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Macroeconomic Impacts of Declining Wage Share in National Income: A Stock-Flow-Consistent Modelling Analysis

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Abstract

The study aims to lay down a parsimonious and tractable stock-flow-consistent macroeconomic modelling approach to enhance the analysis of identification and investigation of the key underlying causes of the macroeconomic and financial instability in the context of the 2007–2008 Global Financial Crises (GFC) and COVID-19 pandemic. The model has the following key features. First, the assets and liabilities of the four major sectors, households, firms, commercial banks and government, are explicitly formalised by considering the accounting flow of the fund approach. Second, the behaviour of each sector has been derived and analysed based on accounting identities derived from the transaction flow matrix. Third, the model is calibrated and simulated by determining the values of the parameters and the exogenous variables based on the US macroeconomic data. Fourth, the most relevant simulation experiments and their results have been sufficiently analysed to produce forecasts and provide specific policy recommendations. The findings suggest that a decline in the wage share in the national income was seen to have undermined financial and macroeconomic stability in the US (and elsewhere). The results concur with the experience of current economic crises that are associated with the impact of COVID-19.

Keywords: Wage Share, Macroeconomic Instability, Financial Fragility, Stock-Flow-Consistent Model, Income Inequality

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1 Introduction

The world has observed the weakness of market discipline in a spectacular fashion both during the ongoing pandemic and prior to that with the events of the 2007–2008 Global Financial Crisis (GFC hereafter). Nations across the globe are currently experiencing the spill-over effects of ill-health on both financial markets and the real economy reflected in the decline in global rates of growth and accumulation. While most economists agree that, with the GFC, the world faced the worst economic crisis since the Great Depression, there has been little agreement regarding the driving forces of the GFC. Two main strands of the discussion about the contributory factors highlight the risky behaviour of the banking sector and, associated with these the importance of financialisation and securitisation. In the main, post-Keynesian (PK) economists believe that the slackening aggregate demand in the US and many other nations has been caused by policies of continual fiscal withdrawal, aggravated by a decades-long decline of the wage share in the GDP. In combination, these factors have driven the non-government sector into cumulative deficits and rising indebtedness, e.g., ILO (2012/2013), Juniper and Mitchell (2008), L. Mishel and Bivens (2015) and Engelbert Stockhammer (2013). There has been a significant decline in the share of wages in GDP in both developed and developing countries since the 1980s. In Australia, wages growth is “the slowest since at least the mid-1960s” as noted by the Governor of the Reserve Bank of Australia (Lowe, 2017). While the Australian economy has experienced better employment outcomes than most other countries from the subsequent pandemic-related downturn, wage growth in Australia has been noticeably weaker than in many comparable economies (Appendix A.1: Figure A.1a-A.1d).

This paper evaluates the Post Keynesian perspective on the GFC by constructing and simulating a macroeconomic model of the US economy that specifically takes into account the impact of the secular decline of the wage share in the national income (GDP). On one hand, this process—reflecting a major shift in the balance of power between capital and labour—led to widening income inequality, most notably in the well-known phenomenon of the ‘working poor’. On the other hand, the policy of balancing the budget in countries like the US and other OECD nations helped to drive their private sectors into a deep deficit. From the early 1980s, the US government’s efforts to move the federal budget into surplus, coincided with growing spending on imports, along with a dramatic deterioration in private sector balance sheets (incorporating both the household and firm sectors).

In the wake of the GFC, the relationship between distributional changes in income and the rise of household debt and the consequent financial instability of the household sector has gained in prominence. Several studies have noted a causal linkage between income distribution and consumer debt as a falling wage share eroded the purchasing power of the households (Cooper, 2012; Leclaire, 2009). Nevertheless, in the modern capitalist system, debts and mortgages are not made available—without constraint—the supply of these debt instruments depends on the creditworthiness of prospective borrowers. The extent to which the response of commercial banks to the demands of households and firms for loans has been limited by pessimistic agreements of creditworthiness has been acknowledged by both researchers and policymakers e.g. Godley and Lavoie (2007) and McLeay (2014). Accordingly, these policies destroyed the real wealth of households and firms

as these sectors became highly leveraged to maintain rates of capital accumulation.

Khandoker (2018) conducted an extensive literature review of contested economic theories and the models, derived from them, including Computational General Equilibrium, and Dynamic Stochastic General Equilibrium Models. The review paid particular attention to the components of each model, scenario, development, and simulation capabilities that could most faithfully account for the phenomenon of financial fragility and macroeconomic instability in the US economy. The model that was finally chosen was further modified so that it could investigate both the individual and combined effects of each of the drivers identified in the economic literature on the GFC, specially the declining wage share, the US government’s fiscal and monetary policies, fluctuations in house prices and impact of credit rationing.

To overcome the limitations of existing mainstream models, the stock-flow consistent (SFC) macroeconomic modelling approach of Godley and Lavoie (2007) was adopted. This approach afforded a logical and consistent framework that was closely aligned with the methods used in the US National Income and Products Accounts (NIPA) table, so that the interconnections between different sectors of the economy (households, banks, firms and governments) could be modelled. SFC model combine both the real and financial sides of the economy way within a unified and coherent dynamic framework. This means that they can provide more accurate policy guidance on how to deal with the consequences of financial instability (J. B. Chatelain & Ralf, 2012; Joseph E. Stiglitz, 2018; G. Zezza & Nikiforos, 2017).

The remainder of the paper is structured as follows: Section 2 briefly discusses the trends and driving forces of declining wage growth in the light of the evidence and theoretical argument. The summary of the proposed SFC model is discussed in Section 3, including, model components and process of scenario development; Section 4 summarises the model calibration and simulation process providing analysis of some of the key simulation results; and Section 5 presents conclusions.

