49**(2): 217–227.

Dilaver, Ö., Calvert Jump, R. and Levine, P. (2018). Agent-based macroeconomics and dynamic stochastic general equilibrium models: Where do we go from here?, *Journal of Economic Surveys* **32**(4): 1134–1159.

Dillard, D. (1980). A Monetary Theory of Production: Keynes and the Institutionalists, *Journal of Economic Issues* **14**(2): 255–273.

Dillard, D. (1984). Keynes and Marx: A Centennial Appraisal, *Journal of Post Keynesian Economics* **6**(3): 421–433.

Dillard, D. (1986). The Institutional Principle of the Principles of Economics, *Journal of Economic Issues* **20**(2): 355–363.

Dillard, D. (1987). Money as an Institution of Capitalism, *Journal of Economic Issues* **21**(4): 1623–1647.

Dobb, M. (1978). The Essence of Capitalism, *in* R. Edwards, C., M. Reich and T. Weisskopf, E. (eds), *The Capitalist System: A Radical Analysis of American Society*, second edn, Prentice-Hall, Englewood Cliffs, N. J., pp. 49–54.

Dore, R., Lazonick, W. and O'Sullivan, M. (1999). Varieties of capitalism in the twentieth century, *Oxford Review of Economic Policy* **15**(4): 102–120.

dos Santos, H., C. (2005). A Stock-Flow Consistent General Framework for Formal Minskyan Analyses of Closed Economies, *Journal of Post Keynesian Economics* **27**(4): 711–735.

dos Santos, H., C. and Zezza, G. (2008). A simplified, 'benchmark', stock-flow consistent Post-Keynesian growth model, *Metroeconomica* **59**(3): 441–478.

dos Santos, L., P. (2015). Not "wage-led" versus "profit-led," but investment-led versus consumption-led growth, *Journal of Post Keynesian Economics* **37**(4): 661–686.

Dosi, G., Fagiolo, G., Napoletano, M. and Roventini, A. (2013). Income distribution, credit and fiscal policies in an agent-based Keynesian model, *Journal of Economic Dynamics and Control* **37**(8): 1598–1625.

Dosi, G., Fagiolo, G., Napoletano, M., Roventini, A. and Treibich, T. (2015). Fiscal and monetary policies in complex evolving economies, *Journal of Economic Dynamics and Control* **52**(C): 166–189.

Dosi, G., Fagiolo, G. and Roventini, A. (2008). The microfoundations of business cycles: An evolutionary, multi-agent model, *Journal of Evolutionary Economics* **18**(3): 413–432.

Dosi, G., Fagiolo, G. and Roventini, A. (2010). Schumpeter meeting Keynes: A policy-friendly model of endogenous growth and business cycles, *Journal of Economic Dynamics and Control* **34**(9): 1748–1767.

Dosi, G., Napoletano, M., Roventini, A. and Treibich, T. (2017). Micro and macro policies in the Keynes+Schumpeter evolutionary models, *Journal of Evolutionary Economics* **27**(1): 63–90.

Dosi, G., Pereira, C., M., Roventini, A. and Virgillito, M. E. (2017). When more flexibility yields more fragility: The microfoundations of Keynesian aggregate unemployment, *Journal of Economic Dynamics and Control* **81**: 162–186.

Dosi, G., Pereira, C., M., Roventini, A. and Virgillito, M. E. (2018a). Causes and consequences of hysteresis: Aggregate demand, productivity, and employment, *Industrial and Corporate Change* **27**(6): 1015–1044.

Dosi, G., Pereira, C., M., Roventini, A. and Virgillito, M. E. (2018b). The effects of

labour market reforms upon unemployment and income inequalities: An agent-based model, *Socio-Economic Review* **16**(4): 687–720.

Dosi, G., Pereira, C., M., Roventini, A. and Virgillito, M. E. (2019). What if supply-side policies are not enough? The perverse interaction of flexibility and austerity, *Journal of Economic Behavior & Organization* **162**: 360–388.

Dosi, G., Pereira, C., M., Roventini, A. and Virgillito, M. E. (2020). The labour-augmented K+S model: A laboratory for the analysis of institutional and policy regimes, *EconomiA* **21**(2): 160–184.

Dosi, G. and Roventini, A. (2019). More is different ... and complex! the case for agent-based macroeconomics, *Journal of Evolutionary Economics* **29**(1): 1–37.

Dosi, G., Sodini, M. and Virgillito, M. E. (2015). Profit-driven and demand-driven investment growth and fluctuations in different accumulation regimes, *Journal of Evolutionary Economics* **25**(4): 707–728.

Dugger, W. (1990). The New Institutionalism: New But Not Institutionalist, *Journal of Economic Issues* **24**(2): 423–431.

Dunn, P., S. (2002). A Post Keynesian approach to the theory of the firm, *in* S. Dow, C. and J. Hillard (eds), *Post Keynesian Econometrics, Microeconometrics and the Theory of the Firm: Vol. 1, Beyond Keynes*, Edward Elgar, Cheltenham, pp. 60–80.

Durand, C. (2017). *Fictitious Capital: How Finance Is Appropriating Our Future*, Verso Books, London.

Durand, C. and Gueuder, M. (2018). The Profit–Investment Nexus in an Era of Financialisation, Globalisation and Monopolisation: A Profit-Centred Perspective, *Review of Political Economy* **30**(2): 126–153.

Durand, C. and Milberg, W. (2020). Intellectual monopoly in global value chains, *Review of International Political Economy* **27**(2): 404–429.

Dutt, A. K. (1984). Stagnation, income distribution and monopoly power, *Cambridge Journal of Economics* **8**(1): 25–40.

Dutt, A. K. (1987). Alternative closures again: A comment on 'Growth, distribution and inflation', *Cambridge Journal of Economics* **11**(1): 75–82.

Dutt, A. K. (2017). Heterodox theories of economic growth and income distribution: A partial survey, *Journal of Economic Surveys* **31**(5): 1240–1271.

Duwicquet, V. (2021). Financialization, dividends, and accumulation of capital, *Journal of Post Keynesian Economics* **44**(2): 239–282.

Dymski, A., G. (1988). A Keynesian Theory of Bank Behavior, *Journal of Post Keynesian Economics* **10**(4): 499–526.

Dymski, A., G. (1990). Money and Credit in Radical Political Economy: A Survey of Contemporary Perspectives, *Review of Radical Political Economics* **22**(2-3): 38–65.

Dymski, A., G. (1992). A "New View" of the Role of Banking Firms in Keynesian Monetary Theory, *Journal of Post Keynesian Economics* **14**(3): 311–320.

Dymski, A., G. (1996). Kalecki's Monetary Economics, *in* J. King, E. (ed.), *An Alternative Macroeconomic Theory: The Kaleckian Model and Post-Keynesian Economics*, Kluwer Academic Publishers, Dordrecht, pp. 115–140.

Edwards, C., R., Reich, M. and Gordon, M., D. (1982). *Segmented Work, Divided Workers: The Historical Transformation of Labor in the United States*, Cambridge University Press, Cambridge, Mass.

Eeckhout, J. (2021). *The Profit Paradox: How Thriving Firms Threaten the Future of Work*, Princeton University Press, Oxford.

Eichner, S., A. (1976). *The Megacorp and Oligopoly: Micro Foundations of Macro Dynamics*, Cambridge University Press, New York.

Eichner, S., A. and Kregel, J. (1975). An Essay on Post-Keynesian Theory: A New Paradigm in Economics, *Journal of Economic Literature* **13**(4): 1293–1314.

Eliasson, G. (1977). Competition and Market Processes in a Simulation Model of the Swedish Economy, *The American Economic Review* **67**(1): 277–281.

Epstein, G. (2019). Financialization, rentier interests and central bank policy, *The Political Economy of Central Banking*, Edward Elgar Publishing, Cheltenham, pp. 380–406.

Ergen, T. and Kohl, S. (2019). Varieties of economization in competition policy: Institutional change in German and American antitrust, 1960–2000, *Review of International Political Economy* **26**(2): 256–286.

Eriksen, E., I. and Sæther, A. (2010). Keynesian economics and the Oslo school, *Nordic Journal of Political Economy* **36**(3): 1–17.

Erosa, A., Fuster, L. and Kambourov, G. (2016). Towards a Micro-Founded Theory of Aggregate Labour Supply, *The Review of Economic Studies* **83**(3): 1001–1039.

Esping-Andersen, G. (1987). Citizenship and Socialism: Decommodification and Solidarity in the Welfare State, *in* M. Rein and G. Esping-Andersen (eds), *Stagnation and Renewal in Social Policy: The Rise and Fall of Policy Regimes*, M.E. Sharpe, Armonk, N. Y., pp. 78–104.

Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*, Polity Press, Cambridge.

Esping-Andersen, G. (2015). Welfare regimes and social stratification, *Journal of European Social Policy* **25**(1): 124–134.

Estevez-Abe, M., Iversen, T. and Soskice, W., D. (2001). Social Protection and the Formation of Skills: A Reinterpretation of the Welfare State', *in* P. Hall, A. and D. Soskice, W. (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, Oxford, pp. 145–183.

Fadda, S. (2013). Labour market institutions and the crisis, *in* S. Fadda and P. Tridico (eds), *Financial Crisis, Labour Markets and Institutions*, Routledge, London, pp. 123–142.

Fagerberg, J. (1984). The "Regulation School" and the Classics: Modes of accumulation and modes of production in a classical model of economic growth, *Working Paper 8426*, CEPREMAP, Paris.

Farhi, E. and Gabaix, X. (2020). Optimal Taxation with Behavioral Agents, *American Economic Review* **110**(1): 298–336.

Farmer, E. A., R. (1999). *The Macroeconomics of Self-Fulfilling Prophecies*, second edn, MIT Press, Cambridge, Mass.

Farmer, E. A., R. (2010). Animal Spirits, Persistent Unemployment and the Belief Function, *National Bureau of Economic Research Working Paper Series* **No. 16522**: 1–38.

Farmer, E. A., R. (2011). Confidence, Crashes and Animal Spirits, *The Economic Journal* **122**(559): 155–172.

Farmer, E. A., R. (2013). Animal Spirits, Financial Crises and Persistent Unemployment, *The Economic Journal* **123**(568): 317–340.

Farmer, E. A., R. (2016). The evolution of endogenous business cycles, *Macroeconomic Dynamics* **20**(2): 544–557.

Farmer, E. A., R. (2017). Post-Keynesian dynamic stochastic general equilibrium theory, *European Journal of Economics and Economic Policies* **14**(2): 173–185.

Farmer, E. A., R. (2018). Pricing assets in a perpetual youth model, *Review of Economic Dynamics* **30**: 106–124.

Farmer, E. A., R. (2020). The Indeterminacy School in Macroeconomics, *Oxford Research Encyclopedia of Economics and Finance* .

Farmer, J. D. and Foley, K., D. (2009). The economy needs agent-based modelling, *Nature* **460**: 685–686.

Fatás, A. and Summers, H., L. (2018). The permanent effects of fiscal consolidations, *Journal of International Economics* **112**: 238–250.

Felipe, J. and McCombie, S. L., J. (2009). Are estimates of labour demand functions

mere statistical artefacts?, *International Review of Applied Economics* **23**(2): 147–168.

Fernández-Huerga, E. (2008). The Economic Behavior of Human Beings: The Institutional/Post-Keynesian Model, *Journal of Economic Issues* **42**(3): 709–726.

