Wage-led or Profit-led: is it the right question to examine the relationship between income inequality and economic growth? Insights from an empirical stock-flow consistent model for Denmark

Abstract

For the last two decades an increasing number of empirical studies have analyzed the relationship between income inequality and economic growth by classifying economies as either wage-led or profit-led. However, some critiques have claimed that rather than being unequivocally wage-led or profit-led, the growth regime of an economy might depend on the circumstances and the nature of the processes that determine income distribution. Using an empirical stock-flow consistent model estimated for Denmark for 2005-2020 we run eight scenarios simulating changes on policy, structural and institutional variables to see how each affects income distribution and, through it, the business cycle and economic growth. We find that the relationship between demand, growth and income distribution is highly dependent on the source of the shock affecting income shares, its impact on the other areas of the economy and the intensity of feedback effects.

Keywords: Demand and growth regimes, Stock-Flow Consistent Models, Denmark

JEL-codes: E12, E25, E57, E01

1 Introduction

In recent years, the identification of an economy's growth regime has received a lot of attention in Post-Keynesian macroeconomic theory. In this regard, the attempts of determining whether a country can be characterised as profit-led or wage-led has motivated a prolific empirical agenda (see Hein & Vogel 2008, Storm & Naastepad 2012, Stockhammer & Wildauer 2015 and Onaran & Obst 2016). The growth regime, in its simplest version, is considered wage-led (profit-led) if the net effect of an increase in wage share on output is positive (negative). The question of whether an economy is wage-led or profit-led has very important policy implications and therefore pursuing a wrong policy can lead to undesired consequences. The empirical inquiry of growth regimes is mostly based on two different strategies: following a "structural" approach, where each demand component is estimated individually, or following a "aggregative" approach, where only one estimation of aggregate demand is carried out.

Each of these approaches has its own advantages and disadvantages. The structural approach allows an investigation of the importance of each individual component of aggregate demand, and how these are affected by changes in income distribution. Two major drawbacks can be identified in this approach. Firstly, by estimating the components individually, no dynamic interdependence between the variables can be found. Secondly, income shares enter the equations as an exogenous variable, which removes the possibility of assessing the effects that changes in demand might have on the income shares. The aggregative approach does actually address the simultaneity between demand and distribution of income and it is therefore capable of assessing the dynamic interdependence between these two relevant variables for the underlying theory. However, since the investigation of the role of each demand component is not possible due to the aggregative nature of this approach, conclusions about which drivers are the most important to explain the nature of the demand regime are limited.

The empirical inquiries, based on the aforementioned approaches, typically attempt to draw a fine conclusion on whether an economy can be classified as wage-led or profit-led. The critics, however, argue that demand and growth regime of an economy might shift and that the net effects of income distribution can depend on the circumstances and the nature of the shock affecting income distribution (Blecker, 2016). They, therefore, call for a more cautious approach when classifying growth regimes. For instance, Blecker (1989, 2011) shows that in an open economy with flexible markups, a change in income distribution can affect demand differently, depending on what causes the shift in income distribution; the impact is more likely to be wage-led, if the shift in income distribution comes from a change in the monopoly power of domestic firms, and it is more likely to be profit-led, if the shift comes from a change in the relative unit labour cost). Skott (2017) argues that 'reduced-form correlations between income distribution and economic growth depend on the nature of the underlying exogenous shocks or policy interventions. For some shocks, the reduced-form correlation between the wage share and economic growth may be positive, suggesting a wage-led economy; for other shocks, the correlation may be negative, suggesting a profit-led economy' (Skott 2017). Onaran and Galanis (2012), von Arnim et al. (2014), and Onaran and Obst (2016) have found that the impact of changes in income distribution also depends on whether they take place in the economy under consideration or occur at the global level. Moreover, it is also argued that when financialization is taken into account, even the distribution of capital income between rentiers and firms can affect demand and growth (Onaran et al. 2011; Hein 2012).

The aim of this paper is to explore how, if at all, the nature of the underlying shocks or policy intervention can matter when discussing the growth regime of an economy. Taking the critics of the existing literature more serious, we adopt a more cautious approach and attempt to uncover various aspects that might be relevant in analysing the growth regime of an economy. For this purpose, we take a more comprehensive modelling strategy and build an empirical stock-flow consistent (SFC) model while using Denmark as a case study. The primary attractiveness of using SFC framework in this context is that it can capture a broad range of transmission channels as well as the important feedback effects in the economy.

Our work contributes to the existing literature on two fronts: theoretical and empirical. From a theoretical perspective, we pay special attention to the labour market dynamics and propose a modelling strategy that enables us to explore various transmission channels, involving a variety of feedback effects that are relevant when discussing growth regimes. Specifically, our proposed model enables us to analyse the determinants of labour and capital distribution shares, and to examine the effects of distribution on growth, as proposed by Bengtson and Stockhammer (2021). On the empirical front, our model not only retains the advantages of the "structural" approach and "aggregative" approach but provides deeper insights into the discussion of growth regimes. In this regard, the rich dynamics of the model allows us to perform a variety of novel shocks, ranging from policy-relevant shocks to shocks that are purely structural in nature – something that is clearly beyond the scope of the models that are not stock-flow-consistent by construction. And to understand the impact of these shocks, the numerical solution of our model - based on actual data - generates results that are not static but dynamic in nature, thereby varying over time along the lines proposed by Blecker (2016). This is crucial to get a clear understanding of the transition of the economy, following shocks of different nature. Furthermore, our proposed model also allows for the assessment of the dynamic sustainability of the underlying demand regimes – not only does it matter whether under certain circumstances and a given period an economy is wage-led or profit-led, but also whether that regime can be sustained or is it deemed to fail.

The rest of the paper is organized as follows. After this introduction, we present a conceptual description of the model used to make the subsequent analysis (the complete description of the model can be found in the appendix). Section 3 presents a series of policy shocks, as well as changes in the structural and institutional parameters of the economy with the goal of finding out whether Denmark can be categorized as wage-led or profit-led or if the deeper insights that the modelling approach that we use lead us to more nuanced conclusions. Finally, section 4 concludes the paper.

2 An empirical Neo-Kaleckian Stock-Flow consistent model of growth and distribution

In this section, we make a conceptual presentation of an empirical model of growth and distribution combining the Neo-Kaleckian framework presented in Hein (2014) with the SFC approach as outlined by Godley and Lavoie (2006). The full description of the model can be found in the appendix.

2.1 Structure, assumptions and data

We assume that Denmark can be classified as a small and very open economy. Following this assumption, the variables related to the rest of the world, such as the international interest rate, the economic activity of trading partners, and foreign prices, are treated as exogenous. Moreover, we also assume the country has a fixed exchange rate.

To define the dimension of the model, we follow the integrated economic accounts of the system of national accounts, where the economy is divided into five institutional sectors: non-financial corporations (N), Financial corporations (F), the Government (G), Households, including non-profit organizations serving households (H), and the rest of the world (W). We aggregate the different financial assets reported in the system of national accounts into five types (interest-bearing assets, securities, loans, equities, and insurances). The various classes of assets comprised in the capital stock are aggregated into two types of physical assets (buildings and dwellings, and equipment).

The transaction flow matrix of the economy is presented in Table 1. We assume non-financial corporations produce all output and pay taxes (net of subsidies). They hire workers (both domestically and internationally) and pay them wages. After deducting these costs, we can obtain the gross operating surplus (gross profits) for the non-financial corporations. These flows of wages and profits (net of indirect taxes) are what we use to compute labour income share and profit share in the economy, which constitute the main variables used to measure functional income distribution.

TABLE 1 NEAR HERE

Based on the classification in the system of national accounts, we integrate three types of capital income in the model: i) income on interest-bearing assets and securities, ii) income on insurance, and iii) income originating from dividends on equities. The variables related to the financial system that determine these payments, such as domestic interest rates on interest-bearing assets, loans and securities, as well as dividends and income related to insurance and pension funds, are taken as exogenous.

Direct taxes are paid by all institutional sectors and received by the government sector. Social contributions are paid by household sector to the different units administrating social security and pension fund systems. These administrative units are either part of the government sector or the financial corporations. In return, social benefits are paid by the government and financial corporations (which own pension funds) to the household sector. Focusing on the cross-border transactions, the data shows that Denmark is a net payer of the social benefits to the rest of the world.

Taking into account all relevant flows, we can define the net lending position of each institutional agent, which must by definition be equal to the change in wealth. The financial account (the region with the five rows describing the transactions of financial assets in Table 1) represents how each institutional sector allocates its financial wealth and how it covers its financing needs. Interest-bearing assets are a liability for the financial corporations and an asset for the four other sectors of the economy. Securities are split into domestic and foreign securities (both types are aggregated in the "Δ Securities" row). We assume that securities held by the rest of the world are issued by financial corporations. Domestic securities are issued by non-financial corporations and the government, and held by households and financial corporations. Loans are an asset for financial corporations and a liability for the rest of the sectors. It is assumed that there is no credit rationing, so that market closure is entirely demand-led. Equities are issued by nonfinancial corporations and the rest of the world, and are mostly held by households, and to a smaller extent, by the government. Finally, insurance is an asset for households and a liability for both financial corporations and the rest of the world. As with the other financial assets, market closure for insurance and pensions is demand-led.

It is important to highlight that the sum of the components of each row has to be equal to zero, implying that any change in the holding of a specific asset for a certain sector must entail an equivalent change in the liabilities for another sector(s). Likewise, for any given sector, the sum of the elements of the columns must also be zero, implying that the budget constraints are fulfilled. This makes the model stock-flow consistent by construction, i.e., no stocks or flows are leaking from the system[i].

Following the standard in Post-Keynesian stock-flow consistent models, we assume the economy to be demand-led, which means that there are no supply-side constraints (including, for instance, no credit-rationing). The demand equations described when presenting the model are mainly based on the standard Post-Keynesian theory. The only part of the economy where there can eventually be bottlenecks is the labour market, where real wages can be quite sensitive to changes in the rate of unemployment. This assumption seems reasonable for mature economies where employment rates tend to be high.

Based on this accounting structure and all these assumptions, we build a fully-fledged estimated model for the Danish economy, which allows us to contribute to the existing literature on demand and growth regimes in several ways. Firstly, endogenizing the distribution of income by defining separate price and wage equations allows for a series of feedback mechanisms between aggregate demand and the distribution of income that might play a relevant role in the dynamics. More specifically, this allows us to explore which type of policies tend to shape income distribution in one way or another, as called for by Bengtson & Stockhammer (2021), and Skott (2017). As discussed in the introduction, the fact that an economy can be wage-led or profit-led might depends on the nature of the shock, as argued by Blecker (1989, 2011) and Skott (2017). Secondly, by expanding the analysis to include the balance sheet effects, we allow for a diversity of transmission channels and sustainability analyses that might end up playing an important role. Thirdly, by explicitly including the labour market in the analysis, we are able to account for the bidirectional interactions between the labour and the goods market. Finally, the use of a methodology, in which the results are dynamic, provides better insights into the various effects that a shock can have over time. In other words, this allows us to get a clear understanding of the transition of the economy from short-run to medium term, following shocks of different nature. Before presenting the simulation experiments, in the next subsection we summarize the main transmission channels identified through the econometric estimations (these estimations can be found in the appendix). The interplay of these transmissions mechanisms and their relative intensities depending on the shock to which the economy is exposed will explain the varying results obtained in the experiments.

2.2 Main transmission mechanisms

Being a Post-Keynesian demand-led model it is convenient to describe the main transmission mechanisms at play through the components of aggregate demand. Figure 1 describes real GDP (*y*) as being determined by consumption (*c*), households and nonfinancial corporations´ investment (i^H and i^N respectively), public consumption (*g*), exports (*x*) and imports (*m*). The variables inside the boxes are exogenous, meaning that they can be affected by policy decisions, structural or institutional changes or events originating in the rest of the world. The variables that appear without a box are endogenous, meaning that the are determined by the combination of other variables of the model. The arrows in the diagram denote causation, and the sign attached to each arrow indicates the sign of the causal effect (for instance, consumption has a positive effect on real GDP).