2 Declining Wage Growth in the Light of Theoretical Arguments and Empirical Evidence

2.1 Decades of Falling Wage Share

Over the 1980s, the wage share of national income plummeted in almost all developing and developed nations, especially amongst OECD nations. As detailed in the previous section of the paper, the decline of wage share in the United States national income is considered to have been an important factor, in the build up of fragility in pre-GFC period, contributing to both the rise in household indebtedness, and the shift of the economy toward more speculative financial

positions³. Real wage income in the US began to fall or stagnate from as early as 1978 (Bivens & Mishel, 2015; Peters, 2008). The standard mainstream view is that persistent unemployment is a result of excessive real wages, so that a moderation of real wages should lead to stronger employment growth. However, other studies question this view. For instance, Guschanski and Onaran (2021); Stockhammer (2009); ILO (2012/2013) and Mitchell (2021) found that 'wage moderation' was one of the underlying structural causes of unemployment and GFC. The growing levels of household debt have proven to be associated with a decline in household net worth, an increase in the financial obligation ratio, and a rise in the number of non-business bankruptcy filings. In this way, the decline in the wage share contributes directly to downward pressure on domestic demand. Surprisingly, while the shift of power from wages to capital (or to profits) is clearly evident in the national income of most OECD nations as well as in other nations around the world, this has not been reflected in the aggregate growth of investment in Australia. The Australian Treasury and the Reserve bank of Australia now concur in the view that wages have been growing slowly but argue that slow growth was evenly shared across the industry. In contrast, US data reveals that the share of aggregate investment in the GDP has generally been declining. Two observations can be made in regard to the US:

First, the clear trend towards a declining wage share of national income, effectively meant that wage increases constantly lagged behind productivity developments.

Second, there was also a trend towards much higher wage dispersion (Appendix A.2: Figure A.2a). At the top of the wage scale, a relatively small group of wage-earners (including managers) saw an enormous increase in their salaries which seemed to be totally decoupled from average wage movements. The number of workers with very low wages, leading to the well-known phenomenon of 'working poor', whose wage levels were situated well below national poverty lines or subsistence levels (Guschanski & Onaran, 2021; L. Mishel & Bivens, 2012; Piketty, 2014; Piketty & Saez, 2001).

2.2 Dual Aspects of Wage Share

Wage income plays a dual role in the economy: on one side, it is a cost for the production firm sector; on the other side, it is the source of income for households, which contributes to the demand for the production sector's goods and services. This dual role of wages has been reflected in most post-Keynesian analyses (Brown, 1997, 2007; Duesenberry, 1949; Lavoie & Stockhammer, 2012). As a result, the overall effect of the decrease of the wage share on aggregate demand must be explained by the differential responsiveness of consumption, investment and net exports to changes in income distribution. By the same token, it is natural to imagine that this decline in wage growth—the largest component of business costs has also contributed to lower inflation outcomes over recent years than expected in both the US and Australia (and elsewhere).

2.3 Driving Forces of the Declining Wage Growth

The causes of the fall of wage share has been hotly debated by economic observers. Engelbert Stockhammer (2013), argues that the fall of wage share in developed nations has been driven by several factors such as mass unemployment throughout much of Europe, financialisation, welfare state retrenchment, the impact of globalisation, and a weakening of the organisational strength of unions, while technical progress has reduced the demand for unskilled labour.

2.3.1 A Weakening of the Bargaining Power of Labour or Technological Advancement

While Post Keynesians view the phenomenon of the decline of wage share, or wage stagnation, as the 'natural' outcome of the weakening of trade union power over the last two or three decades, e.g. Juniper (2009); Mitchell (2009); Palley (2009); E. Stockhammer (2009), a recent study by the Reserve Bank of Australia's (RBA) economists Bishop and Chan (2019) argues that 'changing unionisation patterns' are unlikely to account for much of Australia's recent low wage growth. Some studies, e.g. Weir (2018), identify other contributing factors, for instance, the take-up of new technology hence high productivity growth at the micro level – as the main cause of what they call the 'long-run wage puzzle'. However, this study also pointed out some other factors such as labour market deregulation and decentralisation may, in fact, have played a significant role. For instance, since the 1990s in Western Societies, slack labour markets characterised by higher levels of labour underutilisation, due to contracting-out and increasing levels of insecure or precarious employment, have contributed to a weakening of the bargaining power of labour, along with increasing competitive pressure from internationalisation and outsourcing. The recent analysis by Guschanski and Onaran (2021) suggests that wage share declined due to a fall in labour's bargaining power driven by offshoring to developing countries and changes in labour market institutions such as union density, social government expenditure, and minimum wage. They found the effect of technological change was not robust.

2.3.2 Underemployment, job insecurity and wage inequality

One of the most commonly observed impacts of labour market deregulation and the declining strength of workers and unions in the last four decades has been the rise of part-time and temporary employment and the decline in both well-paying jobs and levels of job security. While more people

³ In the Fordist regulation system before the 80's, wages were the constant variable and profits were the variable that adjusted to cyclical

variations. In "financialized capitalism", profits become the constant and wages become the variable that adjusted to fluctuations in the business cycle.

entered the labour market during this period to meet their material needs and a temporary rise of employment was observed, this did not carry over to an improvement in the nature of jobs and job conditions. Instead, more workers ended up in part-time, temporary, low-wage and non-standard employment than ever before, in particular, from the early 1990s to the period just before the onset of the GFC, through to the present. According to the OECD's latest *Employment Outlook*, one in four workers in Australia is now considered casual. While many workers are moving from one casual position to the next – this does not necessarily imply that their wage bargaining efforts have become more effective. Australia's high underemployment rate reveals that a high proportion of the workforce wish to work for longer hours. This weakening of bargaining power has been compounded by falling unionisation rates and changes in negotiation tactics. The Australian Treasury (2017) has suggested that, although casualisation trends are hard to measure, the share of casual workers rose significantly in the 1990s but then remained steady at around 21 per cent of the workforce. It appears that it will be many years before any "normal" rate of unemployment is attained. The persistent rise of unemployment of the last few years has played a critical role in lower wage growth and growth of wage inequality. It is argued that the bottom 95% of the scale has been earning very low wages in part due to the rise in casual or part-time employment instead of full-time and permanent employment (L. Mishel & Bivens, 2015; Piketty, 2014).