Fernández-Huerga, E. (2019). The Labour Demand of Firms: An Alternative Conception Based on the Capabilities Approach, *Cambridge Journal of Economics* **43**(1): 37–60.

Fernández-Huerga, E., García-Arias, J. and Salvador, A. (2017). Labor supply: Toward the construction of an alternative conception from post Keynesian and institutional economics, *Journal of Post Keynesian Economics* **40**(4): 576–599.

Ferri, P. and Minsky, P., H. (1992). Market processes and thwarting systems, *Structural Change and Economic Dynamics* **3**(1): 79–91.

Fisher, I. (1933). The Debt-Deflation Theory of Great Depressions, *Econometrica* **1**(4): 337–357.

Flaschel, P., Charpe, M., Galanis, G., Proaño, R., C. and Veneziani, R. (2018). Macroeconomic and stock market interactions with endogenous aggregate sentiment dynamics, *Journal of Economic Dynamics and Control* **91**: 237–256.

Foley, K., D. (1986). *Understanding Capital: Marx's Economic Theory*, Harvard University Press, London.

Foley, K., D., Michl, R., T. and Tavani, D. (2019). *Growth and Distribution*, second edn, Harvard University Press, Cambridge, Mass.

Fontana, G. (2003). Post Keynesian Approaches to Endogenous Money: A time framework explanation, *Review of Political Economy* **15**(3): 291–314.

Fontana, G., Pitelis, C. and Runde, J. (2019). Financialisation and the new capitalism?, *Cambridge Journal of Economics* **43**(4): 799–804.

Fontana, G. and Realfonzo, R. (2017). Augusto Graziani and recent advances in the monetary theory of production, *Metroeconomica* **68**(2): 202–204.

Fontana, G., Realfonzo, R. and Passarella, M. V. (2020). Monetary economics after the global financial crisis: What has happened to the endogenous money theory?, *European Journal of Economics and Economic Policies* **17**(3): 339–355.

Forges Davanzati, G. (2014). Credit, Production, and Wages in Thorstein Veblen's Economic Thought, *International Journal of Political Economy* **43**(1): 92–109.

Forges Davanzati, G. (2018). Structural change driven by institutions: Thorstein veblen revised, *Structural Change and Economic Dynamics* **45**: 105–110.

Forges Davanzati, G. and Pacella, A. (2014). Thorstein Veblen on credit and economic crises, *Cambridge Journal of Economics* **38**(5): 1043–1061.

Forges Davanzati, G. and Realfonzo, R. (2004). Labour Market Deregulation and Unemployment in a Monetary Economy, *in* R. Arena and N. Salvadori (eds), *Money Credit and the Role of the State: Essays in Honour of Augusto Graziani*, Ashgate Publishing Limited, Aldershot, pp. 63–72.

Franzese Jr., J., R. (2001). Institutional and Sectoral Interactions in Monetar Policy and Wage/ Price Bargaining, *in* P. Hall, A. and D. Soskice, W. (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, Oxford, pp. 104–144.

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

Frydman, R. and Goldberg, D., M. (2013). Change and expectations in macroeconomic models: Recognizing the limits to knowability, *Journal of Economic Methodology* **20**(2): 118–138.

Fumagalli, A. and Lucarelli, S. (2011). Instability and uncertainty in cognitive capitalism, *in* C. Gnos and L.-P. Rochon (eds), *Credit, Money and Macroeconomic Policy: A Post-Keynesian Approach*, New Directions in Modern Economics, Edward Elgar, Cheltenham, pp. 313–333.

Gabaix, X. (2014). A Sparsity-Based Model of Bounded Rationality, *The Quarterly Journal of Economics* **129**(4): 1661–1710.

Gabaix, X. (2020). A Behavioral New Keynesian Model, *American Economic Review* **110**(8): 2271–2327.

Gaffeo, E., Delli Gatti, D., Desiderio, S. and Gallegati, M. (2008). Adaptive microfoundations for emergent macroeconomics, *Eastern Economic Journal* **34**(4): 441–463.

Galbraith, J. K. (1952). *American Capitalism: The Concept of Countervailing Power*, [1956] revised edn, Houghton Mifflin, Boston.

Galbraith, J. K. (1978). On Post Keynesian Economics, *Journal of Post Keynesian Economics* **1**(1): 8–11.

Galbraith, J. K. (1983). *The Anatomy of Power*, Houghton Mifflin, Boston.

Galbraith, J. K. (1997). Time to Ditch the NAIRU, *Journal of Economic Perspectives* **11**(1): 93–108.

Galí, J. (2011). *Unemployment Fluctuations and Stabilization Policies: A New Keynesian Perspective*, number 7 in *Zeuthen Lecture Book Series*, The MIT Press, London.

Galí, J. (2015). *Monetary Policy, Inflation, and the Business Cycle: An Introduction to the New Keynesian Framework and Its Applications*, second edn, Princeton University Press, Oxford.

Galí, J. (2018). The State of New Keynesian Economics: A Partial Assessment, *Journal of Economic Perspectives* **32**(3): 87–112.

Galí, J. (2020). The effects of a money-financed fiscal stimulus, *Journal of Monetary Economics* **115**: 1–19.

Galí, J. and Gertler, M. (2007). Macroeconomic Modeling for Monetary Policy Evaluation, *Journal of Economic Perspectives* **21**(4): 25–46.

Garegnani, P. (2012). On the present state of the capital controversy, *Cambridge Journal of Economics* **36**(6): 1417–1432.

Gechert, S., Havranek, T., Irsova, Z. and Kolcunova, D. (2021). Measuring capital-

labor substitution: The importance of method choices and publication bias, *Review of Economic Dynamics* .

Gertler, M. and Gilchrist, S. (2018). What Happened: Financial Factors in the Great Recession, *Journal of Economic Perspectives* **32**(3): 3–30.

Gertler, M., Kiyotaki, N. and Prestipino, A. (2020). Credit booms, financial crises, and macroprudential policy, *Review of Economic Dynamics* **37**(Supplement 1): S8–S33.

Ghironi, F. (2018). Macro needs micro, *Oxford Review of Economic Policy* **34**(1-2): 195–218.

Gibson, B. and Setterfield, M. (2018). Real and financial crises in the Keynes–Kalecki structuralist model: An agent-based approach, *Metroeconomica* **69**(3): 566–592.

Gintis, H. (2007). The Dynamics of General Equilibrium, *The Economic Journal* **117**(523): 1280–1309.

Girardi, D., Meloni, W. P. and Stirati, A. (2020). Reverse hysteresis? Persistent effects of autonomous demand expansions, *Cambridge Journal of Economics* **44**(4): 835–869.

Giulioni, G., Silvestri, M. and Bucciarelli, E. (2017). Firms' Finance in an Experimentally Microfounded Agent-Based Macroeconomic Model, *Metroeconomica* **68**(2): 259–320.

Glyn, A. (2006). *Capitalism Unleashed: Finance, Globalization, and Welfare*, [2012] reprint edn, Oxford University Press, Oxford.

Glyn, A. and Rowthorn, E., R. (1988). West European Unemployment: Corporatism and Structural Change, *The American Economic Review* **78**(2): 194–199.

Gobbi, A. and Grazzini, J. (2019). A basic New Keynesian DSGE model with dispersed information: An agent-based approach, *Journal of Economic Behavior & Organization* **157**: 101–116.

Godley, W. (1999). Money and credit in a Keynesian model of income determination, *Cambridge Journal of Economics* **23**(4): 393–411.

Godley, W. (2004). Weaving cloth from Graziani's Thread: Endogenous Money in a Simple (but complete) Keynesian Model, *in* R. Arena and N. Salvadori (eds), *Money, Credit and the Role of the State*, Ashgate Publishing Limited, Aldershot, pp. 125–133.

Godley, W. and Cripps, F. (1983). *Macroeconomics*, Oxford University Press, Oxford.

Godley, W. and Lavoie, M. (2007). *Monetary Economics: An Integrated Approach to Credit, Money, Income, Production and Wealth*, [2012] second edn, Palgrave Macmillan, Basingstoke.

Goodfriend, M. and King, R. (1997). The New Neoclassical Synthesis and the Role of Monetary Policy, *NBER Macroeconomics Annual 1997, Volume 12*, number 12 in *NBER Macroeconomics Annual*, MIT Press, Cambridge, Mass., pp. 231–296.

Goodhart, C. (2008). Book review: Monetary Economics: An Integrated Approach to Credit, Money, Income, Production and Wealth. By Wynne Godley and Marc Lavoie, *Economica* **75**(300): 798–799.

Gordon, M., D. (1988). The Un-Natural Rate of Unemployment: An Econometric Critique of the NAIRU Hypothesis, *The American Economic Review* **78**(2): 117–123.

Gordon, M., D., Weisskopf, E., T. and Bowles, S. (1983). Long Swings and the Nonreproductive Cycle, *The American Economic Review* **73**(2): 152–157.

Goudet, O., Kant, J.-D. and Ballot, G. (2017). WorkSim: A Calibrated Agent-Based Model of the Labor Market Accounting for Workers' Stocks and Gross Flows, *Computational Economics* **50**(1): 21–68.

Grahl, J. and Teague, P. (2000). The Régulation School, the employment relation and financialization, *Economy and Society* **29**(1): 160–178.

Granovetter, S., M. (1985). Economic Action and Social Structure: The Problem of Embeddedness, *American Journal of Sociology* **91**(3): 481–510.

Granovetter, S., M. (2005). The Impact of Social Structure on Economic Outcomes, *Journal of Economic Perspectives* **19**(1): 33–50.

Granovetter, S., M. and Swedberg, R. (eds) (2011). *The Sociology of Economic Life*, third edn, Westview Press, New York.

Graziani, A. (1989). The Theory of Monetary Circuit, *Thames Papers in Political Economy* **Spring**: 1–26.

Graziani, A. (2003). *The Monetary Theory of Production*, Cambridge University Press, Cambridge.

Grazzini, J., Richiardi, G., M. and Tsionas, M. (2017). Bayesian estimation of agent-based models, *Journal of Economic Dynamics and Control* **77**: 26–47.

Grazzini, J. and Richiardi, M. (2015). Estimation of ergodic agent-based models by simulated minimum distance, *Journal of Economic Dynamics and Control* **51**: 148–165.

Green, F. and Weisskopf, E., T. (1990). The Worker Discipline Effect: A Disaggregative Analysis, *The Review of Economics and Statistics* **72**(2): 241–249.

Grittersova, J. (2014). Non-market Cooperation and the Variety of Finance Capitalism in Advanced Democracies, *Review of International Political Economy* **21**(2): 339–371.

Guerini, M. and Moneta, A. (2017). A method for agent-based models validation, *Journal of Economic Dynamics and Control* **82**: 125–141.

Guerini, M., Napoletano, M. and Roventini, A. (2018). No man is an Island: The impact of heterogeneity and local interactions on macroeconomic dynamics, *Economic Modelling* **68**: 82–95.

Gutiérrez, G. and Philippon, T. (2017). Investmentless Growth, *Brookings Papers on Economic Activity* pp. 89–169.

Gutiérrez, G. and Philippon, T. (2018). How EU Markets Became More Competitive Than US Markets: A Study of Institutional Drift, *Technical Report 24700*, National Bureau of Economic Research, Inc, Cambridge, Mass.

Guttmann, R. (2015). The heterodox notion of structural crisis, *Review of Keynesian Economics* **3**(2): 194–212.

Haavelmo, T. (1940). The Inadequacy of Testing Dynamic Theory by Comparing Theoretical Solutions and Observed Cycles, *Econometrica* **8**(4): 312–321.