FIGURE 1 NEAR HERE

The primary source of consumption is disposable income, which is in turn determined by wages (*w*), property income (given by the combination of accumulated financial wealth (*fnw*) and the interest rate (*ir*)) and taxes (T^H). While the interest rate and taxes are exogenous decisions of the government and the central bank, financial wealth and wages are endogenous processes determined within the model. Wages depend on the bargaining power of unions, which is assumed exogenous, and on the rate of unemployment (*UR*) and prices (*p*), which are endogenous. Unemployment, in turn, is determined by the labour force (*LF*) and the level of activity (*y*). Prices are affected by import prices (p^M) and unit labour costs, which are given by the ratio of wages to productivity (*prod*). As shown in the matrix in Table 1, the difference between disposable income and consumption gives the change in households wealth, which will in turn determine consumption in the next period (both directly through the wealth effect that is typical in Keynesian consumption functions and indirectly through property income). Thus, it is clear from the diagram both the diversity of feedback mechanisms that characterize the dynamics of the variables and the importance of coherently accounting for stock-flow relationships as guaranteed by the structure presented in Table 1.

Capital accumulation takes two forms (building and dwellings in the one side and equipment on the other), but for simplicity aggregate them into a single variable. Households and nonfinancial firms are assumed to explain the bulk of capital accumulation, the main drivers being disposable income in the case of households and the profit share (*ps*) and capacity utilization (*u*) for nonfinancial corporations. The intensity of the effect of the profit share on investment is determinant to the conclusions of whether the economy is wage-led or profit-led. As shown in Figure 1, the profit share is endogenously determined by the combination of wages, prices, productivity and indirect taxes (T^Y). This implies that, in turn, shocks to the determinants of these four elements that directly define the profit share will also have implications on income distribution (for instance, a positive shock to the bargaining power of unions will a priori reduce the profit share). For its part, the rate of capacity utilization depends on the level of activity (*y*) and investment of nonfinancial corporations (i^N). Again, these bidirectional relationships between variables and their dynamic interaction over time are a distinct feature of our methodological approach to the question about demand and growth regimes.

Finally, in the bottom part of Figure 1 the main determinants of international trade flows are presented. As is standard in the Armington approach, exports are positively determined by the level of activity of the rest of the world (y^*) and the real exchange rate (*rer*), while imports are mostly determined by the domestic level of activity and the real exchange rate as well. The real exchange rate, in turn, is an endogenous variable given by the exogenous (fixed) nominal exchange rate (*XR*) and the domestic price level (*p*) defined before.

3 Results, analysis and discussion

Now that the building blocks have been set, we turn to the main question of this study: how, if at all, the nature of the underlying shocks or policy intervention can matter when discussing the growth regime of the economy and whether the Danish economy in particular can fit with any of the demand and growth regimes identified in the literature? To address this question, we propose eight different simulation experiments, four of them being more related to policy variables and the other four more related to the structures and the institutions of the economy. We consider that examining the reaction of the model to such a range of experiments can yield more robust conclusions than limiting the analysis to an exogenous change in income distribution regardless of its origin and the variety of transmission channels that that impulse can set in motion. Consequently, instead of drawing absolute conclusions regarding the underlying demand and growth regime, more relative conclusions can be obtained, where the answer is conditional on the nature of the shock affecting income distribution.

We undertake the following four fiscal policy shocks: i) a 1% decrease in the tax rate on labour income; ii) a 1% decrease in the tax rate on profits and property income; iii) a 1% decrease in taxes on production and products; iv) a 1% increase in government consumption. The four shocks are permanent. The reduction in the tax rate on labour income on the one hand, and on profits and property income on the other, should not affect directly affect income distribution as they intervene in the secondary allocation of income account, while income shares are determined previously in the generation of income account. However, changes in income taxes affect disposable income and consumption, thereby setting in motion all the transmission channels embedded in the model. Thus, it is expected to see an indirect effect of the first two shocks on the wage share over time. A similar indirect effect should be observed in the case of the increase in government consumption – the higher aggregate demand that it leads to should not only increase the size of income (most likely affecting the shares) but also trigger other processes that lead to changes in income shares (mainly the level of employment and real wages). On the other hand, the decrease in taxes on production and products should have a direct effect on income shares as it changes GDP at factor cost (the measure of income used to compute income shares). As factor shares are affected, it is expected that they set in motion the transmission channels where they act as explanatory variables (for instance, the investment equations of nonfinancial corporations).

The shocks on the economic structure and the institutions are interesting to explore because instead of affecting income distribution through the transmission channels (as was the case in the shocks related to the policy variables), they themselves constitute part of these transmission mechanisms. More specifically, the structure and the institutions of the economy define the strength of these channels. For instance, in an open economy the foreign trade multiplier is a transmission channel that is always present, but its importance in the overall multiplier effect depends on the economy's propensity to import (i.e., a structural component). We examine the following four experiments, which are assumed to be permanent: i) a 1% increase in the level of productivity; ii) a 1% average increase in the markup[ii]; iii) a 10% increase in the autonomous real wage, reflecting an increase in workers' bargaining power; iv) a 1% decrease in the participation rate in the labour force. The first two shocks should a priori lead to less favourable income distribution for workers, as for a given level of output, higher productivity would require a lower level of employment (thereby reducing the wage bill), and for a given unit labour costs, a higher markup would imply a larger share of income that is appropriated by firms. The last two shocks, on the other hand, should a priori affect the wage share positively. A lower participation rate in the labour force would lead to a lower rate of unemployment which would, in turn, push wages upwards. Higher bargaining power of workers (for instance, due to stronger unions) leads to higher wages regardless of the rate of unemployment.

In order to examine the behaviour of the model under these eight different scenarios, we chose to focus on the impact on the wage share, the rate of capacity utilization and the rate of accumulation (defined as the ratio of investment to the previous stock of capital). Analyzing the impact on the wage share is straightforward, as the starting point of the whole literature on demand and growth regimes is primarily concerned with the relationship between demand and distribution. The choice of the rate of capacity utilization and the rate of accumulation is based on fact that these variables are the ones mostly used in the theoretical models, as presented in the previous section. The size of the shocks we model, is very small (for instance, in the case of tax rates we are making a 1% change in a variable that is bounded between 0 and 1, and most likely closer to 0 than 1), and therefore the impact on the three variables that we focus on is also small. We chose to do it this way to make the results as comparable as possible to the empirical studies on this topic. As a robustness check, in the appendix, we also show that the results are almost identical when we make shocks ten times larger.

3.1 Policy shocks

In the left panel of Figure 2, we plot the impact on the wage share of the four shocks on the policy variables. In the case of the tax rates on income, both the one arising from labour services and the one resulting from profits plus property income, we can see an initial drop followed by a quick recovery that in the long run ends up at a higher level than the baseline. The reason is that the reduction of income taxes raises disposable income which, in turn, increases private consumption. Therefore, aggregate demand and income are higher. Although the higher demand (as reflected in the increase in capacity utilization in the middle panel) increases employment immediately, to which wages react sluggishly. Thus, aggregate income increases more than the wage bill, thereby reducing the wage share in the short run. When the process of wage renegotiations is completed, real wages increase in the medium term, leading to an increase in the wage bill, which shifts income distribution in the favour of workers. The increase in both employment and real wages further stimulates aggregate demand over time. It should be noted that although the impact of these two shocks is very similar in qualitative terms, there are major differences in quantitative terms, the effect of the shock being stronger in the case where the shock is on the tax rate on labour income. This is not surprising, as the propensity to consume out of labour income is larger than the one related to profits and property income.

FIGURE 2 NEAR HERE

Does the evidence from these two shocks imply that the demand regime of the Danish economy is wage-led? Yes and no, as the sequence of events shows that following the reduction in income taxes, it is the increase in aggregate demand that increases the wage share. However, in the subsequent periods, aggregate demand seems to be stimulated by the higher wage share. Structural models in historical time, like empirical SFC models, can thus be capable of capturing these dynamic bidirectional effects between demand and distribution that are absent in models where the distribution is entirely exogenous.

When the taxes on production and products are reduced, there is a negative effect on the wage share both in the short and in the long run, the reason being the increase in GDP at factor cost (the denominator of the wage share). However, households' disposable income is not directly affected, as these taxes fall for nonfinancial corporations. Where this shock does have a contemporaneous impact, is on business investment, as a result of an increase in the profit share. Thus, aggregate demand and capacity utilization increase slightly, driven by investment, followed by subsequent increases in employment and wages (these latter with a lag) which, in turn, stimulates private consumption over time. Despite all these expansionary effects, after a few periods, we can see that capacity utilization starts to gradually decline. The reason is that the main driver of aggregate demand in this shock is not consumption but investment, as the shock is directly increasing the profit share. Increases in investment expand the stock of capital, thereby reducing the rate of capacity utilization (not because economic activity is lower, but because capacity is becoming larger). Eventually, this declining trajectory of capacity utilization offsets the positive effect that the higher profit share has on investment, thereby stabilizing the rate of accumulation (as reflected in the right panel of Figure 2). Hence, it seems that under the circumstances presented in this shock, demand in the Danish economy could also be profit-driven, as the effect of the shock on GDP is expansionary both in the short and in the long run, regardless of the declining trajectory of capacity utilization which is, as a matter of fact, a consequence of demand being driven mostly by investment.

The increase in government consumption initially reduces the wage share because it increases income instantly, while wages react sluggishly. However, as the lower rate of unemployment associated with higher demand feed into the wage bargaining process, the wage bill recovers even surpassing the effect found in the case of the reduction in the tax rate on labour income. Higher employment and wages strengthen disposable income which, in turn, fuels consumption and demand. Therefore, capacity utilization rates are higher all over the sample. Unlike the shock on indirect taxes where the main driver of demand ended up being investment, in this case, it is government spending itself and, endogenously, private consumption. As for capital accumulation, the slightly higher fall in the profit share compared to the increase in capacity utilization results in a decrease in investment, implying that in this scenario growth is profit-led.

The effects of these four shocks on policy variables on growth, as reflected in the right panel of Figure 2, provide mixed evidence about the nature of Denmark´s growth regime. When government spending and net indirect taxes were shocked, evidence supporting profit-led growth was found. While a higher government spending led to a fall in both the profit share and investment, a decrease in indirect taxes ended up increasing both variables. However, the shock in direct taxes (both in labour income and profits plus property income) resulted in a decrease in the profit share, but in an increase in the rate of accumulation, implying that under these circumstances, the economy would exhibit a wage-led pattern. Thus, it does not seem possible to conclude that the Danish economy is either wage-led or profit-led “in all circumstances” – rather, it would seem that depending on the shock that hits the economy the transmission mechanisms embedded in the behavioural equations and the accounting identities start to interact with different intensities, thereby leading to unique trajectories that are in some cases, closer to the wage-led regime and in some cases to the profit-led one.

3.2 Shocks to the economic structure and the institutions

We now turn to the analysis of the four shocks on the structure and the institutions. In the left panel of Figure 3, we plot the evolution of the wage share in each of the four scenarios. In the cases of the shocks on productivity, the bargaining power and the participation rate, the results are in line with our a priori intuitions mentioned above. However, in the case of the increase in the markup, a slight increase in the wage share is observed over time, while from a theoretical point of view a fall would have been expected. This puzzling result arises from the model having more than one single price index (As the model is fully built based on the system of national accounts, each component of aggregate demand has its own price index.). While the increase in the markup affects the prices of consumption goods, the prices of the remaining components of aggregate demand are not affected. Therefore, following the increase in the markup, the GDP deflator (the price index used to compute the growth of aggregate income) reacts less than consumer prices. However, the higher consumption prices trigger an increase in wages that, given the estimated coefficients, lead to them increasing more than the GDP deflator (a figure with the trajectories of nominal wages, consumer prices and the GDP deflator can be found in the annex).

FIGURE 3 NEAR HERE

The trajectories of capacity utilization and the rate of accumulation suggest, again, that whether the Danish economy is wage-led or profit-led depends on the circumstances and the shocks that are performed. When income distribution is more favourable to workers, either because of a higher bargaining power of unions or due to the lower rate of unemployment brought about by the decrease in the participation rate, aggregate demand is stimulated through the consumption channel, which is a sign of a wage-driven economy. Although this encourages firms to increase investment on the one side, the overall effect on accumulation ends up being negative, driven by the fall in the profit share. However, when the shock is made on the markup the resulting increase in the wage share is not strong enough to offset the negative impact on investment. Thus, the overall effect seems to be contractionary, as reflected in the reduction of capacity utilization. The combination of a lower capacity utilization with a fall in the profit share leads to a permanent decrease in the rate of accumulation. Hence, when it comes to changes in the markup, it seems that both demand and growth in the Danish economy are profit-led.

