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Flexibility in design: the multiple applications of a medium-sized empirical model for Denmark

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In this paper, we present QMDE, an empirical quarterly stock-flow consistent (SFC) model of Denmark. It is categorized as a medium-sized model to strike a balance between complexity and economic intuition. This model provides a nuanced understanding of Denmark's economic structure, segmenting it into five institutional sectors and analysing transactions and financial flows among them. The model operates on a demand-led framework, focusing on the main components of aggregate demand influencing real GDP. It details the determinants of consumption, investment, profit share, capacity utilization and international trade flows, using data from Denmark to estimate structural parameters with an autoregressive distributed lag (ARDL) approach. QMDE's versatility is demonstrated through four applications. First, it is used to examine whether Denmark's economy is wage-led or profit-led. The model processes various policy shocks, showing complex relationships between demand, income distribution and economic growth. The results suggest that Denmark does not strictly conform to being either wage-led or profit-led. Second, addressing inflationary pressures post-COVID-19, the model assesses the efficacy of traditional monetary responses and explores alternative fiscal and income policies. The analysis suggests that coordinated tax reductions and wage-price policies effectively mitigate inflation, while supporting GDP growth. Third, analysing the increase in the surplus level of Denmark's current account after 2010, the model identifies key drivers such as increased real net exports and favourable terms of trade. Counterfactual scenarios reveal that changes in trade balances, export prices and savings rates significantly impact the current account balance, suggesting a shift towards a more permanently high surplus. Fourth, investigating the effects of tightening of unemployment benefits under Denmark's flexicurity model, the model evaluates scenarios of policy reversal, the removal of unemployment benefits' role in wage determination and changes in unemployment insurance membership. Findings indicate an overall expansionary but modest effect of unemployment benefits on economic growth and employment, highlighting a policy trade-off between fiscal savings and employment stimulation.

Keywords: Stock-flow consistent models, Denmark, Wage-led vs. profit-led, Inflation, Current account, Unemployment benefits

JEL classification: C32, E12, E63, F32, J65

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1 INTRODUCTION

The Danish economy stands as a fascinating case study in modern macroeconomics. Primarily known for its flexicurity model on the labour market, characterized by flexible hiring practices and potentially generous unemployment benefits, Denmark is unique in several other ways. Having decided not to join the Eurozone, Denmark instead became the first member of the Exchange Rate Mechanism II (ERM II) and has maintained a very tight peg against the Deutsche Mark and then the euro over the past decades. Furthermore, Denmark exhibits a strong and growing current account surplus, which has enabled an apparently paradoxical alliance between fiscal conservatism in the form of balanced or surplus budgets, on the one hand, alongside with full-employment and strong labour unions, on the other hand.

In this paper, we present our Quarterly Model of the Danish Economy (QMDE), a flexible medium-sized empirical stock-flow consistent (SFC) model used to analyse the macroeconomic impacts of various policy changes, shocks or structural shifts within Denmark. QMDE balances complexity with adaptability to address specific research questions efficiently.¹

More precisely, QMDE incorporates essential transmission mechanisms from demand and growth regime theory, including saving propensities, distribution channels and investment-capacity utilization linkages. The framework is adaptable to various research questions through parameter calibration and its strength lies in capturing key economic interdependencies, including wealth effects. The model's structure remains, therefore, open to various outcomes through multiple transmission channels, including endogenous prices and wages, heterogeneous households, neo-Kaleckian dynamics and open economy considerations. As a consequence, the results are entirely empirically determined rather than structurally predetermined. QMDE divides the economy into five main institutional sectors: non-financial corporations, financial corporations, the government, households and the rest of the world. Five types of financial assets are considered: interest-bearing assets, securities, loans, equities and insurances. These assets are exchanged between sectors based on their financial needs and investment decisions.

We particularly employ QMDE for policy analysis, which is one of the most common uses of SFC models. The comprehensive description of the economy, as well as its detailed structure, allows for the incorporation of several policy variables, such as tax rates and different sources of government spending (from 'pure' government consumption to subsidies and transfers). By shocking specific exogenous elements of the model, while the others unchanged, we build different scenarios representing alternative policy experiments, which can be compared to understand the behaviour of the economy, as well as for policy-making purposes.

The rest of the paper proceeds as follows. Section 2 presents the modelling approach behind QMDE, as well as methodological considerations, including pre-emptive rebuttal of the Lucas Critique often levied against structural models. Section 3 provides the structure of QMDE, consisting of its associated flow-matrix, main transmission mechanisms, as well as parameter estimation techniques. Section 4 displays the applications of QMDE across four domains: wage-led vs. profit-led dynamics, inflation and policy responses, current account dynamics and the effects of unemployment benefit reforms. Section 5 concludes by summarizing the previous sections.

1. The workhorse version of QMDE was presented in Byrialsen et al. (2022). The model was subsequently adapted to various research questions surveyed in this paper. The details of the changes will be indicated each time.

2 THE MODELLING APPROACH BEHIND QMDE

As discussed in Pierros (2024), three different types of stock-flow consistent models can be found in the literature. In the first approach, known as ‘The New Cambridge Approach’, the models are rather small. The second approach is inspired by the work of Godley and Lavoie, where the models are larger compared to those from the first approach. Finally, in the third approach, the models are even larger and complex (1000s of equations) and are, therefore, able to be used to perform a large variety of analyses. National statistical models often fall within the last category. All three types of models come with their own strengths and weaknesses. Small simple models, which often consist of few assets and sectors, have difficulties in capturing the complexity of the real world. On the other hand, the economic intuition in the models is easy to follow, and the properties of the solution of these models are not too dependent on the choice of parameters. At the other end of the spectrum, large-scale models have the clear advantage of being able to perform many different analyses without the need to change the model entirely. On the other hand, numerical solutions for these large models have the drawback that only local stability can be analysed – we simply do not know if other solutions to the model could be found and whether these are stable or not. Furthermore, large complex models seem to be quite sensitive to the choice of parameters, just like the economic intuition sometimes becomes difficult to follow. This is of course very relevant for theoretical models but also for empirical models, where the parameters are estimated.

This leads to another issue – ‘realistic’ parameters in the behavioural equations might lead to ‘unrealistic’ stock-flow ratios in the steady state, while ‘unrealistic’ parameters in the behavioural equations might lead to ‘realistic’ stock-flow ratios in the steady state – which choice is the right one? Some situations might require that a ‘realistic’ set of stock-flow ratios are prioritized above an ‘unrealistic’ set of parameters. It could also be argued that in real life, steady states do not exist and that it is realistic to explain the world as a succession of situations and dynamics that, each left to its own, would prove utterly unsustainable.

While theoretical models often focus on finding a steady state, many empirical models focus instead on being able to replicate the development of the endogenous variable as closely as possible with the actual development reported in the national accounts. In these empirical models, the size of the model (level of detail) is often related to the accessibility of data for the country in question. Given the existing availability of data, most of these empirical models can be characterized as medium-sized models with a few hundred equations.

A major reason for the difference in the size of models is the choice of the number of assets and sectors in the model. For instance, in the models used at the Levy Institute for the US and Greece, or by the Danish Economic Council (SMEC), the private sector is aggregated and considered a whole, while other models split the private sector into non-financial corporations, financial corporations and households, following the tradition of sectoral national accounting.

Given the importance of flows and debt positions within the private sector in most economies, it could be considered a major drawback to consolidate this into one sector in a model, but the exact relevance of private sector disaggregation depends on the question at hand. In some cases, it would be a clear limitation, e.g., when analysing mortgage and homeownership dynamics, but in other situations, e.g., when dealing with current account imbalances or trade balance, it might be considered a useful simplification. This approach is fully in line with the approach suggested by both Godley and Dos Santos (Zezza 2021), according to which a simple model should be designed to address a specific problem.