2.3.3 Policies for Balancing the Budget

The period of wage repression and economic contraction during the pre-GFC and pre-pandemic coincided with government policy reforms following the 1980s. The promise of these reforms was to stimulate private investment and exports, which, in turn, were expected to generate higher growth, more jobs and trickle-down effects (Engelbert Stockhammer, 2013). Among these reforms were unprecedented cuts of government expenditure in many sectors—in particular, cutting back on social security benefits that were included with job security, for example, health insurance, food insurance and so on—and privatisation of state-owned resources and corporations—policies aimed at making 'smaller government' in most OECD nations. The US government's efforts to achieve a balanced budget or take the budget into surplus since the early 1990s, alongside growing spending on imports, were associated with a dramatic deterioration of aggregate private sectors' balance sheets (Appendix A.2: Figure A.2b). In a period of historic income stagnation for Australian households, successive federal treasurers were pursuing budget strategies that were slowing the economy down—thereby contributing to the wage stagnation. Accordingly, these policies have destroyed the real wealth of households and firms as they have become highly

leveraged to maintain capital accumulation. Several studies, e.g. Juniper and Mitchell (2008); Crotty (2009); Gennaro Zezza (2008) reveal the extent to which national growth rates were driven by the unsustainable growth of the credit-driven consumption and residential investment to maintain the rate of accumulation.

2.3.4 Abandoning the Full-employment Policies

Since the 1980s, all governments have moved away from full-employment Keynesian policies and have adopted supply-side policies intended to improve productivity and efficiency and make workers individually responsible for unemployment. But exactly how policymakers have enacted labour market deregulation in their countries has often varied a great deal. The "unnecessarily unemployed" or underemployed is the by-product of these reform policies since abandoning the full employment policies. Ross Garnaut (2021) suggested that Australian policymakers should drop the 'Dog days' policy and return Australia to having genuine full employment, which means an unemployment rate should be lower than the conventional Non-Accelerating Inflation Rate of Unemployment (NAIRU) rate⁴. He is critical about Australia's current immigration program, which allows the employers labour exploitation as these workers have limited knowledge and power to bargain their wages and may contribute to lower growth. It is perhaps easy to point the finger at the migrants for slow wage growth but having a strong national industrial and wage policy can stop non-compliant employers and protect workers from exploitation (Jericho, 2021). The 2021 Noble prize winner in Economic science, David Card, cast doubt on received wisdom about immigration. He examined the negative impact of immigration on the wages and employment of locals using natural data and found it was tiny (Card & Krueger, 1994).

2.4 Income Inequality and Wealth effect

2.4.1 Income Inequality

In Australia and Globally, a massive redistribution of income towards profits has occurred over the 40 years. One of the salient features of the last four decades of great moderation has been the ongoing redistribution of national income to profits away from wages. This feature is present in many nations. Real wages in Australia have failed to track GDP per hour worked (in the market sector) and as a result, there has been a dramatic redistribution of national income towards

⁴ This central bank reaction has an important implication for the interpretation of the non-accelerating inflation rate of unemployment (NAIRU). First, it highlights that the adjustment of actual unemployment to the NAIRU is essentially due to a policy reaction, not economic automatism. Hence, the market system in this view is not self-adjusting. Second, there are limitations to the effectiveness of monetary policy. Once inflation and interest get close to zero, it is

impossible for the central bank to lower real interest rates any more (by conventional means). This is the zero lower bound for nominal interest rates that features prominently in many recent New Keynesian models.

capital (profit share). The only way that the wage share can fall this systemically over time is if there has been a redistribution of national income away from labour. Accordingly, the wage share's decline affects the economy's budget position as tax income falls due to the rise of unemployment and underemployment. The burdens of an underperforming economy and high unemployment are not shared equally; lower- and middle-income families, as well as racial and ethnic minorities, are more likely to experience income loss and slower wage growth because of a weak economy. Unsurprisingly, high unemployment and underemployment is a factor that widens wage and income inequality.

COVID-19 has exposed and exacerbated inequalities between countries just as it has within countries. The pandemic has affected everyone; however, its impacts are not being felt the same way. The crisis is bringing inequalities in society into sharp focus, as very often, those with less to start with—poorer health, inadequate housing, less secure jobs—are experiencing larger losses. The economic body's Fiscal Monitor shows Australia's 30-year inequality growth is similar to the US, India, China and the UK. The crisis has hit amid uneven access to opportunities and persistent income gaps in large parts of the world. Pre-existing inequalities are deep in most societies, which has resulted in the pandemic having vastly different effects on poor and richer households. Many academics, researchers, media commentators, and policymakers have addressed this contentious relationship between income inequality and insecure employment have been addressed this topic (Davidson, Bradbury, Wong, & Hill, 2020; Hill & Narayan, 2021; J. E. Stiglitz, 2020).