The reaction of the economy to a shock in productivity seems less controversial, as higher productivity is found to reduce employment, thereby lowering the wage bill and the wage share. The lower labour income reduces aggregate demand through the consumption channel, which decreases capacity utilization. However, the higher profit share induces an increase in the rate of accumulation, as nonfinancial corporations' investment decisions are also driven by the profit share, which is increasing more than twofold compared to the fall in capacity utilization.

Although the results obtained through shocks to the structural and institutional parameters are aligned with the theoretical background, the behaviour of the model in the case of the shock on the markup is striking. The explanation derived from the analysis of the evolution of wages and the different price indices sounds reasonable. After all, real-world economies are constituted by several sectors with different market structures and therefore different markup rates. Thus, it is possible that after an increase in the markup in some sectors, the net effect is an increase in the wage share. To avoid confusing generalizations, we carry out an additional shock where apart from the increase in the markup of consumption goods, we also make a 2% increase in the level of all the other prices in the economy in such a way that, by construction, all productive sectors are increasing their markups. If the model is theoretically consistent then it should happen that as long as prices are increasing more than costs, the wage share decreases.

FIGURE 4 NEAR HERE

This is indeed what is observed (see Figure 4). With the fall in the wage share, capacity utilization goes down, driven by the consumption channel, signalling that demand is wage-driven, as found in the cases of the increase in productivity, the bargaining power, and the reduction in the participation rate. The rate of accumulation seems to be profit-led, as found in the other shocks, although the effect tends to fade away over time. It is important to note that after its initial drop, the wage share starts to recover to approach the baseline level. The reason for this is that the growth rate of wages is higher than the growth rate of the GDP deflator (see annex), implying that over time workers recover part of their share in income. In line with the underlying theory, as long as the GDP deflator is above wages, the overall markup of the economy will be above the baseline and the wage share will be below. What these results show is that when more transmission channels are allowed to play out in the model's dynamics, a broader range of results are possible, which calls for a more nuanced view when defining whether an economy is either wage or profit-driven. Still, the evolution of the economy when the economy is hit by a change in a structural or institutional parameter seems to provide more robust evidence in favour of the notion of demand in Denmark being wage-led while growth being profit-led.

3.3 Discussion

The results found in our experiments seem to be in line with both the mixed evidence regarding the underlying demand and growth regimes of Denmark, as well as with the claims of Blecker (2016) and Skott (2017) that the answer to the question might be dependent on a wide range of elements including transmission mechanisms and the time frame that is used to draw the conclusions. Our analysis suggests that more important than classifying an economy as wage-led or profit-led "in all circumstances" it is to identify: i) the nature of the shock affecting income distribution; ii) the transmission channels through which the shock directly affects the different parts of the economy (markets, budget constraints, agents' behavioural rules, etc.); iii) the channels through which the shock indirectly affects the economy via the change in income distribution; iv) the feedback effects between the variables, most importantly the possible two-way causality between demand and distribution; v) the dynamic context in which the ii, iii and iv play out, implying that the overall effect of a shock on capacity utilization and the rate of accumulation can be dependent on the time frame used to draw the conclusions.

Despite the unique trajectories that the interplay of these five elements bring about, when addressing the question of the relationship between demand and income distribution, our evidence shows that more unambiguous results are found when the experiments consist of changes in the structural and institutional parameters. In all the four scenarios that we analysed, we found demand to be wage-led[iii] and capital accumulation to be profit-led. On the contrary, when the simulations consist of changes to policy variables the evidence is mixed. We believe that this conflicting evidence about the relationship between demand, growth and income distribution depending on the shock affecting the economy coming from a structural or institutional element, or from a policy variable, deserves further research. One tentative hypothesis could be that while economic policy like tax rates or public spending operate on a given economic regime without necessarily changing it, the underlying structure, and institutions (as well as their changes over time) are indeed the determinants of the relationship between demand, growth and distribution or, as have been called in the literature, the demand and growth regime. Still, our conception of time and based on Kalecki's idea that "the long-run trend is but a slowly changing component of a chain of short-period situations; it has no independent entity", implies that permanent changes in policy variables can also end up shaping institutions and therefore the underlying demand and growth regime (as a matter of fact, the State itself is an institution and the policies conducted by the government are part of it).

Both the results of the experiments and the discussion above show, how the analysis of the relationship between demand, growth and income distribution can be enriched when addressed by means of a structural macroeconometric model and, more specifically, a stock-flow consistent model. The diversity of transmission channels and the possibility of digging into them allows for deeper analyses and conclusions than the interpretation of an econometric estimation. The opportunity of conducting more profound examinations of the reaction of the economy to a certain shock also provides us with a priceless input for the research activity: the emergence of puzzles that lead to new questions.

4 Conclusions

The purpose of this paper was to contribute to the literature on demand and growth regimes by proposing to address the question of whether an economy (Denmark in our case) is wage-led or profit-led by using an empirical stock-flow consistent model. Drawing on the advantages of both the "structural" and "aggregative" approaches that have so far been widely-used to answer the question, the use of a structural macroeconometric model ensuring stock-flow consistency enables a more holistic analysis, where a diversity of transmission channels and feedback effects determine the overall effect of a shock hitting the economy. Moreover, the structural nature of the model implies that, unlike in the "structural" and "aggregative" approaches, income distribution is an endogenous variable determined by the interplay of both (exogenous) structural and institutional elements, policy variables and the transmission channels themselves. The possibility of making experiments consisting of shocks on these policy, structural and institutional parameters allow us to take the question about demand and growth regimes to a deeper level.

To address our research question, we use a quarterly model fully based on the system of national accounts, to which we added strong Neo-Kaleckian foundations by separating households into workers and “capital and rentiers”, each of them with specific propensities to save, and by specifying an investment function dependent on capacity utilization and the profit share. The behavioural equations estimated for consumption, investment, exports, imports, wages and prices, the ones driving the most important model dynamics, exhibit the correct signs, the relationship between the parameters being in line with the underlying theory.

In line with the claims of Blecker (2016) and Skott (2017), who question the validity of the conclusions framed in the wage-led vs profit-led dichotomy, we find that the relationship between demand, growth and income distribution is highly dependent on the nature of the shock affecting income shares, its impact on the other areas of the economy and the intensity of feedback effects. Furthermore, the results of the simulations tend to be more univocal when the shocks are made on the structural and institutional parameters of the economy, suggesting that demand in Denmark is wage-led and capital accumulation is profit-led, than when the shocks are made on policy variables, where the evidence is mixed. Based on these results, we conclude that holistic models such as stock-flow consistent models can provide valuable insights into a question that has captured a lot of attention in the history of heterodox economics. We plan to keep on digging deeper into the questions that arose as a result of this study and hope to encourage other researchers to address the question of demand and growth regimes for other countries using empirical SFC models, so that our results can be read in a broader perspective.

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Online Appendix

Appendix 1: Sensitivity analysis

In order to make sure that the results obtained in the paper and the conclusions derived from them are not dependent on the specific size of the shocks that we performed, here we present the impact of the same eight shocks but with a higher intensity. We present the trajectories of the variables for changes of 20% in the parameters or exogenous variables shocked with respect to the baseline. We consider that a discontinuous 20% permanent increase in all these elements is something not very likely to happen, so all the range of results contained between the 1% change that we present in the paper and the 20% variation that is presented in this appendix should cover the possible trajectories of the economy when in the proposed scenarios. It is evident from Figures A1 and A2 that stronger shocks on the exogenous components of the model do not affect the dynamic behaviour of the wage share, capacity utilization and the rate of accumulation. Even small differences can be observed in the trajectories compared to the ones shown in Figures 3 and 4, the results obtained and their interpretation remains unchanged.

Figure A1: Impact of policy shocks (relative to the baseline)

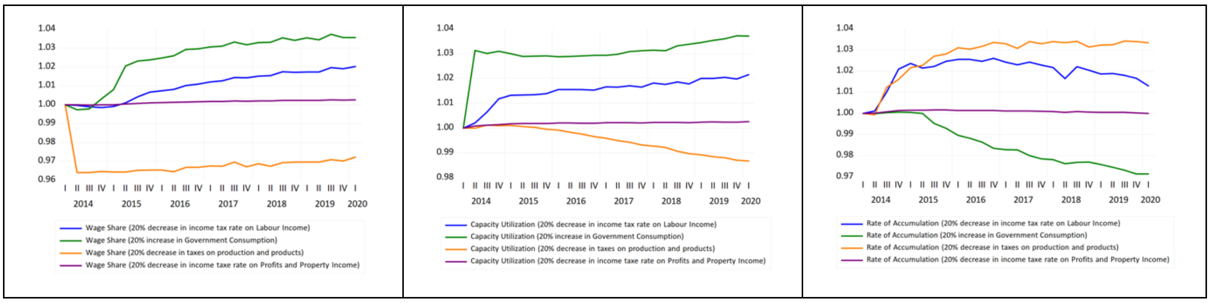
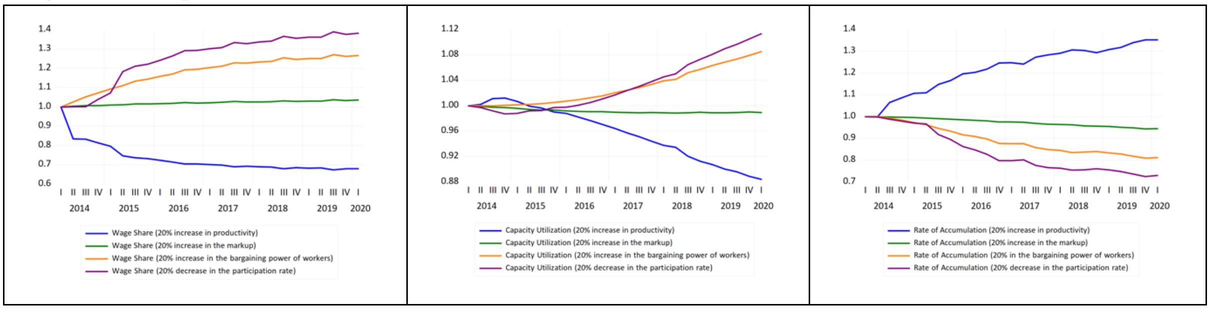
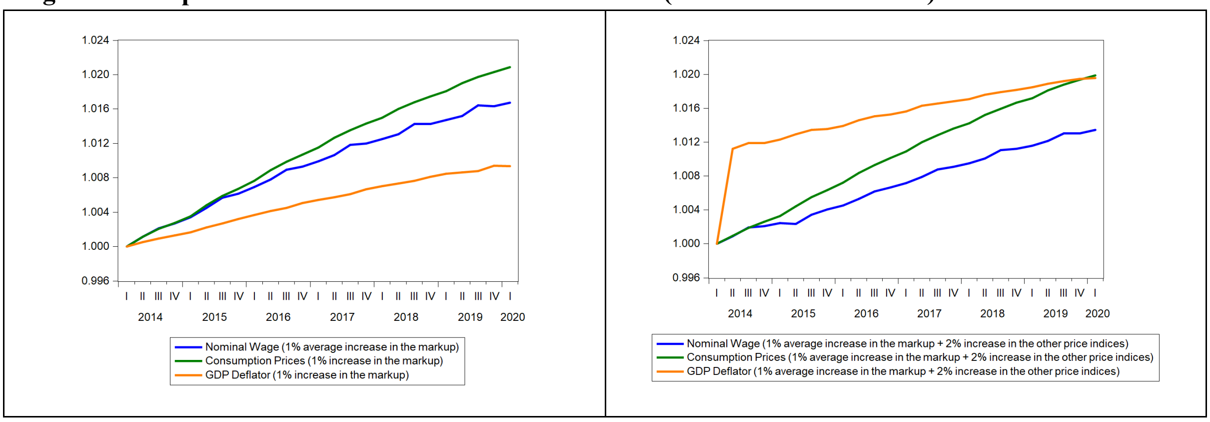


Figure A2: Impact of structural and institutional shocks (relative to the baseline)



Appendix 2: Evolution of wages, consumption prices and the GDP deflator in the markup shock

Figure A3: Impact of structural and institutional shocks (relative to the baseline)



Appendix 3: List of equations of the full model and related symbols

As done in the paper, capital letters denote nominal variables and lower-case letters denote real variables.