As pointed out in Zezza (2021), the author previously disagreed with this position since he used to prefer larger and more detailed models. Later, he changed his mind, since Zezza and Zezza (2019) argue for designing the models to address a specific research question instead of having a large benchmark model, which can address a variety of research questions. As can be seen, by Byrjalsen et al. (2022), we have a slightly different stance since we suggest a medium-sized benchmark model consisting of a few hundred equations, which can be modified to address more specific research questions.

Our position is based on three arguments: (i) a medium-sized benchmark model provides a quite complex representation of all sectors of the economy and the main transactions between them as reported in the sectoral national account. (ii) The model is still so simple that it allows for modification in just one sector and leaving the rest of the model as in the benchmark model. This allows for introducing a very high level of detail in one sector while keeping the rest of the model complex enough to capture the main transmission mechanism between the different sectors. (iii) We fully acknowledge that designing and maintaining a medium-sized model is a big investment of time and resources; however, building even a small empirical model requires much time and resources, while modifying an existing model requires less use of resources. The more flexibility built into a medium-sized benchmark model, therefore, opens up for spreading the investment of designing the model among a higher number of different research questions.

2.1 Methodological considerations

Stock-flow consistent (SFC) models can be classified as macroeconomic structural models, as they explicitly model economic structures through detailed accounting relationships and behavioural equations. They share key features with other structural approaches like dynamic stochastic general equilibrium (DSGE) models, large-scale macroeconomic models and computable general equilibrium (CGE) models, including the representation of institutional arrangements, sectoral interlinkages, specific transmission mechanisms and theoretical foundations about economic functioning. While SFC models are distinguished by their strict accounting framework ensuring stock-flow consistency, which provides additional discipline in the model structure, they maintain the core characteristics of structural models in their ability to capture complex economic relationships while allowing for empirical estimation and calibration.

This modelling approach exposes empirical SFC models to two main critiques. The first, following Lucas (1976), argues that macroeconomic models are fundamentally flawed due to parameter instability in response to policy changes – suggesting that micro-founded models are preferable. The second critique concerns the risk of simultaneity bias in structural estimations, proposing that approaches using instrumental variables, such as two-stage or three-stage least squares, would be more appropriate. We address these concerns in turn.

The Lucas Critique, originating from Lucas (1976), has become the *tarte à la crème* of economic modelling methodology,² especially concerning structural models and any form of predictive inference obtained from them.

2. As pointed out by Goutsmedt et al. (2019), the dominant narrative that the Lucas Critique led to the immediate disqualification of Keynesian macroeconomic models overlooks the active responses from Keynesian economists. While older Keynesians questioned its empirical relevance, younger economists like Blinder and Blanchard tested its validity and found little evidence of parameter instability. Instead, they emphasized supply shocks as key drivers of stagflation. Rather

According to the Lucas Critique, econometric models that rely on historical data to predict policy effects fail because they fail to account for changes in economic agents' behaviour in response to policy shifts. In response, Lucas (1976) advocates for models based on microfoundations with deep parameters that remain constant under different policies (or 'policy-invariant').

The first part of the Lucas Critique, the diagnostic, is rather reasonable. As Olesen (2024) points out, Keynes himself was sceptical about the ability of statistical methods to capture the complex realities of economic systems; he argued that economic relationships were not stable over time due to changes in expectations and shifts in policy or external conditions, which could render econometric models based on historical data unreliable for forecasting future events.

The most doubtful part of the Lucas Critique lies in its recommendations, that is, (a) providing 'microfoundations' (b) on the basis of 'deep parameters'. Many critiques of the Lucas Critique have been written (see Skott 2014; Olesen 2024), but we can synthesize the most obvious epistemological flaws of Lucas' recommendations for our purpose, focusing, respectively, on the need for microfoundations and advocating the use of deep parameters.

Regarding the supposed need for microfoundations of macroeconomics, this blatantly negates the very existence of emerging properties that arise from the interactions of countless economic agents, such as market dynamics or financial instability. Complex economic systems exhibit emergent phenomena that cannot be fully understood by analysing individual agents in isolation. It is also worth noting that even natural sciences do not rely on systematic microfoundations: astrophysics does not need to be based on quantum physics concepts, as different physical laws dominate at different scales of observation.

Furthermore, not all policy changes (such as minor adjustments to tax rates) will trigger changes in structural parameters, making deep parameters unnecessary for analysing such shocks.

On the other hand, deep parameters themselves, such as preferences, may change due to a multitude of factors including demographic shifts, cultural changes and learning effects. Individuals' risk preferences or discount rates might evolve with changes in societal norms or personal circumstances. To the extent that policies could affect these dimensions, they could, therefore, exert a change on deep parameters, which would, therefore, not be policy-invariant anymore.

The Lucas Critique is, therefore, only valid in an intermediate category of situations: where structural parameters change while deep parameters remain constant. The challenge then becomes identifying this frontier between different types of situations – something that is extremely difficult to determine *ex ante*.

The assumption of policy-invariant deep parameters is also an obstacle to the very idea of transformative policies. Indeed, certain policies are explicitly designed to modify behaviours and preferences. For instance, carbon taxes aim to make the cost of carbon-intensive goods reflect their environmental impact, hoping to shift consumer and producer preferences towards greener alternatives. It would, therefore, be counterproductive to assume that policy-invariant parameters exist when the aim is precisely to influence them. It is, therefore, necessary to abandon the path of Lucas (1976) and turn in the opposite direction, namely, towards conscious and informed scenario-making, based on explicit assumptions of interrelations between variables.

than rejecting change outright, Keynesians engaged in empirical work to refine models, challenging the view that the Lucas Critique marked a definitive break in macroeconomics.

Moving on to the second critique levelled at macroeconometric structural models, regarding their estimation approach, we agree that concerns about simultaneity bias require careful consideration. While methods like two-stage and three-stage least squares can address such concerns, our empirical strategy also employs alternative techniques to mitigate potential bias. Specifically, we incorporate lagged variables in our estimation framework. For instance, in modelling aggregate demand components, we use lagged relationships to address potential simultaneity – such as in the case of imports, which are both a component of aggregate demand and determined by lagged aggregate demand levels. This approach helps maintain the model's structural integrity while minimizing estimation bias.

3 QMDE: STRUCTURE AND ASSUMPTIONS³

To define the dimensions 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).

Table 1 presents the economy's transactions-flow matrix. 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 non-financial corporations' gross operating surplus (gross profits). 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.

All five institutional sectors earn and pay interest on their holdings of the five different financial instruments. These interest payments are treated as net. The interest rates paid by the different financial instruments as well as the share of profits distributed as dividends are taken as exogenous.⁴ Direct taxes are paid by all institutional sectors and received by the government sector. Social contributions are paid by the household sector both to the government and to the financial sector. In return, these latter pay social benefits to households, while a small amount is also paid to the rest of the world.⁵

3. The full model description can be found in Byrjalsen et al. (2022).

4. Some readers questioned why gross operating surplus (GOS) appears as a transfer from non-financial corporations (NFCs) to other sectors, separate from net dividends shown below. In reality, all sectors generate some GOS through production. However, to keep the model tractable while matching actual statistics, we simplify by modelling all production through NFCs, who then redistribute GOS to other sectors. This GOS line is, therefore, a modelling device to capture the productive activity of non-NFC sectors. In contrast, net dividends represent actual dividend payments to shareholders, netted between sectors. These flows are distinct in nature, hence their separate representation in the transaction flow matrix.

