ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Detzer, Daniel

Working Paper

Financialisation, debt and inequality: Scenarios based on a stock flow consistent model

Working Paper, No. 64/2016

Provided in Cooperation with:
Berlin Institute for International Political Economy (IPE), Berlin School of Economics and Law

Suggested Citation: Detzer, Daniel (2016) : Financialisation, debt and inequality: Scenarios based on a stock flow consistent model, Working Paper, No. 64/2016, Hochschule für Wirtschaft und Recht Berlin, Institute for International Political Economy (IPE), Berlin

This Version is available at:
https://hdl.handle.net/10419/130196

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

Hochschule für
Wirtschaft und Recht Berlin
Berlin School of Economics and Law

Institute for International Political Economy Berlin

Financialisation, Debt and Inequality – Scenarios Based on a Stock Flow Consistent Model

Author: Daniel Detzer

Working Paper, No. 64/2016

Editors:
Sigrid Betzelt Trevor Evans Eckhard Hein Hansjörg Herr
Birgit Mahnkopf Christina Teipen Achim Truger Markus Wissen

Financialisation, Debt and Inequality – Scenarios Based on a Stock Flow Consistent Model

Daniel Detzer

Abstract: In the era of financialisation, increasing income inequality could be observed in most developed and many developing countries. Despite these similar developments in inequality, the growth performance and drivers for growth differed markedly among countries, allowing clusters of different growth regimes to be identified. Among them two extreme types: the debt-led private-demand boom type and the export-led mercantilist type. Whereas the former relies mainly on credit-financed household consumption in order to compensate for the potential lack of demand (associated with the depressing effect of financialisation), the latter relies on net exports as the main driver of aggregate demand. After a short review of the different channels through which financialisation is expected to affect a countries development, a theoretical discussion on the conditions that tend to support the occurrence of either of the two regimes will build the base for the following model exercise. With the help of a stock-flow consistent model it will be demonstrated then how increasing inequality, depending on a countries institutional structure and regulatory framework, affects growth differently, explaining the occurrence of both regime types. Based on the insights of the theoretical discussion and the model results, a foresight exercise will be performed examining how further increase in inequality might affect development of economies around the world but particularly of the Euro area.

Key words: Euro area, finance-dominate capitalism, financialisation, foresight, household debt, international imbalances, consumption emulation

JEL code: E02 E12 E21 E25 E44 E65 F40 F41 F43

Contact: Daniel Detzer, Berlin School of Economics and Law, Badensche Str. 52, 10825 Berlin, Germany, e-mail: daniel.detzer@hwr-berlin.de

Acknowledgments: The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement n° 266800. I would like to thank in particular Eckhard Hein and Hansjörg Herr who were always available for consultation and very fruitful discussions during the writing process. I'm also indebted to Paul Beckta, Dirk Ehnts, Marc Lavoie, Gennaro Zezza and Thomas Theobald, who gave me helpful advices on the model. I started with SFC-modelling at the Winter School "Applied Macro-Modelling: Fully Scalable Models" at the University of Limerick and would like to thank the organizers Eugenio Caverzasi, Antoine Godin and Stephen Kinsella and the other participants. Earlier versions of the paper were presented at the FESSUD annual conference, 16.10.15, in Lisbon, the 19th Conference of the Research Network Macroeconomics and Macroeconomic Policies (FMM), 23.10.15, in Berlin and in the special lecture 'Financialization and the Open Economy: Fresh Perspectives on Money and Credit', 26.10.2015, at the Bard College in Berlin. I would like to thank the participants for very helpful comments and suggestions. Also, I would like to thank the two FESSUD commentators Wlodzimierz Dymarski and Gilad Isaacs, who gave me very helpful hints and advices. Finally, for editing assistance I am very grateful to Finn Cahill-Webb. Remaining errors are, of course, my own.

1 Introduction

The era of financialisation has been associated with rising inequality of income and wealth. The relationship between financialisation, distribution, and economic development has been explored in work package 3 of the FESSUD project, as has the relationship with the financial and economic crises. In this contribution to work package 11 the relationships between debt, inequality, and domestic growth will be analysed. With the help of a stock-flow consistent model the effects of further increases in inequality on economic development and on financial stability will be assessed. We will use the model to show how similar changes in inequality can lead to the occurrence of different growth regimes depending on a country's prevailing institutional framework and how this supports the observed occurrence of international current account imbalances. Based on these insights we will reflect on the potential macroeconomic developments if trends towards rising inequality continue in the future. In Dodig et al. (2015) we distinguished two extreme types of development under financialisation: the debt-led private-demand boom type and the export-led mercantilist type (as well as an intermediate type, the domestic-demand led type). Whereas the debt-led private-demand boom type relies mainly on credit-financed household consumption in order to compensate for the potential lack of demand (associated with the depressing effect of financialisation on investment in capital stock and on income-financed consumption), the export-led mercantilist type relies on net exports as the main driver of aggregate demand. These two types of development may generate more or less dynamic growth for a certain period of time, however, they contain internal contradictions that may pose a risk to long-term sustainable growth, given by potential over-indebtedness of the private household sector (for the first type) and the foreign sector (for the second type).[1]

Using a stock-flow consistent (SFC) model we will show that depending on the domestic institutional structure, increasing inequality can support the occurrence of these two types of development. We will also explore their respective dynamics. This

[1] We do not claim here, however, that those regimes are necessarily the result of a deliberate government policy. In our model, the occurrence of export-led mercantilist regime occurs more as a side effect due to weak growth of domestic demand associated with the higher inequality. While policy makers in some countries may and have pursued a strategy of export promotion to overcome domestic problems, the mechanisms for such a strategy – namely internal and external devaluation - are not available in the proposed model.

approach allows for the simulation of different scenarios depending on the extent of further redistribution and the values of the important model parameters. It seems, therefore, to be a suitable tool for exploring the effects of different trajectories of inequality on economic development and financial stability.

The paper will be structured as follows. First, we will shortly discuss the main theoretical channels through which financialisation is assumed to affect macroeconomic developments. Since this has already been done extensively in other parts of the FESSUD project, this part will only shortly summarise. Most importantly, we will note that financialisation has contributed to diminish private investment demand and has led through a variety of channels to increasing personal and functional income inequality. We will then give a short review of the relevant literature, which can help to explain why increasing inequality may have led in some countries to low growth and a reliance on external demand, and in other countries to the debt-led private-demand boom type of development. This will help to explore the relevant mechanisms that allow for the occurrence of the two regimes.

The main content of this paper and its contribution will be in the second part, where we will build stylised stock-flow consistent models of the two regimes. Within the models the dynamic and long-run relations between the effects of financialisation, inequality, and debt will be explored. We will start this section with a short literature review of existing formal models dealing with the effects of inequality and debt. Thereafter we will present the structure of our own model. The model parameters will be chosen to produce the macroeconomic features of the two regimes identified in the empirical work (current account deficits, household indebtedness) and to produce sensible values for the relevant macroeconomic relations in general (shares of demand aggregates in GDP, etc.).[2] Within the constructed models, we will explore each regime's dynamics by exposing it to a range of shocks: In particular we will examine the effects of further changes in inequality (functional and wage inequality) within the two regimes, as well as how the dynamics of the regimes change when we assume stricter financial regulation. Based on this analysis we will draw some

[2] Here it should be noted already that while the model assumptions and parameters will not be geared to any specific country, they will be oriented along the lines of a Western industrialised country in the Euro area. This means that the results are of particular use to understand the occurrence of imbalances in this group of countries, while for other countries (e.g. developing countries) applicability is limited or has to be adapted to the specific circumstances (e.g. resource dependency or informal lending).

conclusions and reflect on potential macroeconomic dynamics if the trend towards rising inequality continues.

2 Financialisation, inequality, debt and economic growth

The era of financialisation has been associated with increasing inequality, lower investment demand, a higher potential for debt-financed and wealth-based consumption, as well as the deregulation of international financial markets and capital accounts (Hein & Dodig 2015). Financialisation has contributed to a rising profit share and higher personal income inequality, mainly via reduced bargaining power of trade unions, rising profit claims by more influential shareholders, and a change in the sectoral composition of the economy at the expenses of the government and the non-financial corporate sector in some countries.[3] The investment activity of firms has been depressed through the 'preference channel' – due to a variety of measures managers are incentivised to prefer short term financial investment over long-term real investment – and the 'internal means of finance channel' – a drain of internal sources of finance due to higher dividend demands and share buybacks reducing overall investment in the capital stock. The effect of lower investment on aggregate demand is directly comprehensible. For functional income inequality, a higher share of GDP going to profits in a world where the vast majority of countries are wage-led can be expected to add to stagnationary tendencies.[4] For higher personal income inequality, redistribution from low income households to high income households is expected to lead to overall lower consumption demand due to the lower propensity to consume of the latter group.[5] Hence, in a country where financialisation has strongly

[3] See also the contribution by Köhler et al. (2015), who review different theories of the reasons for declining wage shares and empirically asses them.

[4] The notion of wage-led and profit-led growth regimes stems from the theoretical framework of Bhaduri & Marglin (1990). A country is wage-led when an increase in the wage share increases aggregate demand, while it is profit-led when an increase in the profit share increases aggregate demand. A range of empirical studies have shown that based on their domestic demand aggregates most countries are wage-led, even though for some countries the results can differ when net-exports are also considered (Bowles & Boyer 1995, Stockhammer & Ederer 2008, Stockhammer et al. 2009, 2011, Onaran & Galanis 2012).

[5] For research on different savings rates by different income groups see Dynan et al. (2004) or more recently Alvarez-Cuadrado & Vilalta (2012). See also Brown (2004) for discussion and simulations on the effect of income inequality on aggregate consumption in the USA.

affected investment and where inequality has greatly increased, domestic demand should be growing relatively slowly[6] and a tendency towards net-exports as the driver for growth should be apparent. Examples of such countries are China, Germany, Japan, or Sweden. However, sustaining this 'strategy' of export-led growth meant that these countries had to accumulate large current account surpluses and positive international investment positions. The financing of the counterpart deficits and debts was enabled by another feature linked to the era of financialisation: liberalised and deregulated international capital markets and open capital accounts. Finally, financialisation has provided alternative ways to generate growth for some countries. The liberalisation and deregulation of national financial systems in the era of financialisation allowed some countries to generate demand via debt-financed consumption by households (and partly by debt-financed investment of firms). Countries where such a constellation occurred and which grew dynamically before the crisis were, for example, the USA, the UK, Ireland, Spain, and also Estonia. In the literature a range of explanations are put forward, why in some countries debt driven expansions occurred but not in others.[7] In principle two preconditions must be met for the occurrence of this debt-led private-demand boom type of development. On the one hand, households must have reason to increase their consumption to such a level that they need to borrow. On the other hand, credit supply must be sufficient. If either of these two factors is absent a debt-led expansion driven by private demand will not occur. In line with this, the arguments brought forward in the literature can be analytically divided into two groups; those focusing on the increasing availability of credit, assuming that this was the limiting factor holding back existing consumption demand by households, and those stressing the reasons why households increased their consumption demand, assuming that credit was sufficiently available.[8]

[6] This has to be seen in relation to a country's potential, which is affected by its state of development. While for Germany growth rates of 3-4 percent would be seen as a growth spurt, for China this level of growth would be catastrophically low.

[7] There are other countries, where either inequality was kept in check and/or fiscal policies have filled the aggregate demand gap. Those have been termed domestic demand regimes. However, for the moment we will focus only on those cases that were most relevant for the creation of international imbalances.

[8] As for example in Dutt (2004), who assumes in his model that any expansion of credit supply is willingly absorbed by households.

One of the main supply side explanations for whether a country will tend towards debt-led expansion (like the USA) or a slowdown of activity (like China or Germany) in the face of increasing inequality is found in the degree of development, regulation, and liberalisation of the financial system, which determine the availability of credit for households (Belabed et al. 2013, Kumhof et al. 2012, Cardaci & Saraceno 2015). Here the argument is that in some countries access to consumer credit (in particular, access of low income households) is restricted while in other countries access to credit is relatively easy. Differences in credit access among countries or within one country over time are related to different levels of development of the financial system (Kumhof et al. 2012) or the degree of deregulation and liberalisation (Dutt 2005, Belabed et al. 2013). Others relate the credit expansion to deliberate government policies to alleviate the effects of increasing inequality (Rajan 2010) or see it as the outcome of a bad incentive structure in the financial system or regulatory failure (Stiglitz 2010).

Another supply side argument is related to asset price increases observed in many of the debt-led private-demand boom countries. The argument here is twofold. On the one hand, increasing asset prices increase the collateral households can offer banks to secure loans and so lift credit constraints. On the other hand, when prices for assets held by banks increase, this increases banks' regulatory capital and so allows them to extend additional loans (Bhaduri et al. 2006). Finally, Cynamon & Fazzari (2008) argue that the debt norms of households have changed. While in the past it was common to take out a loan to buy a house or some consumer durables (e.g. a car), it has become much more acceptable to debt finance far less needed commodities and services (e.g. a holiday). The social stigma associated with debt has decreased over time. This could be interpreted in the light of Minsky's (1986) argument for a decrease in debtors' subjective risk in tranquil times (such as the so called 'great moderation').

While these factors can explain why credit was more easily accessible in some countries than in others and why credit supply may change over time – either through an objective increase in the willingness and ability of the financial sector to supply credit or due to a reduction in the self-imposed prudence of households – the reasons why households increased their consumption demands relative to income (forcing them to rely on debt) is not explained by these factors. Explanations provided by the recent literature are often based on relative consumption concerns, emulation

effects, and conspicuous consumption. It is argued that households' own consumption aspirations are partially oriented towards the consumption of a reference group, often the group just above themselves in the income distribution. The strength of these emulations or 'keeping up with the Joneses' effects depend on the institutional setting within a country (labour market structure, access to public services, schooling, etc.). Depending on whether those effects are strong (as in the US) or not (as in Germany) an increase in personal income inequality will either have expansionary effects – because the increased savings of the higher income households are overcompensated by a decrease in the savings of the lower-income households – or lead to a slow-down in demand growth (Duesenberry 1949, Frank 2007, Frank et al. 2014). An alternative argument for the increasing propensity to consume of households is brought forward by Pollin (1988), who argues that there was, what he terms, a 'necessitous demand for credit'. It is assumed that households want to reach a certain level of consumption and if their income declines they would rather lower their savings or go into debt than decrease consumption. For low income households and generally for low income countries this level can be assumed to be determined by a subsistence level of consumption, which can be socioeconomic or existential. More generally, and also relevant for households further up the income distribution, it can be determined by habit persistence. This means that households are reluctant to consume less than a previously experienced level of consumption. According to Barba & Pivetti (2009), the existence of such an acquired standard of living was already recognized by classical economist as 'customary necessities'. Only declines in real wages persisting over longer periods of time will change those 'customary necessities' slowly downwards. Again, the effects of increases in income inequality depend on the country specific strength of these effects, which in turn may be influenced by national institutions (e.g. welfare state provisions) (Duesenberry 1949, Frank 2007, Frank et al. 2014). Finally, some authors relate the increases in consumption in some countries to asset price increases. Here the argument is that increased asset prices have increased households notional wealth compared to income, households feel richer and so consumption out of wealth increases (Bhaduri et al. 2006, Dutt 2006).

3 Literature review

Very few models have dealt with both inequality and debt while simultaneously considering open economy issues. To our knowledge, there are two recent formal models that address these issues in an open economy framework; Kumhof et al. (2012) and Belabed et al. (2013). However, there does exist a range of models which address only parts of these issues.