2.4.2 Households' Financial Stability and Wealth Accumulation

Real wage repression reduces the disposable income of households; hence the burden of household debt (BUR) increases because the repayment (principal and interest payment) of mortgages is calculated based on real household income rather than virtual or wealth income or income from capital gain (CG). Hence the rise of the BUR (i.e. an increase of households' financial fragility) reduces the creditworthiness of the household in terms of accessing mortgages. Eventually, the demand for houses declines with the rising financial fragility of households. Thus, the transaction demand for money is a very important ratio, one linked with real wage repression and demand for housing.

The theoretical link between income inequality and increased financial fragility, measured by household indebtedness, was put forward by Duesenberry (1949) in Relative Income Hypothesis (RIH), which states that household preferences over consumption are interdependent in such a way that an increase in consumption of the very top households in the income distribution translates into a desire for higher consumption of the households just below the very top and so on. The ILO (2012/2013) report noted that if the wage share falls, then we would expect to see a decline in total consumption because "the marginal propensity to consume out of capital income is lower than that out of wage income". In the US, Australia and other OECD nations, the consumption share has increased as a proportion of GDP, but the wage share and regular disposable income have not increased. This

consumption growth puzzle has been explained by many authors who have argued that consumption has become autonomous from income with growth in the net wealth of households and is mostly sourced from housing capital gains and stock market investment income (Nikolaïdi, 2015; Passarella, 2012; Gennaro Zezza, 2008). The crucial driver in their argument is not lending per se but the increase in autonomous consumption of the working class. An increase in borrowing that does not affect consumption (e.g., buying a house) would not affect distribution. It is not the level of household debt that matters but the exogenous increase in consumption relative to income. Nikolaïdi (2015) concluded that the stagnation of wage share boosts the wealth of investor households, which leads them to demand more financial assets to invest in—in particular, assets in the form of mortgage-backed securities (MBS). The overall impact of wage stagnation supports the notion of securitisation having long-run adverse effects on macroeconomic stability.

The US 2007–2008 housing boom was a good example of this approach when households used the equity in their home as a justification for greater indebtedness. The increase in leverage further boosted demand for homes, which, in turn, pushed up home prices, generating greater collateral for new lending. This positive feedback loop between home prices and mortgages could be sustained as long as bankers and households believed that home prices "always go up," which was the conventional thought at that time. In Australia, all of these unsustainable elements are evident that led the US economy into the crisis. Rising house prices create inequality or there are distributional consequences of rising house prices – in terms of debt service, housing accessibility and affordability.

2.5 Wage-led Growth vs Profit-led Growth

Surprisingly, while the shift of power from wages to capital (or to profits) is clearly evident in the national income of most OECD nations as well as in other nations around the world, this has not been reflected in the aggregate growth of an investment. This is evident in the US where the growth of aggregate investment in the GDP has generally been declining. The income shifts from labour to capital where a large number of countries in the past decades have witnessed falling wage shares and polarisation of the personal income distribution. This has demonstrated the limitations and even falsehood of the claim that wage moderation, accompanied by more flexible labour markets as well as labour institutions and laws more favourable to employers, will ultimately make for a more stable economy and a more productive and dynamic economic system, e.g., Lavoie and Stockhammer (2012), Nikolaïdi (2015) and Bhaduri (2011).

3 Modelling analysis

3.1 Scenarios Developed for the Model

Four sectors comprise the economy modelled here: aggregated households, production firms, commercial banks and the public sector, each of which has distinct functions and objectives. All four sectors are explicitly considered, and their behaviours are described. The flow of funds approach is used to track the interconnectedness between economic agents of economic agents. Accordingly, the consumption, investment, government expenditure and banks' lending functions have been modified extensively from the existing models to capture the complex dynamics of GFC. For instance, the theoretical structure of our developed model has been inspired by a few previous works in this field, in particular, J. B. Chatelain (2010) and Passarella (2012) in accommodating the complex nature of housing crises and financial fragility of the private sector.

In particular, to keep the model parsimonious and tractable for achieving the study's goals, modelling the rest of the economy is kept at a simple level. For instance, the study hypothesised that both firms and financial institutions do not issue equities for their financing purposes so that the wealth effects from the housing markets and other effects such as credit rationing and impacts of non-performing loans (NPL) can be examined. One of the clear departures from the existing models is that the banking sector accommodates the demand for loans from firm and households; however, this accommodation takes place within limits imposed by creditworthiness.

The model is assumed to be inflation-neutral with the general output price level normalised to unity along with the lines of traditional PK macroeconomic models by setting up a mark-up on the unit direct cost (UDC) that consists entirely of wages so that the decisions on levels of investment and total capital consumption by firms focus on the real terms. However, the housing market price does not follow one general price level of the production firm sector. By distinguishing the two price levels, one for real estate and the other for general purposes, it becomes easier to measure the effect of price appreciation in the housing market in the modelling.

The aggregated assets and liabilities of the four economic sectors; households, firms, commercial banks and government sector, are presented in the balance sheet matrix (BM) and the transaction matrix (TM), as shown in Table 1 and Table 2, respectively, in Appendix A.5 & A.6. The BM and TM are developed in a way where every financial asset has a counterpart liability. The constraints of each of these sectors describe how the balance between flows of expenditure, factor income, and transfers generates counterpart changes in the stock of assets and liabilities.

The BM or stock matrix of the model measures the level of all stock variables at some given point in time, explaining the financial structure of an economy. This matrix is the basis of the TM (Godley & Lavoie, 2007). All assets

appear with a plus (+) sign for the notational purpose, while liabilities, including net worth, are assigned with a negative (-) sign. To be stock-flow-consistent, each column and each row that deals with financial assets or liabilities must sum to zero. The TM is comprehensive in that it shows that 'everything comes from somewhere and everything goes somewhere. Without this armature, accounting errors might pass unnoticed with the consequence that unacceptable implications could be ignored. Under the adopted accounting framework, "there are no black holes" (Godley & Lavoie, 2007, pp. 378-444).