5. As observed, the rest of the world (ROW) is a net receiver of both social contributions and social benefits, unlike Financial Corporations and the Government who receive contributions but pay benefits. This apparent paradox in ROW flows can be explained by two key factors: first, some workers based in Denmark pay contributions to pension funds located abroad. Second, foreign workers who accumulate pension rights in Denmark often move abroad before or during retirement,

Table 1 Transactions-flow matrix

	Households		Non-financial corporations		Financial corporations		General government		Rest of the world	
	Current	Capital	Current	Capital	Current	Capital	Current	Capital	Current	Capital
Private consumption	$-C_t$		C_t							
Investment (buildings and Dw.)		$-I_{BD_t}^H$	$I_{BD_t}^N$	$-I_{BD_t}^N$		$-I_{BD_t}^F$		$-I_{BD_t}^G$		
Investment (equipment)		$-I_{E_t}^H$	$I_{E_t}^N$	$-I_{E_t}^N$		$-I_{E_t}^F$		$-I_{E_t}^G$		
Investment (inventories)			$I_{INV_t}^H$	$-I_{INV_t}^N$						
Government consumption			G_t^N				$-G_t$			
Net exports			NX_t					$-NX_t$		
Wage bill	WB_t^H		$-WB_t$					WB_t^W		
Gross operating surplus	$B2_t^H$		$-B2_t^H$		$B2_t^F$		$B2_t^G$			
Net indirect taxes			$-NIT_t^N$				NIT_t^G		$-NIT_t^W$	
Net interest on assets	NIA_t^H		NIA_t^N		NIA_t^F		NIA_t^G		NIA_t^W	
Net income on insurance	NIH_t^H		NIH_t^N		NIH_t^F		NIH_t^G		NIH_t^W	
Net dividends	ND_t^H		ND_t^N		ND_t^F		ND_t^G		ND_t^W	
Direct taxes	$-DT_t^H$		$-DT_t^N$		$-DT_t^F$		DT_t^G		$-DT_t^W$	
Social contributions	$-SC_t^H$				SC_t^F		SC_t^G		SC_t^W	
Social benefits	SB_t^H				$-SB_t^F$		$-SB_t^G$		SB_t^W	
Other current transfers	OCT_t^H		$-OCT_t^N$		OCT_t^F		$-OCT_t^G$		OCT_t^W	

(continues overleaf)

Table 1 (continued)

	Households		Non-financial corporations		Financial corporations		General government		Rest of the world	
	Current	Capital	Current	Capital	Current	Capital	Current	Capital	Current	Capital
Saving/current account	$-S_t^H$	S_t^H	$-S_t^N$	S_t^N	$-S_t^F$	S_t^F	$-S_t^G$	S_t^G	CA_t	$-CA_t$
Capital transfers		KT_t^H		KT_t^N		$-KT_t^F$		$-KT_t^G$		$-KT_t^W$
Others		$-NP_t^H$		$-NP_t^N$				NP_t^G		NP_t^W
Net lending		NL_t^H		NL_t^N		NL_t^F		NL_t^G		NL_t^W
Adjustment variable		Adj_t^H		Adj_t^N		Adj_t^F		Adj_t^G		Adj_t^W
Δ Interest-bearing assets		$-IBATR_t^H$		$-IBATR_t^N$		$IBATR_t^F$		$-IBATR_t^G$		$-IBATR_t^W$
Δ Equities		$-EQTR_t^H$		$EQTR_t^N$		$-EQTR_t^F$		$EQTR_t^G$		$EQTR_t^W$
Δ Securities		$-SECTR_t^H$		$SECTR_t^N$		$-SECTR_t^F$		$SECTR_t^G$		$-SECTR_t^W$
Δ Insurance		$-INSTR_t^H$		$-INSTR_t^N$		$INSTR_t^F$		$INSTR_t^G$		$-INSTR_t^W$
Δ Loans		LTR_t^H		LTR_t^N		$-LTR_t^F$		$-LTR_t^G$		LTR_t^W
Δ Wealth		$-\Delta W_t^H$		ΔW_t^N		ΔW_t^F		ΔW_t^G		$\Delta NIIP$

Source: Byrialsen et al. (2024a).

Considering 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 represents how each institutional sector allocates its financial wealth and how it covers its financing needs. Interest-bearing assets are a liability for financial corporations and an asset for the four other sectors of the economy. We assume that financial corporations issue securities held by the rest of the world. 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 market closure is entirely demand-led. Equities are issued by non-financial 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 financial corporations and the rest of the world. As with the other financial assets, market closure for insurance and pensions is demand-led.

3.1 Main transmission mechanisms

Following the standard in post-Keynesian stock-flow consistent models, we assume the economy to be demand-led, meaning 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 unemployment rate. This assumption is reasonable for mature economies where employment rates are high.

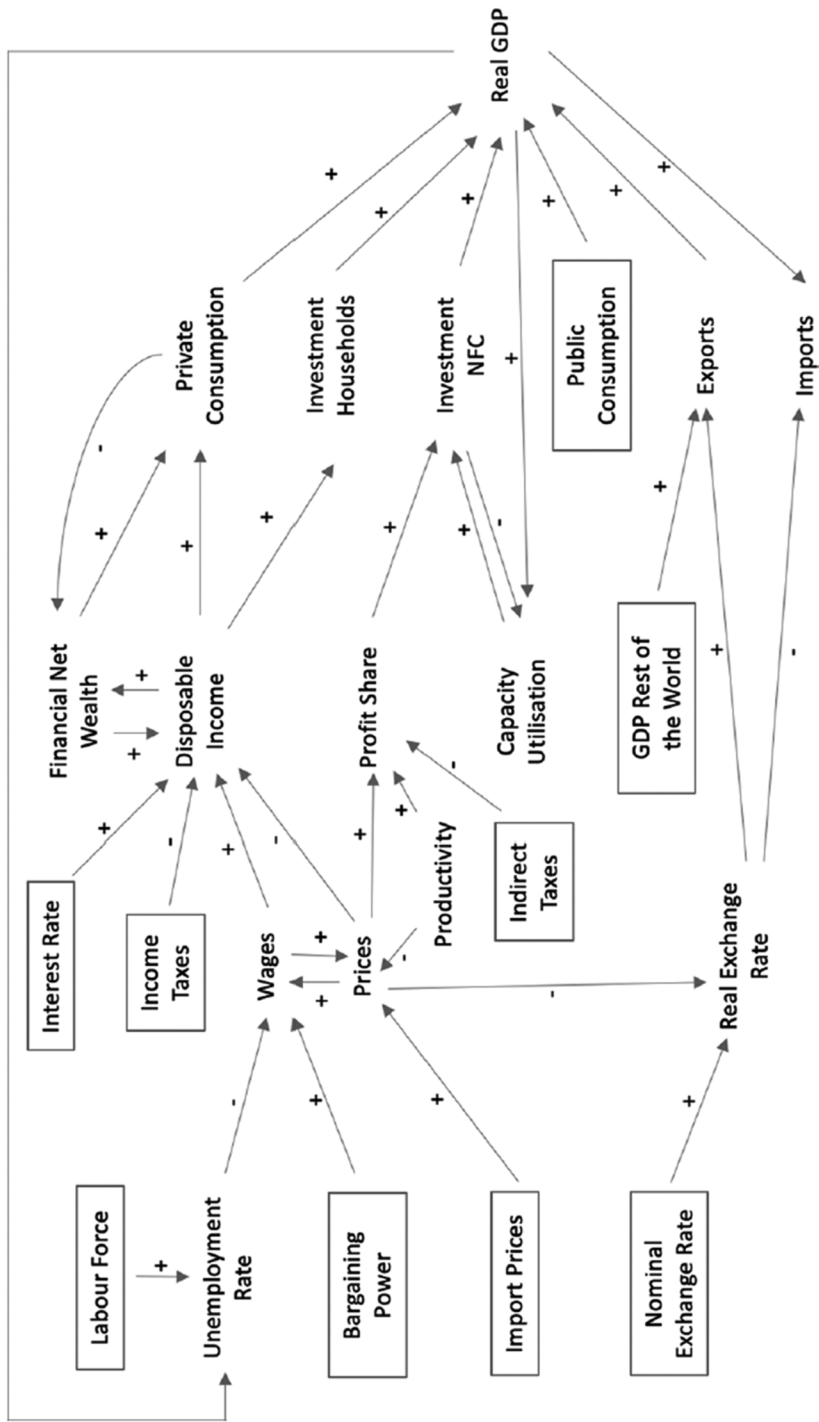
Being a post-Keynesian demand-led model, it is convenient to describe the main transmission mechanisms at play through the components of aggregate demand. Figure 1 describes real GDP (y) as being determined by consumption (c), households and nonfinancial corporations' investment (i^H and i^N , respectively), 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.⁶ The variables that appear without a box are endogenous, meaning that they are determined by the combination of other model variables. 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).