Belabed et al. (2013) construct a three-country SFC model, calibrated for China, Germany, and the USA, examining the effect of increasing inequality on current account balances. Their focus is on consumption emulation, where its relative strength in each country depends on the respective institutional structure. In addition, they consider credit supply side constraints as related to regulation and financial system development, represented by a maximum leverage ratio for households. They find that a large part of the observed debt increases and current account deficits in the USA can be explained by increasing personal income inequality (in particular top end inequality) interacting with institutions which incentivise upward looking consumption emulation and allow for relatively easy access to credit. In contrast, they find that the weak domestic demand and increasing current account surpluses of China and Germany can be explained by a shift in functional income distribution away from the household sector with no compensation by credit-financed consumption.

Kumhof et al. (2012) build an open economy DSGE model in which they address the issue of inequality. In their model, higher inequality in countries with developed financial systems leads to stronger growth in the short run, but also to rising debt balances for workers. These debts are financed by domestic high income households and foreign investors and lead to a deterioration of the current account balance. The effects are stronger with more liberalised financial markets. In an emerging markets scenario, where workers cannot borrow due to a lack of financial intermediation, increasing inequality leads to current account surpluses instead.

Formal models looking at the relations between increasing inequality and debt and its macroeconomic implications are for example: Palley (1994), Dutt (2006), Zezza (2008), Lavoie (2008), Kumhof & Ranciere (2010), Hein (2012a), Kapeller & Schütz (2012), Kim et al. (2014). The stock-flow consistent agent based model of Cardaci & Saraceno (2015) also considers these relationships. However, they are all closed economy models and ignore the international implications.

Palley (1994) is concerned with the effect on macroeconomic dynamics. He incorporates lending in his model and assumes higher propensities to consume of debtor compared to creditor households. In a first version of his model he includes a fixed loan ceiling given by the debt income ratio of the debtors. In this model it is shown how borrowing initially leads to an expansion of aggregate demand and output, but this expansion is subsequently reversed due to the debt service burden. This mechanism is able to generate cycles in a simple multiplier accelerator model. In an extension to the model he introduces some Minskian features by letting the loan ceiling rise in times of economic expansion and decline in times of contraction, which increases the risk of cyclical instability. These theoretical considerations are supported by empirical evidence presented in the final part of his paper.

Dutt (2006) presents the issue of consumer borrowing and debt in a Steindlian distribution and growth model with mark-up pricing, endogenous capacity utilisation, and demand-determined growth. He finds that in the short run consumer borrowing has an expansionary effect and even reduces inequality due to its effect on employment, however, in the longer run due to the build-up of a debt stock and the increasing debt burden the effect becomes ambiguous.

Zezza (2008) attempts in his closed economy SFC model to address the puzzle of falling savings rates in the US, where distributional changes would suggest the opposite. A higher share of income going towards high income households (which he equates in his model with rentier households) should in theory lead to higher savings rates, not falling savings rates. In his model the household sector is split into the top (5%) income earners and the bottom (95%) earners. He adds an equity market and a housing market and shows that an increase in expected housing prices may lead to a price bubble spurring output by consumption out of wealth and increasing residential investment. While in the short run this leads to a drop in the aggregate savings rate, increased income accruing to workers actually leads to a drop in indebtedness in his chosen parameter set. A second exercise he performs is to include an emulation effect in the model, so that there is upward looking consumption. Here increases in workers consumption lead to a demand-led expansion, a decrease of the overall savings rate, and also an increase in debt of the worker households.

Lavoie (2008) includes household debt in a closed economy SFC model, assuming that households do not only consume out of wealth and current disposable income, but also out of the net addition to their stock of loans. The gross amount of new

personal loans is assumed to be a fraction of households' income, which depends negatively on the real interest rate. This can be interpreted as both, a prudence measure of the banking sector or a self-imposed limit of the household sector. However, the so defined amount of loans is always supplied by the banking sector. He also discusses distributional issues. When he assumes that firms want to finance investment with more internal funds and increase their mark-up (leading to a higher profit share) consumption and GDP drop, staying below the baseline scenario also in the long run. This effect is not linked to an assumed difference in propensities to consume out of wages and profits, but rather by the occurring conflicting claims inflation, which makes the fiscal stance in the model more restrictive. If higher dividend demands are the reasons for the increase in the mark-up, an initially expansionary effect occurs (however this vanishes in the long run for the same reason). Finally, Lavoie discusses the effect of higher consumption lending to households. By increasing the gross-value of new loans to personal income ratio he obtains an initially expansionary effect. However, in the longer run a new steady state is approached where consumption and output are below the baseline values. This is due to the higher interest burden households have to pay on their new higher debt stock.

Kumhof & Ranciere (2010) address the issue of inequality and debt in a general equilibrium model. Their household sector is divided, as in Zezza (2008), into the top 5 percent of earners, receiving all their income from profits and interest, and the bottom 95 percent, representing worker households. They introduce a subsistence consumption, which causes households to resist large drops in consumption. After a shock to workers' bargaining power, which redistributes income towards the top income earners, lower-income households increase their borrowing to sustain their consumption, building up higher debt levels. The higher leverage in turn increases the risk of a financial crisis. The occurrence of a financial crisis can help to improve the situation if it reduces leverage substantially, while the impact on real economic activity is small. However, in the framework of Kumhof & Ranciere, the best way to lower the risk of crises after leverage has been built up is to restore workers bargaining power and reduce inequality.

Hein (2012a) uses a simple Kaleckian distribution and growth model with workers, rentiers and firms. Consumption of workers is determined by wages, net additions to debt and the interest paid on the stock of debt. The net-increase in debt is

determined by the provision of additional loans by rentiers. Within this framework Hein analyses the effects of financialisation, focusing on the role of debt for growth and for the stability of the system. In the short run, where workers' debt-to-capital ratio is exogenous, he obtains that an increase in the provision of loans is expansionary, while increases in the interest rate or an increase in the debt-to-capital ratio will lower capacity utilization and capital accumulation. Finally, looking at distribution, he finds that an increasing profit share will have a contractionary effect. For the long run, where he takes the debt-to-capital ratio of workers as endogenous, he obtains two equilibrium values for workers' debt to capital ratio. Only the lower one is stable and the system converges to the lower value as long as the upper value is not exceeded, so that a corridor of stability exists. He finds that in the long run lower animal spirits, a higher profit share and also a higher rate of interest or a higher rentiers' propensity to save all affect the equilibrium capacity utilisation and capital accumulation negatively. The effect of higher lending by rentiers to workers in the long run can be debt-led, so that increased lending leads to higher utilization and accumulation rates, but can also be debt-burdened, where increased lending has the opposite effect in the long run. Which regime prevails depends on the interest rate on debt and the profit rate. If the former is lower than the latter, the debt-led regime occurs, if it is the other way around the debt-burdened regime will prevails. However, as soon as the debt-to-capital ratio exceeds the upper value of the stability corridor the system will collapse. The corridor of stability is enlarged by higher animal spirits, lower interest rates and a higher profit share.

Kim et al. (2014) are concerned with the establishment of consumption norms and the relevance of how debtors treat their debt services. They establish a consumption target which depends on past consumption, emulation of rentiers' consumption, and expected income. If consumption out of income is lower than this consumption target, they will borrow a fraction of the difference. However, the dynamics of the system crucially depend on whether households see debt servicing as a strict substitute for saving or not. If they do, then the authors find that borrowing will boost consumption, without a corresponding drag on consumption (due to the debt stock build up) until a certain point is reached, where debt service exceeds savings out of current income. Here, a sudden negative influence will be exerted. Differently, if debt service and savings are not seen as a substitute, debt still boosts consumption, but the negative influence of debt occurs immediately. Looking at these outcomes from a financial

stability point of view, they conclude that with the former formulation the system is more likely to tend towards financial fragility and sudden stops. Within their model they also look at the effects of increasing inequality, finding an increase in output, independent of the exact formulation of their consumption function.

Kapeller & Schütz (2014) address the issue of higher inequality within a SFC framework. They divide the household sector into low and high wage workers and into a capitalist class. They then introduce relative consumption concerns among the working class households. In their closed private sector economy they assume a gradual decrease in the profit share, which comes solely at the expense of the low-wage workers. In their first scenario, where they assume that workers are not affected by relative consumption concerns, a contractionary effect on the economy is produced, since saving out of profits is higher than saving out of wages. When they assume relative consumption concerns are present and of high importance in the determination of low-wage workers consumption, the same redistribution experiment leads to higher output. However, this comes at the price of increasing low-wage workers' debt to unsustainable levels and is only possible due to the assumption that banks supply all demanded loans. In a further scenario, they assume a banking sector inspired by Minsky where banks supply loans in line with perceived workers ability to service them. The model then produces more or less large phases of expansion, compression, panic, and consolidation, depending on the prudence of the banks. With very cautious behaviour of the banks, the scenario gets close to the contractionary scenario without relative consumption concerns.

Cardaci & Saraceno (2015) build a SFC model with an agent based household sector. In their household sector, households consume according to their own income and emulate the consumption of the households just above them in the income distribution. They have access to credit, which banks however ration according to the overall debt to GDP ratio and households individual financial soundness. They look at two different scenarios; one where access to credit is easy and the other where access is restricted to a low level. If they increase personal income inequality in both, they find for the scenario with little access to credit that the economy enters a recession. In contrast, in the scenario with high access to credit, the redistribution of income leads to an initial expansion. However, when debt becomes too high, banks restrict access to credit and GDP declines slowly and even falls below the baseline level.

As mentioned above, almost all presented models examine the relation between inequality, debt, and macroeconomic growth within a closed economy framework, with the exception of Belabed et al. (2013) and Kumhof et al. (2012). Only Belabed et al. (2013) present their examination within a stock flow consistent model. While they model every decile of the household sector for each country, the other sectors of their economies are lumped together into one sector. Depending on the respective emphasis, the other models are richer in institutional detail, but they neglect the international dimension. The model presented here will add to the literature by taking into account the international dimension – by adding an additional sector representing the rest of the world. This is less detailed than in Belabed et al. (2013) but allows us to give more emphasis on the national sectoral relations. This enables us to look at different effects of financialisation in more detail and also examine policy changes in a single coherent framework.

4 Model Structure[9]

In this section we will introduce our basic model set-up. We will employ the method of stock-flow consistent accounting advanced by Lavoie & Godley (2002) and Godley & Lavoie (2007).[10] The model will be able to display personal and functional income distribution in a stylised way. Within this model, incorporating the insights of the previous discussion on consumption behaviour by households and the importance of credit availability, we will show how increasing inequality has supported the occurrence of debt-led private-demand and export-led mercantilist regimes. As discussed above, there are a variety of reasons which may be more or less relevant for different countries having prevented or supported the occurrence of either regime. From these different explanations, on the demand side we will focus on relative consumption concerns and model household consumption behaviour along these lines. We will also consider the effects of credit supply side constraints, which in principle can be interpreted as a constraint imposed by prudence considerations of the banking sector, by regulation, or by the household sector as a self-imposed

[9] The entire set of model equations can be found in Appendix 1. Within this section we will try to keep the amount of equations to a minimum. Also a full list of all variables can be found there.

[10] For a structured overview of the SFC literature as well as an introduction in the main issues surrounding it see Caverzasi & Godin (2015).

conventional constraint. While asset price bubbles play an important role, in particular as an explanation for the US-crisis, their role will not be explored within this paper.

4.1 Balance sheet and transaction flow matrices

Our model economy contains a firm sector, a banking sector, the government, a household sector, and an external sector. Similar to Kapeller & Schütz (2014), the household sector is split into three parts to explicitly allow us to model the effects of changes in the income distribution: a rentier sector, where we have the main wealth holders and profit recipients, and two worker household sectors. Worker 1 households are assumed to be the lower-wage workers, while worker 2 households receive relatively higher wages. This allows us to model separately wage distribution and functional income distribution. To show the effects of domestic developments on the current account we add a simple external sector which represents the rest of the world (RoW). We abstained from introducing a central bank. Therefore, there is only private bank money in the form of deposits.

The balance sheet of the economy is shown in table 1. The only asset worker households hold are bank deposits. If they run down their deposits and become net debtors they can draw on loans from the banking sector. The rentier sector can choose among bank deposits and equities issued by firms. Firms can finance their assets by issuing equity and by drawing on bank loans. Their main asset is their capital stock, but should they repay all their loans, they will accumulate a financial surplus in the form of deposits held with the banking sector. If the government sector runs a deficit it finances it fully by bank loans. Should a situation occur where the government becomes a net lender it would accumulate deposits. The financial relations to the rest of the world are all mediated through the banking sector. If the domestic economy runs a current account surplus the banking sector provides loans to the external sector in order to finance the foreign current account deficit. If the domestic economy runs a deficit the foreign sector will accumulate deposits with the domestic banking sector.[11] The banking sector has deposits from all sectors as its liabilities and loans as its assets, which have to be equal so that banks' net-worth is always zero.

In table 2 the transaction flow matrix is displayed. Workers' income is comprised of wage income and the interest received on deposits. They pay interest on loans and

[11] This could also be seen as the intermediation through the TARGET system.

taxes to the government and spend on consumption. Rentiers receive interest on deposits and dividends on equities. They pay taxes on this income to the government and spend on consumption. The firms produce investment goods sold to the firm sector, consumption goods sold to households and the government, and export goods sold to the foreign sector. The firm sector buys import goods in order to sell them to the other sectors. Gross profits are total production minus the wage bill. From this firms pay taxes and set aside depreciation allowances. They pay interest on loans and receive interest if they hold deposits. Net profits are partially paid out to rentiers and partially retained. Retained profits, together with depreciation allowances, loans, and newly issued equities are used to finance gross investments.[12] Banks receive interest on loans and pay interest on deposits. We assume that interest on both loans and deposits are equal and therefore the banking sector will not accumulate any profits. Turning our attention to the government, it receives taxes from households and firms, and spends on government consumption. It pays interest on its bank loans and may receive interest on deposits. The foreign sector demands export goods from and sells import goods to the firm sector. It receives interest on deposits and pays interest on loans.

[12] If the firm sector runs a sustained surplus and pays down all loans, it may also accumulate deposits.