Non-Financial Corporations

$$Y_t = C_t + I_t + G_t + X_t - M_t \tag{A. 1}$$

$$y_t = c_t + i_t + g_t + x_t - m_t \tag{A. 2}$$

$$P_t^y = \frac{Y_t}{y_t} \tag{A. 3}$$

$$I_t = I_{BD_t}^N + I_{BD_t}^H + I_{BD_t}^G + I_{BD_t}^F + I_{E_t}^N + I_{E_t}^H + I_{E_t}^G + I_{E_t}^F \tag{A. 4}$$

$$i_t = i_{BD_t}^N + i_{BD_t}^H + i_{BD_t}^G + i_{BD_t}^F + i_{E_t}^N + i_{E_t}^H + i_{E_t}^G + i_{E_t}^F \tag{A. 5}$$

$$\Delta P_t^C = -0.18 * \Delta P_{t-1}^C - 0.19 * \Delta P_{t-2}^C + 0.45 * \Delta P_{t-4}^C + 0.14 * \Delta\left(\frac{wage_t}{a_t} + pm_t\right) - 0.0\text{:} * \Delta\left(\frac{wage_{t-1}}{a_{t-1}} + pm_{t-1}\right) \tag{A. 6}$$

$$S_t^N = Y_t - WB_t - B2_t^H - B2_t^G - B2_t^F + NIA_t^N + NII_t^N + ND_t^N - NIT_t^N - DT_t^N - OCT_t^N \tag{A. 7}$$

$$WB_t^N = wage_t * N_t^N \tag{A. 8}$$

$$N_t = \frac{y_t}{a} \tag{A. 9}$$

$$NIT_t^N = \theta^{Y,N} * Y_t \tag{A. 10}$$

$$NIA_t^N = i_{t-1}^D IBA_{t-1}^N + i_{t-1}^S SEC_{t-1}^N + i_{t-1}^L L_{t-1}^N \tag{A. 11}$$

$$NII_t^N = i_{t-1}^I INS_{t-1}^N \tag{A. 12}$$

$$ND_t^N = div_t EQ_{t-1}^N \tag{A. 13}$$

$$DT_t^N = \theta^N * Y_t \tag{A. 14}$$

$$B2_t = YF_t - WB_t^N \tag{A. 15}$$

$$\Pi_t = \frac{B2_t}{YF_t} \tag{A. 16}$$

$$\Delta ln\left(\frac{i_{BD,t}^N}{bd_{t-1}^N}\right) = 0.40 - 0.49 * \Delta ln\left(\frac{i_{BD_{t-1}}^N}{bd_{t-2}^N}\right) - 0.09 * \Delta ln(\Pi_t) + 0.72 * \Delta ln\,(u_t) + 0.01 * - 0.40 * ln\left(\frac{i_{BD_{t-1}}^N}{bd_{t-2}^N}\right) + 0.40 * \Delta ln(\Pi_{t-1}) + 1.04 * \Delta ln\,(u_{t-1}) + 0.09 * \tag{A. 17}$$

$$\Delta ln\left(\frac{i_{E,t}^N}{e_{t-1}^N}\right) = -0.01 - 0.17 * \Delta ln\left(\frac{i_{E_{t-1}}^N}{e_{t-2}^{NFC}}\right) + 0.01 * \Delta ln(\Pi_t) + 0.32 * \Delta ln\,(u_t) - 0.24 * - 0.41 * ln\left(\frac{i_{E_{t-1}}^N}{e_{t-2}^N}\right) + 0.44 * ln(\Pi_{t-1}) + 0.49 * ln\,(u_{t-1}) + 0.06 * ln\,(\tag{A. 18}$$

$$u_t = y_t/_{(bd_{t-1}^N + e_{t-1}^N)} \tag{A. 19}$$

$$q_t = \frac{EQ_{s,t}^N}{BD_t^N + E_t^N} \tag{A. 20}$$

$$I_{BD_t}^N = i_{BD_t}^N * p_t^{BD} \tag{A. 21}$$

$$I_{E_t}^N = i_{E_t}^N * p_t^E \tag{A. 22}$$

$$i_t^N = i_{BD_t}^N + i_{E_t}^N \tag{A. 23}$$

$$I_t^N = I_{BD_t}^N + I_{E_t}^N \tag{A. 24}$$

$$BD_t^N = BD_{t-1}^N + I_{BD_t}^N - \delta_{BD} BD_{t-1}^N + BD_{t-1}^N \Delta p_t^{BD} \tag{A. 25}$$

$$E_t^N = E_{t-1}^N + I_{E_t}^N - \delta_E E_{t-1}^N + E_{t-1}^N \Delta p_t^E \tag{A. 26}$$

$$e_t^N = \frac{E_t^N}{p_t^E} \tag{A. 27}$$

$$bd_t^N = \frac{BD_t^N}{p_t^{BD}} \tag{A. 28}$$

$$NL_t^N = S_t^N - I_{BD_t}^N - I_{E_t}^N - I_{INV_t} - NP_t^N + KT_t^N \quad (A.\ 29)$$
$$EQTR_t^N = EQTR_{d,t}^N - EQTR_{s,t}^N \quad (A.\ 30)$$
$$EQTR_{s,t}^N = EQTR_{d,t}^{H,N} + EQTR_{d,t}^{F,N} + EQTR_{d,t}^{G,N} + EQTR_{d,t}^{W,N} \quad (A.\ 31)$$
$$EQ_{s,t}^N = EQ_{d,t}^{H,N} + EQ_{d,t}^{F,N} + EQ_{d,t}^{G,N} + EQ_{d,t}^{W,N} \quad (A.\ 32)$$
$$EQ_t^N = EQ_{t-1}^N + EQTR_t^N + EQ_{CG_t}^N \quad (A.\ 33)$$
$$IBA_t^N = IBA_{t-1}^N + IBATR_t^N + IBA_{CG_t}^N \quad (A.\ 34)$$
$$IBATR_t^N = NL_t^N + EQTR_t^N + LTR_t^N + SECTR_t^N - INSTR_t^N \quad (A.\ 35)$$
$$FNW_t^N = IBA_t^N - EQ_t^N - SEC_t^N - L_t^N + INS_t^N \quad (A.\ 36)$$
$$NW_t^N = FNW_t^N + BD_t^N + E_t^N + INV_t^N \quad (A.\ 37)$$

Households

$$YD_t^{H,1} = (1-\theta^{H,1})[NIA_t^H + NII_t^H + ND_t^H + B_{2_t}^H] \quad (A.\ 38)$$
$$YD_t^{H,2} = (1-\theta^{H,2})[WB_t^H + SB_t^H - SC_t^H + OCT_t^H] \quad (A.\ 39)$$
$$YD_t^H = YD_t^{H,1} + YD_t^{H,2} \quad (A.\ 40)$$
$$WB_t^H = wage \cdot N_t^H \quad (A.\ 41)$$
$$NIA_t^H = i_{t-1}^D IBA_{t-1}^H + i_{t-1}^S SEC_{t-1}^H + i_{t-1}^L L_{t-1}^H \quad (A.\ 42)$$
$$NII_t^H = i_{t-1}^I INS_{t-1}^H \quad (A.\ 43)$$
$$ND_t^H = div_t EQ_{t-1}^H \quad (A.\ 44)$$
$$NSBEN_t^H = NBEN_t^H - NPEN_t^H \quad (A.\ 45)$$
$$\Delta ln\,(NPEN_t^H) = 0.092 * \Delta ln\,(NPEN_{t-1}^H) + 0.269 * \Delta ln\,(WB_t^H) - 46.166 * \Delta ln\left(\frac{Ret_{t-}}{Pop_{t-}}\right. \quad (A.\ 46)$$
$$* ln\,(NPEN_{t-1}^H) + 0.363 * ln\,(WB_{t-1}^H) - 0.954 * ln\,(\frac{Ret_{t-1}}{Pop_{t-1}})$$
$$\Delta\, ln\, ln\,(NBEN_t^H) \quad (A.\ 47)$$
$$= -28.18 + 1.65 * \Delta\, ln\, ln\,(POP_t - LF_t)\ + 0.001 * \Delta(UN_t) + 0.0005$$
$$- 0.77 * ln\, ln\,(NBEN_{t-1}^H)\ + 0.0004 * (UN_{t-1}) + 2.48 * ln\, ln\,(POP_{t-1}$$
$$yd_t^1 = \frac{YD_t^{H,1}}{P_t^c} \quad (A.\ 48)$$
$$yd_t^2 = \frac{YD_t^{H,2}}{P_t^c} \quad (A.\ 49)$$
$$\Delta\, ln\, ln\,(c_t)\ = 1.58 - 0.33 * ln(c_{t-1}) + 0.11 * ln(yd_{t-1}^1) + 0.06 * ln\, ln\,(yd_{t-1}^2)\ + 0.0 \quad (A.\ 50)$$
$$+ 0.06 * \Delta\, ln\, ln\,(yd_t^1)\ + 0.06 * \Delta\, ln\, ln\,(yd_{t-2}^1)\ + 0.09 * \Delta\, ln\, ln\,(yd$$
$$C_t = c_t \cdot P_t^c \quad (A.\ 51)$$
$$\Delta\, ln\, ln\,(w_t)\ = 0.13 - 0.31 * \Delta\, ln\, ln\,(ur_{t-4})\ + 0.55 * \Delta\, ln\, ln\,(a_t)\ - 0.10 * ln\, ln\,(w_{t-} \quad (A.\ 52)$$
$$* (ur_{t-2}) + 0.07 * ln\, ln\,(a_{t-1})$$
$$wage_t = w_t P_t^C \quad (A.\ 53)$$
$$\Delta\, ln\, ln\left(\frac{i_{BD_t}^H}{bd_{t-1}^H}\right) \quad (A.\ 54)$$
$$= 0.45 - 0.39 * \Delta\, ln\, ln\left(\frac{i_{BD_{t-1}}^H}{bd_{t-2}^H}\right) - 0.43 * \Delta\, ln\, ln\left(\frac{i_{BD_{t-3}}^H}{bd_{t-4}^H}\right) + 0.62 *$$
$$ln\, ln\left(\frac{P_{t-1}^{BD}}{P_{t-1}^I}\right) + 0.65 * \Delta\, ln\, ln\left(\frac{P_{t-2}^{BD}}{P_{t-2}^I}\right) + 0.21 * \Delta\, ln\, ln\left(\frac{yd_{t-2}^H}{bd_{t-3}^H}\right) - 0$$
$$ln\, ln\left(\frac{L_{t-1}^H}{BD_{t-2}^H}\right) - 0.16 * ln\, ln\left(\frac{i_{BD_{t-1}}^H}{bd_{t-2}^H}\right) + 0.53 * \left(\frac{yd_{t-1}^H}{bd_{t-2}^H}\right) - 0.64 * \left(\frac{I}{I}\right.$$
$$* \left(\frac{L_{t-1}^H}{BD_{t-2}^H}\right)$$
$$\Delta\, ln\, ln\left(\frac{i_E^H}{e_{t-1}^H}\right) = -0.62 * \Delta\, ln\, ln\left(\frac{i_{E_{t-1}}^H}{e_{t-2}^H}\right) - 0.25 * \left(\frac{i_{E_{t-2}}^H}{e_{t-3}^H}\right) + 0.19 * \left(\frac{yd_{t-1}^H}{e_{t-2}^H}\right) \quad (A.\ 55)$$
$$I_{BD_t}^H = i_{BD_t}^H * p_t^{BD} \quad (A.\ 56)$$
$$I_{E_t}^H = i_{E_t}^H * p_t^{EQUIP} \quad (A.\ 57)$$
$$i_t^H = i_{BD_t}^H + i_{E_t}^H \quad (A.\ 58)$$
$$I_t^H = I_{BD_t}^H + I_{E_t}^H \quad (A.\ 59)$$
$$E_t^H = E_{t-1}^H + I_E^H - \delta_E E_{t-1}^H + E_{t-1}^H \Delta p_t^E \quad (A.\ 60)$$
$$BD_t^H = BD_{t-1}^H + I_{BD}^H - \delta_{BD} BD_{t-1}^H + BD_{t-1}^H \Delta p_t^{BD} \quad (A.\ 61)$$