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 to be exogenous, and on the rate of unemployment (UR) and prices (p), which are endogenous.

resulting in benefit payments to the ROW. These demographic and institutional patterns explain the observed flows.

6. While QMDE is a growth model, it operates primarily by reproducing long-term economic dynamics as a sequence of short-term outcomes, rather than through constant exogenous growth rates. Tax rates are exogenous, but tax revenues remain endogenous to economic activity. Government spending is exogenous, and while the model does not feature explicit automatic stabilizers or cyclical fiscal responses, it captures regime shifts. QMDE runs in-sample, with rest-of-the-world GDP following actual historical growth rates rather than a constant rate.



Source: Byrialsen et al. (2024a).

Figure 1 Main transmission mechanisms captured in the model

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 depicted in the matrix in Table 1, the discrepancy between disposable income and consumption delineates the change in households' wealth, thereby impacting consumption in the subsequent period, both directly through the wealth effect inherent in Keynesian consumption functions and indirectly through property income. Thus, it is evident from the diagram both the array of feedback mechanisms characterizing the dynamics of the variables and the necessity of coherent accounting for stock-flow relationships, as ensured by the structure outlined in Table 1.

Households and non-financial firms are assumed to explain the bulk of capital accumulation, the main drivers being disposable income in the case of households⁷ and the profit share (ps) and capacity utilization (u) for nonfinancial corporations. As shown in Figure 1, the profit share is endogenously determined by the combination of wages, prices, productivity and indirect taxes (T^N). 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). Productivity is also influenced by real GDP, though this relationship is omitted from the figure for visual clarity.

Finally, at the bottom of Figure 1, the main determinants of international trade flows are presented. As is standard in most open economy models, 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 predominantly influenced by the domestic level of activity and the real exchange rate. 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.

3.2 Data

While standard Keynesian theory guides the specification of the behavioural equations, the actual determinants of the individual equations are determined by data. The structural parameters are estimated using quarterly data for Denmark for the period 2005–2020. Before estimating the behavioural equations, we remove seasonal fluctuations 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 useful for exploring cointegrating relationships among variables with different orders of integration.

We follow a general-to-specific methodology where we start with many 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.

7. In this framework, inspired by the post-Keynesian approaches, savings emerge as a residual from income and consumption flows rather than being determined behaviourally. Changes in sectoral net lending positions reflect changes in financial assets/liabilities, with their sum necessarily equalling zero through the model's stock-flow consistent accounting structure.

4 APPLICATIONS OF QMDE

In this section, we show how QMDE can be used to investigate the four following issues:

- Determining if Denmark is wage-led or profit-led, and assessing the relevance of this question
- Identifying appropriate policies to tackle inflation
- Understanding the drivers behind Denmark's increasing current account surplus
- Evaluating the effectiveness of Denmark's unemployment benefits policy

4.1 Is Denmark wage-led or profit-led, and is this the right question?

One of the uses of QMDE was motivated by the question of whether an economy is wage-led or profit-led, an issue that sparked some debates among post-Keynesians.

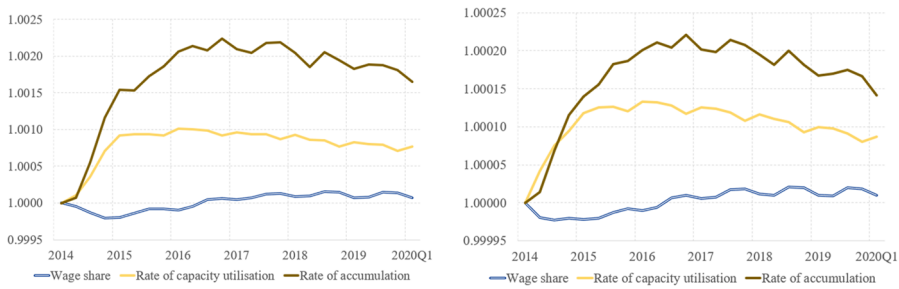
The analysis of wage-led vs. profit-led regimes is crucial given the strong correlation between functional income distribution and personal income inequalities. Our choice of an SFC framework, as detailed in our previous work, enables us to capture comprehensive feedback mechanisms between the real and financial sectors that influence an economy's distributional dynamics. Following established empirical literature, we examine both short-run effects through capacity utilization and long-run effects through real GDP growth, allowing us to identify potential temporal differences in growth regimes. This integrated approach provides a more complete understanding of how distributional changes affect economic outcomes.

In this context, the benchmark model was slightly modified to allow for simultaneous price and nominal wage determination, thereby enabling for a more realistic description of the conflict over income distribution. This representation of wage and price determination became part of the benchmark model after this first application.

The wage-led or profit-led nature emerges from analysing the impacts of various shocks (tax rates, government spending, productivity) on capacity utilization, wage share and the rate of accumulation. Different shocks may yield different regimes: for demand analysis, one can compare wage share with capacity utilization; for growth, wage share with accumulation rate.

We undertake the following two fiscal policy shocks: (i) a 1 percent decrease in the tax rate on labour income and (ii) a 1 percent increase in government consumption. Both shocks are permanent. To illustrate the impact of these shocks, we plot the dynamic trajectories of capacity utilization, the rate of accumulation (firms' investment over their capital stock) and the wage share. Using these variables allows us to show the impact of the shocks on both activity and income distribution. On the left panel of Figure 2, we plot the impact of the decrease in the tax rate on labour income, while on the right panel, we show the effects of the increase in government consumption.

In the case of the tax rate on income, an initial drop in the wage share is observed. However, this is followed by a quick recovery that, in the long run, ends up at a slightly 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) increases employment immediately, wages react sluggishly. Thus, aggregate income increases more than the wage bill, thereby reducing the wage share in the short run. When the wage renegotiations are completed, real wages increase in the medium term, leading to an increase in the wage bill, which shifts income distribution in favour of workers. Employment and real wage increases further stimulate aggregate demand over time.



Source: Byrialsen et al. (2024a).