Table 1: Balance Sheet Matrix

Balance Sheet Matrix

	Worker 1	Worker 2	Rentiers	Firms	Banks	Government	RoW	Sum
Deposits	$+D_{W1}$	$+D_{W2}$	$+D_{R}$	$+D_{F}$	$-D$	$+D_{Gov}$	$+D_{RoW}$	0
Loans	$-L_{W1}$	$-L_{W2}$		$-L_{F}$	$+L$	$-L_{Gov}$	$-L_{RoW}$	0
Equities			$+E_{h,R} * p_{E}$	$-E_{s,F} * p_{E}$				0
Fixed Capital				$+K$				$+K$
Net worth	$-V_{W1}$	$-V_{W2}$	$-V_{R}$	$-V_{F}$	0	$-V_{Gov}$	$-V_{RoW}$	$-K$
Sum	0	0	0	0	0	0	0	0

Table 2: Transaction Flow Matrix

Transaction Flow Matrix									
	Worker 1	Worker 2	Rentiers	Firms		Banks	Government	RoW	Sum
				current	capital				
Consumption	$-C_{W1}$	$-C_{W2}$	$-C_R$	+C					0
Investment				+I	-I				0
Government consumption				+G			-G		0
Exports				+Ex				-Ex	0
Imports				-Im				+Im	0
WB	$+w_{W1} * N_{W1}$	$+w_{W2} * N_{W2}$		-WB					0
Depreciation Allowance				-DA	+DA				
Taxes	$-T_{W1}$	$-T_{W2}$	$-T_R$	$-T_F$			+T		0
Entrepreneural Profits			$+ PD_F$	$- P_F$	$+ PU_F$				0
Interest on loans	$-r_L(-1)*L_{W1}(-1)$	$-r_L(-1)*L_{W2}(-1)$		$-r_L(-1)*L_F(-1)$		$+r_L(-1)*L(-1)$	$-r_L(-1)*L_{Gov}(-1)$	$-r_L(-1)*L_{RoW}(-1)$	0
Interest on deposits	$+r_D(-1)*D_{W1}(-1)$	$+r_D(-1)*D_{W2}(-1)$	$+r_D(-1)*D_R(-1)$	$+r_D(-1)*D_F(-1)$		$-r_D(-1)*D(-1)$	$+r_D(-1)*D_{Gov}(-1)$	$+r_D(-1)*D_{RoW}(-1)$	0
*Sum	Sav_{W1}	Sav_{W2}	Sav_R	0	Sav_F	0	Sav_{Gov}	$Sav_{RoW} = (-CA)$	
Changes in Stocks									
Loans	$+\Delta L_{W1}$	$+\Delta L_{W2}$			$+\Delta L_F$	$+\Delta L$	$+\Delta L_F$	$+\Delta L_{RoW}$	0
Deposits	$-\Delta D_{W1}$	$-\Delta D_{W2}$	$-\Delta D_R$		$-\Delta D_F$	$+\Delta D$	$-\Delta D_G$	$-\Delta D_{RoW}$	0
Equities			$-\Delta E_{h,R}*p_E$		$+\Delta E_{s,F}*p_E$				0
Sum	0	0	0	0	0	0	0	0	0

4.2 Behavioural equations

4.2.1 Distribution, employment and production

The proposed model is demand constrained and firms produce and sell on demand so that there are no inventories. Total production is therefore given as the sum of total consumption demand, investment demand, government demand, and export demand minus the part of demand that is covered by imports. With fixed labour productivity, the production level determines total employment. Firms hire labour power from type 1 and type 2 worker households. We assume for simplicity that the production process necessitates equal amounts of both workers, so that an increase in employment benefits both types equally. Also we assume that there is no constraint on the supply of labour (Equations 1 – 4).

As in the model by Dos Santos and Zezza (2008) we assume a constant capital potential output ratio, fixed labour productivity and fixed prices. Functional income distribution is set exogenously and assumed to be determined by institutional factors such as the power of labour unions, competition in the goods market, power and dividend/interest aspirations of rentiers, etc. – variables exogenous to the model. The total wage bill is determined by the wage share and total production. Dividing the wage bill by total employment provides the average wage. The distribution of the total wage bill within the working class is set exogenously. The better earning worker 2 households receive a multiple of the average wage, the wage of worker 1 households is then determined as residual (Equations 5 – 9).

4.2.2 The firm sector

The firms' capital stock in the current period is given by the previous period's capital stock plus gross investment minus the depreciation of the capital stock, which equals the depreciation allowances of firms. Each period a constant fraction of the capital stock of the previous period is retired. The rate at which firms want to let the capital stock grow (the accumulation rate) is oriented along the lines of the post-Kaleckian investment function introduced by Bhaduri & Marglin (1990) or Kurz (1990). This means we assume that the utilisation rate is adjusting endogenously.

$$gr_K = \beta_1 + \beta_2 * u(-1) + \beta_3 * PS(-1) - \beta_4 * r_L(-1) + \beta_5 * (PU_F(-1) + DA(-1))/K(-1)$$

Accumulation is positively affected by firms' animal spirits. Additionally, the previous period's utilisation rate (which can be seen as a proxy for future expected utilisation and sales) and the profit share (which gives the profits per unit of production) affect investment

positively, because both increase the expected profit rate. In addition to these factors, we add the cash flow rate, which is given by retained earnings plus the depreciation allowances, which firms have built, normalised by the capital stock. The cash flow rate positively affects the ability of firms to finance investment internally. This is important for the overall ability of firms to invest, when acting in incomplete credit markets with asymmetric information (Kalecki 1937) and can be seen as the internal means of finance channel (Hein 2010, Hein & van Treeck 2010). Therefore, higher dividend payments, e.g. a lower retention rate, have a negative impact on investment through this channel. The interest rate has a dual negative impact, directly and indirectly. The indirect effect is, as with dividend payments, via the cash flow variable which will be lower when interest payments increase. The direct effect is that higher interest payment commitments, when the interest rate rises, lower firms' credit worthiness and increases the risk of insolvency, so that entrepreneurs may be more reluctant to start new investment projects. Also banks are more reluctant to grant additional credit (Lavoie & Godley 2001, 2002, Minsky 1975, 1982, 1986) (Equations 10 – 16).

Firms' gross profits are determined as total production times the profit share. Firms pay a fraction of their positive profits after depreciation and interest payments as taxes. What is left after net interest payments, taxes, and depreciation allowances are firms' net profits. An exogenously determined fraction of these profits is retained[13] and the rest is distributed to the rentiers (Equations 17 – 23).

Firms need to finance their investment. For the share that is not covered by retained profits and depreciation allowances they need to raise external finance. They plan to raise a certain fraction of this external finance demand by selling new shares to the public. They decide upon the number of shares they plan to sell in the market based on the previous period's price. Actual revenues received from the public offering are however determined by the current period's price (which is determined according to the rentiers' portfolio decision). The residual finance demand is covered by bank loans or by drawing on existing deposits (Equations 24 – 32).

[13] A feature of financialisation commonly found in the literature is that due to the increased power of rentiers, they have managed to increase the overall profit pay-out by firms via higher dividends and share buy-backs. In further experiments, this could be simulated by decreasing the retention rate.

4.2.3 The household sector

For the consumption function of high wage workers (type 2) and rentiers we follow the standard formulation in Godley & Lavoie (2007) so that consumption is determined by households' previous period's income (and therefore increases with accumulated wealth).

$$C_{W2} = pc_{Yd,W2} * Yd_{W2}(-1) + pc_{V,W2} * V_{W2}(-1)$$

$$C_R = pc_{Yd,R} * Yd_R(-1) + pc_{V,R} * V_R(-1)$$

For worker 1 households' consumption we deviate from this standard formulation and add an emulation term. Inspired by Veblen's (1899) concept of conspicuous consumption and Duesenberry's (1949) relative income hypothesis, low income workers' consumption is positively influenced by the consumption of high wage workers. As do Kapeller & Schütz (2014), we also assume that relative consumption concerns are more relevant among worker households (that share a common social identity), while the rentier class (representing a distant group) has no influence.[14],[15] The desired consumption of worker 1 households is then determined by their income, their wealth, and the consumption of worker 2 households, which they try to emulate. The relative importance of the emulation among workers is determined by different factors and given exogenously.[16]

If their consumption aspirations are below their income, workers' actual consumption will be equal to their desired consumption. If workers income is lower than their consumption aspirations, they can take out loans. In the baseline cases banks grant all loans demanded, so that actual consumption will always equal desired consumption.

However, in line with the argument that a restriction of credit supply can prevent the occurrence of a debt-led private-demand regime, we impose in the financial constraint scenario a limit to credit supply. The amount of consumption workers can finance by debt will be restricted based on households' debt to income ratio and an exogenously given prudential ratio. The lower this prudential ratio the lower the acceptable debt to income

[14] Empirical evidence for this type of aggregate consumption function is provided by Kim et al. (2015) for US-households.

[15] This assumption is in line with the argument by Frank (2007) that consumption behaviour is most heavily influence by reference groups close to one in rank, time and space and that very distant reference groups are of less relevance. For example, the spacious mansions and huge cars of the super-rich influence a middle class worker's consumption behaviour much less than the new car of its neighbour or co-worker.

[16] Our consumption function is oriented along the same lines as the consumption function found in Belabed et al. 2013. For the discussion of this consumption emulation effect in the literature see for example Duesenberry (1949), Frank (2007), and Frank et al. (2014).

ratio. In line with the arguments presented above, it can be interpreted either as a self-imposed convention by workers (as proposed by Pollin 1988 or Cynamon & Fazzari 2008), as a constraint imposed by banks own prudence or financial regulation, or as a measure of financial sector development.

$$c_{d,W1} = (1\text{-imit}) * pc_{Yd,W1} * Yd_{W1}(-1) + imit * C_{W2} + pc_{V,W1} * D_{W1}$$

Consumption function for the baseline scenarios

$$C_{W1} = c_{d,W1}$$

Consumption function for the financial constraint scenario

$$C_{W1} = z_{99} * c_{d,W1} + z_{100} * (c_{d,W1} - (c_{d,W1} - Yd_{W1}(-1)) * L_{W1}(-1)/Yd_{W1}(-1)/PrudRat)$$

$$z_{99} = 1, \text{ if } c_{d,W1} < Yd_{W1}; \text{ else } 0$$

$$z_{100} = 1, \text{ if } c_{d,W1} > Yd_{W1}; \text{ else } 0$$

If consumption is below income, households accumulate wealth. Both worker households will only hold deposits as savings. Rentiers make a portfolio choice between holding firms' equity and deposits. The portfolio composition of expected wealth is determined by the relative rate of returns along the principles proposed in Godley & Lavoie (2007)[17]. In addition rentiers want to hold a certain amount of deposits for transaction purposes. Since it is the only sector holding equities they have to hold all shares issued by the firm sector. Given this constraint, the price of equity is the adjusting variable. Deposits form the buffer stock if rentiers' expectations are not met. The actual wealth of rentiers is then determined by their savings and capital gains or losses due to price changes of equities (Equations 33 – 67).

4.2.4 The government sector

Government income consists of tax income received from households and firms. Government consumption expenditure is growing at a rate that follows the overall growth of the economy, but is adjusted to reach a deficit target (we assume for the baseline case a 3 percent deficit in line with the EU stability and growth pact). The deficit is defined as government consumption minus tax receipts minus net interest payments (Equations 68 –

[17] These imply a range of adding up constraints, which ensure consistency of the chosen parameters for the portfolio decision of households. For an overview of those see Godley & Lavoie (2007, 141 - 146).

76). Therefore, the government sector is largely passive and does not play a stabilising role but focuses on reaching its deficit target.

4.2.5 The banking sector

Banks are the counterparts for all loans and deposits in the economy. They are also the financial link to the rest of the world. Banks supply loans on demand (with the exception to worker 1 households, when we impose a financial constraint) and are willing to accept any amount of deposits. They receive interest on loans and pay interest on deposits. We assume that interest rates on loans and deposits both equal the policy rate, so that there will be no profits in the banking sector. Therefore, banks represent more of an accounting vehicle in this model and have no own relevant behavioural equations (Equations 77 – 80).

4.2.6 The rest of the world

While many open economy SFC models are developed as multiple country models, where the whole sectoral structure of each economy is itself explicitly modelled (see for example Belabed et al. 2013, Bortz 2014, Godley & Lavoie 2007, Mazier & Tiou-Tagba Aliti 2012, Lavoie & Zhao 2010), we use a simpler framework and the rest of the world is added as another sector to our model economy, as for example done by Godley & Lavoie (2012) or Meijers et al. (2013). We assume that this external sector grows at an exogenously given rate and that our domestic economy's exports grow at the same rate. Imports from the rest of the world are determined as a share of domestic production. As Godley & Lavoie (2012) or Meijers et al. (2013) we do not discuss terms of trade and exchange rate issues. This can partially be justified by the fact that we assume our economy to be part of the Euro area. Additionally, even though countries will still be affected by the external exchange rate of the euro, the effects on the exchange rate from actions of our economy are assumed to be negligible, making this factor also exogenous to our model. In addition, with fixed prices we have also abstained, somewhat unrealistically, from allowing for internal devaluation via differential inflation rates. The current account is determined by the balance on the trade account and net interest payments to/from the RoW. The banking sector intermediates the external financial relations by taking deposits from and granting loans to the RoW. At least in the Euro area this happens automatically through the TARGET system. The growth of

the economy in the steady state is driven by the exogenously given growth of exports, which we set at 3.5 percent (Equations 81 – 89).[18]

5 Modelling strategy and the baseline scenarios

As mentioned earlier, while in almost all countries examined in the FESSUD project there has been an increase in personal income inequality and a shift towards profits, the outcome on a macroeconomic level has differed from country to country. Some countries ended up with meagre growth and substantial current account surpluses (export-led mercantilist economies in our classification), while others have experienced higher growth, increasing debt levels, and current account deficits (debt-led private-demand economies). While there are many factors influencing the macroeconomic performance of countries, we attempt to show that increasing inequality can have different effects depending on the specific institutional setting of a country and the form which inequality takes. Although the country studies of work package 3[19] have found a range of important features and phenomena influencing the respective macroeconomic developments, we chose to focus on the emulation effect, a phenomenon directly related to inequality. Other important findings which could be modelled and examined in further research are, for example, the existence of a socio-economic minimum consumption level which persisted despite lower incomes and which had led to increasing household debt levels (see for example the FESSUD country study on Estonia (Kattel & Juuse 2014), or the role of asset price bubbles (as in the case of Spain (Ferreiro et al. 2014)). Both could add in particular to the understanding of the mechanisms behind the debt-led private-demand boom type of development.

As a modelling strategy we created two baseline scenarios of two very similar stylised economies with the same set of parameters except for the emulation term: we will start with Baseline scenario 1, which represents an economy with an institutional structure that minimises the emulation effect (we set emulation to zero so that low-wage workers'

[18] This roughly equals the average world growth rate in the 2000s before the financial and economic crisis.

[19] See FESSUD studies 18 – 34, i.e. Badics and Szikszai (2015) on Hungary, Bahçe et al. (2015) on Turkey, Bezemer and Muysken (2015) on the Netherlands, Cornilleau and Creel, J. (2014) on France, Detzer and Hein (2014) on Germany, Dymarski (2015) on Poland, Evans (2015) on the USA, Ferreiro, Galvez and Gonzalez (2014) on Spain, Gabbi, Ticci and Vozella (2014) on Italy, Guðmundsson (2015) on Iceland, Juuse and Kattel (2014) on Estonia, Lagoa et al. (2014) on Portugal, Lepper et al. (2015) on the UK, Newman (2014) on South Africa, Shabani and Toporowski (2015) on Japan, Stenfors (2014) on Sweden, and Varoufakis and Tserkezis (2014) on Greece. The studies are available at http://fessud.eu/studies-in-financial-systems/

consumption is only influenced by their own income and wealth). Using the same starting values to minimise effects of path dependency, we created our baseline 2 scenario representing a country with an institutional structure allowing for high emulation effects (we set emulation to 0.5 so that low-wage workers' consumption is strongly influenced by observed consumption of high wage workers). There are various factors proposed which determine the relative importance of emulation for consumption in a country. Belabed et al. (2013) for example argue that consumption in all countries is to a certain degree affected by upwards comparison. However, this effect is weakened by country specific factors. The strength of this emulation effect is influenced by country specific institutional factors such as flexibility of labour markets, availability and quality of public infrastructure, etc. The more universal, good quality services a state offers, the lower the influence of the emulation effect on consumption should be. For example, if high quality public schools can be found throughout a country, the necessity to pay high fees for private schools or to move to certain areas where the public schools are regarded as of higher quality is less relevant. According to Frank (2007), certain regulations and also how public services (e.g. kindergarten vouchers or free public kindergartens) are provided encourages or discourages emulative behaviour and the focus on positional goods. Belabed et al. (2013) calculate the effects of differences in labor market arrangements and public infrastructure (health care, schooling, transfers, etc.). According to their calculation the difference of 0.5, which is the difference in emulation between our baseline 1 and 2 cases, would approximately reflect the difference in emulation between the USA and Germany. After having found a steady state for both economies, we conducted within both economies the same experiments and then compared the deviation from the baseline. For the interpretation of the results in the following scenario analyses it is important to distinguish between the 'short to medium' run transition effects (being predominantly described and displayed in the figures) where growth rates differ, and the steady-state results in which the economies always return to the exogenously given growth rate determined by the growth of exports. However, the level of the long-run steady-state growth path, the composition of demand components, and also the financial positions may change substantially due to the shocks.