Haavelmo, T. (1978). Wicksell on the Currency Theory vs. the Banking Principle, *The Scandinavian Journal of Economics* **80**(2): 209–215.

Haavelmo, T. (2012). Equations vs. Identities in Macroeconomics, *Nordic Journal of Political Economy* **37**(1): 1–11.

Hahn, F. (1971). Equilibrium with Transaction Costs, *Econometrica* **39**(3): 417–439.

Hahnel, R. and Wright, E. O. (2016). *Alternatives to Capitalism Proposals for a Democratic Economy*, Verso, London.

Haldane, G., A. and Turrell, E., A. (2018). An interdisciplinary model for macroeconomics, *Oxford Review of Economic Policy* **34**(1-2): 219–251.

Haldane, G., A. and Turrell, E., A. (2019). Drawing on different disciplines: Macroeconomic agent-based models, *Journal of Evolutionary Economics* **29**(1): 39–66.

Hall, A., P. (2018). Varieties of capitalism in light of the euro crisis, *Journal of European Public Policy* **25**(1): 7–30.

Hall, A., P. and Gingerich, W., D. (2009). Varieties of Capitalism and Institutional Complementarities in the Political Economy: An Empirical Analysis, *British Journal of Political Science* **39**(3): 449–482.

Hall, A., P. and Soskice, W., D. (2001a). An Introduction to Varieties of Capitalism, *in* P. Hall, A. and D. Soskice, W. (eds), *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, Oxford, pp. 1–68.

Hall, A., P. and Soskice, W., D. (2001b). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*, Oxford University Press, Oxford.

Hall, L., R. and Hitch, J., C. (1939). Price theory and business behavour, *Oxford Economic Papers* **os-2**(1): 12–45.

Hancké, B., Rhodes, M. and Thatcher, M. (2007). Introduction: Beyond Varieties of Capitalism, *in* B. Hancké, M. Rhodes and M. Thatcher (eds), *Beyond Varieties of Capitalism: Conflict, Contradictions, and Complementarities in the European Economy*, Oxford University Press, Oxford, pp. 3–38.

Hansen, H., A. (1936). Mr. Keynes on Underemployment Equilibrium, *Journal of Political Economy* **44**(5): 667–686.

Harcourt, C., G. (2015). On the Cambridge, England, Critique of the Marginal Productivity Theory of Distribution, *Review of Radical Political Economics* **47**(2): 243–255.

Hart, D., O. (1975). On the optimality of equilibrium when the market structure is incomplete, *Journal of Economic Theory* **11**(3): 418–443.

Hart, D., O. (1988). Incomplete Contracts and the Theory of the Firm, *Journal of Law, Economics, & Organization* **4**(1): 119–139.

Harvey, T., J. (1994). Circular Causation and the Veblenian Dichotomy in the "General Theory": An Introduction to Institutionalist Method, *Journal of Post Keynesian Economics* **17**(1): 69–89.

Hay, C. (2005). Two can play at That Game . . . or Can They? Varieties of Capitalism, Varieties of Institutionalism, *in* D. Coates (ed.), *Varieties of Capitalism, Varieties of Approaches*, Palgrave Macmillan, New York, pp. 106–121.

Hay, C. (2020). Does capitalism (still) come in varieties?, *Review of International Political Economy* **27**(2): 302–319.

Hay, C. and Wincott, D. (2012). *The Political Economy of European Welfare Capitalism*, Palgrave Macmillan, Basingstoke.

Heathcote, J., Storesletten, K. and Violante, L., G. (2020). Optimal progressivity with age-dependent taxation, *Journal of Public Economics* **189**: 104074.

Heckman, J., J. and Moktan, S. (2020). Publishing and Promotion in Economics: The Tyranny of the Top Five, *Journal of Economic Literature* **58**(2): 419–70.

Heilbroner, L., R. (1953). *The Worldly Philosophers: The Lives, Times, and Ideas of the Great Economic Thinkers*, [2000] seventh edn, Penguin, London.

Hein, E. (2015). Finance-dominated capitalism and re-distribution of income: A Kaleckian perspective, *Cambridge Journal of Economics* **39**(3): 907–934.

Hein, E. (2017a). The Bhaduri–Marglin post-Kaleckian model in the history of distribution and growth theories: An assessment by means of model closures, *Review of Keynesian Economics* **5**(2): 218–238.

Hein, E. (2017b). Post-Keynesian macroeconomics since the mid 1990s: Main developments, *European Journal of Economics and Economic Policies* **14**(2): 131–172.

Hein, E. (2018). Autonomous government expenditure growth, deficits, debt, and distribution in a neo-Kaleckian growth model, *Journal of Post Keynesian Economics* **41**(2): 316–338.

Hein, E. (2019). Financialisation and tendencies towards stagnation: The role of macroeconomic regime changes in the course of and after the financial and economic crisis 2007–09, *Cambridge Journal of Economics* **43**(4): 975–999.

Hein, E., Meloni, W. P. and Tridico, P. (2020). Welfare models and demand-led growth regimes before and after the financial and economic crisis, *Review of International Political Economy* pp. 1–36.

Hein, E. and van Treeck, T. (2010a). Financialisation and Rising Shareholder Power in Kaleckian/Post-Kaleckian Models of Distribution and Growth, *Review of Political Economy* **22**(2): 205–233.

Hein, E. and van Treeck, T. (2010b). "Financialisation" in post-Keynesian models of distribution and growth: A systematic review, *in* M. Setterfield (ed.), *Handbook of*

Alternative Theories of Economic Growth, Edward Elgar, Cheltenham, pp. 277–292.

Heise, A. (2020). Wage-led and profit-led regime research - promising scientific research programme or scientific cul-de-sac?, *Economic Issues* **25**(2): 31–49.

Hendry, F., D. and Muellbauer, N. J., J. (2018). The future of macroeconomics: Macro theory and models at the Bank of England, *Oxford Review of Economic Policy* **34**(1-2): 287–328.

Hicks, R., J. (1937). Mr. Keynes and the ”Classics”; A Suggested Interpretation, *Econometrica* **5**(2): 147–159.

Hilferding, R. (1910). *Finance Capital: A Study of the Latest Phase of Capitalist Development*, [1981] reprint edn, Routledge & Kegan Paul, London.

Hodgson, M., G. (1996). Varieties of capitalism and varieties of economic theory, *Review of International Political Economy* **3**(3): 380–433.

Holmström, B. and Milgrom, P. (1991). Multitask Principal-Agent Analyses: Incentive Contracts, Asset Ownership, and Job Design, *Journal of Law, Economics, & Organization* **7**: 24–52.

Holmström, B. and Tirole, J. (1997). Financial Intermediation, Loanable Funds, and The Real Sector, *The Quarterly Journal of Economics* **112**(3): 663–691.

Hommes, C. and LeBaron, B. (eds) (2018). *Computational Economics: Heterogeneous Agent Modeling*, Elsevier, Amsterdam.

Hope, D. and Soskice, W., D. (2016). Growth Models, Varieties of Capitalism, and Macroeconomics, *Politics & Society* **44**(2): 209–226.

Howell, R., D. and Azizoglu, M., B. (2011). Unemployment benefits and work incentives: The US labour market in the Great Recession, *Oxford Review of Economic Policy* **27**(2): 221–240.

Howell, R., D., Baker, D., Glyn, A. and Schmitt, J. (2007). Are Protective Labor

Market Institutions at the Root of Unemployment? A Critical Review of the Evidence, *Capitalism & Society* **2**(1).

Howell, R., D. and Okatenko, A. (2010). By what measure? A comparison of French and US labor market performance with new indicators of employment adequacy, *International Review of Applied Economics* **24**(3): 333–357.

Huggett, M. (1993). The risk-free rate in heterogeneous-agent incomplete-insurance economies, *Journal of Economic Dynamics and Control* **17**(5): 953–969.

Hughes Hallett, A. and Piscitelli, L. (2002). Testing for hysteresis against nonlinear alternatives, *Journal of Economic Dynamics and Control* **27**(2): 303–327.

Hunt, K., E. (1978). The Transition from Feudalism to Capitalism, *in* R. Edwards, C., M. Reich and T. Weisskopf, E. (eds), *The Capitalist System: A Radical Analysis of American Society*, second edn, Prentice-Hall, Englewood Cliffs, N. J., pp. 54–64.

Husson, M. (2015). Unemployment, working time and financialisation: The French case, *Cambridge Journal of Economics* **39**(3): 887–905.

Imrohoroğlu, A. (1989). Cost of Business Cycles with Indivisibilities and Liquidity Constraints, *Journal of Political Economy* **97**(6): 1364–1383.

Iversen, T. (1999). *Contested Economic Institutions: The Politics of Macroeconomics and Wage Bargaining in Advanced Democracies*, Cambridge University Press, Cambridge, Mass.

Iversen, T. and Soskice, W., D. (2006a). Electoral Institutions and the Politics of Coalitions: Why Some Democracies Redistribute More than Others, *The American Political Science Review* **100**(2): 165–181.

Iversen, T. and Soskice, W., D. (2006b). New Macroeconomics and Political Science, *Annual Review of Political Science* **9**(1): 425–453.

Jakab, Z. and Kumhof, M. (2019). Banks are not intermediaries of loanable funds – facts, theory and evidence, *Staff Working Paper 761*, Bank of England.

Jayadev, A. (2007). Capital account openness and the labour share of income, *Cambridge Journal of Economics* **31**(3): 423–443.

Jensen, H., Petrella, I., Ravn, S. H. and Santoro, E. (2020). Leverage and Deepening Business-Cycle Skewness, *American Economic Journal: Macroeconomics* **12**(1): 245–81.

Jespersen, J. (2009). *Macroeconomic Methodology: A Post-Keynesian Perspective*, Edward Elgar, Cheltenham.

Jessop, R. (2001a). Institutional Re(turns) and the Strategic – Relational Approach, *Environment and Planning A: Economy and Space* **33**(7): 1213–1235.

Jessop, R. (2001b). *Regulation Theory and the Crisis of Capitalism: Volume One The Parisian Regulation School*, Edward Elgar, Cheltenham.

Jessop, R. (2001c). *Regulation Theory and the Crisis of Capitalism: Volume Two European and American Perspectives on Regulation*, Edward Elgar, Cheltenham.

Jessop, R. (2014). Capitalist diversity and variety: Variegation, the world market, compossibility and ecological dominance, *Capital & Class* **38**(1): 45–58.

Kahn, F., R. (1931). The Relation of Home Investment to Unemployment, *The Economic Journal* **41**(162): 173–198.

Kaldor, N. (1955). Alternative Theories of Distribution, *Review of Economic Studies* **23**(2): 83–100.

Kaldor, N. (1957). A Model of Economic Growth, *The Economic Journal* **67**(268): 591–624.

Kaldor, N. (1961). Capital Accumulation and Economic Growth, *in* F. Lutz, A. and D. Hague, C. (eds), *The Theory of Capital*, International Economic Assocation Series, Palgrave Macmillan, London, pp. 177–222.

Kaldor, N. (1972). The Irrelevance of Equilibrium Economics, *The Economic Journal* **82**(328): 1237–1255.

Kaldor, N. (1978). *Further Essays on Applied Economics*, Vol. 6 of *Collected Economic Essays*, Duckworth, London.

Kalecki, M. (1938). The Determinants of Distribution of the National Income, *Econometrica* **6**(2): 97–112.