Figure 2 Impact of fiscal policy shocks

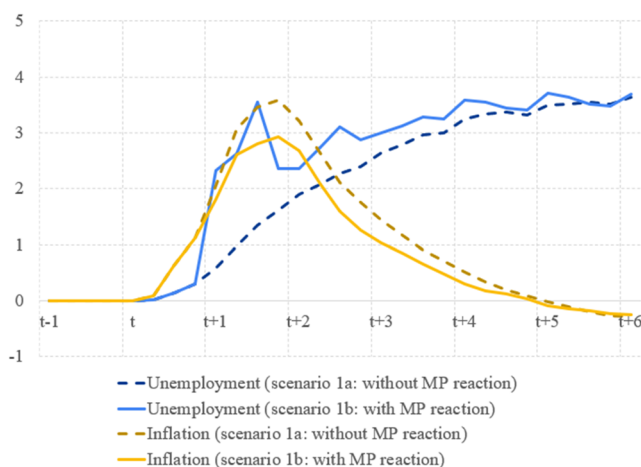
Does the evidence from this shock imply that Denmark is a wage-led economy? It is not possible to provide a conclusive answer, as the sequence of events shows that following the reduction in income taxes, the increase in aggregate demand raises the wage share and not vice versa. However, in the subsequent periods, the higher wage share stimulates aggregate demand, which aligns with the wage-led hypothesis. Structural models in historical time, like empirical SFC models, can thus capture these dynamic bidirectional effects between demand and distribution that are absent in models where the distribution is entirely exogenous. For a more detailed discussion about how the analysis of demand and growth regimes can benefit from the use of SFC models, see Byrialsen et al. (2024a; 2024b).

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 feeds 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, as can be observed by comparing the long-term evolution of the wage share in both panels. 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 is consumption, in this case, it is government spending itself, private consumption and investment increasing endogenously to a lesser extent. As for capital accumulation, even if the profit share falls more than what capacity utilization increases, the higher sensitivity of investment to utilization found in the data for Denmark leads to an increase in capital accumulation. Hence, in this scenario, growth is positively correlated with the wage share. However, for the reasons already mentioned regarding demand, it would not be suitable to talk about wage-led growth.

4.2 Which policies should we use to fight inflation?

Inflation has regained prominence in developed economies since 2021. Initially due to supply chain disruptions linked to COVID-19 as well as the successive closures and reopening of economies, inflationary pressures have been subsequently intensified by the war in Ukraine, which has propelled the price of energy, notably imported. This has reopened the debate around the relevance of traditional, interest rate-based monetary policy response in the face of shocks stemming from the supply-side, largely imported and impacting predominantly prices of necessary items (Laurentjoye 2024).

In Raza et al. (2023), QMDE was used to evaluate how monetary, fiscal and income policies affect prices and output in Denmark, assessing policy effectiveness against



Source: Raza et al. (2023).

Figure 3 Unemployment and inflation rates, with and without monetary policy intervention

inflationary shocks. More precisely, the benchmark version of QMDE's wage-price setting was modified by introducing unions' targeted wage rates based on workers' inflation expectations into the wage equation. The price equations were augmented to include aggregate demand effects, arguing that while demand-side price explanations are less relevant under normal conditions, they become crucial during periods of dramatic demand shifts combined with supply disruptions, as seen post-COVID.

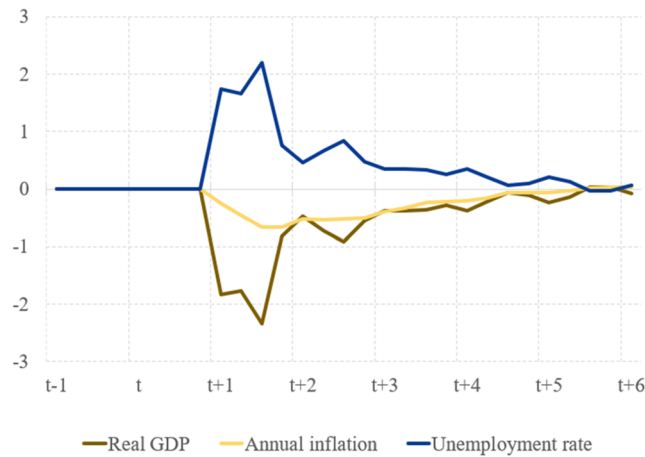
We developed scenarios to analyse the post-COVID inflationary environment faced by Denmark and other countries (scenario 1a), the consequent monetary tightening necessitated by Denmark's fixed exchange rate regime (scenario 1b), and potential unconventional fiscal and income policies that could mitigate inflation within existing institutional frameworks (scenario 2).

Initially, we recreate in-sample the conditions leading to high inflation, starting from a period of stability before the COVID-19 crisis. We introduce shocks to mimic post-pandemic challenges, consisting of an increase in import prices (shock 1), which triggers a decline in GDP and rising inflation, followed by an interest rate hike (shock 2), which partly offsets inflation but amplifies the recessive effect and unemployment, as can be seen in Figure 3.

By comparing scenarios 1a and 1b, we can isolate the impact of monetary policy tightening. The results reveal a challenging trade-off between inflation control and economic activity. As illustrated in Figure 4, the cost of reducing inflation by one percentage point is substantial, resulting in at least twice that magnitude in terms of both real GDP decline and unemployment increase.

Scenario 2 examines the use of alternative policies: reducing taxes on labour and production,⁸ coordinated with wage and price policies. The proposed fiscal interventions in Denmark involve reducing the labour income tax rate by 1 percentage point from its current level of around 38 percent and lowering the indirect tax rate by one percentage

8. These measures fall under the umbrella of what Dao et al. (2023) label 'unconventional fiscal policies', but our paper was already accepted for publication when the term became employed.



Source: Raza et al. (2023).

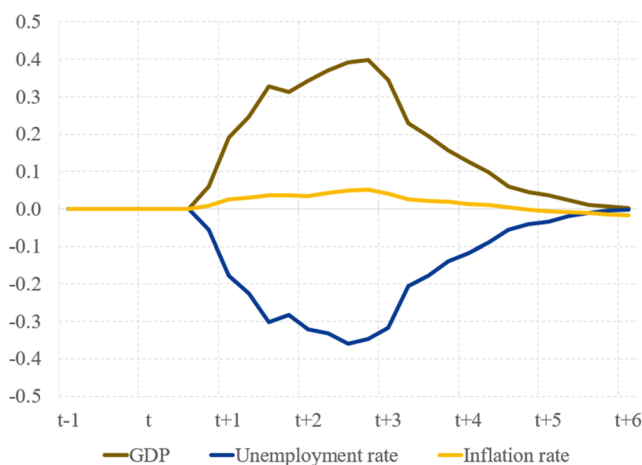
Figure 4 Effects of monetary policy alone



Figure 5 Effects of alternative fiscal and income policies

point from its baseline level of approximately 16 percent. These tax cuts are suggested to be implemented for a duration of two years, coinciding with the increase in interest rates, and are contingent upon close coordination with labour unions and employers to ensure their integration into wage negotiations and price setting. This combined approach helps mitigate GDP decline and inflation, as Figure 5 shows.

When zooming in on real GDP, inflation and unemployment, a fiscal intervention combined with incomes policy has the effect of persistently increasing GDP (peaking at 0.6 percent) while lowering unemployment and inflation (by more than 0.4 and 0.3 percentage points, respectively), compared with scenario 1.



Source: Raza et al. (2023).

Figure 6 Effects of alternative fiscal-cum-wage-policy measures alone

However, implementing coordinated fiscal and income policies poses challenges. While adjusting wages in response to tax cuts is straightforward, determining how production taxes impact prices is complex due to varied mark-ups among firms. A targeted approach, focusing on sectors driving price increases, may be more effective.⁹

We acknowledge the challenge of estimating the impact of indirect tax cuts on prices and consider that our model may overstate the benefits of price-based income policies. To address this, we exclude price-based policies and focus on discretionary fiscal measures alongside wage-based income policies. Results show positive effects on GDP and employment, with minimal impact on inflation (Figure 6), suggesting that the economic benefits of discretionary fiscal policies may outweigh inflation concerns.