5.1 Starting values and parameters

The chosen parameters and starting values can be found in Appendix 2. We chose the parameters to produce plausible values[20] for our baseline scenario in terms of shares in GDP, utilisation rates, and saving/lending relationships. In addition we oriented the values along typical stylised facts (e.g. higher propensities to save for high income earners) and of values chosen in other stock-flow consistent models of a similar structure. In addition we wanted our baseline scenario to recreate some well-known features established in the Post-Keynesian literature, such as the paradox of thrift and the paradox of costs. Regarding the distribution of the wage bill we start with a very low degree of inequality[21], while for functional income distribution on the firm level 60 percent goes to wages and 40 percent to profits.

5.2 The baseline scenario with and without emulation

We created two baseline cases, which only differ with respect to the strength of the emulation effect: one scenario where we assume no emulation effect (Baseline 1 in the following) and one scenario with an emulation effect of 0.5 (Baseline 2 in the following). We present the steady-state values for the baseline 1 scenario (without emulation effects) in table 3. The steady-state growth rates of GDP and its demand components and of the capital stock all converge to 3.5 percent, in line with the exogenously given growth of exports. The utilisation rate converges to 68.39 percent. The economy has a low trade surplus of 0.7 percent. Regarding the financial balances the household sector and also its three subsectors are in surplus. The firms, the government sector, and the RoW are net financial debtors.

[20] The values do not correspond to the values found in any particular country, but are close to what can be found in a typical western industrialised country. The shares in GDP would roughly fit the values found for the Euro area in the year 2000. However, the share of consumption is slightly too low and investment and government expenditure are too high.

Also, with the very low degree of inequality, both baseline cases do not clearly exhibit features of the export-led mercantilist or the debt-led private-demand types of development. The developments will only show if we allow inequality to increase.

[21] For the baseline scenario we fixed the average wage at 0.6. The upper 50 percent of the working class earn 10% above the average wage (0.66), while the lower 50 percent of the workers earn 10 percent below the average wage (0.54).

To create the baseline 2 scenario we increased the emulation factor to 0.5, while all other parameters remained unchanged. We compare the steady-state values of baseline 1 and baseline 2 in table 3. When comparing the figures the focus should be on the qualitative change and less on the quantitative size of the effect. Compared to baseline 1 the steady-state GDP level is higher in the baseline 2 scenario. This is due to the increased consumption of worker 1 households, which now try to mimic the higher consumption level of worker 2 households. The new steady state is characterised by a higher share of consumption in GDP, while exports and the trade balance have deteriorated. Regarding the wealth position, worker 1 households have run down parts of their wealth, while the net international investment position of the domestic economy has deteriorated.

6 Experiments

We will use the models to conduct a range of experiments: First, we will increase the propensity to consume of worker 2 households. Then, we will focus on income inequality. We will first change functional income distribution by redistributing towards profits. Then we will simulate an increase in wage inequality. To mention an important result in advance, it will turn out that increasing wage inequality in baseline 1 without the effects of emulation will create the export-led mercantilist growth model, while in baseline 2 the debt-led private-demand boom scenario will be created. To show the importance of credit supply we will repeat the experiment in baseline 2, however, in this case we will impose a financial constraint that limits access to credit as discussed earlier. Here, it will become clear that only with the help of easy credit policies the debt-led private-demand types of growth will become feasible, therefore outlining the central role of financial deregulation for this type of regime. While we will discuss each experiment in turn, the effect on the long-run steady-state values of those changes are summarised in Table 4 and Table 5.[22]

[22] To investigate the effects of the different experiments we simulated both baseline models until they converged to a steady state. With the obtained steady-state values we ran the model for 100 periods to then shock the relevant parameters and run the model for another 400 periods to obtain the new long-run steady states. Each period should be considered as one year. With 500 periods our simulations cover a very long period of 500 years. This is due to the fact that after a shock the model is adjusting for a relatively long time towards the new long-run steady state. However, as one can see in the figures, the most relevant deviations take place within 10 – 20 periods after a shock, while the changes thereafter are of relatively small magnitude.

Table 3: Long-run simulation results for Baseline 1 and Baseline 2

	Baseline 1: no emulation	Baseline 2: 50 % emulation
GDP comp. to Baseline 1	100.0%	101.3%
Capital Stock comp. to Baseline 1	100.0%	101.3%
utilisation rate	68.4%	68.4%
Shares in GDP		
Net Investment to GDP	10.2%	10.2%
Depreciation to GDP	14.1%	14.1%
Consumption to GDP	50.3%	50.8%
Government expenditure to GDP	24.6%	24.6%
Gross Investment to GDP	24.4%	24.4%
TradeBalance to GDP	0.7%	0.3%
Imports to GDP	30.0%	30.0%
Exports to GDP	30.7%	30.3%
Cons. Worker 1 to GDP	19.6%	20.1%
Cons. Worker 2 to GDP	21.7%	21.7%
Cons. Rentier to GDP to GDP	9.0%	9.0%
Net financial wealth to GDP ratios		
Worker 1	23.1%	6.8%
Worker 2	114.2%	114.2%
Rentier	108.5%	108.5%
Firms	-127.8%	-127.8%
Rest of the World	-29.4%	-13.1%
Government	-88.7%	-88.7%

Source: own calculation

Table 4: Long-run simulation results after shocks to Baseline 1 (no emulation)

	Baseline	reduced propensity to consume W2	higher profit share	higher wage dispersion
GDP compared to Baseline 1	100%	97.3%	95.0%	98.8%
Capital Stock compared to Baseline 1	100%	97.3%	99.5%	98.8%
utilisation rate	68.39%	68.39%	65.29%	68.39%
Shares in GDP				
Net Investment	10.24%	10.24%	10.72%	10.24%
Depreciation	14.13%	14.13%	14.80%	14.13%
Consumption	50.33%	49.38%	47.28%	49.91%
Government expenditure	24.60%	24.68%	24.87%	24.63%
Gross Investment	24.36%	24.36%	25.52%	24.36%
Trade Balance	0.71%	1.57%	2.33%	1.09%
Imports	30.00%	30.00%	30.00%	30.00%
Exports	30.71%	31.57%	32.33%	31.09%
Cons. Worker 1	19.64%	19.64%	16.36%	15.27%
Cons. Worker 2	21.71%	20.77%	18.10%	25.66%
Cons. Rentier	8.98%	8.98%	12.82%	8.98%
Net financial wealth to GDP ratios				
Worker 1	23.14%	23.1%	19.3%	18.00%
Worker 2	114.25%	149.8%	95.2%	135.02%
Rentier	108.54%	108.5%	158.6%	108.54%
Firms	-127.78%	-127.8%	-87.8%	-127.78%
Rest of the World	-29.43%	-65.0%	-96.6%	-45.06%
Government	-88.71%	-88.7%	-88.7%	-88.71%

Source: own calculations

Table 5: Long-run simulation results after shocks to Baseline 2 (50% emulation)

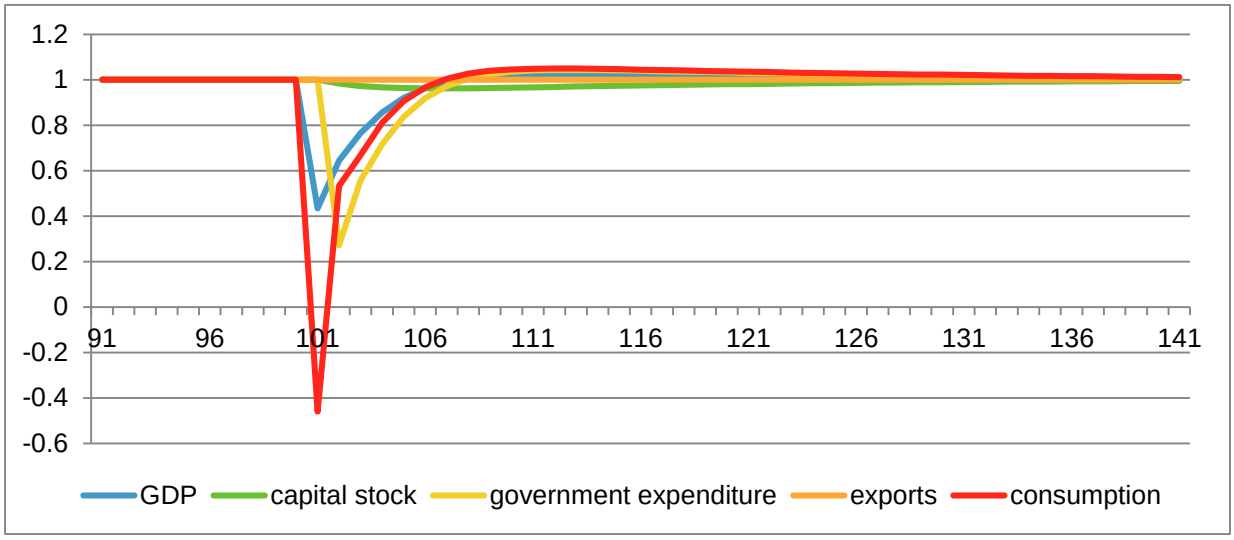
	Baseline 2	reduced propensity to consume W2	higher profit share	higher wage dispersion	higher wage dispersion - with financial regulation
GDP compared to Baseline 2	100%	96.7%	94.7%	110.7%	99.87%
Capital Stock compared to Baseline 2	100%	96.7%	99.2%	110.7%	99.87%
utilisation	68.39%	68.39%	65.3%	68.39%	68.39%
Shares in GDP					
Net Investment	10.24%	10.24%	10.72%	10.24%	10.24%
Depreciation	14.13%	14.13%	14.80%	14.13%	14.13%
Consumption	50.76%	49.64%	47.64%	53.67%	50.69%
Government expenditure	24.56%	24.66%	24.84%	24.59%	24.59%
Gross Investment	24.36%	24.36%	25.52%	24.36%	24.36%
TradeBalance	0.32%	1.34%	2.00%	-2.62%	0.36%
Imports	30.00%	30.00%	30.00%	30.00%	30.00%
Exports	30.32%	31.34%	32.00%	27.38%	30.36%
Cons. Worker 1	20.07%	19.89%	16.72%	19.02%	16.05%
Cons. Worker 2	21.71%	20.77%	18.10%	25.66%	25.66%
Cons. Rentier	8.98%	8.98%	12.82%	8.98%	8.98%
Net financial wealth to GDP ratios					
Worker 1	6.8%	13.5%	5.7%	-135.6%	-12.3%
Worker 2	114.2%	149.8%	95.2%	135.0%	135.0%
Rentier	108.5%	108.5%	158.6%	108.5%	108.5%
Firms	-127.8%	-127.8%	-87.8%	-127.8%	-127.8%
Rest of the World	-13.1%	-55.4%	-83.0%	108.5%	-14.7%
Government	-88.7%	-88.7%	-88.7%	-88.7%	-88.7%

Source: own calculation

6.1 Scenario 1: Increased propensity to save

We shock both baselines by reducing the propensity to consume of worker 2 households from 0.7 to 0.6. Here in both cases we find the paradox of thrift to be valid. In the baseline 1 scenario without emulation after an initial decline of worker 2 consumption, also the government reduces its consumption, since it sees its deficit increasing above its target. Because of lower utilisation rates and less favourable development of cash flows, the firm sector reduces its investment. While in the long-run utilisation reaches its previous level again, GDP and capital stock are below the baseline. Overall, worker 2 households' consumption has decreased its relative share in GDP. Furthermore, the lower relative growth rate compared to the rest of the world in the transition phase has led to an increase in the trade balance. This is reflected in the financial balances: while worker 2 households accumulated more financial wealth due to their higher savings rate, the improving trade balance has led to increased indebtedness of the RoW (see figure 1, table 4).

Figure 1: Growth difference from Baseline 1 after a decline of worker 2 propensity to consume

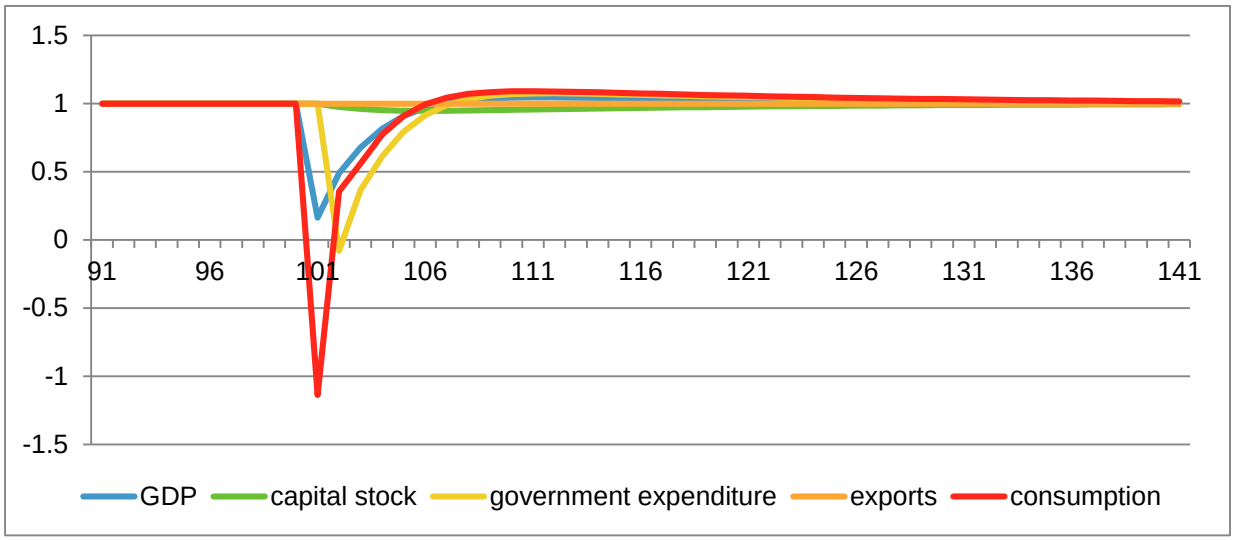


Source: own illustration

The results of the increased propensity to save of worker 2 households are qualitatively the same in the scenario with emulation. However, the effects are stronger due to the fact that the reduced consumption of worker 2 households lowers also the consumption of worker 1 households, so that GDP sees a greater drop relative to baseline. Both worker households

increase their financial wealth and the increase in the trade balance and in the debt level of the RoW is stronger (figure 2, table 5).