Kalecki, M. (1942). A Theory of Profits, *The Economic Journal* **52**(206-207): 258–267.

Kalecki, M. (1943). Political aspects of full employment, *The Political Quarterly* **14**(4): 322–330.

Kalecki, M. (1954). *Theory of Economic Dynamics*, [1969] reprint edn, Monthly Review Press, London.

Kalecki, M. (1971). *Selected Essays on the Dynamics of the Capitalist Economy*, Cambridge University Press, Cambridge.

Kapeller, J. (2010). Some Critical Notes on Citation Metrics and Heterodox Economics, *Review of Radical Political Economics* **42**(3): 330–337.

Kapeller, J. and Schütz, B. (2014). Debt, boom, bust: A theory of Minsky-Veblen cycles, *Journal of Post Keynesian Economics* **36**(4): 781–814.

Kaplan, G. and Violante, L., G. (2018). Microeconomic Heterogeneity and Macroeconomic Shocks, *Journal of Economic Perspectives* **32**(3): 167–94.

Karwowski, E., Shabani, M. and Stockhammer, E. (2019). Dimensions and Determinants of Financialisation: Comparing OECD Countries since 1997, *New Political Economy* pp. 1–21.

Kehoe, J., P., Midrigan, V. and Pastorino, E. (2018). Evolution of Modern Business Cycle Models: Accounting for the Great Recession, *Journal of Economic Perspectives* **32**(3): 141–66.

Kerr, P. and Scazzieri, R. (2013). Structural Economic Dynamics and the Cambridge Tradition, *in* G. Harcourt, C. and P. Kriesler (eds), *The Oxford Handbook of Post-*

Keynesian Economics: Volume 1 Theory and Origins, Oxford University Press, Oxford, pp. 257–287.

Kesting, S. (2005). Countervailing, conditioned, and contingent–the power theory of John Kenneth Galbraith, *Journal of Post Keynesian Economics* **28**(1): 3–23.

Kesting, S. and Nielsen, K. (2008). Varieties of Capitalism: Theoretical Critique and Empirical Observations, *in* W. Elsner and H. Hanappi (eds), *Varieties of Capitalism and New Institutional Deals*, Edward Elgar, Cheltenham, pp. 23–51.

Keynes, J. M. (1936). *The General Theory of Employment, Interest and Money*, [2017] reprint edn, Wordsworth, Hertfordshire.

Keynes, J. M. (1937). The General Theory of Employment, *The Quarterly Journal of Economics* **51**(2): 209–223.

Keynes, J. M. (1963). On the Theory of a Monetary Economy, *Nebraska Journal of Economics and Business* **2**(2): 7–9.

Kim, K., Y. (2019). Household Debt Accumulation and the Great Recession of the United States: A Comparative Perspective, *Review of Radical Political Economics* **52**(1): 26–49.

Kim, K., Y., Lima, G. T. and Setterfield, M. (2019). Political aspects of household finance: Debt, wage bargaining, and macroeconomic (in)stability, *Journal of Post Keynesian Economics* **42**(1): 16–38.

Kim, Y. K. (2016). Macroeconomic effects of household debt: An empirical analysis, *Review of Keynesian Economics* **4**(2): 127–150.

King, E., J. (2002). *A History of Post Keynesian Economcis since 1936*, Edward Elgar, Cheltenham.

King, E., J. (2015). *Advanced Introduction to Post Keynesian Economics*, Edward Elgar, Cheltenham.

Kirman, P., A. (1992). Whom or What Does the Representative Individual Represent?, *Journal of Economic Perspectives* **6**(2): 117–136.

Kirman, P., A. (1999). Interaction and Markets, *in* M. Gallegati and A. Kirman, P. (eds), *Beyond the Representative Agent*, Edward Elgar, Cheltenham, pp. 1–44.

Kirman, P., A. (2016). Ants and nonoptimal self-organization: Lessons for macroeconomics, *Macroeconomic Dynamics* **20**(2): 601–621.

Kleinknecht, A. (2020). The (negative) impact of supply-side labour market reforms on productivity: An overview of the evidence, *Cambridge Journal of Economics* **44**(2): 445–464.

Kleinknecht, A., Kwee, Z. and Budyanto, L. (2016). Rigidities through flexibility: Flexible labour and the rise of management bureaucracies, *Cambridge Journal of Economics* **40**(4): 1137–1147.

Knight, H., F. (1921). *Risk, Uncertainty and Profit*, number 16 in *Reprints of Scarce Tracts in Economics and Political Science*, Houghton Mifflin, Boston.

Köhler, K. (2019). Exchange rate dynamics, balance sheet effects, and capital flows. A Minskyan model of emerging market boom-bust cycles, *Structural Change and Economic Dynamics* **51**: 270–283.

Köhler, K., Guschanski, A. and Stockhammer, E. (2019). The impact of financialisation on the wage share: A theoretical clarification and empirical test, *Cambridge Journal of Economics* **43**(4): 937–974.

Köhler, K. and Stockhammer, E. (2021). Growing differently? Financial cycles, austerity, and competitiveness in growth models since the Global Financial Crisis, *Review of International Political Economy* pp. 1–28.

Krippner, R., G. (2005). The financialization of the American economy, *Socio-Economic Review* **3**(2): 173–208.

Krugman, P. (2018). Good enough for government work? Macroeconomics since the crisis, *Oxford Review of Economic Policy* **34**(1-2): 156–168.

Krugman, P., Obstfeld, M. and Melitz, J., M. (2018). *International Economics Theory and Policy*, eleventh edn, Pearson, London.

Krusell, P., Mukoyama, T., Rogerson, R. and Şahin, A. (2020). Gross worker flows and fluctuations in the aggregate labor market, *Review of Economic Dynamics* **37**(Supplement 1): S205–S226.

Krusell, P. and Smith, A., A. (2006). Quantitative Macroeconomic Models with Heterogeneous Agents, *in* R. Blundell, T. Persson and W. Newey, K. (eds), *Advances in Economics and Econometrics: Theory and Applications, Ninth World Congress*, Vol. 1 of *Econometric Society Monographs*, Cambridge University Press, Cambridge, pp. 298–340.

Kydland, E., F. and Prescott, C., E. (1977). Rules Rather than Discretion: The Inconsistency of Optimal Plans, *Journal of Political Economy* **85**(3): 473–491.

Kydland, E., F. and Prescott, C., E. (1982). Time to Build and Aggregate Fluctuations, *Econometrica* **50**(6): 1345–1370.

Labrousse, A. and Michel, S. (2018). Accumulation regimes, *in* T.-H. Jo, L. Chester and C. D'Ippoliti (eds), *The Routledge Handbook of Heterodox Economics: Theorizing, Analyzing, and Transforming Capitalism*, Routledge International Handbooks, Routledge, Abingdon, pp. 54–69.

Lamperti, F., Roventini, A. and Sani, A. (2018). Agent-based model calibration using machine learning surrogates, *Journal of Economic Dynamics and Control* **90**(C): 366–389.

Lang, D., Setterfield, M. and Shikaki, I. (2020). Is there scientific progress in macroeconomics? The case of the NAIRU, *European Journal of Economics and Economic Policies: Intervention* **17**(1): 19–38.

Lange, O. (1935). Marxian Economics and Modern Economic Theory, *The Review of Economic Studies* **2**(3): 189–201.

Lapavitsas, C. (2009). Financialised Capitalism: Crisis and Financial Expropriation, *Historical Materialism* **17**(2): 114–148.

Lavoie, M. (1992). *Foundations of Post-Keynesian Economic Analysis*, Edward Elgar, Aldershot.

Lavoie, M. (1995). The Kaleckian model of growth and distribution and its neo-Ricardian and neo-Marxian critiques, *Cambridge Journal of Economics* **19**(6): 789–818.

Lavoie, M. (2003). Real Wages and Unemployment with Effective and Notional Demand for Labor, *Review of Radical Political Economics* **35**(2): 166–182.

Lavoie, M. (2004). Circuit and Coherent Stock-flow Accounting, *in* R. Arena and N. Salvadori (eds), *Money Credit and the Role of the State: Essays in Honour of Augusto Graziani*, Ashgate Publishing Limited, Aldershot, pp. 134–149.

Lavoie, M. (2006). Do Heterodox Theories Have Anything in Common? A Post-Keynesian Point of View, *European Journal of Economics and Economic Policies: Intervention* **3**(1): 87–112.

Lavoie, M. (2014a). A comment on 'Endogenous money and effective demand': A revolution or a step backwards?, *Review of Keynesian Economics* **2**(3): 321–332.

Lavoie, M. (2014b). *Post-Keynesian Economics: New Foundations*, Edward Elgar, Cheltenham.

Lavoie, M. (2015). Book review: Wendy Carlin and David Soskice, Macroeconomics: Institutions, Instability, and the Financial System (, Oxford, UK 2015) 638 pages, *European Journal of Economics and Economic Policies: Intervention* **12**(1): 135–142.

Lavoie, M. (2017). The origins and evolution of the debate on wage-led and profit-led regimes, *European Journal of Economics and Economic Policies* **14**(2): 200–221.

Lavoie, M. (2021). Wynne Godley's monetary circuit, *Journal of Post Keynesian Economics* **44**(1): 6–23.

Lavoie, M. and Godley, W. (2001). Kaleckian Models of Growth in a Coherent Stock-Flow Monetary Framework: A Kaldorian View, *Journal of Post Keynesian Economics* **24**(2): 277–311.

Lavoie, M. and Nah, W. J. (2020). Overhead Labour Costs in a Neo-Kaleckian

Growth Model with Autonomous Non-Capacity Creating Expenditures, *Review of Political Economy* pp. 1–27.

Lavoie, M. and Reissl, S. (2019). Further insights on endogenous money and the liquidity preference theory of interest, *Journal of Post Keynesian Economics* **42**(4): 503–526.

Lavoie, M. and Stockhammer, E. (2013a). Wage-led growth: Concepts, theories and policies, *in* M. Lavoie and E. Stockhammer (eds), *Wage-Led Growth: An Equitable Strategy for Economic Recovery*, Palgrave Macmillan, London, pp. 13–39.

Lavoie, M. and Stockhammer, E. (eds) (2013b). *Wage-Led Growth: An Equitable Strategy for Economic Recovery*, Palgrave Macmillan, London.

Lawson, T. (1997). *Economics and Reality*, Routledge, London.

Layard, R., Nickell, S. and Jackman, R. (1991). *Unemployment: Macroeconomics Performance and the Labour Market*, Oxford University Press, Oxford.

Lazonick, W. (1978). The Subjection of Labour to Capital: The Rise of the Capitalist System, *Review of Radical Political Economics* **10**(1): 1–31.

Lazonick, W. (2010). Innovative Business Models and Varieties of Capitalism: Financialization of the U.S. Corporation, *Business History Review* **84**(4): 675–702.

Lazonick, W. (2014). Profits Without Prosperity, *Harvard Business Review* **92**(9): 46–55.

Lazonick, W. and Mazzucato, M. (2013). The risk-reward nexus in the innovation-inequality relationship: Who takes the risks? Who gets the rewards?, *Industrial and Corporate Change* **22**(4): 1093–1128.

Lazonick, W. and O'Sullivan, M. (2000). Maximizing shareholder value: A new ideology for corporate governance, *Economy and Society* **29**(1): 13–35.

Le Bourva, J. (1992). Money creation and credit multipliers, *Review of Political Economy* **4**(4): 447–466.