In assessing the affordability of proposed policies, we evaluate their impact on public debt sustainability. Following Canelli et al. (2022), we analyse whether the primary balance covers the net debt burden. Figure 7 illustrates this condition, revealing that interest rate hikes have the most significant effect on public debt, exacerbated by economic contraction. While fiscal intervention initially worsens debt dynamics, it ultimately improves outcomes compared to monetary policy alone. Despite the dilemma policymakers face regarding deficits, Denmark's favourable fiscal position and current account surplus suggest room for discretionary fiscal measures without relying on foreign credit.

Our conclusion is that a close coordination of fiscal and income policies can help reduce the effects of adverse shocks to income without increasing inflation. Furthermore, we find that of all the policies implemented, monetary policy has the most dramatic effects on public debt sustainability.

9. Identifying these sectors could be done using an input–output approach *à la* Weber et al. (2024).

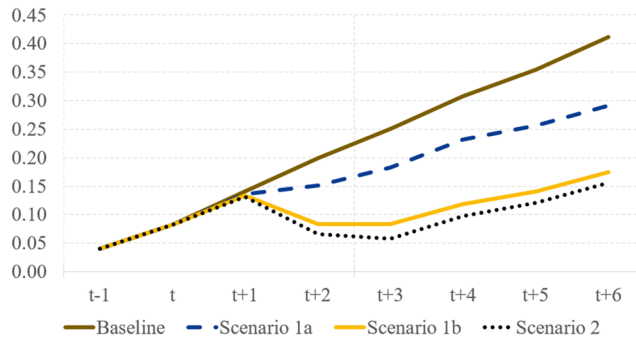


Figure 7 Debt sustainability analysis for the various sets of policies (%GDP, cumulative effect)

4.3 The drivers of the increasing current account surplus

An important feature of the Danish economy for the last 35 years is the persistent surplus on the current account, which has transformed a long-standing foreign debt into increasing foreign wealth. Especially notable is the period after 2010, during which foreign wealth has escalated rapidly due to historically high levels of current account surpluses. From 1989 to 2010, the average surplus of the current account was 2.1 percent, but for the period 2010–2022, the average has surged to almost 8 percent, and exceeding 10 percent for the years post-2020. According to Danmarks Nationalbank (2017), these exceptionally large surpluses of the current account are attributed to the behaviour of the private sector (consolidating after the financial crisis).

A descriptive analysis of the drivers behind the improvement of the current account since 2010 points to three aspects: (i) an increase in the trade balance (driven by a large increase in real net exports), (ii) an increase in the terms of trade and (iii) an improvement in the income account.

To examine these findings within a consistent framework, Byrialsen and Valdecantos (2024) use a slightly modified version of the benchmark QMDE-model explore how the current account balance would have evolved under alternative circumstances. The model used to make these experiments includes the adjustments made in the previous two cases, to which we added an extra component to the export equation to represent the supply-side effect.¹⁰ This modification was not specifically necessary to represent the scenarios we were interested in, but resulted from new evidence on the determinants of Danish exports that was published while we were developing the model. This is a good illustrative example of the flexibility that the structure of structural macroeconomic models enable for.

As the core of the model is presented in Section 3, we will only focus on the interaction with the rest of the world in this summary. Since Denmark has decided to peg the Danish krone to the euro, a fixed nominal exchange rate closure is defined in the model. Consequently, the real exchange rate is only affected by changes in the relative prices between Denmark and the rest of the world. We assume import prices to be determined outside the model, so changes in terms of trade can only be explained by changes in export

10. Following the findings of Kastrup and Kronborg (2021), who identify that ‘the extensive margin is the primary factor in the long run and thus explains 70% of the variation in exports after five years’, we include real GDP as a proxy of the supply-side effects that explains part of the observed increase in Danish exports.

prices. In the model, export prices are (both in the long-run and short-run) explained as a function of the domestic unit labour costs and import prices.

For real exports, a long-run relationship between exports, economic activity among the trading partners, world trade and domestic activity can be found, where domestic activity is a proxy for the supply-side effects. In the short run, a relationship between real exports, real economic activity among the trading partners, global trade and the real exchange rate is included in the model. For imports, a long-run relationship between real imports, domestic economic activity and global trade is found, while in the short run, a relationship between imports, the real exchange rate and domestic economic activity is identified.

On the financial side of the economy, the persistent surplus of the current account results in an accumulation of wealth abroad, which, in a dynamic model, affects future property income and thereby the current account in a positive direction.

To explore how the current account balance would have evolved under alternative circumstances related to the part of the model presented above, we perform the counterfactual analysis in three steps:

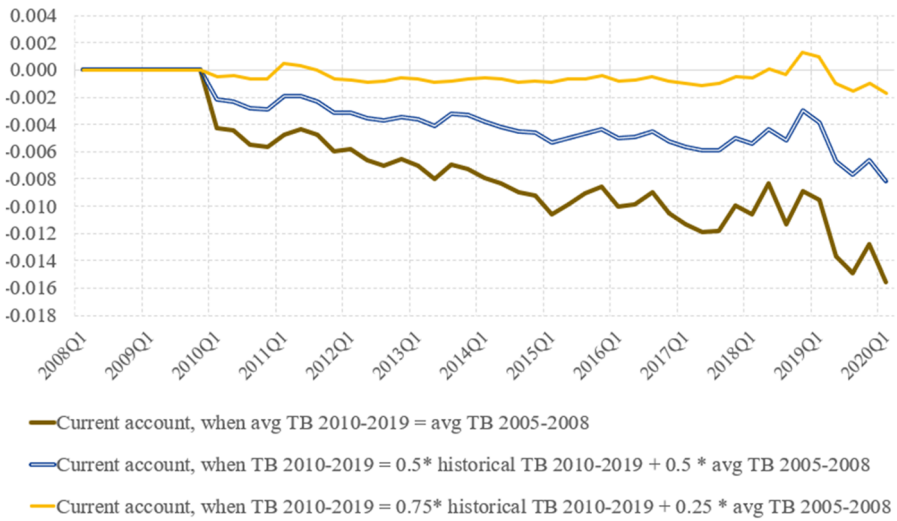
1. A slower growth rate of the quantities exported and imported in the period 2010–2019, such that the average real trade balance-to-GDP ratio stays at 5.5 percent (the value registered in the period 2005–2008).
2. A less favourable evolution of export prices, such that they remain constant at the level taken after recovering from the shock of the Great Financial Crisis of 2008–2009.
3. A reduction in households' saving rate in 2010–2019, such that the consumption-to-disposable income ratio reaches 1 (which is equal to the historical norm for the period 1995–2020).

Our main findings can be summarized as follows:

First, reducing the trade balance leads to a worsening of the current account as seen in Figure 8. This result is straightforward, suggesting that had it not been for the actual trade balance improvement observed in 2010–2019, the Danish current account would have been lower than observed. In this first counterfactual scenario, the current account balance is on average 0.8 percentage points (of GDP) below its actual level. This result seems to be robust to other scenarios where the trade balance is kept below its actual trajectory, as shown in the upper and lower lines. Depending on how closer the trajectories of exports and imports get to their actuals, the closer the current account gets to its actual trajectory as well. Trivial as these results may seem, they exhibit a source of improvement in the Danish current account balance that was not considered in previous analyses.