Figure 2: Growth difference from Baseline 2 after a decline of worker 2 propensity to consume



Source: own illustration

6.2 Scenario 2: Changes in the functional distribution of income

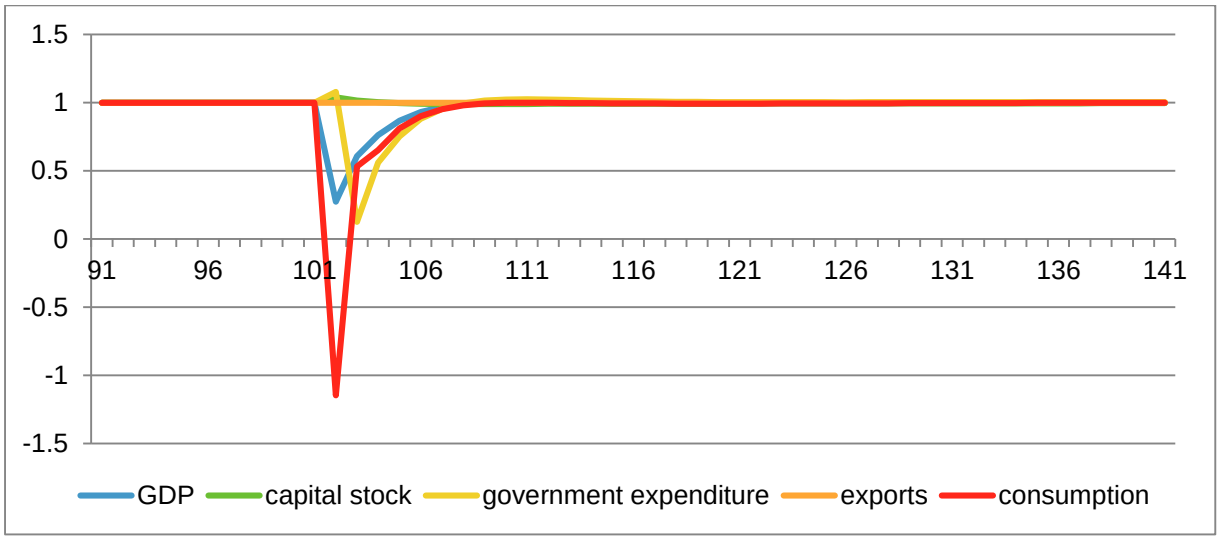
Next we assume a decline in the wage share by 10 percentage points of GDP. This decline is modelled in a way that it affects all worker households equally – this means the wage distribution remains unaltered.[23] This could be interpreted as a general decline of workers bargaining power, due to weaker unions, global wage competition, or a decline in product market competition, e.g. due to an increase in the degree of monopoly. Here for both baseline cases we find that a higher profit share, while able to increase total profits, leads to a relatively lower GDP and a lower capital stock in the long run. With a lag of one period, the increase in the profit share and the accompanying increased cash flows led firms to increase their investment. Also government expenditure increased initially, since the redistribution towards profits led to higher tax revenues in the previous period, so that the deficit declined. However, these increases in expenditures are compensated by workers decreasing consumption when their real income falls, so that GDP growth declines. With

[23] We are making this assumption of a change in the functional distribution of income which does not affect wage distribution for purely analytical reasons. Theoretically a variety of cases is possible including an increasing wage share going along with higher wage inequality.

the decline of GDP and tax revenue growth also the government sector, following its deficit target, reduces its expenditures. Because of declining utilisation rates the firm sector reduces its investment spending. In the new steady state we have an overall lower level of activity and a lower capital stock (which is to be expected for a wage led economy). However, the capital stock has grown stronger than output so that utilisation in the new steady state is lower. Investment as a share of GDP has increased. Overall consumption has gone down. However, while workers have lost, rentiers could increase their consumption. Due to the overall contractionary effect the trade balance of the domestic economy has improved. The changes in distribution are reflected in the financial positions of the sectors. Workers have reduced their financial wealth, while the financial position of rentiers has improved. Also the firm sector could reduce its debt level, while the domestic economy as a whole increased its financial claims on the RoW.

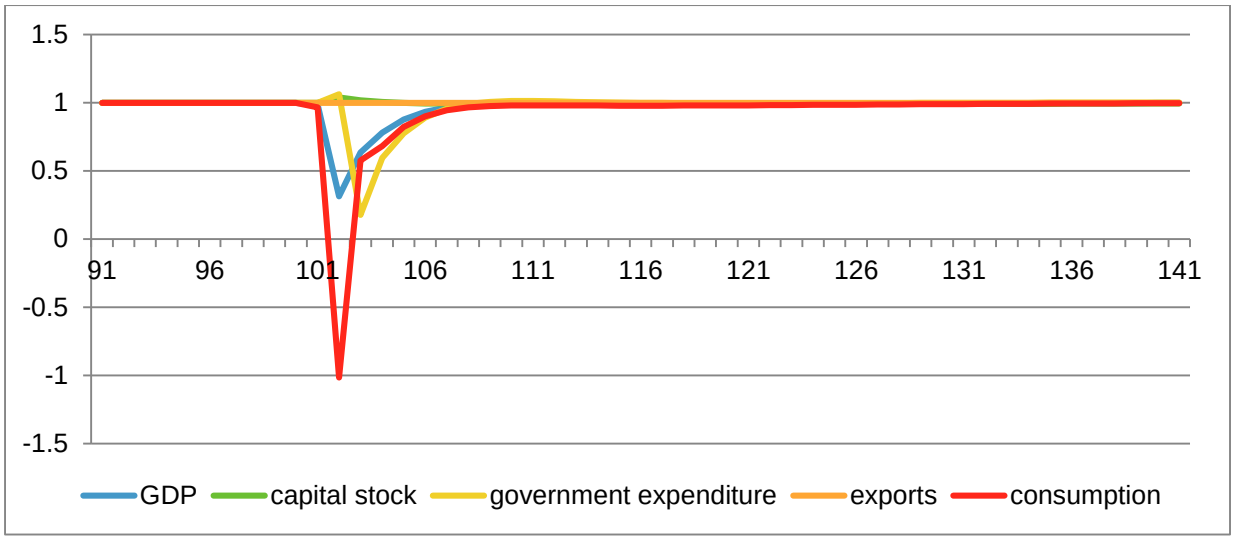
While the results are qualitatively the same results for both baseline, in the economy with the higher emulation effect, the effects are slightly stronger again. This is due to the fact that the emulation behaviour has led to an overall higher propensity to consume of worker households, and so redistribution away from worker households to rentiers (with their lower propensity to consume) will have a stronger effect than in the economy without emulation effects.

Figure 3: Growth difference from Baseline 1 after an increase in the profit share



Source: own illustration

Figure 4: Growth difference from Baseline 2 after an increase in the profit share



Source: own illustration

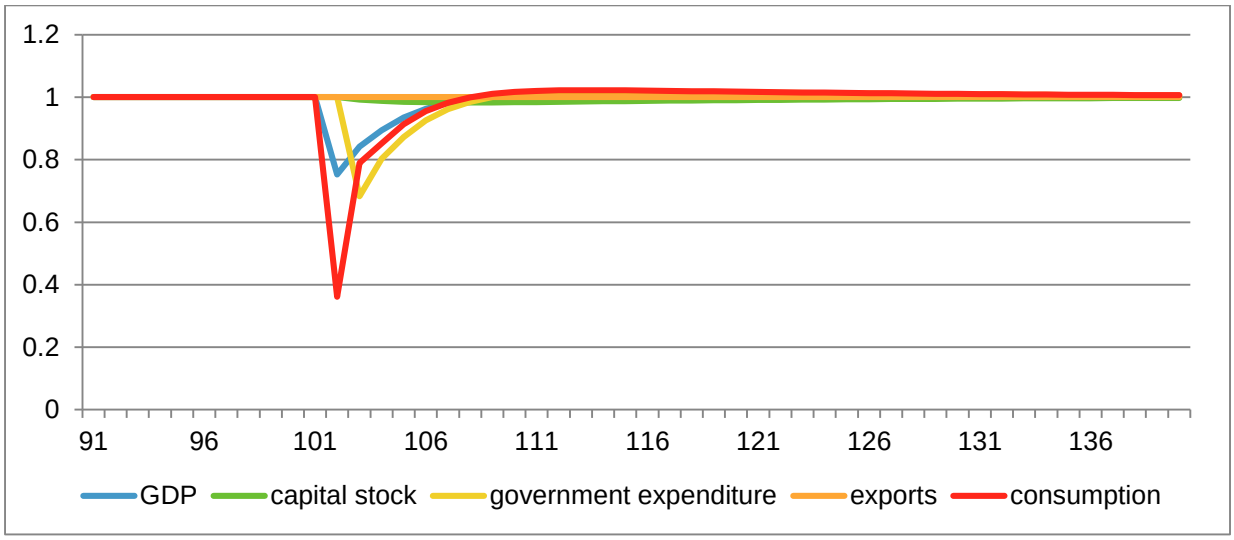
6.3 Scenario 3: Changes in the wage dispersion

Next we focus on personal income distribution and change the wage dispersion. As mentioned earlier, we assumed relatively mild wage inequality for the baseline scenarios with the worker 1 households earning 10 percent below the average wage and the worker 2 households earning 10 percent above the average wage. In this scenario we increase the wage dispersion by increasing this differential to 30 percent each, so that the average wage in the economy and the functional income distribution are not affected.

In the case of the baseline 1 scenario we find typically expected effects (Figure 5 and 6, Table 4). Consumption growth substantially goes down. Worker 1 households, which have a higher propensity to consume out of income see their income decline and lower their consumption correspondingly. At the same time worker 2 households increase their consumption because of their higher income. However, due to their lower propensity to consume this does not compensate fully for the decline in low-wage workers' consumption. With the slow-down of the economy the government sees its deficit increase and reduces its expenditures growth as well. The firms, confronted with lower capacity utilisation and lower cash flows, also reduce investment. In the long run, the economy reaches a new steady state with a GDP level and a capital stock below the baseline. The share of worker 1 household consumption in GDP has dropped and worker 2 households consume relatively more. The slow-down of the economy relative to the RoW has improved the trade balance. This is reflected in the financial positions. Worker 1 households have lowered their financial

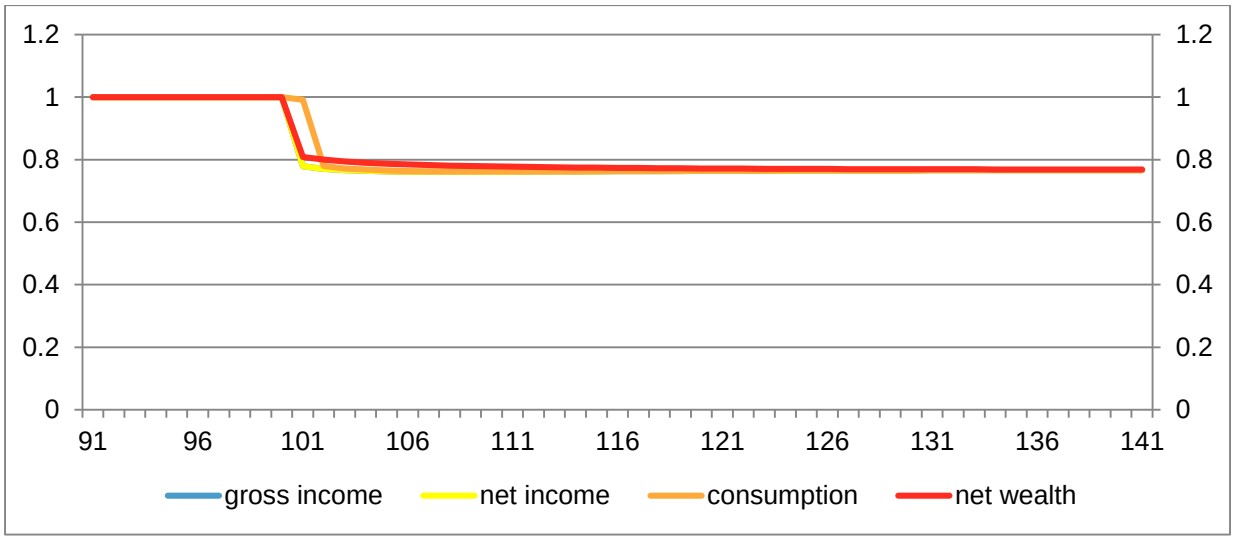
wealth in line with the lower income and worker 2 households have increased their financial wealth. The improved trade balance has led to an improvement of the domestic economy's net international investment position and correspondingly to an increase in the indebtedness of the RoW.

Figure 5: Growth difference from Baseline 1 after an increase in wage dispersion



Source: own illustration

Figure 6: Worker 1 households, deviation from Baseline 1 after an increase in wage dispersion

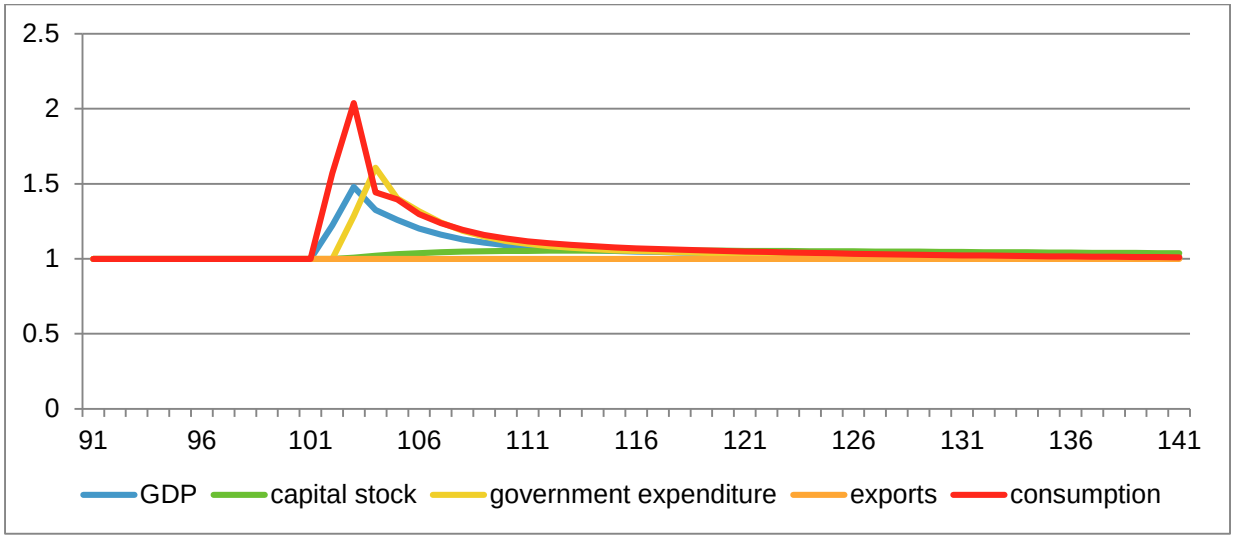


Source: own illustration

Conducting the same experiment in the baseline 2 case, the obtained results are quite different (Figure 7 and 8, Table 5). While worker 2 households increase their consumption

in line with their increased income, a difference is noted from the baseline 1 scenario, as worker 1 households do not decrease their consumption correspondingly. Rather, worker 1 households' consumption is initially negatively affected by their lower income, but this is subsequently compensated by their emulation behaviour. Observing the higher consumption level of worker 2 households, worker 1 households try to keep up and increase their consumption again. However, with consumption being higher than disposable income, worker 1 households first run down their financial wealth and then get increasingly indebted. The overall higher consumption stimulates the economy and lowers the government deficit, so that the government increases its expenditure. Firms' utilisation rates and cash flows rise so that they start increasing investment. In the long-run steady state, the level of GDP and the capital stock are both on a higher level. However, strong domestic growth compared to the RoW has led to a deterioration of the trade balance. This led to higher indebtedness of our domestic economy against the RoW, leaving it in a potentially vulnerable position to capital outflows. In their attempt to keep up with their better earning peers, worker 1 households have increased their debt-to income ratio substantially[24], which makes the economy financially more fragile.