To develop the scenario of the model, the behaviours of the different sectors of the model have been portrayed with the help of the balance sheet matrix (BM), and transaction matrix (TM), guided by theoretical and empirical arguments⁵. Then each of the variables of the four sectors of the economy is defined. When additional unknowns were introduced in the behavioural equations, they were immediately defined. In this way, the same number of unknown equations of the model was determined, and the scenario of the whole economic system is then determined⁶.

3.2 Model calibration and determination of baseline solution

To implement and quantify the developed model, calibration and simulation techniques have been applied using programming languages (e.g., MATLAB, Simulink, EViews and Excel). *First*, numerical values to quantify and evaluate the effects of policies of the parameters are individuated based on the US economic and financial data, trends and stylised facts collected from a wide range of data sources, e.g., the Board of Governors of the US Federal Reserve System, the Bureau of Economic Analysis, Consumer Expenditure Survey, National Income and Product Account (NIPA) table. For instance, NIPA table has been extensively used for calculating the initial values of components of the US economy's Gross Domestic Product (GDP). Some values of the parameters were assigned based on the choices on the observation of stylised facts and from existing research. *Second*, the model is calibrated or estimated; this means the 'steady state solution' of the model is determined⁷.

Once the calibration is done, the model is allowed to run for a sufficient stimulation period to reach a state where all stocks and flows appear to grow at a constant rate. This state is termed the 'baseline solution'. From this baseline condition, selected shocks have been applied to examine the dynamics of key macroeconomic variables. The outcomes after applying the shocks have been compared with base data. Then the results have been analysed for insights into the macroeconomic and financial stability.

4 Simulation Experiments

This model has the potential for a large set of experiments to be undertaken using computer programs. By

⁵ For the details of derived identity, accounting equations and behavioural equations, see Khandoker (2018).

⁶ For model variables and equations please contact the corresponding author.

⁷ See Khandoker (2018) for detailed parameterisation process. Contact the author for any specific initial values of the exogenous and dependant variables.

changing the parameters of the exogenous variables, the simulation experiment allows one to see how the economy reacts with any particular changes that are inherently at the heart of SFC models in the short run or long run.

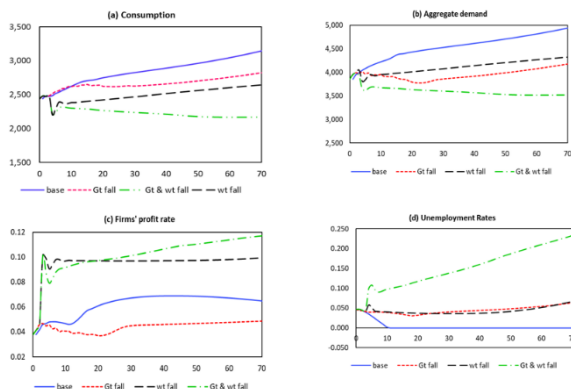


Figure 1- Simulation One- Effects of 'wage-share shock', 'government-expenditure shock', and 'government-expenditure-and-wage-share shock' on - (a) consumption, (b) aggregate demand (c) firms profit & (d) unemployment rate

By examining those results, the performance of the model can be evaluated as it forecasts for many periods into the future. A detailed discussion of the simulation experiments and analysis of the results is beyond the scope of this study but can be found in Khandoker (2018). These results will be discussed in our subsequent publications. Below, we discuss the impacts of

- 'wage-share shock', 'government-expenditure shock', and 'wage-share-and-government-expenditure shock', and
- 'interest-rate shock', 'interest-rate-and-house-price shock', and 'wage-share-and-interest-rate shock'

on some key macroeconomic variables to understand the dynamics of some pre- and post-GFC and current macroeconomic variables. The most interesting and significant effects of these simulation experiments have been presented in Figures 4.1 and 4.2.

4.1 Effects of Wage Share fall along with a fall of Government Expenditure

In this experiment, three different sets of simulations have been exercised in this first experiment as a part of the model's implementation: i) declining share of wage in the GDP; ii) declining government expenditure; and iii) co-existence of the decline of both wage share and government expenditure. In the long run, the observed patterns of decreased consumption behaviour are associated with a decreased level of disposable income and a decreased level of capital accumulation in households due to the high and persistent increase in unemployment (Figure 1). These experiments help to understand one of the salient features of the last four decades of ongoing redistribution of national income to profits away from wages across most nations worldwide. In fact, these results correspond with the co-existence of high profit but

lower growth of investment demand with the higher (and persistent) level of unemployment since the 1980s in the US and other OECD nations (Khandoker (2018). The simulation findings concur with some of the existing literature (Guschanski & Onaran, 2021), which claims the decline of wage share is an important contributing factor in the rise of household indebtedness, deterioration of workers' financial position and tendency to give rise to unsustainable growth regime in the overall economy. However, the outcomes contrast with the popular claim and conventional policy model that the growth of profit helps to increase the growth of capital and investment, and therefore, employment.

Although a detailed explanation of this 'profit-investment puzzle' is beyond the scope of this study, it should be said that firms may prefer to spend excess profit to pay off debts or invest in financial securities, e.g. Treeck (2008), E. Stockhammer (2009). These simulation experiments vividly help to understand the dynamics of decades of declining wage growth in Australia. These findings match up with the line of the research of the Reserve Bank of Australia (RBA), Treasury and other institutions, who believe that slowing wage growth has implications for slowing consumption expenditure which can act as a brake on overall economic growth (Gilfillan, 2019). This also helps to investigate the related macroeconomic dynamics that jolt the system into widespread instability by creating unemployment and financial fragility in the various sectors of the economy.