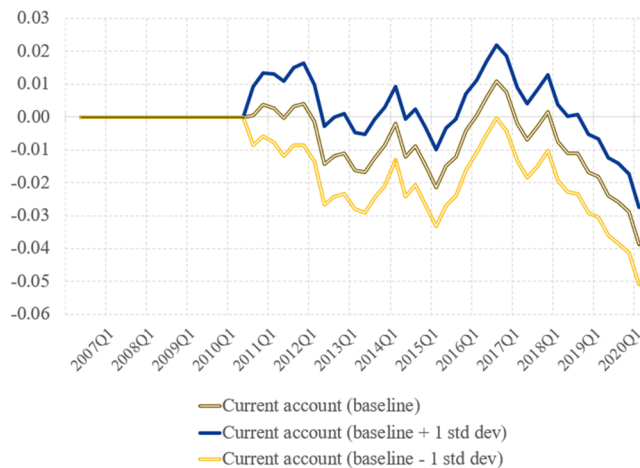
Second, lower export price growth also worsens the current account balance as seen in Figure 9. The baseline scenario yields a current account balance that is, on average, 2 percentage points lower than the actual value, which is substantial. This deviation is large not only relative to the total increase in the current account balance (8 percentage points from 2005–2008 to 2010–2019) but also when compared to the impact of real trade flows assessed in the previous scenario. A scenario combining the baseline with one standard deviation produces a current account balance only 0.5 percentage points below the actual value. These findings underscore the significant effect of export prices (or terms of trade more broadly) on the current account balance, suggesting that part of the observed increase in the 2010s can reasonably be attributed to the favourable export prices experienced by the Danish economy.

Third, a reduction in the savings rate among households also results in a lower current account surplus as presented in Figure 10. A savings rate reduced to the historical norm led to a reduction of the surplus by between 0.6 and 1 percentage point. This result is



Source: Byrialsen and Valdecantos (2024).

Figure 8 Effect of a slower growth rate of the quantities exported and imported. Scenarios are presented as the difference to the actual current account to GDP ratio

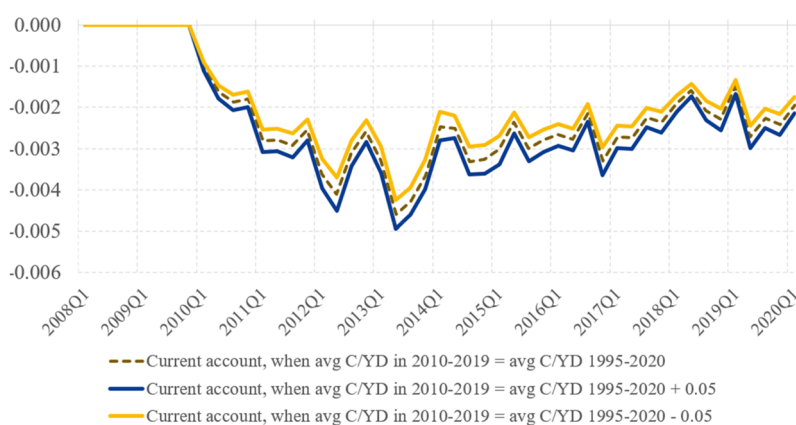


Source: Byrialsen and Valdecantos (2024).

Figure 9 Effect of a lower export price growth. Scenarios are presented as the difference to the actual current account to GDP ratio

explained by the fact that the increase in household consumption reduces savings, thereby contributing to a decline in private net lending.

In addition to the direct boost in output from higher consumption, indirect impacts arise via the multiplier effect: greater output raises both disposable income and capacity



Source: Byrialsen and Valdecantos (2024).

Figure 10 Effect of a reduction in the savings rate among households. Scenarios are presented as the difference to the actual current account to GDP ratio

utilization, driving up investments by households and firms. Together, these effects reduce private net lending across all scenarios. Meanwhile, the heightened economic activity improves the public sector balance due to the strength of automatic stabilizers in the Danish fiscal system: tax revenue increases with higher incomes, while public spending decreases in response to reduced transfers to the private sector, such as lower unemployment benefits. Ultimately, the deterioration in private sector net lending outweighs the improvement in public sector net lending, resulting in a decline in the current account balance.

Therefore, our findings suggest that the extraordinarily high level of current account surplus also includes features that might make it more a permanent than a temporary phenomenon. These findings help explain the current situation, where increased domestic savings among both the private and public sectors are fully consistent with the large current account surplus.

4.4 Evaluating the unemployment benefits policy of Denmark

Thomsen et al. (2024) use a variant of the QMDE to assess the macroeconomic impact of labour market reforms. To this end, the tightening of unemployment benefits in Denmark is used as a case study. The Danish labour market – often called the flexicurity model – has been effective in maintaining a low and stable unemployment rate compared to other European countries. The flexicurity model rests on three basic pillars: (i) flexibility in hiring and laying off workers, (ii) security in the form of generous unemployment benefits and (iii) an active labour market policy. The flexible hiring and termination terms ensure that employers can adjust their workforce quickly according to changes in production. Workers' unions allow these flexibilities because of the high level of unemployment benefits, ensuring that individuals will not risk a major reduction in income in the event of job loss. To receive these benefits, it is required that unemployed individuals – while actively searching for a job – participate in programs aimed at improving their skills, thereby increasing their chances of reemployment.

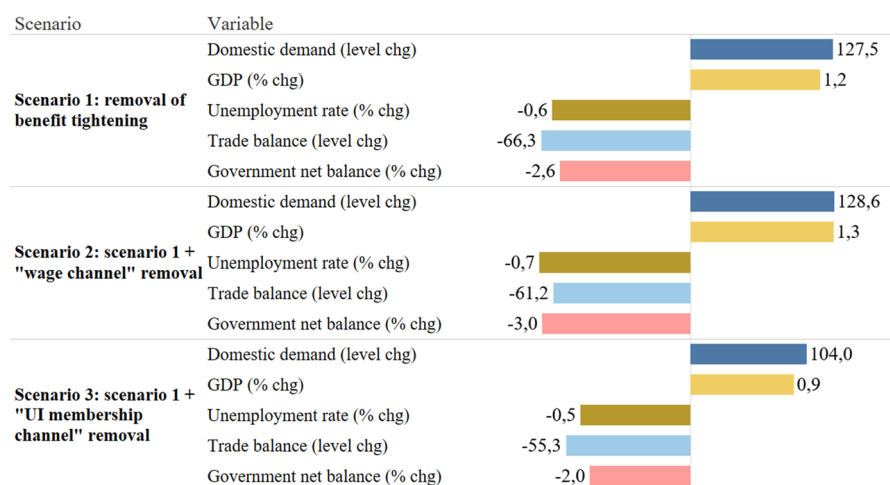
The flexicurity model of Denmark has come under pressure on several occasions. For instance, in 2010, the government lowered the duration of unemployment benefits from four to two years. In 2012, the government adopted a number of labour reforms, including the decision to lower unemployment benefits for the period 2016–2023. The purpose of the reform was to increase economic growth and employment while reducing the pressure on the public balance. The growth rate of the maximum level of unemployment benefits in Denmark is partly determined by past wages and partly by an exogenous growth rate set by the government.