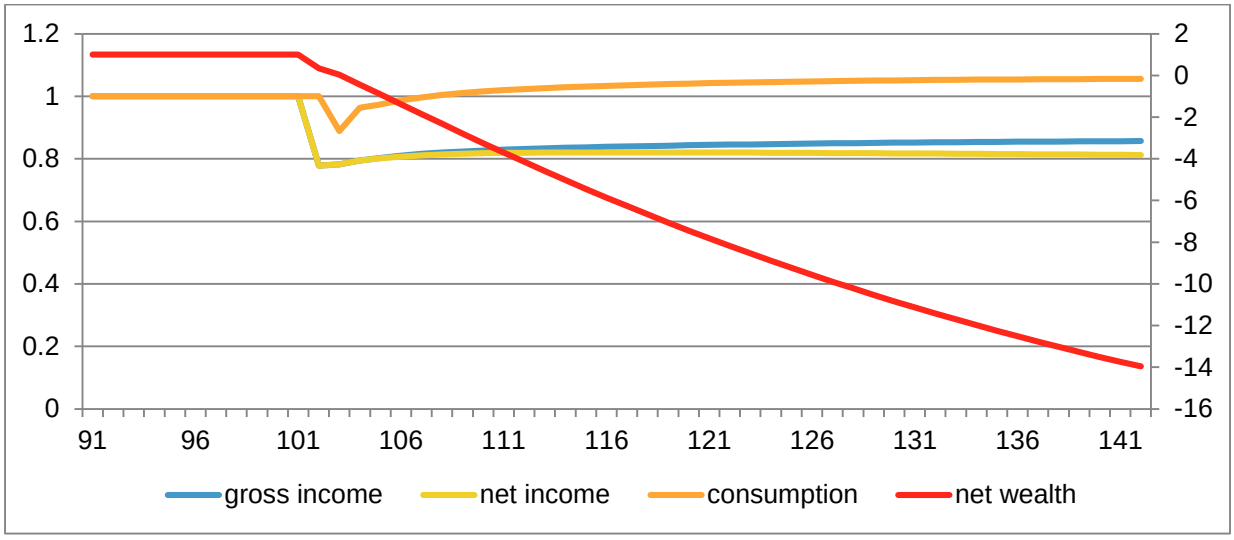
Figure 7: Growth difference from Baseline 2 after an increase in wage dispersion



Source: own illustration

[24] In our scenario, debt increases to 939% of disposable income. Indebtedness of the lowest quintile, including installment, mortgage, and credit card debt, in the US amounted to 392.8 percent of disposable income (Barba and Pivetti 2009).

Figure 8: Worker 1 households, deviation from Baseline 2 after an increase in wage dispersion



Source: own illustration

6.4 Scenario 4: Increased wage dispersion with strong financial regulation

In the previous analyses we have assumed that banks supply credit on demand without limits, which was of key importance in enabling the strong increase in the worker 1 households' debt levels in scenario 3. While this is clearly an extreme assumption it is inspired by the observation that the era of financialisation is associated with a weakening of financial regulation and easier access of households to credit. Examples for this easier access in the US are the lines of unsecured credit provided by credit cards and the ease of using mortgage equity withdrawals to finance consumption – all types of loans that were more restricted 20-30 years ago (Cynamon & Fazzari 2008). Similar evidence for easier access to consumer credit can be found in many countries.[25]

However, while a lowering of financial standards could be observed in many countries, in some countries there were still substantial regulations in place. Also, it should be noted that these changing attitudes of households towards credit did not occur in all countries to the same degree – previous experiences of debt bubbles or a lack of optimism about the future economic developments may have induced households to restrict themselves in their use of debt. Also, in some countries high debt levels did not allow for a further extension of credit. Regulatory and norm-based restrictions may have become more binding with the financial

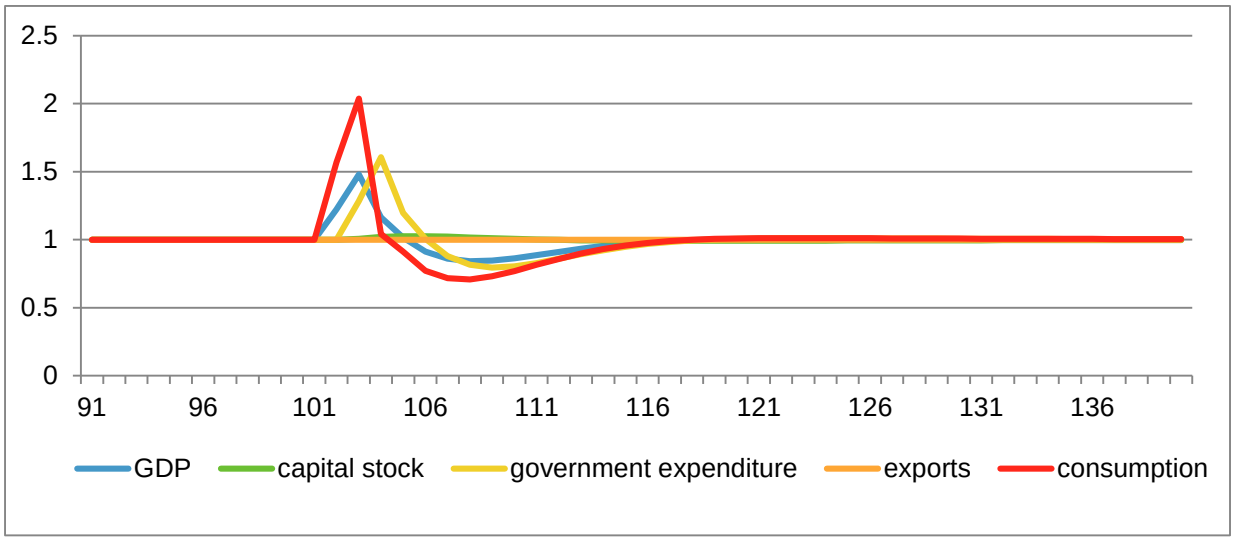
[25] see FESSUD studies on financial systems 1 -17 for detailed studies on the spread of those and financial innovations that facilitated easier access to credit (available at http://fessud.eu/studies-in-financial-systems/).

crisis. Countries have introduced new regulations to address the problems observed during the crisis. In addition, consumer attitudes towards borrowing for consumption purposes may have changed due to their experience of the financial crisis or may be restricted due incurred debt in the credit boom. Therefore, in the following we will investigate how increases in inequality affect the macroeconomic developments when there exist binding financial constraints. For this we modify the consumption function as described above. Desired consumption of worker 1 households is determined as before. However, if workers require credit to achieve their desired consumption level, a financial constraint is imposed based on the prevailing debt-to-income ratio. Actual consumption equals desired consumption if it is below disposable income or if households were not indebted in the previous period. However, if desired consumption is above disposable income, actual consumption is reduced depending on the debt-to-income ratio in the previous period, the size of the expected income gap, and an exogenously given prudential ratio (the higher the ratio the easier the access to credit). We repeat scenario 3, the increase of wage dispersion, in the economy with the higher emulation (Baseline 2), but with the modified consumption function. We use a parameter of 1 for the prudential ratio which substantially limits households' access to credit compared to the original baseline 2 case.

The initial effects after the shock are similar to the ones observed in scenario 3 (see Figures 6 and 7). Worker 2 households increase their consumption in line with their higher income. Worker 1 households first react to the reduction of their own income and limit consumption accordingly. However, with the observation of the higher consumption of worker 2 households, they increase consumption as well. Consumption increases above income and so they run down their wealth and eventually have to resort to credit. While in the beginning, the financial constraint is only weak, it increases with a higher debt-to-income ratio so that the gap between desired consumption and actual consumption grows. This drags overall consumption and GDP growth down. Initial positive impacts on government consumption and capital accumulation are reversed. In the long run, we achieve a steady state with a slightly lower capital stock and GDP level. Due to the introduced financial regulation, the expansionary effect of debt-financed consumption that previously countered the contractionary effect of higher inequality (an effect found in scenario 3) only occurred for a short period. Hence, countries face a dilemma – in the face of further increasing inequality they seem to be able to choose between higher growth,

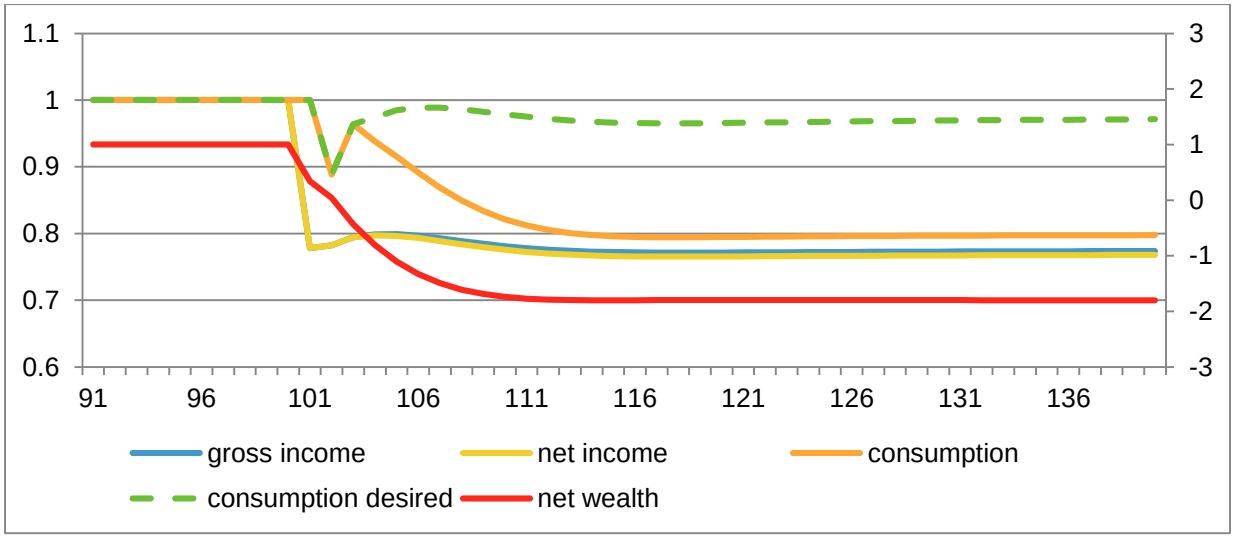
coupled with an increasingly financially fragile household sector, or lower growth, while maintaining a financially sounder household sector.[26]

Figure 6: Growth difference from Baseline 2 after an increase in wage dispersion with financial regulation



Source: own illustration

Figure 7: Worker 1 households, deviation from Baseline 2 after an increase in wage dispersion with financial regulation



Source: own illustration

[26] Here we equate higher financial fragility with higher debt-to-income ratios.

7 Summary, discussion of results and conclusions

The final aim of this paper is to give some foresight of how further increases in inequality will affect macroeconomic developments over the medium term. We started from the observation that in the era of financialisation increasing functional and personal income inequality could be observed in most developed countries. At the same time at the international level growing current account imbalances have occurred, with a set of countries growing relatively strongly – often based on consumption growth, but realising current account deficits (debt-led private-demand boom countries), and another set of countries growing weakly – with exports as growth drivers and realising current account surpluses (export-led mercantilist countries). The link between the increasing inequality and the occurrence of the export-led mercantilist countries is established easily in a Post-Keynesian theoretical framework. Increasing functional and personal income inequality redistributes income to groups with higher savings propensities and therefore undermines consumption growth. Lower growth compared to the rest of the world then improves the current account balance. The strong growth of the first set of countries in the face of increasing inequality is puzzling at first. However, coupled with the observation that in those countries lower-income households have (despite lower incomes) not decreased their consumption, but rather chosen to reduce their savings or even become indebted, it appears less of a puzzle. It remains, however, to determine what factors were responsible for this decline in savings rates and allowed for the increasing indebtedness of households. Reviewing the literature, it becomes clear that two factors have to interact to create the debt-led private-demand boom type regime. On the one hand, a reason for households to reduce their savings rates is required. Potential explanations for this reduction provided by the literature are relative consumption concerns, habit persistence, a minimum level of consumption, or wealth based consumption in the face of asset price bubbles. On the other hand, a sufficient credit supply to those households that want to consume in excess of their income needs to be available. Here, the literature argues that credit became increasingly available in some countries due to deregulation of the financial sector, due to increasing collateral and bank equity because of booming asset prices, and because of changed attitudes towards debt-financed consumption and reduced stigmas associated with debt.

We have explored the interaction and importance of these factors within a stock-flow consistent model. We created two identical baseline economies, with the only difference being the importance of relative consumption concerns in households' consumption.

Initially, for both baselines we assumed relatively low inequality and free access to credit. We exposed both economies to the same types of shocks. Related to functional inequality we found that in both economies an increasing profit share reduces growth and improves the trade balance. Increasing personal income inequality in an economy where relative consumption concerns are of little relevance leads to the expected result of a lower growth path and a tendency towards the export-led mercantilist type of development. Alternatively, in the economy where relative consumption concerns play an important role, an increase in inequality shifts the growth path upwards. This is due to the aspiration of low-wage workers to keep up with higher-wage workers' consumption. For this, however, the debt-to-income ratio of those households has to increase substantially, making the economy more vulnerable to financial instability. At the same time, the higher growth path compared to the rest of the world led to a deteriorating trade balance. In this case, increasing inequality has contributed to the debt-led private-demand type of development. Finally, we gave up the assumption of free access to credit and introduced a financial constraint. Depending on how restrictive the financial constraint, the expansive effect of increasing inequality is smaller, or the regime even follows the trajectory of the export-led mercantilist type of development. Therefore, we have demonstrated that increasing inequality should lead each economy towards weaker growth and, given unchanged growth in the rest of the world, an improving trade balance. However, as we have shown, under specific constellations in which households decrease their savings rates sufficiently and credit is freely available to those households, the results can be reversed for some time and increasing inequality increases growth and causes a deterioration of the trade balance.

Before the obtained results are applied to conduct our foresight analysis, some caveats should be raised. The results depend on the specific parameter constellation chosen for the simulation. Plus, a key assumption made in order to obtain the two regimes was the difference in relative consumption concerns. Regarding the parameter choice, we have not calibrated the model to any specific country. Instead, we chose them to deliver plausible results and oriented our choice along empirically found parameters and parameters used in the literature. The wage-led character of the economy also depends on the parameter choice we made, but given the econometric research on this topic it can be seen as plausible for most countries. Relative consumption concerns are a culturally and institutionally determined factor and their relative strength depends on a variety of institutional settings and may change over time. A clearer investigation into their determinants should be conducted. Also it is only one of the explanations found in the

literature that can explain the occurrence of the macroeconomic features of the debt-led private-demand boom type of development and its relevance is mostly documented for the USA. While in the FESSUD case studies (Dodig et al. 2015) and within other research (for example conducted by Hein (2012)) many countries showed features of the debt-led private-demand type of development in the macroeconomic data, the underlying explanation may be different. For example in Spain, the increase in housing prices seemed to be of high relevance for its development (Ferreiro et al. 2014), and for many of the Eastern European countries, the case for a minimum consumption that is upheld relatively independent of developments in income may be a more appropriate explanation (Gabor 2014, Kattel & Juuse 2014). The dynamics of the model should be examined under such alternative assumptions. Finally, changes in the financial sector and in credit supply have played a central role for the developments before the crisis. While we are examining the role of a financial constraint in the scenario conducted last, this clearly is an overly simplified representation of the complex processes and changes in the financial sector in many countries. However, the specific developments in the financial sector in the era of financialisation have been country specific and taken different forms. An advantage of the abstract nature of the financial constraint we adopted is that it can be interpreted in a variety of ways and so applies to many countries. Having those restrictions in mind, however, we can conduct some thought experiments based on the insights obtained, to provide some predictions of potential further developments if inequality continues to follow its current trajectory and increases further in the future.

Let's assume first, that functional income inequality follows its current trend and the wage share is declining further in the future. What can we predict for the future Euro area and worldwide macroeconomic development in the face of this development? Our results suggest that further increases in functional income inequality will have a depressive effect; this was true for both examined cases. Each of our model economies was able to compensate in the long run for this, partially by increasing exports and increasing its trade surplus. However, if past trends continue and functional income distribution deteriorates further in large parts of the world economy/Euro area (as observed since the 1980s (Hein 2012)) this remedy does not hold up and this trend will contribute to lower overall growth rates in the world.