LeBaron, B. and Tesfatsion, L. (2008). Modeling Macroeconomies as Open-Ended

Dynamic Systems of Interacting Agents, *American Economic Review* **98**(2): 246–50.

Lee, S., F. (1998). *Post Keynesian Price Theory*, Cambridge University Press, Cambridge.

Lee, S., F. (2009). *A History of Heterodox Economics: Challenging the Mainstream in the Twentieth Century*, number 4 in *Routledge Advances in Heterodox Economics*, Routledge, London.

Lee, S., F. (2011). Modeling the Economy as a Whole: An Integrative Approach, *American Journal of Economics and Sociology* **70**(5): 1282–1314.

Lee, S., F. and Jo, T.-H. (2018). *Microeconomic Theory: A Heterodox Approach*, number 37 in *Routledge Advances in Heterodox Economics*, Routledge, Abingdon, Oxon.

Leijonhufvud, A. (1993). Towards a Not-Too-Rational Macroeconomics, *Southern Economic Journal* **60**(1): 1–13.

Leijonhufvud, A. (2000). *Macroeconomic Instability and Coordination: Selected Essays of Axel Leijonhufvud*, Economists of the Twentieth Century, Edward Elgar, Cheltenham.

Leijonhufvud, A. (2009). Out of the corridor: Keynes and the crisis, *Cambridge Journal of Economics* **33**(4): 741–757.

Lengnick, M. (2013). Agent-based macroeconomics: A baseline model, *Journal of Economic Behavior & Organization* **86**: 102–120.

Lengnick, M. and Wohltmann, H.-W. (2013). Agent-based financial markets and New Keynesian macroeconomics: A synthesis, *Journal of Economic Interaction and Coordination* **8**(1): 1–32.

Lerner, A. P. (1977a). From Pre-Keynes to Post-Keynes, *Social Research* **44**(3): 387–415.

Lerner, A. P. (1977b). Stagflation–Its Cause and Cure, *Challenge* **20**(4): 14–19.

Levine, R. (2002). Bank-Based or Market-Based Financial Systems: Which Is Better?, *Journal of Financial Intermediation* **11**(4): 398–428.

Lichtenstein, M., P. (1983). *An Introduction to Post-Keynesian and Marxian Theories of Value and Price*, MacMillan Press Ltd., London.

Lin, K.-H. and Tomaskovic-Devey, D. (2013). Financialization and U.S. Income Inequality, 1970–2008, *American Journal of Sociology* **118**(5): 1284–1329.

Lindbeck, A. (1983). The Recent Slowdown of Productivity Growth, *The Economic Journal* **93**(369): 13–34.

Lindbeck, A. and Snower, D. (1987). Efficiency wages versus insiders and outsiders, *European Economic Review* **31**(1-2): 407–416.

Lipietz, A. (1985). *The Enchanted World: Inflation, Credit and the World Crisis*, Verso Books, London.

Lipietz, A. (1988). Accumulation, Crises, and Ways Out, *International Journal of Political Economy* **18**(2): 10–43.

Lipietz, A. and Jenson, J. (1987). Rebel sons: The Regulation School, *French Politics and Society* **5**(4): 17–26.

Lucas, E., R. (1972). Expectations and the neutrality of money, *Journal of Economic Theory* **4**(2): 103–124.

Lucas, E., R. (1976). Econometric policy evaluation: A critique, *Carnegie-Rochester Conference Series on Public Policy* **1**: 19–46.

Lucas, E., R. and Rapping, A., L. (1971). Real Wages, Employment and Inflation, *in* E. Phelps, S. (ed.), *Microeconomic Foundations of Employmsnt and Inflation Theory*, Macmillan, London.

Lux, T. (2018). Estimation of agent-based models using sequential Monte Carlo methods, *Journal of Economic Dynamics and Control* **91**: 391–408.

Magacho, R., G. and McCombie, S. L., J. (2018). A sectoral explanation of per capita

income convergence and divergence: Estimating Verdoorn's law for countries at different stages of development, *Cambridge Journal of Economics* **42**(4): 917–934.

Magdoff, H. and Sweezy, M., P. (1987). *Stagnation and the Financial Explosion*, Monthly Review Press, New York.

Mangin, S. (2017). A theory of production, matching, and distribution, *Journal of Economic Theory* **172**: 376–409.

Mankiw, N. G. (2016). *Macroeconomics*, ninth edn, Macmillan Education, New York.

Manning, A. (2003). The real thin theory: Monopsony in modern labour markets, *European Association of Labour Economists, 14th Annual Conference, 2002* **10**(2): 105–131.

Marglin, A., S. and Schor, B., J. (eds) (1990). *The Golden Age of Capitalism Reinterpreting the Postwar Experience*, Clarendon, Oxford.

Martin, C. J. (2005). Beyond Bone Structure: Historical Institutionalism and the Style of Economic Growth, *in* D. Coates (ed.), *Varieties of Capitalism, Varieties of Approaches*, Palgrave Macmillan, New York, pp. 47–62.

Marx, K. (1867). *Capital: Volume I*, [2013] reprint edn, Wordsworth, Hertfordshire.

Marx, K. (1885). *Capital: Volume II*, Wordsworth Classics of World Literature, [2013] reprint edn, Wordsworth, Hertfordshire.

Marx, K. (1894). *Capital: Volume III*, [1991] reprint edn, Penguin, London.

McCombie, S. L., J. (2001). What Does the Aggregate Production Function Show? Further Thoughts on Solow's "Second Thoughts on Growth Theory", *Journal of Post Keynesian Economics* **23**(4): 589–615.

McKay, A. and Reis, R. (2016). The Role of Automatic Stabilizers in the U.S. Business Cycle, *Econometrica* **84**(1): 141–194.

McKibbin, J., W. and Stoeckel, A. (2018). Modelling a complex world: Improving macro-models, *Oxford Review of Economic Policy* **34**(1-2): 329–347.

McLeay, M., Radia, A. and Thomas, R. (2014). Money creation in the modern economy, *Quarterly Bulletin* **Spring**: 14–27.

Mearman, A. (2006). Critical Realism in Economics and Open-Systems Ontology: A Critique, *Review of Social Economy* **64**(1): 47–75.

Mettenheim, K. (2013). Back to Basics in Banking Theory and Varieties of Finance Capitalism, *Accounting, Economics, and Law: A Convivium* **3**(3): 357–405.

Mian, A. and Sufi, A. (2018). Finance and Business Cycles: The Credit-Driven Household Demand Channel, *Journal of Economic Perspectives* **32**(3): 31–58.

Michell, J. (2017). Do Shadow Banks Create Money? 'Financialisation' and the Monetary Circuit, *Metroeconomica* **68**(2): 354–377.

Michell, J. and Toporowski, J. (2013). Critical Observations on Financialization and the Financial Process, *International Journal of Political Economy* **42**(4): 67–82.

Michl, R., T. (2018). Hysteresis in a Three-Equation Model, *Eastern Economic Journal* **44**(2): 305–322.

Minsky, P., H. (1975). *John Maynard Keynes*, [2008] second edn, McGraw-Hill, London.

Minsky, P., H. (1980). Capitalist Financial Processes and the Instability of Capitalism, *Journal of Economic Issues* **14**(2): 505–523.

Minsky, P., H. (1982). *Can "It" Happen Again?*, [2016] revised edn, Routledge Classics, London.

Minsky, P., H. (1985). An introduction to Post-Keynesian economics, *Economic Forum* **15**(2): 1–13.

Minsky, P., H. (1986a). The Evolution of Financial Institutions and the Performance of the Economy, *Journal of Economic Issues* **20**(2): 345–353.

Minsky, P., H. (1986b). *Stabilizing an Unstable Economy*, [2008] revised edn, McGraw-Hill, New York.

Minsky, P., H. (1996). Uncertainty and the Institutional Structure of Capitalist Economies, *Journal of Economic Issues* **30**(2): 357–368.

Minsky, P., H. and Whalen, J., C. (1996). Economic Insecurity and the Institutional Prerequisites for Successful Capitalism, *Journal of Post Keynesian Economics* **19**(2): 155–170.

Mitchell, C., W. (1935). Commons on Institutional Economics, *The American Economic Review* **25**(4): 635–652.

Mjøset, L. (1987). Nordic economic policies in the 1970s and 1980s, *International Organization* **41**(3): 403–456.

Moene, K. O. and Wallerstein, M. (2005). The Scandinavian model and economic development, *Development Outreach* **8**(1): 18–20.

Montalban, M., Frigant, V. and Jullien, B. (2019). Platform economy as a new form of capitalism: A Régulationist research programme, *Cambridge Journal of Economics* **43**(4): 805–824.

Mortensen, T., D. (1982). Property Rights and Efficiency in Mating, Racing, and Related Games, *The American Economic Review* **72**(5): 968–979.

Muth, F., J. (1961). Rational Expectations and the Theory of Price Movements, *Econometrica* **29**(3): 315–335.

Myrdal, G. (1944). *An American Dilemma: The Negro Problem and Modern Democracy*, Harper, New York.

Myrdal, G. (1954). *The Political Element in the Development of Economic Theory*, [2017] reprint edn, Routledge, Abingdon, Oxon.

Myrdal, G. (1957). *Economic Theory and Underdeveloped Regions*, General Duckworth & Co, London.

Myrdal, G. (1978). Institutional Economics, *Journal of Economic Issues* **12**(4): 771–783.

Nickell, S. (1997). Unemployment and Labor Market Rigidities: Europe versus North America, *Journal of Economic Perspectives* **11**(3): 55–74.

Nikiforos, M. (2016). On the 'utilisation controversy': A theoretical and empirical discussion of the Kaleckian model of growth and distribution, *Cambridge Journal of Economics* **40**(2): 437–467.

Nikiforos, M. and Zezza, G. (2017). Stock-flow consistent macroeconomic models: A survey, *Journal of Economic Surveys* **31**(5): 1204–1239.

Nordhaus, D., W. and Godley, W. (1972). Pricing in the Trade Cycle, *The Economic Journal* **82**(327): 853–882.

North, C., D. (1990). *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge.

Onaran, Ö. and Galanis, G. (2013). Is Aggregate Demand Wage-led or Profit-led? A Global Model, *in* M. Lavoie and E. Stockhammer (eds), *Wage-Led Growth: An Equitable Strategy for Economic Recovery*, Palgrave Macmillan, London, pp. 71–99.

Onaran, Ö. and Obst, T. (2016). Wage-led growth in the EU15 member-states: The effects of income distribution on growth, investment, trade balance and inflation, *Cambridge Journal of Economics* **40**(6): 1517–1551.

Oren, T. and Blyth, M. (2019). From Big Bang to Big Crash: The Early Origins of the UK's Finance-led Growth Model and the Persistence of Bad Policy Ideas, *New Political Economy* **24**(5): 605–622.

Orhangazi, Ö. (2019). The role of intangible assets in explaining the investment–profit puzzle, *Cambridge Journal of Economics* **43**(5): 1251–1286.

Orléan, A. (2014). *The Empire of Value*, The MIT Press.

O'Sullivan, M. (2007). Acting out institutional change: Understanding the recent transformation of the French financial system, *Socio-Economic Review* **5**(3): 389–436.

Pariboni, R., Paternesi Meloni, W. and Tridico, P. (2020). When Melius Abundare Is No Longer True: Excessive Financialization and Inequality as Drivers of Stagnation, *Review of Political Economy* **32**(2): 216–242.

Pariboni, R. and Tridico, P. (2019). Labour share decline, financialisation and structural change, *Cambridge Journal of Economics* **43**(4): 1073–1102.