$$NL_t^H = YD_t^{H,1} + YD_t^{H,2} - C_t - I_{BD_t}^H - I_{E_t}^H + KT_t^H - NP_t^H \tag{A. 62}$$

$$INSTR_t^H = NPEN_t^H + INSXTR_t^H \tag{A. 63}$$

$$INS_t^H = INS_{t-1}^H + INSTR_t^H + INS_{CG_t}^H \tag{A. 65}$$

$$IBATR_t^H = NL^H + LTR_t^H - EQTR_t^H - INSTR_t^H - SECTR_t^H \tag{A. 66}$$

$$IBA_t^H = IBA_{t-1}^H + IBATR_t^H + IBA_{CG_t}^H \tag{A. 67}$$

$$\Delta\left(\frac{EQ_t^H - EQ_{rv,t}^H}{EQ_{t-1}^H + SEC_{t-1}^H + IBA_{t-1}^H}\right) = 0.07 + 6.85 * \Delta ibd_{t-1} + 0.16 * \Delta\left(\frac{DIV_{t-1}^H + EQ_{rv_{t-1}}^H}{EQ_{t-2}^H}\right) - 0.10 * \left(\frac{EQ_{t-1}^H - EQ_{rv,t-1}^H}{EQ_{t-2}^H + SEC_{t-2}^H + IBA_{t-2}^H}\right) - 2.14 * ibd_{t-1} + 0.16 * \left(\frac{DIV_{t-2}^H + E}{EQ_{t-3}^H} \right. \tag{A. 68}$$

$$EQ_{d,t}^{H,N} = \zeta_1 EQ_t^H \tag{A. 69}$$

$$EQ_{d,t}^{H,F} = \zeta_2 EQ_t^H \tag{A. 70}$$

$$EQ_{d,t}^{H,W} = EQ_t^H - EQ_{d,t}^{H,N} - EQ_{d,t}^{H,F} \tag{A. 71}$$

$$\Delta\left(\frac{LTR_t^H}{YD_t^H}\right) = 1.27 + 0.13 * \Delta\left(\frac{LTR_{t-2}^H}{YD_{t-2}^H}\right) - 26.26 * \Delta i_t^L + 0.26 * \Delta ln\left(\frac{i_{BD_{t-3}}^H}{yd_{t-3}^H}\right) - 0.72 * \left(\right. - 0.49 * \left(\frac{L_{t-2}^H}{YD_{t-2}^H}\right) \tag{A. 72}$$

$$L_t^H = L_{t-1}^H + LTR_t^H + L_{CG_t}^H \tag{A. 73}$$

$$FA_t^H = IBA_t^H + EQ_t^H + INS_t^H + SEC_t^H \tag{A. 74}$$

$$FL^H = L_t^H \tag{A. 75}$$

$$FNW_t^H = FA_t^H - FL_t^H \tag{A. 76}$$

$$W_t^H = FNW_t^H + E_t^H + BD_t^H \tag{A. 77}$$

$$fnw_t^H = \frac{FNW_t^H}{P_t^c} \tag{A. 78}$$

$$w_t^H = \frac{W_t^H}{P_t^c} \tag{A. 79}$$

Financial Sector

$$S_t^F = B2_t^F + NIA_t^F + NII_t^F + ND_t^F - DT_t^F + SC_t^F - SB_t^F + OCT_t^F \tag{A. 80}$$

$$NIA_t^F = i_{t-1}^D IBA_{t-1}^F + i_{t-1}^S SEC_{t-1}^F + i_{t-1}^L L_{t-1}^F \tag{A. 81}$$

$$NII_t^F = i_{t-1}^I INS_{t-1}^F \tag{A. 82}$$

$$ND_t^F = div_t EQ_{t-1}^F \tag{A. 83}$$

$$DT_t^F = \theta^F * [B2_t^F + NIA_t^F + NII_t^F + ND_t^F] \tag{A. 84}$$

$$E_t^F = E_{t-1}^F + I_E^F - \delta_E E_{t-1}^F + E_{t-1}^F \Delta p_t^E \tag{A. 85}$$

$$BD_t^F = BD_{t-1}^F + I_{BD}^F - \delta_{BD} BD_{t-1}^F + BD_{t-1}^F \Delta p_t^{BD} \tag{A. 86}$$

$$NL_t^F = S_t^F - KT_t^F - I_E^F - I_{BD}^F \tag{A. 87}$$

$$IBATR_t^F = -(IBATR_t^N + IBATR_t^G + IBATR_t^H + IBATR_t^W) \tag{A. 88}$$

$$IBA_t^F = IBA_{t-1}^F + IBATR_t^F + IBA_{CG_t}^F \tag{A. 89}$$

$$SECTR_t^{F\sim W} = SECTR_t^W \tag{A. 90}$$

$$SECTR_t^{F\sim dom} = SECTR_t^{F\sim W} + NL_t^F + IBATR_t^F + INSTR_t^F - LTR_t^F - EQTR_t^F \tag{A. 91}$$

$$SECTR_t^F = SECTR_t^{F\sim dom} + SECTR_t^{F\sim W} \tag{A. 92}$$

$$SEC_t^F = SEC_{t-1}^F + SECTR_t^F + SEC_{CG_t}^F \tag{A. 93}$$

$$L_t^F = -(L_t^N + L_t^G + L_t^H + L_t^W) \tag{A. 94}$$

$$LTR_t^F = L_t^F - L_{t-1}^F - L_{CG_t}^F \tag{A. 95}$$

$$EQTR_t^F = EQTR_{d,t}^F - EQTR_{s,t}^F \tag{A. 96}$$

$$EQTR_{s,t}^F = EQTR_{d,t}^{H,F} + EQTR_{d,t}^{N,F} + EQTR_{d,t}^{G,F} + EQTR_{d,t}^{W,F} \tag{A. 97}$$

$$EQ_{s,t}^F = EQ_{d,t}^{H,F} + EQ_{d,t}^{N,F} + EQ_{d,t}^{G,F} + EQ_{d,t}^{W,F} \tag{A. 98}$$

$$EQ_t^F = EQ_{t-1}^F + EQTR_t^F + EQ_{CG_t}^F \tag{A. 99}$$

$$INSTR_t^F = INSTR_t^H + INSTR^W \tag{A. 100}$$

$$INS_t^F = INS_{t-1}^F + INSTR_t^F + INS_{CGt}^F \tag{A. 101}$$

$$FNW_t^F = -IBA_t^F + EQ_t^F + SEC_t^{F\sim H} + L_t^F - INS_t^F \tag{A. 102}$$

$$W_t^F = FNW_t^F + E_t^F + BD_t^F \tag{A. 103}$$

Government

$$DT_t^G = DT_t^N + DT_t^H + DT_t^F + DT_t^W \quad \text{(A. 104)}$$

$$NIT_t^G = NIT_t^N + NIT_t^W \quad \text{(A. 105)}$$

$$OCT_t^G = -(OCT_t^H + OCT_t^N + OCT_t^F + OCT_t^W) \quad \text{(A. 106)}$$

$$SB_t^G = -(SB_t^H + SB_t^W - SB_t^F) \quad \text{(A. 107)}$$

$$SC_t^G = (SC_t^H - SC_t^W - SC_t^F) \quad \text{(A. 108)}$$

$$NIA_t^G = i_{t-1}^D IBA_{t-1}^G + i_{t-1}^S SEC_{t-1}^G + i_{t-1}^L L_{t-1}^G \quad \text{(A. 109)}$$

$$NII_t^G = i_{t-1}^I INS_{t-1}^G \quad \text{(A. 110)}$$

$$ND_t^G = div_t EQ_{t-1}^G \quad \text{(A. 111)}$$

$$E_t^G = E_{t-1}^G + I_E^G - \delta_E E_{t-1}^G + E_{t-1}^G \Delta p_t^E \quad \text{(A. 112)}$$

$$BD_t^G = BD_{t-1}^G + I_{BD}^G - \delta_{BD} BD_{t-1}^G + BD_{t-1}^G \Delta p_t^{BD} \quad \text{(A. 113)}$$

$$NL_t^G = B2_t^G + NIA_t^G + NII_t^G + ND_t^G + NIT_t^G + DT_t^G + SC_t^G - SB_t^G - OCT_t^G - G_t - I_{E_t}^G - \\ - KT_t^G \quad \text{(A. 114)}$$

$$SECTR_t^G = NL_t^G - LTR_t^G - IBATR_t^G - EQTR_t^G - INSTR_t^G \quad \text{(A. 115)}$$

$$SEC_t^G = SEC_{t-1}^G + SECTR_t^G + SEC_{CG_t}^G \quad \text{(A. 116)}$$

Rest of the world

$$\Delta\, ln\, ln\, (x_t) = \ 0.60 + 1.43 * \Delta\, ln\, ln\, (y_{t-4}^{TP}) \ - 0.49 * \Delta\, ln\, ln\, (rer_t) - 0.49 * ln\, ln\, (x_{t-1} \\ ln\, ln\, (y_{t-1}^{TP}) \quad \text{(A. 117)}$$

$$\Delta\, ln\, ln\, (m_t) \ = -3.79 - 0.12 * \Delta\, ln\, ln\, (m_{t-2}) \ + 0.30 * \Delta\, ln\, ln\, (rer_{t-1}) \ + 0.41 * \Delta\, ln \\ + 1.30 * \Delta\, ln\, ln\, (y_t) \ - 0.32 * ln\, ln\, (m_{t-1}) + \ 0.59 * ln\, ln\, (y_{t-1}) \quad \text{(A. 118)}$$

$$rer_t = xr_t \frac{P_t^C}{P_t^*} \quad \text{(A. 119)}$$

$$M_t = m_t * P_t^m \quad \text{(A. 120)}$$

$$X_t = x_t * P_t^x \quad \text{(A. 121)}$$

$$NIT_t^W = \theta^{Y,W} * Y_t \quad \text{(A. 122)}$$

$$NL_t^W = M_t - X_t + NIA_t^W + NII_t^W + ND_t^W + WB_t^W - NIT_t^W - DT_t^W + SC_t^W + SB_t^W + OC \\ - KTR_t^W \quad \text{(A. 123)}$$

$$CAB_t = -[M_t - X_t + NIA_t^W + NII_t^W + ND_t^W + WB_t^W - NIT_t^W - DT_t^W + SC_t^W + SB_t^W + \quad \text{(A. 124)}$$

$$NIA_t^W = i_{t-1}^D IBA_{t-1}^W + i_{t-1}^S SEC_{t-1}^W + i_{t-1}^L L_{t-1}^W \quad \text{(A. 125)}$$

$$NII_t^W = i_{t-1}^I INS_{t-1}^W \quad \text{(A. 126)}$$

$$ND_t^W = div_t EQ_{t-1}^W \quad \text{(A. 127)}$$

$$IBA_t^W = IBA_{t-1}^W + IBATR_t^W + IBA_{CG_t}^W \quad \text{(A. 128)}$$

$$EQ_t^W = EQ_{t-1}^W + EQTR_t^W + EQ_{CG_t}^W \quad \text{(A. 129)}$$

$$INS_t^W = INS_{t-1}^W + INSTR_t^W + INS_{CG_t}^W \quad \text{(A. 130)}$$

$$IBATR_t^W = NL_t^W - EQTR_t^W - INSTR_t^W + L_t^W - SEC_t^W \quad \text{(A. 131)}$$

$$FNW_t^W = IBA_t^W + EQ_t^W + INS_t^W + SEC_t^W - L_t^W \quad \text{(A. 132)}$$

Labour market

$$Y_t^F = Y_t - T_t^{PN} \quad \text{(A. 133)}$$

$$WS_t = \frac{WB_t^N}{Y_t^F} \quad \text{(A. 134)}$$

$$N_t = \frac{y_t}{a} \quad \text{(A. 135)}$$

$$N_t^N = N_t + N_t^W \quad \text{(A. 136)}$$

$$N_t^W = \frac{WB_t^W}{wage_t} \quad \text{(A. 137)}$$

$$UN_t = LF_t - N_t \quad \text{(A. 138)}$$

$$UR_t = \frac{UN_t}{LF_t} \quad \text{(A. 139)}$$

$$LF_t = part * Pop_t \quad \text{(A. 140)}$$

$$Ret_t = \frac{Pop_{(65+),t}}{Pop_t} \quad \text{(A. 141)}$$

Symbols:

N = non-financial corporations, F = financial corporations, G = government, H = Households, W = Rest of the World

Notation	Description
Y	Nominal GDP
C	Nominal Private Consumption
I	Nominal Gross fixed capital formation
X	Noninal Exports of goods and services
M	Nominal Imports of goods and services
P_t^y	GDP deflator
y	Real GDP
c	Real Private Consumption
i	Real Gross fixed capital formation
x	Real Exports of goods and services
m	Real Imports of goods and services
$I_{BD_t}^N$	Nonfinancial corporations Nominal Investment in Buildings and Dwellings
$I_{BD_t}^F$	Financial corporations Nominal Investment in Buildings and Dwellings
$I_{BD_t}^H$	Households Nominal Investment in Buildings and Dwellings
$I_{BD_t}^G$	Government Nominal Investment in Buildings and Dwellings
$I_{E_t}^N$	Nonfinancial corporations Nominal Investment in Equipment
$I_{E_t}^F$	Financial corporations Nominal Investment in Equipment
$I_{E_t}^H$	Households Nominal Investment in Equipment
$I_{E_t}^G$	Government Nominal Investment in Equipment
P_t^C	Price deflator on consumption
WB_t^N	Wage bill paid by firms
WB_t^H	Wage bill received by households
WB_t^W	Wage bill received by the rest of the world
N_t^N	Total Employment
N_t^H	Employment hired to the households
N_t^W	Employment hired to the rest of the world
UN_t	Unemployment
ur_t	Rate of unemployment
LF_t	Labour force
POP_t	Population
Ret_{t-1}	Retired people
$wage_t$	Wage rate
YD_t^H	Disposable income
yd_t^1	Disposable income of profit
yd_t^2	Disposable income on wages/transfers
$NPEN_t^H$	Change in pension entitlements
$NBEN_t^H$	Benefits received by the households
$S_t^N, S_t^F, S_t^H, S_t^G, S_t^W$	Savings
$B2_t$	Aggregate gross operating surplus
$B_{2_t}^N, B_{2_t}^F, B_{2_t}^H, B_{2_t}^G$	Sectoral gross operating surpluses
$NIA_t^N, NIA_t^F, NIA_t^H, NIA_t^G, NIA_t^W$	Net interest income on interest bearing assets
$NII_t^N, NII_t^F, NII_t^H, NII_t^G, NII_t^W$	Net interest income on insurance
$ND_t^N, ND_t^F, ND_t^H, ND_t^G, ND_t^W$	Net dividends
$NIT_t^N, NIT_t^W, NIT_t^G$	Net indirect taxes
$DT_t^N, DT_t^F, DT_t^G, DT_t^H, DT_t^W$	Income taxes
$SC_t^H, SC_t^F, SC_t^G, SC_t^W$	Social contributions
$SB_t^H, SB_t^F, SB_t^G, SB_t^W$	Social benefits
$OCT_t^H, OCT_t^N, OCT_t^F, OCT_t^G, OCT_t^W$	Other current transfers
YF_t	GDP at factor costs

Π_t	Profit share
a_t	Labour productivity
u_t	Capacity utilization
q_t	Tobin's q
rer_t	Real exchange rate
xr_t	Nominal exchange rate
$BD_t^N, BD_t^F, BD_t^G, BD_t^H$	Stock of buildings and dwellings
$E_t^N, E_t^F, E_t^G, E_t^H$	Stock of capital of equipment
$NL_t^N, NL_t^F, NL_t^G, NL_t^H, NL_t^W$	Net lending
CAB_t	Current account balance
$NP_t^N, NP_t^F, NP_t^G, NP_t^H, NP_t^W$	Net acquisitions of non-produced non-financial assets
$KT_t^N, KT_t^F, KT_t^G, KT_t^H, KT_t^W$	Capital transfers
$EQ_t^N, EQ_t^F, EQ_t^G, EQ_t^H, EQ_t^W$	Stock of Equities
$EQTR_t^N, EQTR_t^F, EQTR_t^G, EQTR_t^H, EQTR_t^{NW}$	Transaction of equities
$EQ_{CG_t}^N, EQ_{CG_t}^F, EQ_{CG_t}^G, EQ_{CG_t}^H, EQ_{CG_t}^W$	Capital gains on equities
$EQTR_{d,t}^N$	Nonfinancial corporations' demand for equities (flow)
$EQTR_{s,t}^N$	Nonfinancial corporations' supply of equities (flow)
$EQTR_{d,t}^F$	Financial corporations' demand for equities (flow)
$EQTR_{s,t}^F$	Financial corporations' supply of equities (flow)
$EQ_{d,t}^{H,N}$	Households demand for equities issued by nonfinancial corporations
$EQ_{d,t}^{H,F}$	Households demand for equities issued by financial corporations
$EQ_{d,t}^{H,W}$	Households demand for equities issued by the rest of the world
$IBA_t^N, IBA_t^F, IBA_t^G, IBA_t^H, IBA_t^W$	Stock of interest-bearing assets
$IBATR_t^N, IBATR_t^F, IBATR_t^G, IBATR_t^H, IBATR_t^W$	Transaction of interest-bearing assets
$IBA_{CG_t}^N, IBA_{CG_t}^F, IBA_{CG_t}^G, IBA_{CG_t}^H, IBA_{CG_t}^W$	Capital gains on interest-bearing assets
$L_t^N, L_t^F, L_t^G, L_t^H, L_t^W$	Stock of loans
$LTR_t^N, LTR_t^F, LTR_t^G, LTR_t^H, LTR_t^W$	Transaction of loans
$L_{CG_t}^N, L_{CG_t}^F, L_{CG_t}^G, L_{CG_t}^H, L_{CG_t}^W$	Capital gains on loans
$SEC_t^N, SEC_t^F, SEC_t^G, SEC_t^H, SEC_t^W$	Stock of securities
$SECTR_t^N, SECTR_t^F, SECTR_t^G, SECTR_t^H, SECTR_t^W$	Transaction of securities
$SEC_{CG_t}^N, SEC_{CG_t}^F, SEC_{CG_t}^G, SEC_{CG_t}^H, SEC_{CG_t}^W$	Capital gains on securities
$SECTR_t^{F\sim dom}$	Domestic securities issued by Financial corporations
$SECTR_t^{F\sim W}$	Domestic securities held by the rest of the world
$INS_t^N, INS_t^F, INS_t^G, INS_t^H, INS_t^W$	Stock of insurance technical reserves
$INSTR_t^N, INSTR_t^F, INSTR_t^G, INSTR_t^H, INSTR_t^W$	Transaction of insurances
$INS_{CGt}^N, INS_{CGt}^F, INS_{CGt}^G, INS_{CGt}^H, INS_{CGt}^W$	Capital gains on insurances
$FNW_t^N, FNW_t^F, FNW_t^G, FNW_t^H, FNW_t^W$	Financial net wealth
$W_t^N, W_t^F, W_t^G, W_t^H, W_t^W$	Net wealth

Parameters

$\theta^{y,N}, \theta^{y,W}$	Net indirect tax rate
$\theta^{H,1}, \theta^{H,2}$	Income tax rate levied Households
θ^N	Income tax rate levied on nonfinancial corporations
θ^F	Income tax rate levied on financial corporations
p_t^{BD}	Price deflator of building and dwellings
p_t^E	Price deflator of Equipment
P_t^m	Price deflator of imports

P_t^x	Price deflator of exports
P_t^G	Price deflator of public consumption
P_t^*	International price index
δ_{BD}, δ_E	Depreciation rates of the capital stock
i_t^D	Interest rate on interest-bearing assets
i_t^S	Interest rate on securities
i_t^L	Interest rate on loans
i_t^I	Interest rate on insurance technical reserves
div	Dividend distribution rate
ζ_1	Households share of equities issued by nonfinancial corporations
ζ_2	Households share of equities issued by financial corporations

Appendix 4: Estimation of Behavioural Equations

In this appendix all the estimated behavioural equations are presented. The model is estimated using quarterly national account data for Denmark for the period 2005q1 to 2020q1. Before estimating the behavioral equations, we remove seasonal fluctuation from our variables. In most cases, the structural parameters are estimated using ARDL following the approach proposed in (Pesaran et al, 2001), also known as the ARDL bounds test. This estimation strategy is quite useful in exploring cointegrating relationships amongst variables that have different orders of integrations. We follow a general-to-specific methodology where we start with a large number of lags and then drop irrelevant lags to choose a parsimonious model. In the case of cointegration, we estimate an error-correction version of the model. In the case of no cointegration, we simply estimate a dynamic regression using stationary data. Even though our estimation strategy attempts to choose a model structure that best fits the data for a given dependent variable, our choice of variables in every equation is purely based on theory.

Wages

Dependent Variable: D(LOG(RW_DS))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/30/22 Time: 13:00
Sample (adjusted): 2006Q3 2020Q1
Included observations: 55 after adjustments
D(LOG(RW_DS)) = P(520) + P(521)*D(UR(-4)) + P(522)
*D(LOG(PRODK_DS)) + P(523)*LOG(RW_DS(-1)) + P(524)
*UR_DS(-2) + P(525)*LOG(PRODK_DS(-2)) + P(526)*D_2009Q4
+ P(527)*D_2011Q1

	Coefficient	Std. Error	t-Statistic	Prob.
P(520)	0.126429	0.113408	1.114809	0.2706
P(521)	-0.306399	0.182799	-1.676150	0.1003
P(522)	0.551023	0.087966	6.264020	0.0000
P(523)	-0.100306	0.053624	-1.870537	0.0676
P(524)	-0.152915	0.073282	-2.086660	0.0424
P(525)	0.065181	0.045946	1.418633	0.1626
P(526)	-0.020795	0.007935	-2.620528	0.0118
P(527)	-0.018751	0.007405	-2.532095	0.0147

R-squared	0.586263	Mean dependent var	0.002833
Adjusted R-squared	0.524642	S.D. dependent var	0.010129
S.E. of regression	0.006984	Akaike info criterion	-6.956737
Sum squared resid	0.002292	Schwarz criterion	-6.664761
Log likelihood	199.3103	Hannan-Quinn criter.	-6.843827
F-statistic	9.514097	Durbin-Watson stat	1.954218
Prob(F-statistic)	0.000000		

Prices

Dependent Variable: D(PC_DS)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/30/22 Time: 13:00
Sample (adjusted): 2006Q3 2020Q1
Included observations: 55 after adjustments
D(PC_DS) = C(21)*D(PC_DS(-1)) + C(22)*D(PC_DS(-2)) + C(23)
*D(PC_DS(-4)) + C(24)*D(WAGE_DS/PROD_DS+PM_DS) + C(25)
PC_DS(-1) + C(26)(WAGE_DS(-1)/PROD_DS(-1)+PM_DS(-1))

	Coefficient	Std. Error	t-Statistic	Prob.
C(21)	-0.178351	0.102659	-1.737308	0.0886
C(22)	-0.192208	0.101302	-1.897367	0.0637
C(23)	0.446135	0.103457	4.312279	0.0001
C(24)	0.136355	0.041869	3.256735	0.0020
C(25)	-0.029245	0.017149	-1.705359	0.0945
C(26)	0.021289	0.011715	1.817351	0.0753

R-squared	0.570991	Mean dependent var	0.003099
Adjusted R-squared	0.527214	S.D. dependent var	0.007639
S.E. of regression	0.005253	Akaike info criterion	-7.557476
Sum squared resid	0.001352	Schwarz criterion	-7.338495
Log likelihood	213.8306	Hannan-Quinn criter.	-7.472794
Durbin-Watson stat	2.309287		