Regarding personal income distribution we found that the effect highly depends on the prevailing institutional structure. In countries where emulation is low, higher inequality will slow growth. Contrastingly, if institutions in a country foster emulation effects, an increase in

inequality may help a country to temporarily grow faster. However, this is only possible because part of the household sector increases its debt level substantially. This in turn is only possible to a limited degree and cannot be repeated indefinitely. Furthermore, it increases financial fragility, which heightens the risk of financial instability and financial crises, which will harm growth in the long run.[27]

This means if the trend towards higher personal income inequality continues in the future, it will have a depressing effect in some countries, where there is no compensating effect (for example the emulation effect). Everything else equal, they will have to increasingly depend on exports and demand generation in other countries. In countries with different institutional structures in place, the effect of higher personal income inequality may be expansionary at least for a while, if credit is sufficiently available. Therefore, the overall effect of further increasing personal income inequality on world and Euro area GDP development depends on the institutions in place in different countries and the access to debt for lower-income households. Based on these insights two potential trajectories for the future development of the Euro area can be imagined:

In the face of further increasing inequality, if a sufficiently high number of countries are institutionally structured in a way that households are willing to uphold demand despite decreases in income, and at the same time the financial sector is willing and able to provide sufficient credit, so that a debt-led private-demand type of development is enabled, they may observe relatively high growth rates in the medium term. Given this, the export-led mercantilist countries will also be able to follow their model and the Euro area may reach a balanced current account position with the world as a whole. However, in this case we will see the reoccurrence of the Euro area imbalances and observe a number of ‘export-led mercantilist countries’ accumulating assets and a number of countries following a ‘debt-led private-demand’ model going into debt internationally. The latter regime is likely to eventually exhaust itself if debt stocks have grown too large. Then in the longer term growth rates for all countries will slow down. Potentially worse, due to the increased debt levels nationally and internationally, those economies would also increase their financial fragility and may experience national and international financial crises.

[27] There is a growing body of literature demonstrating a variety of ways how inequality might negatively affect growth. Besides the demand channels and the risk due to increasing national and international debt imbalances which were the focus of this paper, there is a variety of supply side and political economy arguments, showing additional negative impacts on growth and growth potential (for an overview see Dabla-Norris et al. (2015)).

However, as mentioned earlier, this scenario hinges on two key assumptions: households need to be willing not to reduce consumption in accordance with their decreasing incomes and sufficient access to credit has to be available. This willingness to consume and even to go into debt, as mentioned earlier, depends on the specific institutional structure of a country. However, it may also depend to a certain degree on the general optimism about the future developments and prospects. Therefore, given the problematic situation in the Euro area with the overall weak performance, the high rates of unemployment (in particular in the south), the austerity measures, and labour market reforms, a lack of optimism and increased precautionary savings for the nearer future may be likely, making the debt-led private-demand constellation less likely to occur. Also, in a Minskian sense, the experience of the recent crisis may have increased the perceived borrowers' risk and so households may be less willing to go into debt. Looking at credit supply to households, a number of developments indicate that it will become rather more restrictive in the medium term future. Currently, policy makers and regulators in the Euro area, but also around the world, are re-establishing financial regulation. Depending on the seriousness of the attempts, it should at least limit credit supply. In addition, the financial and the Euro area crisis have negatively affected banks' balance sheets. Therefore, they may curb credit supply to repair their balance sheets. Finally, debt levels in many countries have increased substantially in the booms before the crisis, so that the potential for further increases are limited or households may even wish to reduce their debt levels and some countries may enter what Richard Koo (2009) termed a balance sheet recession.[28]

Given these factors, it is unlikely that many countries in the Euro area will be able to follow the debt-led private-demand type of development in the near future. Hence, we would expect further increases in inequality to have a depressing effect on growth in the Euro area, relatively independent of the institutional structure. This slow-down in growth, absent of other changes, means an increasing reliance in many Euro area countries on net-exports as growth drivers and the Euro area as a whole may turn export-led mercantilist. However, while for some small and medium sized countries this may be regarded as a functioning model, an economy the size of the Euro area pursuing this regime will negatively affect growth in the rest of the world and add to stagnationary tendencies. In addition, other countries may not accept an increasing debt level and free riding of the Euro area on their

[28] This was, for example, observed in Portugal in the 2000s, after a period of strong growth in the 1980s and 1990s in which debt levels increased substantially (Lagoa et al. 2014).

demand generation. Therefore, other countries may impose measures undermining this strategy.

8 References

Alvarez-Cuadrado, F. and M. E.-A. Vilalta (2012), 'Income inequality and saving', IZA Discussion Paper 7083, Institute for the Study of Labor, Bonn.

Badics, T. and S. Szikszai (2015), ‘Financialisation and the financial and economic crises: the case of Hungary’, FESSUD Studies in Financial Systems No. 31, University of Leeds.

Bahçe, S., H. Cömert, S. Çolak, N. Erdem, E. Karaçimen, A.H. Köse, Ö. Orhangazi, G. Özgür, and G. Yalman (2015), ‘Financialisation and the financial and economic crises: the case of Turkey’, FESSUD Studies in Financial Systems No. 21, University of Leeds.

Barba, A. and M. Pivetti (2009), 'Rising household debt: Its causes and macroeconomic implications—a long-period analysis', *Cambridge Journal of Economics*, 33, 113 - 137.

Belabed, C.A., T. Theobald and T. van Treeck (2013), ‘Income Distribution and Current Account Imbalances’, IMK Working Paper No. 126, Macroeconomic Policy Institute (IMK) at the Hans Boeckler Foundation, Düsseldorf.

Bezemer, D. and J. Muysken (2015), ‘Financialization and the Financial and Economic Crises: The Case of The Netherlands’, FESSUD Studies in Financial Systems No 33, University of Leeds.

Bhaduri, A. and S. Marglin (1990), ‘Unemployment and the Real Wage: The Economic Basis for Contesting Political Ideologies’, *Cambridge Journal of Economics*, 14, 4, 375-393.

Bhaduri, A. K. Laski and M. Riese (2006), ‘A Model of Interaction between the Virtual and the Real Economy’, *Metroeconomica*, 57, 3, 412-427.

Bortz, P.G. (2014), ‘Foreign debt, distribution, inflation, and growth in an SFC model’, *European Journal of Economics and Economic Policies: Intervention*, 11, 3, 269-299.

Bowles, S. and R. Boyer (1995), ‘Wages, aggregate demand and unemployment in an open economy: an empirical investigation’, in G. Epstein and H. Gintis (eds.) *Macroeconomic Policy After the Conservative Era. Studies in Investment, Saving and Finance*, Cambridge: Cambridge University Press.

Brown C. (2004), ‘Does Income Distribution Matter for Effective Demand? Evidence from the United States’, *Review of Political Economy*, 16, 3, 291-307.

Cardaci, A. and F. Saraceno (2015), ‘Inequality, Financialisation and Economic Crises: an Agent-Based Macro Model’, paper presented at the conference ‘The Spectre of Stagnation? Europe in the World Economy’, Berlin

Caverzasi, E., A. Godin (2015), ‘Post-Keynesian stock-flow-consistent modelling: a survey’, *Cambridge Journal of Economics*, 39, 1, 157-187.

Cornilleau, G. and J. Creel (2014), ‘Financialisation and the financial and economic crises: the case of France’, FESSUD Studies in Financial Systems No. 22, University of Leeds.

Cynamon, B. Z. and S.M. Fazzari (2008), 'Household debt in the consumer age: Source of growth - risk of collapse', *Capitalism and Society*, 3, 2, 1-30.

Dabla-Norris E., K. Kochhar, N. Suphaphiphat, F. Ricka, E. Tsounta (2015), ‘Causes and Consequences of Income Inequality: A Global Perspective’, IMF Staff Discussion Note SDN/15/13, International Monetary Fund.

Detzer, D. und E. Hein (2014), ‘Financialisation and the financial and economic crises: the case of Germany’, FESSUD Studies in Financial Systems No. 18, University of Leeds.

Dodig N., E. Hein and D. Detzer (2015), ‘Financialisation and the financial and economic crises: Theoretical framework and empirical analysis for 15 countries’, FESSUD Working Paper Series No. 110, University of Leeds.

Dos Santos, C.H. and G. Zezza (2008), ‘A Simplified, ‘Benchmark’, Stock-Flow Consistent Post-Keynesian Growth Model, *Metroeconomica*, 59, 3, 441–478.

Duesenberry, J. S. (1949), *Income, Saving and the Theory of Consumer Behavior*, Harvard University Press.

Dutt A.K. (2006), ‘Maturity, stagnation and consumer debt: a Steindlian approach’, *Metroeconomica*, 57, 339-364.

Dymarski, W. (2015), ‘Financialisation and the financial and economic crises: the case of Poland’, FESSUD Studies in Financial System No. 29, University of Leeds.

Dynan, K. E., J. Skinner and S.P. Zeldes (2004), 'Do the rich save more?', *Journal of Political Economy*, 112, 2, 397-444.

Evans, T. (2015), ‘Financialisation and the financial and economic crises: the case of the U.S.A.’, FESSUD Studies in Financial Systems No.32, University of Leeds.

Ferreiro, J., C. ,Gálvez, and A. González (2015), ‘Financialisation and the Financial and Economic Crises: The Case of Spain’, FESSUD Studies in Financial Systems No 19, University of Leeds.

Frank, R. H. (2007), *Falling Behind: How Rising Inequality Harms the Middle Class*, University of California Press.

Frank, R. H., A.S. Levine and O. Dijk (2014), 'Expenditure cascades', *Review of Behavioral Economics*, 1, 55–73.

Gabor, D. (2013), 'The Romanian Financial System: from central bank-led to dependent financialization', FESSUD Studies in Financial Systems No. 5, University of Leeds.

Gabbi, G., E. Ticci and P. Vozella (2014), 'Financialisation and the financial and economic crises: the case of Italy', FESSUD Studies in Financial Systems No. 23, University of Leeds.

Godley W. and M. Lavoie (2007), *Monetary Economics. An Integrated Approach to Credit. Money, Income, Production and Wealth*', Palgrave Macmillan, New York.

Godley W. and M. Lavoie (2012), 'Fiscal Policy in a Stock-Flow Consistent (SFC) Model', in M. Lavoie and G. Zezza (eds.), *The Stock-Flow Consistent Approach. Selected Writings of Wynne Godley*, Palgrave Macmillan, Basingstoke, UK.

Guðmundsson, B.R. (2015), 'Financialisation and the Financial and Economic Crisis: The Case of Iceland', FESSUD Studies in Financial Systems No. 34, University of Leeds.

Hein, E. (2010), 'A Keynesian perspective on 'financialisation'', in P. Arestis and M. Sawyer (eds.), *21st Century Keynesian Economics, International Papers in Political Economy*, Palgrave Macmillan, Basingstoke.

Hein E. (2012), *The Macroeconomics of Finance-dominated Capitalism – and its Crisis*, Edward Elgar, Cheltenham, UK.

Hein, E. (2012a), 'Finance-dominated capitalism, re-distribution, household debt and financial fragility in a Kaleckian distribution and growth model', *PSL Quarterly Review*, 65, 260, 11-51.

Hein E. and N. Dodig (2015), 'Finance-dominated capitalism, distribution, growth and crisis – long-run tendencies, in E. Hein, D. Detzer and N. Dodig (eds.), *The Demise of Finance-dominated Capitalism. Explaining the Financial and Economic Crisis*, Edward Elgar, Cheltenham.

Hein, E. and T. van Treeck (2010), ''Financialisation' in Post-Keynesian models of distribution and growth – a systematic review', in M. Setterfield (ed.), *Handbook of Alternative Theories of Economic Growth*, Edward Elgar, Cheltenham.

Juuse, E. and R. Kattel (2014), ‘Financialisation and the Financial and Economic Crises: The Case of Estonia’, FESSUD Studies in Financial Systems No 20, University of Leeds.

Kalecki, M. (1937), ‘The Principle of increasing risk’, *Economica*, 4, 440 - 447.

Kim, Y.K., M. Setterfield and Y. Mei (2014), ‘A theory of aggregate consumption’, *European Journal of Economics and Economic Policies: Intervention*, 11, 1, 31–49.

Kim, Y.K., M. Setterfield and Y. Mei (2015), ‘Aggregate consumption and debt accumulation: an empirical examination of US household behaviour’, *Cambridge Journal of Economics*, 39, 1, 93-112.

Köhler, K., A. Guschanski and E. Stockhammer (2015), ‘How does Financialisation Affect Functional Income Distribution? A Theoretical Clarification and Empirical Assessment’, Post Keynesian Economics Study Group Working Paper 1507.

Kumhof, M. and R. Ranciere (2010), ‘Inequality, Leverage and Crises’, IMF Working Papers 268, International Monetary Fund.

Kumhof, M., C. Lebarz, R. Ranciere, A.W. Richter and N.A. Throckmorton (2012), ‘Income Inequality and Current Account Imbalances’, IMF Working Papers 12/08, International Monetary Fund.

Kurz, H.D. (1990), ‘Technical change, growth and distribution: a steady-state approach to ‘unsteady’ growth’, in H.D. Kurz (ed.), Capital, Distribution and Effective Demand, Polity Press, Cambridge, UK.

Lagoa, S., E. Leão, P.R. Mamede and R. Barrada (2014), ‘Financialisation and the Financial and Economic Crises: The Case of Portugal’, FESSUD Studies in Financial Systems No 24, University of Leeds.

Lavoie, M. (2008), ‘Financialisation Issues in a Post-Keynesian Stock-flow Consistent Model’, *Intervention*, 5, 2, 331-356.

Lavoie M. and W. Godley (2002), ‘Kaleckian models of growth in a coherent stock-flow monetary framework: a Kaldorian view’, *Journal of Post Keynesian Economics*, 24, 2, 277-311

Lavoie, M. and J. Zhao (2010), ‘A Study of the Diversification of China's Foreign Reserves within a Three-Country Stock-Flow Consistent Model’, *Metroeconomica*, 61, 558–592.

Lepper, J., M. Shabani, J. Toporowski and J. Tyson (2015), ‘Financialisation and the financial and economic crises: the case of United Kingdom’, FESSUD Studies in Financial Systems No. 30, University of Leeds.

Mazier, J. and G. Tiou-Tagba Aliti (2012), 'World Imbalances And Macroeconomic Adjustments: A Three-Country Sock-Flow Consistent Model With Fixed or Flexible Prices', *Metroeconomica*, 63, 2, 358-388.

Meijers, H., J. Muysken and O. Sleijpen (2015), 'The Deposit Financing Gap: Another Dutch disease', *European Journal of Economics and Economic Policies: Intervention*, 12, 1, 32-50.

Minsky, H.P. (1975), *John Maynard Keynes*, Columbia University Press.

Minsky, H.P. (1982), *Can »it« Happen Again? Essays on Instability and Finance*, M.E. Sharpe, Armonk, N.Y.

Minsky, H.P. (1986), *Stabilizing an Unstable Economy*, Yale University Press, New Haven.

Newman, S. (2014), 'Financialisation and the financial and economic crises: the case of South Africa', FESSUD Studies in Financial Systems No. 26, University of Leeds.

Onaran, O. and G. Galanis (2012), 'Is aggregate demand wage-led or profit-led? National and global effects', ILO Conditions of Work and Employment Series No. 40, International Labor Office.

Palley T.I. (1994), 'Debt, Aggregate Demand, and the Business Cycle: An Analysis in the Spirit of Kaldor and Minsky', *Journal of Post Keynesian Economics*, 16, 3, 371-390.

Pollin, R. (1988): 'The growth of US household debt: demand-side influences', *Journal of Macroeconomics*, 10, 2, 231–248.

Rajan, R. G. (2010), *Fault Lines: How Hidden Fractures Still Threaten the World Economy*, Princeton University Press, New Jersey.

Koo, R. (2009), *The Holy Grail of Macroeconomics: Lessons from Japan's Great Recession*, John Wiley & Sons.

Shabani, M. and J. Toporowski (2015), 'Financialisation and the financial and economic crises: the case of Japan', FESSUD Studies in Financial Systems No. 28, University of Leeds.