Pasinetti, L., L. (1962). Rate of Profit and Income Distribution in Relation to the Rate of Economic Growth, *Review of Economic Studies* **29**(4): 267–279.

Pasinetti, L., L. (2005). The Cambridge School of Keynesian Economics, *Cambridge Journal of Economics* **29**(6): 837–848.

Pasinetti, L., L. (2007). *Keynes and the Cambridge Keynesians: A "Revolution in Economics" to Be Accomplished*, Cambridge University Press, Cambridge.

Pasinetti, L. L. (2021). Economic theory and institutions, *Structural Change and Economic Dynamics* **56**: 438–442.

Passarella, M. V. (2012). A simplified stock-flow consistent dynamic model of the systemic financial fragility in the 'New Capitalism', *Journal of Economic Behavior & Organization* **83**(3): 570–582.

Passarella, M. V. (2014). Financialization and the Monetary Circuit: A Macro-accounting Approach, *Review of Political Economy* **26**(1): 128–148.

Passarella, M. V. (2017). Monetary theories of production, *in* T.-H. Jo, L. Chester and C. D'Ippoliti (eds), *The Routledge Handbook of Heterodox Economics: Theorizing, Analyzing, and Transforming Capitalism*, Routledge International Handbooks, Routledge, Abingdon, Oxon, pp. 70–83.

Peck, J. and Theodore, N. (2007). Variegated capitalism, *Progress in Human Geography* **31**(6): 731–772.

Pedrosa, Í. and Lang, D. (2021). To what extent does aggregate leverage determine financial fragility? New insights from an agent-based stock-flow consistent model, *Journal of Evolutionary Economics* **31**(4): 1221–1275.

Perugini, C., Vecchi, M. and Venturini, F. (2017). Globalisation and the decline of the labour share: A microeconomic perspective, *Economic Systems* **41**(4): 524–536.

Petit, P. (1999). Structural Forms and Growth Regimes of the Post-Fordist Era, *Review of Social Economy* **57**(2): 220–243.

Petit, P. (2002). From cumulative growth to régulation theory, *in* R. Boyer and Y. Saillard (eds), *Régulation Theory: The State of the Art*, Routledge, London, pp. 168–173.

Petri, F. (2019). Capital Theory 1873–2019 and the State of Macroeconomics, *History of Economics Review* **74**(1): 1–24.

Petrongolo, B. and Pissarides, A., C. (2001). Looking into the Black Box: A Survey of the Matching Function, *Journal of Economic Literature* **39**(2): 390–431.

Phelps, S., E. (2007). Macroeconomics for a Modern Economy, *The American Economic Review* **97**(3): 543–561.

Phillips, A. W. (1958). The Relation between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957, *Economica* **25**(100): 283–299.

Piketty, T. (2014). *Capital in the Twenty-First Century*, The Belknap Press, London.

Piketty, T. (2020). *Capital and Ideology*, The Belknap Press, London.

Piore, J., M. (2016). Varieties of Capitalism Theory: Its Considerable Limits, *Politics & Society* **44**(2): 237–241.

Pissarides, A., C. (1984). Search Intensity, Job Advertising, and Efficiency, *Journal of Labor Economics* **2**(1): 128–143.

Pissarides, A., C. (1985). Short-Run Equilibrium Dynamics of Unemployment, Vacancies, and Real Wages, *The American Economic Review* **75**(4): 676–690.

Polanyi, K. (1944). *The Great Transformation*, [1985] reprint edn, Beacon Press, Boston.

Pontusson, J. (2005). Varieties of Commonalities of Capitalism, *in* D. Coates (ed.), *Varieties of Capitalism, Varieties of Approaches*, Palgrave Macmillan, New York, pp. 163–188.

Pontusson, J. and Baccaro, L. (2020). Comparative Political Economy and Varieties of Macroeconomics, *Oxford Research Encyclopedia of Politics* .

Pontusson, J., Rueda, D. and Way, R., C. (2002). Comparative Political Economy of Wage Distribution: The Role of Partisanship and Labour Market Institutions, *British Journal of Political Science* **32**(2): 281–308.

Rabinovich, J. (2019). The financialization of the non-financial corporation. A critique to the financial turn of accumulation hypothesis, *Metroeconomica* **70**(4): 738–775.

Rabinovich, J. (2021). Financialisation and the 'supply-side' face of the investment-profit puzzle, *Journal of Post Keynesian Economics* **44**(3): 434–462.

Ramskogler, P. (2011). Credit Money, Collateral and the Solvency of Banks: A Post Keynesian Analysis of Credit Market Failures, *Review of Political Economy* **23**(1): 69–79.

Ravn, O., M. and Sterk, V. (2017). Job uncertainty and deep recessions, *Journal of Monetary Economics* **90**: 125–141.

Ravn, O., M. and Sterk, V. (2021). Macroeconomic Fluctuations with HANK & SAM: An Analytical Approach, *Journal of the European Economic Association* **19**(2): 1162–1202.

Realfonzo, R. (2006). The Italian Circuitist Approach, *in* P. Arestis and M. Sawyer, C. (eds), *A Handbook of Alternative Monetary Economics*, Edward Elgar, Cheltenham, pp. 105–120.

Reich, M., Gordon, M., D. and Edwards, C., R. (1973). A Theory of Labor Market Segmentation, *The American Economic Review* **63**(2): 359–365.

Reis, R. (2018). Is something really wrong with macroeconomics?, *Oxford Review of Economic Policy* **34**(1-2): 132–155.

Renaud, J.-F. (2000). The Problem of the Monetary Realization of Profits in a Post Keynesian Sequential Financing Model: Two solutions of the Kaleckian option, *Review of Political Economy* **12**(3): 285–303.

Reynolds, J., P. (1983). Kalecki's Degree of Monopoly, *Journal of Post Keynesian Economics* **5**(3): 493–503.

Riccetti, L., Russo, A. and Gallegati, M. (2013). Leveraged network-based financial accelerator, *Journal of Economic Dynamics and Control* **37**(8): 1626–1640.

Riccetti, L., Russo, A. and Gallegati, M. (2015). An agent based decentralized matching macroeconomic model, *Journal of Economic Interaction and Coordination* **10**(2): 305–332.

Riccetti, L., Russo, A. and Gallegati, M. (2016a). Financialisation and crisis in an agent based macroeconomic model, *Economic Modelling* **52**: 162–172.

Riccetti, L., Russo, A. and Gallegati, M. (2016b). Stock market dynamics, leveraged network-based financial accelerator and monetary policy, *International Review of Economics & Finance* **43**: 509–524.

Richiardi, G., M. (2006). Toward a Non-Equilibrium Unemployment Theory, *Computational Economics* **27**(1): 135–160.

Richiardi, G., M. (2012). Agent-based computational economics: A short introduction, *The Knowledge Engineering Review* **27**(2): 137–149.

Rima, H., I. (1984). Whatever Happened to the Concept of Involuntary Unemployment?, *International Journal of Social Economics* **11**(3/4): 62–71.

Rima, H., I. (1986). The Peculiarities of Labor Markets and the Residuum, *Eastern Economic Journal* **12**(2): 158–174.

Rima, H., I. (2003). From profit margins to income distribution: Joan Robinson's odyssey from marginal productivity theory, *Review of Political Economy* **15**(4): 575–586.

Rima, H., I. (2004). Increasing Returns, New Growth Theory, and the Classicals, *Journal of Post Keynesian Economics* **27**(1): 171–184.

Robbins, L. (1932). *An Essay on the Nature & Significance of Economic Science*, Macmillan Co, London.

Roberts, A. and Kwon, R. (2017). Finance, inequality and the varieties of capitalism in post-industrial democracies, *Socio-Economic Review* **15**(3): 511–538.

Robinson, J. (1933). *The Economics of Imperfect Competition*, [1969] second edn, Macmillan, London.

Robinson, J. (1943). *An Essay on Marxian Economics*, [1966] second edn, Macmillan, London.

Robinson, J. (1956). *The Accumulation of Capital*, [2013] third edn, Palgrave Macmillan, London.

Robinson, J. (1960). *Collected Economic Papers: Volume Two*, Basil Blackwell, Oxford.

Robinson, J. (1962). *Essays in the Theory of Economic Growth*, Macmillan, London.

Robinson, J. (1972). The Second Crisis of Economic Theory, *The American Economic Review* **62**(1/2): 1–10.

Robinson, J. (1974). History versus Equilibrium, *Thames Papers in Political Economy* **Autumn**: 1–11.

Robinson, J. (1979a). History versus Equilibrium, *Collected Economic Papers: Volume Five*, Basil Blackwell, Oxford, pp. 48–58.

Robinson, J. (1979b). Solving the Stagflation Puzzle, *Challenge* **22**(5): 40–46.

Robinson, J. A. and Acemoglu, D. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*, Profile, London.

Rochon, L.-P. (1997). Keynes's Finance Motive: A re-assessment. Credit, liquidity preference and the rate of interest, *Review of Political Economy* **9**(3): 277–293.

Rochon, L.-P. and Setterfield, M. (2012). A Kaleckian model of growth and distribution with conflict-inflation and Post Keynesian nominal interest rate rules, *Journal of Post Keynesian Economics* **34**(3): 497–520.

Rodriguez-Gil, A. (2018). Hysteresis and labour market institutions. Evidence from the UK and the Netherlands, *Empirical Economics* **55**(4): 1985–2025.

Røed, K. (1997). Hysteresis in Unemployment, *Journal of Economic Surveys* **11**(4): 389–418.

Rotta, T. N. and Teixeira, R. A. (2016). The autonomisation of abstract wealth: New insights on the labour theory of value, *Cambridge Journal of Economics* **40**(4): 1185–1201.

Rowthorn, E., R. (1977). Conflict, inflation and money, *Cambridge Journal of Economics* **1**(3): 215–239.

Rowthorn, E., R. (1981). Demand, real wages and economic growth, *Thames Papers in Political Economy* **Autumn**: 1–39.

Rowthorn, E., R. (1995). Capital formation and unemployment, *Oxford Review of Economic Policy* **11**(1): 26–39.

Rowthorn, E., R. (1999). Unemployment, wage bargaining and capital-labour substitution, *Cambridge Journal of Economics* **23**(4): 413–425.

Ruebeck, S., C., Ussher, J., L. and Barr, M., J. (2017). Introduction to the Symposium on Agent-based Modeling, *Eastern Economic Journal* **43**(2): 189–191.

Russo, A. (2014). A Stochastic Model of Wealth Accumulation with Class Division, *Metroeconomica* **65**(1): 1–35.

Russo, A., Riccetti, L. and Gallegati, M. (2016). Increasing inequality, consumer credit and financial fragility in an agent based macroeconomic model, *Journal of Evolutionary Economics* **26**(1): 25–47.

Salle, I. and Seppecher, P. (2018). Stabilizing an unstable complex economy on the limitations of simple rules, *Journal of Economic Dynamics and Control* **91**: 289–317.

Samuelson, A., P. (1948). *Economics: An Introductory Analysis*, third edition [1955] edn, McGraw-Hill, New York.

Sandbu, M. (2020). *The Economics of Belonging: A Radical Plan to Win Back the Left Behind and Achieve Prosperity for All*, Princeton University Press, Oxford.

Sardoni, C. (2011). *Unemployment, Recession and Effective Demand: The Contributions of Marx, Keynes and Kalecki*, Edward Elgar, Cheltenham.