As part of the 2012 reforms, the government decided to lower the exogenous growth rate of the maximum level of unemployment benefits. To evaluate this reform, we integrate the central features of the Danish unemployment benefits system, specifically including the factors that are targeted by policymakers to control the level of unemployment benefits. We significantly modify QMDE and propose several macroeconomic channels through which unemployment benefits can affect macroeconomic outcomes. More specifically, we endogenize the labour supply, modify the wage equation and introduce the legal framework, according to which unemployment benefits are determined and paid out. To assess the macroeconomic impact of unemployment benefits under various circumstances, we carry out the following three counterfactual scenarios:

1. In the first scenario, we perform a counterfactual analysis by simply removing the implementation of the policy regarding unemployment benefits tightening. In other words, we reverse the public policy of suppressing the growth rate of the maximum unemployment benefits and compare it with the baseline, which contains the effects of the policy.
2. In the second scenario, we eliminate the role of unemployment benefits in wage determination. The motivation behind this scenario is that the maximum level of unemployment benefits in relation to wages has fallen over the past couple of decades. Thus, workers have no incentive to use the level of unemployment benefits as a reason to demand higher wages. After removing the wage channel, we reintroduce the situation described in scenario 1.
3. In the third scenario, we assess the role of the unemployment insurance membership channel, which states that an increase in unemployment benefits attracts more people to join the unemployment insurance membership. In this scenario, we assume that unemployment insurance membership is exogenous and is not affected by the level of unemployment benefits. Afterwards, we reintroduce the situation described in scenario 1. The comparison of scenario 3 with scenario 1 allows us to see the significance of the unemployment insurance membership channel.

The results of the three scenarios are presented in Figure 11. Two important aspects emerge from these findings. First, from the perspective of growth and employment, the overall effect of unemployment benefits is expansionary in all cases. This expansionary (net) effect suggests that the positive impacts of unemployment benefits linked to the domestic demand channel outweigh their adverse effects, typically associated with real exchange rate appreciation and falling trade balance. While the results vary across the three scenarios, the overall magnitude appears to be weak, indicating weaker (net) effects of unemployment benefits.

From a public finance standpoint, an increase in unemployment benefits puts pressure on the public budget, deteriorating the government's net lending position across all three scenarios. While the expansionary effect on economic activity helps maintain tax revenues through both income tax and VAT, these only partially offset the direct cost of benefits. Given this context, we can argue that the tightening of unemployment benefits may have



Source: Thomsen et al. (2024).

Figure 11 Effects of the three scenarios after 16 quarters, compared to baseline

contributed to improving the public balance, but its contribution to growth and employment – as was the official stated goal at the time – remains unclear.

A key institutional feature underlying these results is that unemployment benefits in the Danish system are conditional on prior contributions to the unemployment insurance scheme. Our model captures this through the insurance rate (IR'), which represents the fraction of the labour force participating in the insurance scheme. Following empirical evidence (Aastrup 2018; Jensen and Nørgaard 2021; Risgaard 2021), we model this rate as positively linked to the compensation rate, reflecting that workers' decisions to join the insurance scheme depend on the relative generosity of benefits compared to membership costs.

5 CONCLUSION

In this paper, we presented QMDE, our empirical quarterly SFC model of Denmark.

We distinguished three types of stock-flow consistent (SFC) models: small, medium and large. Small models offer simplicity but struggle to capture real-world complexity. QMDE belongs to the second category. Large models allow diverse analyses but may lack economic intuition. Medium-sized models strike a balance, offering complexity without overwhelming detail. In general, the choice between model sizes should depend on the research question.

We addressed the Lucas Critique, stemming from Lucas (1976), which questions the reliability of econometric models in predicting policy effects. It argues that historical data-based models fail to capture agents' behavioural changes in response to policy shifts. While its diagnostic aspect is reasonable, its recommendations for microfoundations and deep parameters have flaws. Microfoundations overlook emergent properties in complex systems, and assuming policy-invariant parameters disregards evolving preferences influenced by societal shifts and policy interventions. We, therefore, advocate a move towards scenario-making with explicit assumptions about variable interrelations.

In Section 3, we presented the structural framework and transmission mechanisms of QMDE, which delineates the economy into five institutional sectors, detailing transactions and financial flows among them. The model operates on a demand-led framework, emphasizing the main components of aggregate demand influencing real GDP. Furthermore, it elucidates the determinants of consumption, investment, profit share, capacity utilization and international trade flows. Data from Denmark are used for the estimation of structural parameters, employing an ARDL approach to explore cointegrating relationships and model specification based on theoretical considerations.

In Sec. 4, we explored four applications of QMDE:

The first application (Byrialsen et al. 2024a; 2024b) pertains to the determination of whether Denmark is wage-led or profit-led. The model's analysis of fiscal policy shocks in Denmark indicates a complex relationship between demand, income distribution and economic growth, making it difficult to categorize the economy strictly as either wage-led or profit-led. While the reduction in the tax rate on labour income initially leads to a decrease in the wage share followed by a recovery, suggesting alignment with the wage-led hypothesis, subsequent periods show bidirectional effects where the higher wage share stimulates aggregate demand. Similarly, an increase in government consumption initially reduces the wage share but results in a recovery driven by higher demand and lower unemployment. Although growth appears positively correlated with the wage share in this scenario, the dynamic interactions between government spending, consumption, investment and income distribution suggest that Denmark's growth regime cannot be unequivocally classified as either wage-led or profit-led.

The second application (Raza et al. 2023) conducted using QMDE for Denmark's inflationary environment post-COVID-19 crisis suggests that traditional monetary policy responses may not be sufficient in mitigating the effects of supply-side shocks, particularly those driven by imported inflationary pressures. A first scenario, focusing on monetary policy adjustments in response to import price shocks, reveals a decline in GDP alongside persistent inflation, despite interest rate increases.

In contrast, exploring alternative policy measures, including reducing taxes on labour and production combined with coordinated wage and price policies, shows promise in mitigating GDP decline and inflation. This combined approach leads to persistent increases in GDP while simultaneously lowering unemployment and inflation. Furthermore, while interest rate hikes have the most significant effect on public debt, fiscal intervention initially worsens debt dynamics but ultimately improves outcomes compared to monetary policy alone.

The third application (Byrialsen and Valdecantos 2024) identifies three main drivers behind the improvement in the current account since 2010: an increase in the trade balance driven by real net exports, an increase in the terms of trade and an improvement in the income account. The model reveals that slower growth rates of exports and imports, maintaining the trade balance-to-GDP ratio at pre-crisis levels, would have led to a lower current account balance than observed. Furthermore, a less favourable evolution of export prices would have also resulted in a lower current account surplus. Finally, a reduction in households' saving rate to historical norms would have further reduced the current account surplus. Overall, these findings suggest that the exceptionally high level of the current account surplus may have more permanent features than temporary ones. Increased domestic savings among both the private and public sectors align with the large current account surplus.

The fourth and last application of QMDE (Thomsen et al. 2024) investigates the flexicurity model of Denmark, characterized by flexible hiring practices and generous unemployment benefits, which has faced reforms aiming to reduce public expenditure

and stimulate economic growth. Using a variant of the QMDE, we evaluate the macroeconomic impact of tightening unemployment benefits. Three counterfactual scenarios are explored: (1) reversing the policy of suppressing benefit growth, (2) eliminating unemployment benefits' role in wage determination and (3) assessing the effect of unemployment insurance membership. Results suggest unemployment benefits' overall expansionary effect on growth and employment, although weaker than anticipated. However, increased benefits strain public finances, posing a policy trade-off. While benefit reduction may aid public balance, its impact on growth and employment remains uncertain. These findings question the efficacy of reducing benefits to stimulate economic growth.

In comparing our model with mainstream approaches, we would like to emphasize that our aim is to offer a distinct perspective rather than critique existing frameworks. QMDE's strength lies in its comprehensive behavioural structure for consumption and investment, anchored in a robust national accounting framework coupled with balance-sheet feedback mechanisms onto flows – a feature often absent in mainstream models. While mainstream approaches typically maintain a narrow focus, our SFC framework inherently captures financial-real economy feedbacks, which we have found crucial in various applications, such as wage-led/profit-led analyses.

This comprehensive approach allows us to examine multiple research questions within a unified framework, though we acknowledge the model's main limitation in its relatively simplified supply side, including productivity dynamics. This remains an area for potential future development.

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