A 'rise of wage share' share experiment (e.g. raising the minimum wage', creating more secured employment conditions, increasing social security) produces stable dynamics of the key macroeconomic variables both in the short and long run. The findings of this experiment are congruent with the work done by Card and Krueger (1994), the 2021 Noble prize winners in Economic science and some other studies e.g. (Bishop, 2018; Manning, 2021). The Card study estimated the effects of phenomena like immigration or minimum wage using real-world laboratory micro-level data for "natural experiment" mimicking traditional science. They found "no indication" that the rise in the minimum wage would cost jobs. The analysis concurs with the work of Watts (2010), who suggested that a minimum wage reduces earnings inequality, ensures a fairer distribution of economy-wide productivity gains and builds prosperity from the bottom up by increasing incentives to work, particularly for welfare-dependent youth. Watts argued that a minimum wage be set at a level that enables an individual to participate in a sophisticated modern economy—at macro level that becomes the nominal anchor of the wage and price system by critically discussing the conventional policies of 'freezing minimum wage'. These findings are counter to conventional economic theory that advocates imposing or increasing a minimum wage would cost jobs and Employers wouldn't have the money to keep on as many staff.

4.2 Effects of Wage Share fall along with a rise of Housing price and a rise of the Cash rate

The next simulation experiment was done to explore and investigate the impacts of the rise of interest rate and the

rise of asset price along with a fall of wage share on some key macroeconomic and financial variables. The effects of these shocks on household consumption, income and wealth accumulation, and overall financial fragility are reflected in Figure 2. The growth pattern of consumption arising from interest-rate-and-house-price shock (Figure 2) was observed in the pre-GFC growth pattern of the US and pre-COVID - pandemic in Australia and elsewhere, as documented by many researchers: that is, consumption became more autonomous and was credit-driven. The combined rise of interest rates and housing prices stimulated consumption, directly stimulating the growth of output and aggregate demand. The increase in consumption of households compared to the baseline implies a strong stimulus for demand-led growth. Therefore, the savings related to disposable income declined. This behaviour of households also triggered more demand for mortgages. Therefore, with all three simulations, the households' financial fragility was found to be hitting ceiling level for the whole period. This meant that the cost of debt service increased and housing default also increased, both of which led to lower net capital accumulation on the part of households.

This economic growth episode has been profoundly based on credit-driven consumption⁸ (with expenditure patterns influenced by capital gains arising from mostly housing markets and the stock markets). These findings concur with some existing studies—for example, Bhaduri, Laski, and Riese (2006), Gennaro Zezza (2008), Bhaduri (2011) and Passarella (2012). Figure 2 shows the aftershock dynamics of some of the variables of our interest in the production sectors in relation to aggregate output and investment, profit share and overall unemployment. The profit rate increased in the production firm sector due to wage-share-and-interest-rate shock. Due to fall in the wage share, the profit share significantly increased. Accordingly, tax revenue decreased due to lower wage income in the short and long run, triggered continued growth of the government deficit. The impact of these combined shocks, interest-rate rise and wage-share fall, on the rate of unemployment shows that the rise of profit is found not an effective tool to fight long-term unemployment.

The outcomes of this simulation generate some interesting insights into the macroeconomic and financial stability dynamics of the pre-GFC period in the United States and perhaps can help to get some good insights into this post-pandemic climate, especially when it comes to the choice between monetary and fiscal policy for driving investment. In particular, the simulation implies that contractionary monetary policy (i.e., a rise in the interest rate) is not a good choice in a recessionary environment as it takes a long time to achieve macroeconomic goals.

The appreciation of housing prices demonstrates a 'multiplier' process that is implicit here because it represents the interaction between the traditional Keynesian multiplier (but for those intercept shifts on the Keynesian-cross diagram due to wealth effects) and the accelerator. In other words, it explains why low-interest rates and high house prices can drive growth in effective demand despite a low wage share and high unemployment. This analysis replicates Australia's contemporary conditions well. In summary, the substantial redistribution of national income towards capital over the last

three decades has undermined the capacity of households to maintain consumption growth with recourse to debt.

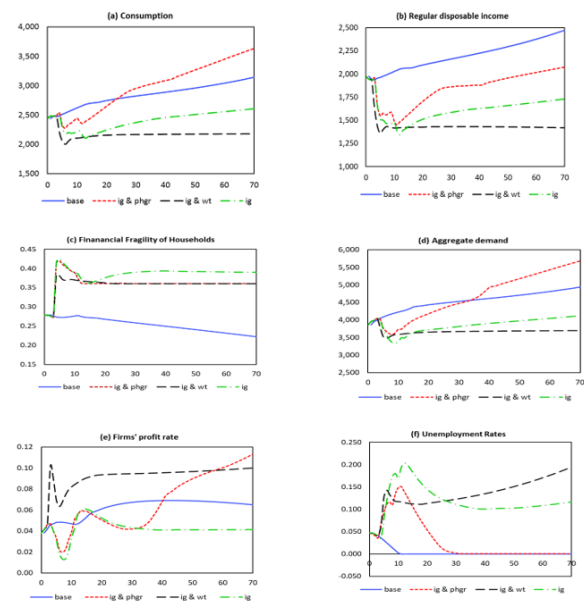


Figure 2- Simulation Two- Effects of 'interest-rate shock', 'interest-rate-and-house-price shock', and 'wage-share-and-interest-rate shock' on - (a) consumption, (b) regular disposable income (c) financial fragility of households (d) aggregate demand (e) firms' profits rate and (f)unemployment rate.