Real Private Consumption

Dependent Variable: D(LOG(PCONK_DS))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 06/01/22 Time: 17:15
Sample (adjusted): 2006Q1 2020Q1
Included observations: 57 after adjustments
D(LOG(PCONK_DS)) = C(1) + C(2)*LOG(PCONK_DS(-1)) + C(3)
*LOG(YD1_HK_DS(-1)) + C(4)*LOG(YD2A_HK_DS(-1)) + C(5)
*LOG(FNW_HK(-2)) + C(6)*DLOG(YD1_HK_DS) + C(7)
*D(LOG(YD1_HK_DS(-2))) + C(8)*D(LOG(YD2A_HK_DS)) + C(10)
*D_2008Q4 + C(11)*D_2018Q2 + C(12)*D_2020Q1

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	1.587713	0.590569	2.688448	0.0100
C(2)	-0.331284	0.090341	-3.667029	0.0006
C(3)	0.117414	0.047778	2.457506	0.0178
C(4)	0.060414	0.025419	2.376777	0.0217
C(5)	0.028064	0.009288	3.021632	0.0041
C(6)	0.061398	0.038694	1.586761	0.1194
C(7)	0.061843	0.031019	1.993708	0.0521
C(8)	0.090805	0.019010	4.776672	0.0000
C(10)	-0.036097	0.009689	-3.725377	0.0005
C(11)	0.021656	0.009370	2.311248	0.0254
C(12)	-0.026748	0.009497	-2.816490	0.0071

R-squared	0.635285	Mean dependent var	0.002265
Adjusted R-squared	0.555999	S.D. dependent var	0.013178
S.E. of regression	0.008781	Akaike info criterion	-6.460932
Sum squared resid	0.003547	Schwarz criterion	-6.066659
Log likelihood	195.1366	Hannan-Quinn criter.	-6.307704
F-statistic	8.012588	Durbin-Watson stat	2.184965
Prob(F-statistic)	0.000000		

Exports

Dependent Variable: DLOG(XK_DS)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/31/22 Time: 10:47
Sample (adjusted): 2006Q3 2020Q1
Included observations: 55 after adjustments
DLOG(XK_DS) = P(651) + P(652)*DLOG(GDP_TP(-4)) + P(653)
*DLOG(RER) + P(654)*LOG(XK_DS(-1)) + P(655)*LOG(GDP_TP(
-1)) + P(657)*D_2008Q2

	Coefficient	Std. Error	t-Statistic	Prob.
P(651)	0.599442	0.329621	1.818581	0.0751
P(652)	1.426091	0.455354	3.131832	0.0029
P(653)	-0.494797	0.262204	-1.887070	0.0651
P(654)	-0.487067	0.102481	-4.752768	0.0000
P(655)	0.377061	0.078055	4.830700	0.0000
P(657)	0.057398	0.020549	2.793175	0.0074

R-squared	0.404258	Mean dependent var	0.005666
Adjusted R-squared	0.343468	S.D. dependent var	0.024440
S.E. of regression	0.019803	Akaike info criterion	-4.903302
Sum squared resid	0.019216	Schwarz criterion	-4.684321
Log likelihood	140.8408	Hannan-Quinn criter.	-4.818620
F-statistic	6.650086	Durbin-Watson stat	1.941515
Prob(F-statistic)	0.000085		

Imports

Dependent Variable: DLOG(MK_DS)
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/31/22 Time: 09:37
Sample (adjusted): 2006Q2 2020Q1
Included observations: 56 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed
bandwidth = 4.0000)
DLOG(MK_DS) = P(661) + P(662)*DLOG(MK_DS(-2)) + P(663)
*DLOG(RER(-1)) + P(664)*DLOG(RER(-3)) + P(665)
*DLOG(YK_DS) + P(666)*LOG(MK_DS(-1)) + P(667)
*LOG(YK_DS(-1)) + P(668)*D_20091 + P(669)*D_2009Q4

	Coefficient	Std. Error	t-Statistic	Prob.
P(661)	-3.798025	0.730446	-5.199594	0.0000
P(662)	-0.125433	0.063756	-1.967384	0.0551
P(663)	0.298491	0.227577	1.311606	0.1960
P(664)	0.406530	0.209667	1.938933	0.0585
P(665)	1.297138	0.204759	6.334957	0.0000
P(666)	-0.317032	0.056579	-5.603327	0.0000
P(667)	0.590128	0.104653	5.638925	0.0000
P(668)	-0.078005	0.004651	-16.77269	0.0000
P(669)	-0.071022	0.005777	-12.29438	0.0000

R-squared	0.683320	Mean dependent var	0.006830
Adjusted R-squared	0.629417	S.D. dependent var	0.030491
S.E. of regression	0.018561	Akaike info criterion	-4.989246
Sum squared resid	0.016193	Schwarz criterion	-4.663743
Log likelihood	148.6989	Hannan-Quinn criter.	-4.863049
F-statistic	12.67687	Durbin-Watson stat	2.512723
Prob(F-statistic)	0.000000		

Households' investment in buildings and dwellings

Dependent Variable: DLOG(I_BD_H_K_DS/BD_H_K(-1))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 05/31/22 Time: 09:37
Sample (adjusted): 2006Q3 2020Q1
Included observations: 55 after adjustments
HAC standard errors & covariance (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)
DLOG(I_BD_H_K_DS/BD_H_K(-1)) = P(620) + P(621) *DLOG(I_BD_H_K_DS(-1)/BD_H_K(-2)) + P(622) *DLOG(I_BD_H_K_DS(-3)/BD_H_K(-4)) + P(623)*DLOG(P_BD(-1) /PI(-1)) + P(624)*DLOG(P_BD(-2)/PI(-2)) + P(625) *DLOG(YD_HK_DS(-2)/BD_H_K(-3)) + P(626)*DLOG(-L_H(-1) /BD_H(-2)) + P(627)*LOG(I_BD_H_K_DS(-1)/BD_H_K(-2)) + P(628)*LOG(YD_HK_DS(-1)/BD_H_K(-2)) + P(629)*LOG(P_BD(-1)/PI(-1)) + P(630)*LOG(-L_H(-1)/BD_H(-2)) + P(631)*D_2006Q4 + P(632)*D_2014Q4

	Coefficient	Std. Error	t-Statistic	Prob.
P(620)	0.454193	0.355606	1.277235	0.2085
P(621)	-0.389618	0.119782	-3.252733	0.0023
P(622)	-0.428082	0.107446	-3.984173	0.0003
P(623)	0.623658	0.350623	1.778715	0.0825
P(624)	0.652399	0.399479	1.633124	0.1099
P(625)	0.205805	0.129286	1.591856	0.1189
P(626)	-0.682466	0.190783	-3.577181	0.0009
P(627)	-0.155232	0.042641	-3.640441	0.0007
P(628)	0.526918	0.132545	3.975382	0.0003
P(629)	-0.635644	0.331642	-1.916657	0.0621
P(630)	-0.317241	0.101717	-3.118848	0.0033
P(631)	-0.059486	0.028000	-2.124486	0.0396
P(632)	0.098915	0.009764	10.13016	0.0000

R-squared	0.730172	Mean dependent var	-0.006495
Adjusted R-squared	0.653079	S.D. dependent var	0.050140
S.E. of regression	0.029533	Akaike info criterion	-4.003576
Sum squared resid	0.036631	Schwarz criterion	-3.529115
Log likelihood	123.0983	Hannan-Quinn criter.	-3.820098
F-statistic	9.471240	Durbin-Watson stat	2.260117
Prob(F-statistic)	0.000000		

Households' investment in equipment

Dependent Variable: DLOG(I_EQUIP_H_K_DS/EQUIP_H_K(-1))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 06/01/22 Time: 16:47
Sample (adjusted): 2006Q2 2020Q1
Included observations: 56 after adjustments
DLOG(I_EQUIP_H_K_DS/EQUIP_H_K(-1)) = P(636) + P(637) * DLOG(I_EQUIP_H_K_DS(-1)/EQUIP_H_K(-2)) + P(638) * DLOG(I_EQUIP_H_K_DS(-2)/EQUIP_H_K(-3)) + P(639) *DLOG(YD_HK_DS/EQUIP_H_K(-1)) + P(640)*DUMMY4

	Coefficient	Std. Error	t-Statistic	Prob.
P(636)	0.006986	0.006055	1.153814	0.2540
P(637)	-0.619173	0.097291	-6.364125	0.0000
P(638)	-0.246440	0.096155	-2.562929	0.0134
P(639)	0.192310	0.150914	1.274295	0.2083
P(640)	-0.144175	0.022627	-6.371723	0.0000

R-squared	0.605536	Mean dependent var	-0.001263
Adjusted R-squared	0.574598	S.D. dependent var	0.065602
S.E. of regression	0.042787	Akaike info criterion	-3.380109
Sum squared resid	0.093368	Schwarz criterion	-3.199274
Log likelihood	99.64305	Hannan-Quinn criter.	-3.309999
F-statistic	19.57234	Durbin-Watson stat	1.859806
Prob(F-statistic)	0.000000		

Non-financial Corporations' investment in buildings and dwellings

Dependent Variable: DLOG(I_BD_NFC_K_DS/BD_NFC_K(-1))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 06/21/22 Time: 19:32
Sample (adjusted): 2006Q1 2020Q1
Included observations: 57 after adjustments
DLOG(I_BD_NFC_K_DS/BD_NFC_K(-1)) = P(800) + P(801)
*DLOG(I_BD_NFC_K_DS(-1)/BD_NFC_K(-2)) + P(802)
*DLOG(PS_DS) + P(803) * DLOG(U_DS) + P(804)*
LOG(I_BD_NFC_K_DS(-1)/BD_NFC_K(-2)) + P(805) *
LOG(PS_DS(-1)) + P(806) * LOG(U_DS(-1))+P(892)
*DLOG(TOBINQ)+P(893)*LOG(TOBINQ(-1))

	Coefficient	Std. Error	t-Statistic	Prob.
P(800)	0.397106	0.238655	1.663931	0.1026
P(801)	-0.485097	0.101002	-4.802834	0.0000
P(802)	-0.090710	0.242614	-0.373888	0.7101
P(803)	0.720729	0.404068	1.783680	0.0808
P(804)	-0.396795	0.097098	-4.086535	0.0002
P(805)	0.402187	0.203555	1.975814	0.0539
P(806)	1.043789	0.279083	3.740066	0.0005
P(892)	0.008666	0.071092	0.121900	0.9035
P(893)	0.086964	0.034904	2.491496	0.0162

R-squared	0.643092	Mean dependent var	-0.005002
Adjusted R-squared	0.583608	S.D. dependent var	0.048768
S.E. of regression	0.031470	Akaike info criterion	-3.935655
Sum squared resid	0.047536	Schwarz criterion	-3.613068
Log likelihood	121.1662	Hannan-Quinn criter.	-3.810287
F-statistic	10.81107	Durbin-Watson stat	2.020163
Prob(F-statistic)	0.000000		

Non-financial Corporations' investment in equipment

Dependent Variable: DLOG(I_EQUIP_NFC_K_DS/EQUIP_NFC_K(-1))
Method: Least Squares (Gauss-Newton / Marquardt steps)
Date: 06/21/22 Time: 19:32
Sample (adjusted): 2006Q1 2020Q1
Included observations: 57 after adjustments
DLOG(I_EQUIP_NFC_K_DS/EQUIP_NFC_K(-1)) = P(807) + P(808) *
DLOG(I_EQUIP_NFC_K_DS(-1)/EQUIP_NFC_K(-2)) + P(809) *
DLOG(PS_DS) + P(810) * DLOG(U_DS) + P(811) *
LOG(I_EQUIP_NFC_K_DS(-1)/EQUIP_NFC_K(-2)) + P(812) *
LOG(PS_DS(-1)) + P(813) * LOG(U_DS(-1)) + P(814) * DUMMY10
+ P(815) * DUMMY11 + P(890)*DLOG(TOBINQ) + P(891)
*LOG(TOBINQ(-1))