Sargent, J., T. (1987). *Dynamic Macroeconomic Theory*, Harvard University Press, London.

Sasaki, H. and Fujita, S. (2014). Pro-shareholder income distribution, debt accumulation, and cyclical fluctuations in a post-Keynesian model with labor supply constraints, *European Journal of Economics and Economic Policies* **11**(1): 10–30.

Sawyer, C., M. (1985). *The Economics of Michał Kalecki*, Macmillan, Basingstoke.

Sawyer, C., M. (2014). Bank-based versus market-based financial systems: A critique of the dichotomy, *Technical Report 19*, Financialisation, Economy, Society & Sustainable Development (FESSUD) Project, Leeds.

Sawyer, C., M. and Passarella, M. V. (2017). The Monetary Circuit in the Age of Financialisation: A Stock-Flow Consistent Model with A Twofold Banking Sector, *Metroeconomica* **68**(2): 321–353.

Schelling, C., T. (1978). *Micromotives and Macrobehavior*, Fels Lectures on Public Policy Analysis, Norton, New York.

Schmedders, K. and Judd, L., K. (eds) (2013). *Handbook of Computational Economics Vol. 3*, Elsevier, Amsterdam.

Schneider, R., M. and Paunescu, M. (2012). Changing Varieties of Capitalism and

Revealed Comparative Advantages from 1990 to 2005: A Test of the Hall and Soskice Claims, *Socio-Economic Review* **10**(4): 731–753.

Schor, B., J. and Bowles, S. (1987). Employment Rents and the Incidence of Strikes, *The Review of Economics and Statistics* **69**(4): 584–592.

Schumpeter, A., J. (1911). *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*, [1983] revised edn, Transaction Publishers, New Brunswick, N. J.

Schumpeter, A., J. (1939). *Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process*, McGraw-Hill, New York.

Schumpeter, A., J. (1942). *Capitalism, Socialism and Democracy*, [1994] fifth edn, Routledge, London.

Schumpeter, A., J. (1954). *History of Economic Analysis*, [2006] revised edn, Oxford University Press, New York.

Schwartz, H. M. and Tranøy, B. S. (2019). Thinking about Thinking about Comparative Political Economy: From Macro to Micro and Back, *Politics & Society* **47**(1): 23–54.

Screpanti, E. (1999). Capitalist Forms and the Essence of Capitalism, *Review of International Political Economy* **6**(1): 1–26.

Seccareccia, M. (2004). Aspects of a New Conceptual Integration of Keynes' Treatise on Money and the General Theory: Logical Time Units and Macroeconomic Price Formation, *in* R. Arena and N. Salvadori (eds), *Money Credit and the Role of the State: Essays in Honour of Augusto Graziani*, Ashgate Publishing Limited, Aldershot, pp. 283–308.

Seccareccia, M. (2015). Basic Income, Full Employment, and Social Provisioning: Some Polanyian/Keynesian Insights, *Journal of Economic Issues* **49**(2): 397–404.

Seppecher, P. (2012). Flexibility of wages and macroeconomic instability in an

Agent-based computational model with endogenous money, *Macroeconomic Dynamics* **16**(S2): 284–297.

Seppecher, P., Salle, I. and Lang, D. (2019). Is the market really a good teacher?, *Journal of Evolutionary Economics* **29**(1): 299–335.

Seppecher, P., Salle, I. and Lavoie, M. (2018). What drives markups? Evolutionary pricing in an agent-based stock-flow consistent macroeconomic model, *Industrial and Corporate Change* **27**(6): 1045–1067.

Setterfield, M. (1997). 'History versus equilibrium' and the theory of economic growth, *Cambridge Journal of Economics* **21**(3): 365–378.

Setterfield, M. (2001). Cumulative causation, interrelatedness and the theory of economic growth: A reply to Argyrous and Toner, *Cambridge Journal of Economics* **25**(1): 107–112.

Setterfield, M. (2009). Macroeconomics without the LM curve: An alternative view, *Cambridge Journal of Economics* **33**(2): 273–293.

Setterfield, M. (2011). Anticipations of the Crisis: On the Similarities between post-Keynesian Economics and Regulation Theory, *Revue de la régulation* **10**.

Setterfield, M. and Kim, K., Y. (2020). Varieties of capitalism, increasing income inequality and the sustainability of long-run growth, *Cambridge Journal of Economics* **44**(3): 559–582.

Shaikh, A. (1974). Laws of Production and Laws of Algebra: The Humbug Production Function, *The Review of Economics and Statistics* **56**(1): 115–120.

Shapiro, C. and Stiglitz, E., J. (1984). Equilibrium Unemployment as a Worker Discipline Device, *The American Economic Review* **74**(3): 433–444.

Shapiro, N. (2012). Keynes, Steindl and the Critique of Austerity Economics, *Monthly Review* **63**(3): 103–113.

Shapiro, N. and Sawyer, C., M. (2003). Post Keynesian Price Theory, *Journal of Post Keynesian Economics* **25**(3): 355–365.

Shimer, R. (2005). The Cyclical Behavior of Equilibrium Unemployment and Vacancies, *American Economic Review* **95**(1): 25–49.

Shonfield, A. (1965). *Modern Capitalism: The Changing Balance of Public and Private Power*, Oxford University Press, London.

Simon, A., H. (1955). A Behavioral Model of Rational Choice, *The Quarterly Journal of Economics* **69**(1): 99–118.

Simon, A., H. (1972). Theories of Bounded Rationality, *in* C. McGuire and R. Radner (eds), *Decision and Organisation*, North-Holland, Amsterdam, pp. 161–176.

Sims, A., C. (1980). Macroeconomics and Reality, *Econometrica* **48**(1): 1–48.

Sinitskaya, E. and Tesfatsion, L. (2015). Macroeconomies as constructively rational games, *Journal of Economic Dynamics and Control* **61**: 152–182.

Skott, P. (1985). Vicious Circles and Cumulative Causation, *Thames Papers in Political Economy* **Summer**: 1–22.

Skott, P. (2005). Fairness as a source of hysteresis in employment and relative wages, *Journal of Economic Behavior & Organization* **57**(3): 305–331.

Skott, P. (2012). Theoretical and empirical shortcomings of the Kaleckian investment function, *Metroeconomica* **63**(1): 109–138.

Skott, P. (2017). Weaknesses of 'wage-led growth', *Review of Keynesian Economics* **5**(3): 336–359.

Skott, P. (2019). Challenges for post-Keynesian macroeconomics: A behavioural and structuralist perspective, *in* J. Jespersen and F. Olesen (eds), *Progressive Post-Keynesian Economics: Dealing with Reality*, Edward Elgar Publishing, Cheltenham, pp. 16–33.

Skott, P. and Ryoo, S. (2008). Macroeconomic implications of financialisation, *Cambridge Journal of Economics* **32**(6): 827–862.

Smith, A. (1776). *An Inquiry into the Nature and Causes of the Wealth of Nations*, [2010] reprint edn, Bottom of the Hill Publishing, London.

Snowdon, B. and Vane, R., H. (2005). *Modern Macroeconomics: Its Origins, Development and Current State*, Edward Elgar, Cheltenham.

Solow, M., R. (1990). *The Labor Market as a Social Institution*, Basil Blackwell, Oxford.

Soskice, W., D. (2007). Macroeconomics and Varieties of Capitalism, *in* B. Hancké, M. Rhodes and M. Thatcher (eds), *Beyond Varieties of Capitalism : Conflict, Contradictions, and Complementarities in the European Economy*, Oxford University Press, Oxford, pp. 89–121.

Spencer, A., D. (2006). Work for all those who want it? Why the neoclassical labour supply curve is an inappropriate foundation for the theory of employment and unemployment, *Cambridge Journal of Economics* **30**(3): 459–472.

Sraffa, P. and Dobb, M. (eds) (1951). *The Works and Correspondence of David Ricardo: Volume 1 On the Principles of Political Economy and Taxation*, Cambridge University Press, Cambridge.

Standing, G. (1991). Book Reviews: Gøsta Esping-Andersen, The Three Worlds of Welfare Capitalism: Princeton, NJ, Princeton University Press; Cambridge, Polity Press, 1990, pp. xi + 248 ISBN 0745 606652, *Journal of European Social Policy* **1**(1): 71–75.

Standing, G. (2011). *The Precariat: The New Dangerous Class*, Bloomsbury Academic, London.

Steindl, J. (1952). *Maturity and Stagnation in American Capitalism*, [1976] reprint edn, Monthly Review Press, London.

Steindl, J. (1979). Stagnation theory and stagnation policy, *Cambridge Journal of Economics* **3**(1): 1–14.

Steindl, J. (1985). J. M. Keynes: Society and the Economist, *in* F. Vicarelli (ed.), *Keynes's Relevance Today*, Palgrave Macmillan, London, pp. 99–125.

Stelzner, M. and Paul, M. (forthcoming). Monopsony and collective action in an institutional context, *Review of Social Economy* pp. 1–21.

Stiglitz, E., J. (2018). Where modern macroeconomics went wrong, *Oxford Review of Economic Policy* **34**(1-2): 70–106.

Stirati, A. (2018). On the causes of the changes in income shares: Some reflections in the light the United States experience, *Journal of Post Keynesian Economics* **41**(2): 260–283.

Stockhammer, E. (2004). Financialisation and the slowdown of accumulation, *Cambridge Journal of Economics* **28**(5): 719–741.

Stockhammer, E. (2005). Shareholder Value Orientation and the Investment-Profit Puzzle, *Journal of Post Keynesian Economics* **28**(2): 193–215.

Stockhammer, E. (2008a). Is the NAIRU theory a Monetarist, New Keynesian, Post Keynesian or a Marxist theory?, *Metroeconomica* **59**(3): 479–510.

Stockhammer, E. (2008b). Some Stylized Facts on the Finance-Dominated Accumulation Regime, *Competition & Change* **12**(2): 184–202.

Stockhammer, E. (2011). Wage norms, capital accumulation, and unemployment: A post-Keynesian view, *Oxford Review of Economic Policy* **27**(2): 295–311.

Stockhammer, E. (2017). Wage-led versus profit-led demand: What have we learned? A Kaleckian–Minskyan view, *Review of Keynesian Economics* **5**(1): 25–42.

Stockhammer, E. (2018). Demand regimes, financialisation and hysteresis. New Keynesian and post-Keynesian macroeconomic underpinnings of the Varieties of Capitalism, *Working Paper 1809*, Post Keynesian Economics Society, London.

Stockhammer, E. (2019). An update on Kalecki–Minsky modelling, *European Journal of Economics and Economic Policies: Intervention* **16**(2): 179–192.

Stockhammer, E. (forthcoming). Post-Keynesian Macroeconomic Foundations for Comparative Political Economy, *Politics & Society* pp. 1–32.

Stockhammer, E., Durand, C. and List, L. (2016). European growth models and working class restructuring: An International post-Keynesian Political Economy perspective, *Environment and Planning A: Economy and Space* **48**(9): 1804–1828.

Stockhammer, E., Guschanski, A. and Köhler, K. (2014). Unemployment, capital accumulation and labour market institutions in the Great Recession, *European Journal of Economics and Economic Policies: Intervention* **11**(2): 182–194.

Storm, S. and Naastepad, C. W. M. (2008). The NAIRU reconsidered: Why labour market deregulation may raise unemployment, *International Review of Applied Economics* **22**(5): 527–544.