5 Concluding Remarks

The study aimed to lay down a parsimonious and tractable stock-flow-consistent (SFC) macroeconomic modelling approach to enhance the analysis of the key underlying causes of macroeconomic and financial instability. In particular, this study focuses on one deep-seated dynamics—the decades of declining trends of wage share in the national income (GDP)—and its relationship with the overall macroeconomic performance by drawing evidence from the pre-GFC period and ongoing COVID-19 pandemic economic climate. First, the shift in the power relations between capital and labour has been analysed resulting from decades of real wage repression guided by the evidence and contested theoretical arguments. It has been found these shifts contributed to widening the income and wealth inequality gap between income groups and created the well-known phenomenon of the 'working poor'.

Then the study briefly discusses the construction and implementation of the SFC model where the theoretical and empirical evidence have been incorporated to be used to track the extent of the impact of each of the factors in the dynamics of the system and make specific policy recommendations. The model has been calibrated using US macroeconomic data supplemented with necessary hypothetical data. Simulation experiments have then been performed to evaluate the impacts

⁸ Analysts have named the resulting regime as New (or Money-Manager) where consumption has become more autonomous in relation to disposable income. The detail of this era is beyond of scope

of this study but will be published in the subsequent papers. See Khandoker (2018)

of different policy measures and economic shocks on the key macroeconomic and financial stability performance etc. The aftershock performance, for instance, government expenditure, wage share, interest rate, and house price, have been analysed by examining the paths of relevant variables, both in the short and long run.

The outcomes of this simulation results generate some interesting insights into the macroeconomic and financial stability dynamics of the pre-and post-GFC period in the United States and elsewhere. These results perhaps well resonate with the contemporary economic climate in Australia too. The findings suggest that a decline in wage share in the national income was seen to have a contributing factor to the rise of household indebtedness, deterioration of workers' financial position and the tendency to give rise to an unsustainable growth regime in the US (and elsewhere). This also helps to investigate the related macroeconomic dynamics that jolt the system into widespread instability by creating unemployment and financial fragility in the various sectors of the economy.

Accordingly, the research identifies the broader scope of engagement with policy debates and the effectiveness of policies in safeguarding an economy from major crises, like GFC, pandemics and climate emergencies. Hopefully, this kind of powerful analytical tool can be used to analyse and investigate the behaviour and trajectory of key macroeconomic variables if someone wants to examine the political economy of modern capitalism in a rigorous way to help shape alternative policy development.

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Appendix

A.1: Data and Trends



Figure 1.1a: WPI in Australia



Figure A.1b: Wage share in Australia

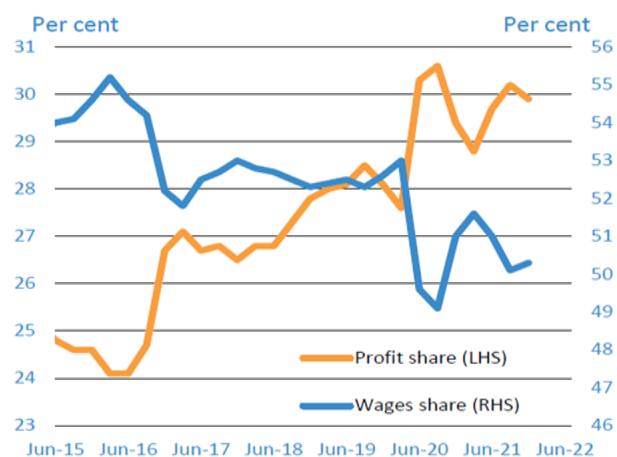


Figure A. 1c Wages and Profits share



Figure A.1d: wages Price Index for Australia, Employment Cost Index for the United States; Indicator of negotiated wages for the Euro Area;

Sources: Monthly Statistical Bulletin—Parliament of Australia.
https://parlinfo.aph.gov.au/parlInfo/download/library/prspub/WUKX6/upload_binary/WUKX6.pdf;fileType=application/pdf; Reserve Bank of Australia (RBA), Australian Bureau of Statistics (ABS)

A.2: Data & Trends

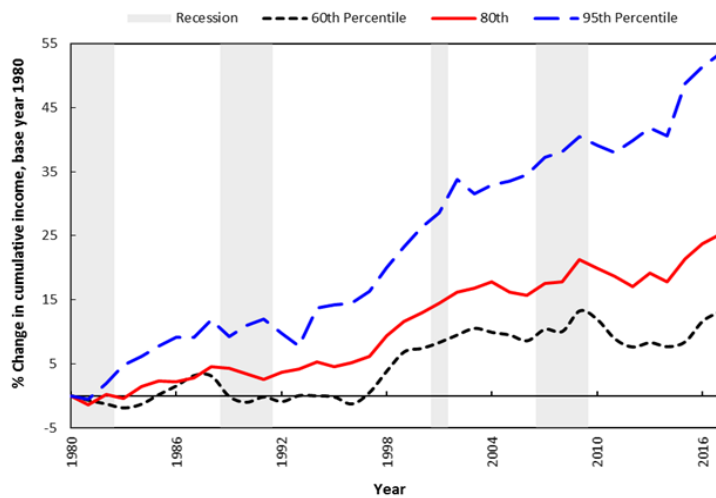


Figure A.2a: Growth of wages of workers at different earning levels in US, 1980-2017