	Coefficient	Std. Error	t-Statistic	Prob.
P(807)	-0.007702	0.320692	-0.024017	0.9809
P(808)	-0.172228	0.100883	-1.707199	0.0945
P(809)	0.005661	0.280151	0.020207	0.9840
P(810)	0.317621	0.470105	0.675637	0.5027
P(811)	-0.410045	0.096222	-4.261453	0.0001
P(812)	0.440581	0.214514	2.053856	0.0457
P(813)	0.488587	0.152082	3.212653	0.0024
P(814)	0.179397	0.029401	6.101706	0.0000
P(815)	-0.132821	0.022862	-5.809745	0.0000
P(890)	-0.239325	0.081730	-2.928253	0.0053
P(891)	0.064286	0.033594	1.913628	0.0619

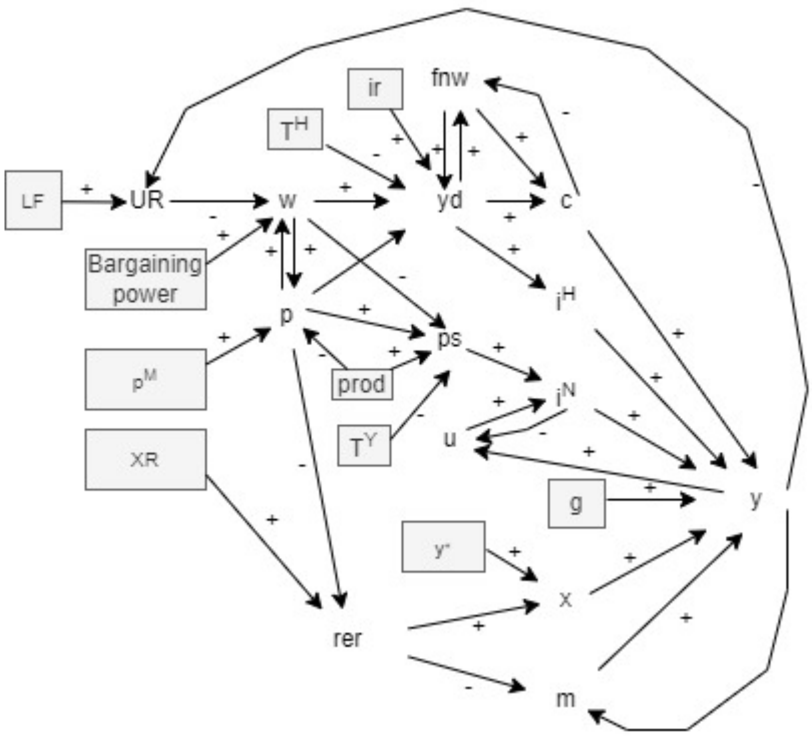
R-squared	0.763999	Mean dependent var	-0.001262
Adjusted R-squared	0.712694	S.D. dependent var	0.066459
S.E. of regression	0.035623	Akaike info criterion	-3.660117
Sum squared resid	0.058373	Schwarz criterion	-3.265844
Log likelihood	115.3133	Hannan-Quinn criter.	-3.506889
F-statistic	14.89144	Durbin-Watson stat	2.112399
Prob(F-statistic)	0.000000		

Table 1: Theoretical transactions flow matrix for Denmark

	Households		Non-Financial Corporations		Financial Corporations		General Government		Rest of the World		Total
	Current	Capital	Current	Capital	Current	Capital	Current	Capital	Current	Capital	
Private Consumption	$-C_t$		C_t								0
Investment (Buildings and Dw.)		$-I^H_{BD_t}$	I_{BD_t}	$-I^N_{BD_t}$		$-I^F_{BD_t}$		$-I^G_{BD_t}$			0
Investment (Equipment)		$-I^H_{E_t}$	I_{E_t}	$-I^N_{E_t}$		$-I^F_{E_t}$		$-I^G_{E_t}$			0
Investment (Inventories)			$-I^H_{INV_t}$	$-I_{INV_t}$							0
Government Consumption	G^H_t		G^N_t				$-G_t$				0
Net Exports			NX_t						$-NX_t$		0
Wage Bill	WB^H_t		$-WB_t$						WB^W_t		0
Gross Operating Surplus	$B2^H_t$		$B2^N_t$		$B2^F_t$		$B2^G_t$				0
Net Indirect Taxes			$-NIT^N_t$				NIT^G_t		$-NIT^W_t$		0
Net Interest on Assets	NIA^H_t		NIA^N_t		NIA^F_t		NIA^G_t		NIA^W_t		0
Net Income on Insurance	NII^H_t		NII^N_t		NII^F_t		NII^G_t		NII^W_t		0
Net Dividends	ND^H_t		ND^N_t		ND^F_t		ND^G_t		ND^W_t		0
Direct Taxes	$-DT^H_t$		$-DT^N_t$		$-DT^F_t$		DT^G_t		$-DT^W_t$		0
Social Contributions	$-SC^H_t$				SC^F_t		SC^G_t		SC^W_t		0
Social Benefits	SB^H_t				$-SB^F_t$		$-SB^G_t$		SB^W_t		0
Other Current Transfers	OCT^H_t		$-OCT^N_t$		OCT^F_t		$-OCT^G_t$		OCT^W_t		0
Saving/Current Account	$-S^H_t$	S^H_t	$-S^N_t$	S^N_t	$-S^F_t$	S^F_t	$-S^G_t$	S^G_t	CA_t	$-CA_t$	0
Capital Transfers		KT^H_t		KT^N_t		$-KT^F_t$		$-KT^G_t$		$-KT^W_t$	0
Others		$-NP^H_t$		$-NP^N_t$				NP^G_t		NP^W_t	0
Net Lending		NL^H_t		NL^N_t		NL^F_t		NL^G_t		NL^W_t	0
Adjustment variable		Adj^H_t		Adj^N_t		Adj^F_t		Adj^G_t		Adj^W_t	0
Δ Interest Bearing Assets		$-IBATR^H_t$		$-IBATR^N_t$		$IBATR^F_t$		$IBATR^G_t$		$-IBATR^W_t$	0
Δ Equities		$-EQTR^H_t$		$EQTR^N_t$		$-EQTR^F_t$		$-EQTR^G_t$		$EQTR^W_t$	0
Δ Securities		$-SECTR^H_t$		$SECTR^N_t$		$-SECTR^F_t$		$SECTR^G_t$		$-SECTR^W_t$	0
Δ Insurance		$-INSTR^H_t$		$-INSTR^N_t$		$INSTR^F_t$		$INSTR^G_t$		$-INSTR^W_t$	0
Δ Loans		LTR^H_t		LTR^N_t		$-LTR^F_t$		$-LTR^G_t$		LTR^W_t	0
Δ Wealth		$-\Delta W^H_t$		$-\Delta W^N_t$		$-\Delta W^F_t$		$-\Delta W^G_t$		$\Delta NIIP$	0

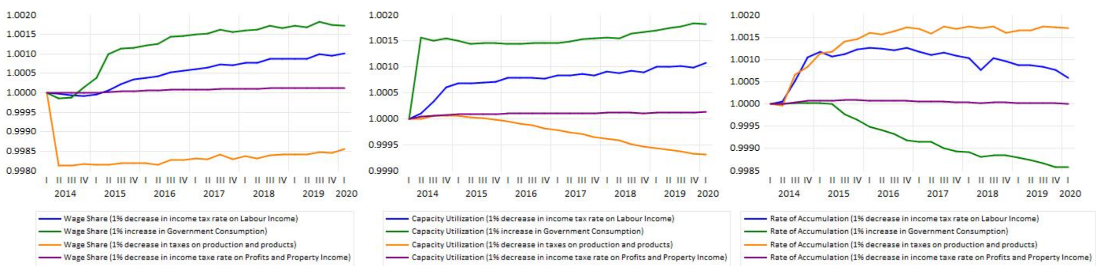
Source: self-elaborated

Figure 1: Main Transmission Channels



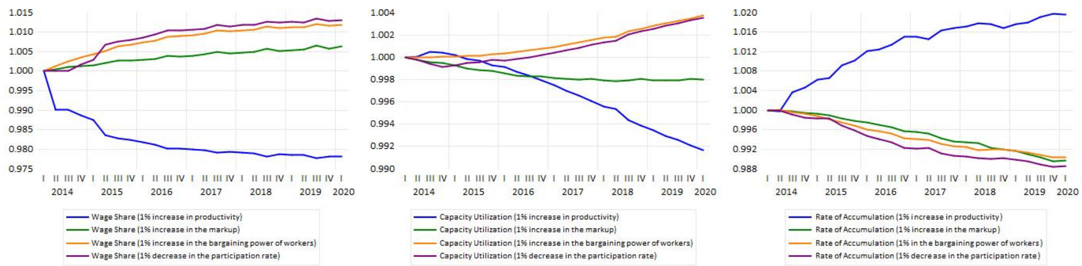
Source: self-elaborated

Figure 2: Impact of policy shocks (relative to the baseline)



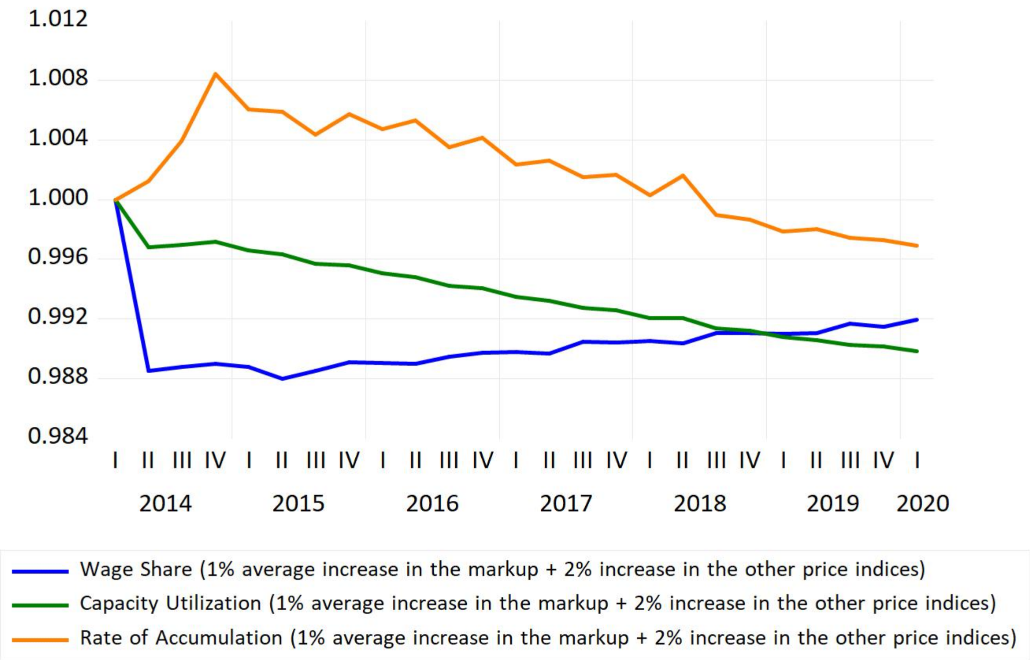
Source: self-elaborated

Figure 3: Impact of structural and institutional shocks (relative to the baseline)



Source: self-elaborated

Figure 4: Impact of a generalized increase in prices (relative to the baseline)



Source: self-elaborated

Figure 1: Main Transmission Channels
Figure 2: Impact of policy shocks (relative to the baseline)
Figure 3: Impact of structural and institutional shocks (relative to the baseline)
Figure 4: Impact of a generalized increase in prices (relative to the baseline)

[i] The "Adjustment variable" row accounts for the discrepancies between the data reported in the income accounts (the ones up to the "net lending" row) and the financial account. This adjustment variable is kept as exogenous all over the sample.
[ii] The markup is an endogenous variable in the model. Prices and wages are determined through behavioural equations, while productivity and import prices are exogenous. The markup is determined based on the combination of the values taken by these variables at every point of time. This specific shock is made by changing the long run coefficient of production costs in the price equation in such a way that the markup is on average 1% above the baseline.
[iii] The only exception was the shock to the markup, where we found that demand was profit-led. However, when the shock was adjusted to match the increase of the markup with a decrease in the wage share, demand turned to be wage-led.