Storm, S. and Naastepad, C. W. M. (2009). Labor Market Regulation and Productivity Growth: Evidence for Twenty OECD Countries (1984–2004), *Industrial Relations: A Journal of Economy and Society* **48**(4): 629–654.

Storm, S. and Naastepad, C. W. M. (2012). *Macroeconomics beyond the NAIRU*, Harvard University Press, London.

Storm, S. and Naastepad, C. W. M. (2013). Wage-led or Profit-led Supply: Wages, Productivity and Investment, *in* M. Lavoie and E. Stockhammer (eds), *Wage-Led Growth: An Equitable Strategy for Economic Recovery*, Palgrave Macmillan, London, pp. 100–124.

Streeck, W. (2011). Taking capitalism seriously: Towards an institutionalist approach to contemporary political economy, *Socio-Economic Review* **9**(1): 137–167.

Streeck, W. (2016). Varieties of Varieties: "VoC" and the Growth Models, *Politics & Society* **44**(2): 243–247.

Sum, N.-L. and Jessop, R. (2013). *Towards a Cultural Political Economy: Putting Culture in Its Place in Political Economy*, Edward Elgar, Cheltenham.

Summers, H., L. (2014). U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound, *Business Economics* **49**(2): 65–73.

Swedberg, R. (1954). *Introduction to the Transaction Edition*, [2017] reprint edn, Routledge, Abingdon, Oxon, pp. vii–xxxvii.

Swedberg, R. (1995). Schumpeter's vision of socioeconomics, *The Journal of Socio-Economics* **24**(4): 525–544.

Sweeney, R. (2019). Transformation of banking reconsidered: How feasible is 'de-financialisation'?, *Cambridge Journal of Economics* **43**(4): 1053–1071.

Sweezy, M., P. (1942). *The Theory of Capitalist Development*, [1956] reprint edn, Monthly Review Press, New York.

Sweezy, M., P. (1958). Veblen's Critique of the American Economy, *The American Economic Review* **48**(2): 21–29.

Sylos-Labini, P. (1983). Factors Affecting Changes in Productivity, *Journal of Post Keynesian Economics* **6**(2): 161–179.

Sylos-Labini, P. (1995). Why the interpretation of the Cobb-Douglas production function must be radically changed, *Structural Change and Economic Dynamics* **6**(4): 485–504.

Syverson, C. (2019). Macroeconomics and Market Power: Context, Implications, and Open Questions, *Journal of Economic Perspectives* **33**(3): 23–43.

Tabellini, G. (2010). Culture and Institutions: Economic Development in the Regions of Europe, *Journal of the European Economic Association* **8**(4): 677–716.

Taylor, B., J. (1993). Discretion versus policy rules in practice, *Carnegie-Rochester Conference Series on Public Policy* **39**: 195–214.

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

Tcherneva, R., P. (2020). *The Case for a Job Guarantee*, Polity Press, Cambridge.

Tedeschi, G., Iori, G. and Gallegati, M. (2012). Herding effects in order driven markets: The rise and fall of gurus, *Journal of Economic Behavior & Organization* **81**(1): 82–96.

Teglio, A., Mazzocchetti, A., Ponta, L., Raberto, M. and Cincotti, S. (2019). Budgetary rigour with stimulus in lean times: Policy advices from an agent-based model, *Journal of Economic Behavior & Organization* **157**: 59–83.

Temin, P. (2020). Finance and Intangibles in American Economic Growth: Eating the Family Cow, *International Journal of Political Economy* **49**(1): 23–42.

Tesfatsion, L. (2002). Agent-Based Computational Economics: Growing Economies from the Bottom Up, *Artifical Life* **8**(1): 55–82.

Tesfatsion, L. (2017a). Elements of Dynamic Economic Modeling: Presentation and Analysis, *Eastern Economic Journal* **43**(2): 192–216.

Tesfatsion, L. (2017b). Modeling economic systems as locally-constructive sequential games, *Journal of Economic Methodology* **24**(4): 384–409.

Tesfatsion, L. and Judd, L., K. (eds) (2006). *Handbook of Computational Economics: Vol 2. Agent-based Computational Economics*, North-Holland Elsevir, Amsterdam.

Thirlwall, P., A. (1983). A Plain Man's Guide to Kaldor's Growth Laws, *Journal of Post Keynesian Economics* **5**(3): 345–358.

Thirlwall, P., A. (1993). The Renaissance of Keynesian Economics, *Banca Nazionale del Lavoro Quarterly Review* **46**(186): 327–337.

Tobin, J. (1982). Money and Finance in the Macroeconomic Process, *Journal of Money, Credit and Banking* **14**(2): 171–204.

Todd, M, P. and Gigerenzer, G. (2003). Bounding rationality to the world, *The Economic Psychology of Herbert A. Simon* **24**(2): 143–165.

Todorova, Z. (2013). Connecting social provisioning and functional finance in a post-Keynesian–Institutional analysis of the public sector, *European Journal of Economics and Economic Policies* **10**(1): 61–75.

Toner, P. (2001). 'History versus equilibrium' and the theory of economic growth, by Mark Setterfield: A comment, *Cambridge Journal of Economics* **25**(1): 97–102.

Tooze, A. (2018). *Crashed: How a Decade of Financial Crises Changed the World*, Allen Lane, London.

Toporowski, J. (2020a). *Credit and Crisis from Marx to Minsky*, Edward Elgar, Cheltenham.

Toporowski, J. (2020b). Financialisation and the periodisation of capitalism: Appearances and processes, *Review of Evolutionary Political Economy* **1**(2): 149–160.

Uemura, H., Tohyama, H. and Harada, Y. (2019). Special feature: Varieties of capitalism, civil society, and welfare/environmental policies, *Evolutionary and Institutional Economics Review* **16**(2): 427–432.

van der Zwan, N. (2014). Making sense of financialization, *Socio-Economic Review* **12**(1): 99–129.

van Treeck, T. (2008). Reconsidering the investment-profit nexus in finance-led economies: An ARDL-based approach, *Metroeconomica* **59**(3): 371–404.

van Treeck, T. (2009a). The political economy debate on 'financialization' – a macroeconomic perspective, *Review of International Political Economy* **16**(5): 907–944.

van Treeck, T. (2009b). A synthetic, stock–flow consistent macroeconomic model of 'financialisation', *Cambridge Journal of Economics* **33**(3): 467–493.

Varian, R., H. (2019). *Intermediate Microeconomics: A Modern Approach*, ninth edn, W.W. Norton and Company, New York.

Veblen, T. (1898). Why is Economics not an Evolutionary Science?, *The Quarterly Journal of Economics* **12**(4): 373–397.

Veblen, T. (1899). *The Theory of the Leisure Class*, [1998] revised edn, Prometheus Books, Amherst, NY.

Veblen, T. (1904). *The Theory of Business Enterprise*, [1912] reprint edn, Charles Scribner's sons, New York.

Veblen, T. (1908a). Fisher's Capital and Income, *Political Science Quarterly* **23**(1): 112–128.

Veblen, T. (1908b). On the Nature of Capital I, *The Quarterly Journal of Economics* **22**(4): 517–542.

Veblen, T. (1908c). On the Nature of Capital II: Investment, Intangible Assets, and the Pecuniary Magnate, *The Quarterly Journal of Economics* **23**(1): 104–136.

Vejlin, R. (2017). Optimal unemployment insurance: How important is the demand side?, *Macroeconomic Dynamics* **21**(8): 2070–2095.

Verdoorn, J., P. (2002). Factors that Determine the Growth of Labour Productivity, *in* J. McCombie, S. L., M. Pugno and B. Soro (eds), *Productivity Growth and Economic Performance: Essays on Verdoorn's Law*, Palgrave Macmillan, Basingstoke, pp. 28–36.

Vines, D. and Wills, S. (2018). The rebuilding macroeconomic theory project: An analytical assessment, *Oxford Review of Economic Policy* **34**(1-2): 1–42.

Vines, D. and Wills, S. (2020). The rebuilding macroeconomic theory project part II: Multiple equilibria, toy models, and policy models in a new macroeconomic paradigm, *Oxford Review of Economic Policy* **36**(3): 427–497.

Visser, J. (2019). ICTWSS Database, *Technical Report version 6.1*, Amsterdam Institute for Advanced Labour Studies (AIAS), University of Amsterdam, Amsterdam.

Werner, A., R. (2014a). Can banks individually create money out of nothing? — The theories and the empirical evidence, *International Review of Financial Analysis* **36**: 1–19.

Werner, A., R. (2014b). How do banks create money, and why can other firms not do the same? An explanation for the coexistence of lending and deposit-taking, *International Review of Financial Analysis* **36**: 71–77.

Werner, A., R. (2016). A lost century in economics: Three theories of banking and the conclusive evidence, *International Review of Financial Analysis* **46**: 361–379.

Whalen, J., C. (2013). Post-Keynesian Institutionalism after the Great Recession, *European Journal of Economics and Economic Policies* **10**(1): 12–27.

Whalen, J., C. (2020). Post-Keynesian institutionalism: Past, present, and future, *Evolutionary and Institutional Economics Review* **17**(1): 71–92.

Williamson, E., O. (1975). *Markets and Hierarchies: Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*, Free Press, New York.

Williamson, E., O. (1981). The Modern Corporation: Origins, Evolution, Attributes, *Journal of Economic Literature* **19**(4): 1537–1568.

Williamson, E., O. (1985). *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting*, Free Press, London.

Wolff, D., R. and Resnick, A., S. (2012). *Contending Economic Theories: Neoclassical, Keynesian, and Marxian*, The MIT Press, London.

Wood, D. G., J. (2017). The effects of the distribution of mortgage credit on the wage share: Varieties of residential capitalism compared, *Comparative European Politics* **15**(6): 819–847.

Woodford, M. (2009). Convergence in Macroeconomics: Elements of the New Synthesis, *American Economic Journal: Macroeconomics* **1**(1): 267–79.

Woodford, M. (2010). Financial Intermediation and Macroeconomic Analysis, *Journal of Economic Perspectives* **24**(4): 21–44.

Woodford, M. (2013). Macroeconomic Analysis Without the Rational Expectations Hypothesis, *Annual Review of Economics* **5**(1): 303–346.

Wray, L. R. (2011). Minsky's Money Manager Capitalism and the Global Financial Crisis, *International Journal of Political Economy* **40**(2): 5–20.

Wren-Lewis, S. (2018). Ending the microfoundations hegemony, *Oxford Review of Economic Policy* **34**(1-2): 55–69.

Yagan, D. (2019). Employment Hysteresis from the Great Recession, *Journal of Political Economy* **127**(5): 2505–2558.

Yoshihara, N. (2017). A progress report on Marxian economic theory: On the controversies in exploitation theory since Okishio (1963), *Journal of Economic Surveys* **31**(2): 632–659.

Young, A., A. (1928). Increasing Returns and Economic Progress, *The Economic Journal* **38**(152): 527–542.

Zalewski, A., D. and Whalen, J., C. (2010). Financialization and Income Inequality: A Post Keynesian Institutionalist Analysis, *Journal of Economic Issues* **44**(3): 757–777.

Zezza, G. (2012). Godley and Graziani: Stock-flow Consistent Monetary Circuits, *in* D. Papadimitriou, B. and G. Zezza (eds), *Contributions in Stock-flow Modeling: Essays in Honor of Wynne Godley*, Palgrave Macmillan, Basingstoke, pp. 154–172.

Zuboff, S. (2019). *The Age of Surveillance Capitalism: The Fight for the Future at the New Frontier of Power*, Profile Books, London.