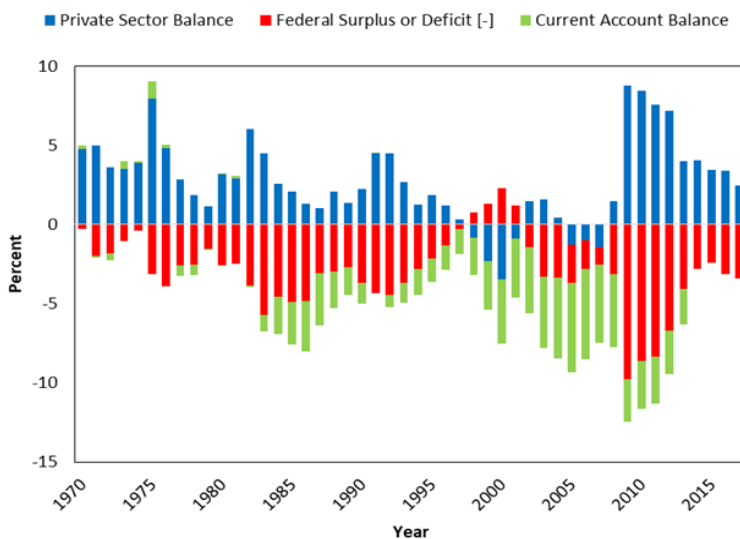


Figure A.2b: Sectoral balances of the US economy, 1970-2016

Source (Figure A.2 a & b): Calculated based on data from Federal Reserve Economic Data

A.3: Balance sheet Matrix

Table 1: Balance sheet matrix

	Households	Production firm sector	Commercial Banks	Public Sector		Real Assets
				Government	Central bank	
Real estate	$+P_{h(t)}H_{d(t)}$	$+P_{h(t)}HU_t$				$+P_{h(t)}H_{s(t)}$
Deposits	$+D_{h(t)}$		$-D_{h(t)}$			0
Loans to firms		$-L_{f(t)}$	$+L_{f(t)}$			0
Mortgages	$-M_{h(t)} - NPL_{h(t)}$		$+M_{h(t)} + NPL_{h(t)}$			0
Government Bonds			$+B_{gbd(t)}$	$-B_{gd(t)}$	$+B_{gcb(t)}$	0
Money	$+HPM_{h(t)}$		$+HPM_{b(t)}$		$-HPM_{(t)}$	0
Firms Equity	$+FE_{f(t)}$	$-FE_{f(t)}$				
Banks Equity	$+BE_{(t)}$		$-BE_{b(t)}$			
Tangible capital		$+K_{f(t)}$				$+K_{f(t)}$
Net worth	$-V_{h(t)}$	$-V_{f(t)}$	0	$V_{g(t)}$		$-K_{f(t)}$ $-P_{h(t)}H_{s(t)}$

Note: In the balance sheet matrix, the plus sign (+) expresses the assets of the particular sector, and the minus sign (-) expresses the liabilities of that sector

A.4: Transaction sheet Matrix

Table 2: Transaction sheet matrix

	Households	Production firm sector		Commercial Banks		Public sector			Σ
						Government	Central Bank		
	(1)	Current (2)	Capital (3)	Current (4)	Capital (5)	(6)	Current (7)	Capital (8)	0
Consumption	$-C_{(t)}$	$+C_{(t)}$							0
Housing Investment		$+\Delta H_{d(t)}$	$-\Delta H_{d(t)}$						0
Firm' other investment		$+I_t$	$-I_t$						0
Govt. expenditure		$+G_t$				$-G_t$			0
Wage Bill	$+WB_t$	$-WB_t$							0
Firms' profit		$-\Pi_{f(t)}$	$+\Pi_{f(t)}$						0
Banks' profit	$+P_{ab(t)}$		$-P_{b(t)}$	$+P_{ud(t)}$					0
Income Tax	$-T_{(t)}$					$+T_{(t)}$			0
Capital depreciation			$-\delta K_{f(t-1)}$						$-\delta K_{f(t-1)}$
Interest on Mortgages	$-i_{m(t-1)}(M_{h(t)} - NPL_{h(t)})$			$+i_{m(t-1)}(M_{h(t-1)} - NPL_{h(t)})$					0
Interest on Firm Loans		$-i_{f(t-1)}(L_{f(t-1)} - NPL_{f(t)})$		$+i_{f(t-1)}(L_{f(t-1)} - NPL_{f(t)})$					0
Interest on HH's deposits	$+i_d \cdot D_{h(t-1)}$			$-i_{d(t)} \cdot D_{h(t-1)}$					0
Central's bank profit						$+P_{cb(t)}$	$-P_{cb(t)}$		0
Interest on Govt. Bonds				$+i_{gb} \cdot B_{gbd(t-1)}$		$-i_{gb} \cdot B_{gd(t-1)}$	$+i_{gb} \cdot B_{gcb(t-1)}$		0
Δ Housing investment	$-P_{h(t)}\Delta H_{d(t)}$		$+P_{h(t)}\Delta H_{d(t)}$						
Δ Deposits	$-\Delta D_{h(t)}$				$+\Delta D_{h(t)}$				0
Δ Mortgage	$+\Delta M_{h(t)}$				$-\Delta M_{h(t)}$				0
Δ Firm Loans			$+\Delta L_{f(t)}$		$-\Delta L_{f(t)}$				0
Δ Govt. Bonds					$-\Delta B_{gbd(t)}$	$+\Delta B_{gd(t)}$		$-\Delta B_{gcb(t)}$	0
Δ High Powered Money	$-\Delta HPM_{h(t)}$				$-\Delta HPM_{b(t)}$			$+\Delta HPM_{(t)}$	0
Δ Banks equity	$-\Delta BE_{(t)}$				$+\Delta BE_{(t)}$				0
Δ Firms' Equity	$-\Delta FE_{f(t)}$		$+\Delta FE_{f(t)}$						
Σ	0	0	0	0	0	0	0	0	0