Stenfors, A. (2014), 'Financialisation and the financial and economic crises: the case of Sweden', FESSUD Studies in Financial Systems No. 27, University of Leeds.

Stiglitz, J. E. (2010), *Freefall America, free markets, and the sinking of the world economy*, W. W. Norton and Company, New York.

Stockhammer, E., and S. Ederer (2008), 'Demand effects of a falling wage share in Austria', *Empirica*, 35, 5, 481–502.

Stockhammer, E., O. Onaran and S. Ederer (2009), ‘Functional income distribution and aggregate demand in the Euro area’, *Cambridge Journal of Economics*, 33, 139–159.

Stockhammer, E., E. Hein and L. Grafl (2011), ‘Globalization and the effects of changes in functional income distribution on aggregate demand in Germany’, *International Review of Applied Economics*, 25, 1, 1–23.

Varoufakis, J. and L. Tserkezis (2014), ‘Financialisation and the financial and economic crises: the case of Greece’, FESSUD Studies in Financial Systems No. 25, University of Leeds.

Veblen, T. (1899), *The Theory of the Leisure Class*, Dover Publications, 1994.

Zezza, G. (2008), ‘U.S. growth, the housing market, and the distribution of income’, *Journal of Post Keynesian Economics*, 30, 3, 375-401

9 Appendix 1: The complete Model

(1) $Y = C + I + G + Ex - Im$
(2) $N = Y / pr$
(3) $N_{W1} = N * n_{W1}$
(4) $N_{W2} = N * (1-n_{W1})$

Distribution

(5) $WS = 1 - PS$
(6) $WB = WS * Y$
(7) $w_a = WB / N$
(8) $w_{W2} = w_a * wm_{W2}$
(9) $w_{W1} = (WB - N_{W2} * w_{W2}) / N_{W1}$

Capital Stock

(10) $K = K(-1) + I(-1) - DA(-1)$
(11) $DA = \delta * K(-1)$
(12) $Y_{fc} = K / COR$
(13) $u = Y / Y_{fc}$
(14) $I = I_{net} + DA$
(15) $I_{net} = gr_K * K(-1)$
(16) $gr_K = \beta_1 + \beta_2 * u(-1) + \beta_3 * PS(-1) - \beta_4 * r_L(-1) + \beta_5 * (PU_F(-1) + DA(-1))/K(-1)$

Profit distribution

(17) $Pg_F = PS * Y$
(18) $INT_{net,F} = r_L(-1) * L_F(-1) - r_D(-1) * D_F(-1)$
(19) $T_F = \max(t_F*(Pg_F - INT_{net,F} -DA) , 0)$
(20) $P_F = Pg_F - INT_{net,F} - DA - T_F$
(21) $PD_F = \max(P_F * (1-RR) , 0)$
(22) $DpS = PD_F / E_{s,F}(-1)$
(23) $PU_F = P_F - PD_F$

Financing by Firms

(24) $exFD_F = I - PU_F - DA$
(25) $E_{issued} = exFD_F / p_E(-1) * EFR$
(26) $E_{s,F} = E_{s,F}(-1) + E_{issued}$
(27) $\text{Bankbalance}_F = \text{Bankbalance}_F(-1) - exFD_F + E_{issued} * p_E$
(28) $D_F = \text{Bankbalance}_F * z_9$
(29) $L_F = - \text{Bankbalance}_F * z_{10}$
(30) $z_9 = 1$, if $\text{Bankbalance}_F > 0$; else 0
(31) $z_{10} = 1$, if $\text{Bankbalance}_F < 0$; else 0
(32) $V_F = V_F(-1) + I(-1) - DA(-1) + (D_F - D_F(-1)) - (L_F - L_F(-1)) - CG_E - E_{issued} * p_E$

Household Worker 1

(33) $Yg_{W1} = w_{W1} * N_{W1} + D_{W1}(-1) * r_D(-1)$

(34) $T_{W1} = \max(t*(Yg_{W1}) , 0)$

(35) $Yd_{W1} = Yg_{W1} - T_{W1} - L_{W1}(-1) * r_L(-1)$

(36) $c_{d,W1} = (1\text{-}imit) * pc_{Yd,W1} * Yd_{W1}(-1) + imit * C_{W2} + pc_{V,W1} * D_{W1}$

(37) $C_{W1} = c_{d,W1}$

(38) $V_{W1} = V_{W1}(-1) + Yd_{W1} - C_{W1}$

(39) $D_{W1} = V_{W1} * z_3$

(40) $L_{W1} = -V_{W1} * z_4$

(41) $z_3 = 1$, if $V_{W1} > 0$; else 0

(42) $z_4 = 1$, if $V_{W1} < 0$; else 0

Modified Consumption W1 for financial regulation scenario

(43) $c_{d,W1} = (1\text{-}imit) * pc_{Yd,W1} * Yd_{W1}(-1) + imit * C_{W2} + pc_{V,W1} * D_{W1}$

(44) $C_{W1} = z_{99} * c_{d,W1} + z_{100} * (c_{d,W1} - (c_{d,W1} - Yd_{W1}(-1)) * L_{W1}(-1)/Yd_{W1}(-1)/PrudRat)$

(45) $z_{99} = 1$, if $c_{d,W1} < Yd_{W1}$; else 0

(46) $z_{100} = 1$, if $c_{d,W1} > Yd_{W1}$; else 0

Households Worker 2

(47) $Yg_{W2} = w_{W2} * N_{W2} + D_{W2}(-1) * r_D(-1)$

(48) $T_{W2} = \max(t * (Yg_{W2}) , 0)$

(49) $Yd_{W2} = Yg_{W2} - T_{W2} - L_{W2}(-1) * r_L(-1)$

(50) $C_{W2} = pc_{Yd,W2} * Yd_{W2}(-1) + pc_{V,W2} * V_{W2}(-1)$

(51) $V_{W2} = V_{W2}(-1) + Yd_{W2} - C_{W2}$

(52) $D_{W2} = V_{W2} * z_5$

(53) $L_{W2} = -V_{W2} * z_6$

(54) $z_5 = 1$, if $V_{W2} > 0$; else 0

(55) $z_6 = 1$, if $V_{W2} < 0$; else 0

Households Rentiers

(56) $Yg_R = D_R(-1) * r_D(-1) + E_{h,R}(-1) * DpS$

(57) $T_R = \max(t * (Yg_R) , 0)$

(58) $Yd_R = Yg_R - T_R$

(59) $C_R = pc_R * Yd_R(-1) + pcV_R * V_R(-1)$

(60) $V_R = V_R(-1) + Yd_R - C_R + CG_E$

(61) $V^e_R = V_R(-1) * (1+gr_Y(-1))$

Portfolio decision

Tobin Equations (not in the model):

(62) $D_R/V_R = \theta_0 + \theta_1 * r_D - \theta 2 * DpS/p_E(-1) + \theta 3 * Yd_R/V_R$

(63) $p_E * E_{h,R} / V_R = (1 - \theta_0) - \theta_1 * r_D + \theta_2 * DpS/p_E(-1) - \theta_3 * Yd_R/V_R$

Model equations:

(64) $E_{h,R} = E_{s,F}$

(65) $p_E = (((1 - \theta_0) - \theta_1 * r_D + \theta_2 * DpS/p_E(-1)) * V^e_R - \theta_3 * Yd_R) / E_{h,R}$

(66) $D_R = V_R - p_E * E_{h,R}$

(67) $CG_E = (p_E - p_E(-1)) * E_{h,R}(-1)$

Government

(68) $G = G(-1) * (1 + gr_G)$

(69) $gr_G = gr_Y(-1) + (defT_{Gov} - (def_{Gov}(-1) / Y(-1)))$

(70) $T = T_{W1} + T_{W2} + T_R + T_F$

(71) $def_{Gov} = G - T + L_{Gov}(-1) * r_L(-1) - D_{Gov}(-1) * r_D(-1)$

(72) $V_{Gov} = V_{Gov}(-1) - def_{Gov}$

(73) $D_{Gov} = V_{Gov} * z_7$

(74) $L_{Gov} = -V_{Gov} * z_8$

(75) $z_7 = 1$, if $V_{Gov} > 0$; else 0

(76) $z_8 = 1$, if $V_{Gov} < 0$; else 0

Banks

(77) $r_D = r$

(78) $r_L = r$

(79) $L = L_F + L_{W1} + L_{W2} + L_{Gov} + L_{RoW}$

(80) $D = D_F + D_{W1} + D_{W2} + D_R + D_{Gov} + D_{RoW}$

RoW

(81) $Y_{RoW} = Y_{RoW}(-1) * (1 + g_{RoW})$

(82) $Im = pIm * Y$

(83) $Ex = Ex(-1) * (1 + g_{RoW})$

(84) $CA = Ex - Im - r_D(-1) * D_{RoW}(-1) + r_L(-1) * L_{RoW}(-1)$

(85) $V_{RoW} = V_{RoW}(-1) - CA$

(86) $D_{RoW} = V_{RoW} * z_1$

(87) $L_{RoW} = -V_{RoW} * z_2$

(88) $z_1 = 1$, if V_RoW > 0; else 0

(89) $z_2 = 1$, if V_RoW < 0; else 0

10 Appendix 2: List of variables, parameter values and starting values

		endogenous	exogenous	paramter value	Steady-state / starting value Baseline 1	Steady-state / starting values Baseline 2
$Bankbalance_F$	Bankbalance of Firms	x			-41.792	-41.792
β_1	parameters for investment decision		x	0		
β_2	parameters for investment decision		x	0.04		
β_3	parameters for investment decision		x	0.005		
β_4	parameters for investment decision		x	0.02		
β_5	parameters for investment decision		x	0.075		
C_R	Consumption Rentiers	x			N/A	N/A
$C_{d,W1}$	Consumption desired Worker 1	x				
C_{W1}	Consumption Worker 1	x			N/A	N/A
C_{W2}	Consumption Worker 2	x			21.714	21.714
CA	Current Account Balance	x			N/A	N/A
C	Total Consumption	x			50.329	50.763
COR	Capital Output Ratio		x	2		
CG_E	Capital Gains on Equity					
D	Deposits	x			N/A	N/A
D_F	Deposits Firms	x			0	0.000
D_{Gov}	Deposits Government	x			0	0.000
D_R	Deposits Rentiers	x			22.55	22.550
D_{W1}	Deposits Worker 1	x			23.14	6.805
D_{W2}	Deposits Worker 2	x			114.248	114.248
DA	Depreciation allowances = depreciation of capital stock	x			14.128	14.128
def_{Gov}	Government Deficit	x			3	3.000
$defT_{Gov}$	Government Deficit to GDP Target		x	0.03		
δ	depriciation rate		x	0.05		
DpS	Dividend per share	x			N/A	N/A
E_{issued}	Equity issued in the current period	x			N/A	N/A
EFR	Equity finance ratio		x	0.1		
$E_{h,R}$	Equity held by Rentiers	x			100	100.000
$E_{s,F}$	Equity supplied by Firms	x			100	100.000
Ex	Exports	x			30.711	30.316
$exFD_F$	external Finance Demand Firms	x			N/A	N/A
G	Governnment Expenditure	x			24.597	24.557
gr_G	growth rate government expenditure	x			0.35	0.350
gr_K	growth rate capital stock	x			0.35	0.350
gr_Y	GDP growth rate	x			0.35	0.350

gr_{RoW}	growth rate RoW and Exports		x	0.035		
I	Gross investment	x			24.363	24.363
Im	Imports	x			N/A	N/A
imit	imitation parameter		x	0/0.5		
I_{net}	Net-Investment	x			N/A	N/A
$INT_{net,F}$	net interest payments firms	x			N/A	N/A
K	Capital Stock	x			292.44	292.440
L	Loans	x			N/A	N/A
L_F	Loans Firms	x			41.792	41.792
L_{Gov}	Loans Government	x			88.714	88.714
L_{RoW}	Loans Rest of the World	x			29.432	13.098
L_{W1}	Loans Worker 1	x			0	0.000
L_{W2}	Loans Worker 2	x			0	0.000
$Mcap_F$	Market capitalisation firms	x			N/A	N/A
N	Employment	x			N/A	N/A
N_{W1}	Employment worker 1	x			N/A	N/A
n_{W1}	share of worker 1 in total employment		x	0.5		
N_{W2}	Employment worker 2	x			N/A	N/A
P	prices		x	1		
p_E	Equity prices	x			0.86	0.860
P_F	Profits after taxes, depreciation and interest payments	x			N/A	N/A
PD_F	Profits distributed by Firms	x			12.989	12.989
PU_F	Profits undistributed	x			8.659	8.659
$pc_{Yd,R}$	propensity to consume out of income rentiers		x	0.5		
$pc_{Yd,W1}$	propensity to consume out of income worker 1		x	0.95		
$pc_{Yd,W2}$	propensity to consume out of income worker 2		x	0.7		
$pc_{V,R}$	propensity to consume out of wealth rentiers		x	0.04		
$pc_{V,W1}$	propensity to consume out of wealth worker 1		x	0.04		
$pc_{V,W2}$	propensity to consume out of wealth worker 2		x	0.04		
Pg_F	Gross Profits Firms	x			N/A	N/A
pIm	propensity to import		x	0.3		
Pr	productivity		x	1		
PrudRat	Prudential Ratio		x	1		
PS	Profit Share		x	0.4		
R	policy interst rate		x	0.01		
r_D	deposit interest rate	x			N/A	N/A
r_L	loan interest rate	x			N/A	N/A
RR	retention ratio		x	0.4		
T	Taxes	x			N/A	N/A
t	tax rate personal		x	0.25		
T_F	Taxes Firms	x			N/A	N/A

t_F	tax rate corporate		x	0.15		
T_R	Taxes Rentier	x			N/A	N/A
T_{W1}	Taxes Worker 1	x			N/A	N/A
T_{W2}	Taxes Worker 2	x			N/A	N/A
θ_0	parameter in portfolio decision		x	0.5		
θ_1	parameter in portfolio decision		x	2		
θ_2	parameter in portfolio decision		x	2		
θ_3	parameter in portfolio decision		x	0.005		
u	capacity utilization	x			0.684	0.684
V^e_R	net wealth rentiers expected					
V_F	net wealth firms	x			164.662	164.662
V_{Gov}	net wealth Government	x			-88.714	-88.714
V_R	net wealth rentiers	x			108.537	108.537
V_{RoW}	net wealth Rest of the World	x			-29.432	-13.098
V_{W1}	net wealth worker 1	x			23.14	6.805
V_{W2}	net wealth worker 2	x			114.248	114.248
w_{W1}	wage rate worker 1	x			N/A	N/A
w_{W2}	wage rate worker 2	x			N/A	N/A
w_a	average wage rate	x			N/A	N/A
WB	Wage Bill	x			N/A	N/A
wm_{W2}	wage multiple of worker 2 compared to average wage		x	1.1		
WS	Wage Share	x			N/A	N/A
Y	Output Domestic	x			100	100.000
Y_{RoW}	Output Rest of the World					
Yd_R	disposable income Rentiers	x			9.905	9.905
Yd_{W1}	disposable income worker 1	x			20.418	20.299
Yd_{W2}	disposable income worker 2	x			25.578	25.578
Y_{fc}	output at full capacity utilization of capital stock	x			N/A	N/A
Yg_R	gross income rentiers	x			N/A	N/A
Yg_{W1}	gross income worker 1	x			N/A	N/A
Yg_{W2}	gross income worker 2	x			N/A	N/A

Imprint

Editors:
Sigrid Betzelt Trevor Evans Eckhard Hein Hansjörg Herr
Birgit Mahnkopf Christina Teipen Achim Truger Markus Wissen

ISSN 1869-6406

Printed by
HWR Berlin

Berlin April 2016