Forum for Macroeconomics and Macroeconomic Policies

IMK Macroeconomic Policy Institute

The IMK is an institute of the Hans-Böckler-Stiftung

FMM-WORKING PAPER

Nr. 6 · July, 2017 · Hans-Böckler-Stiftung

OPPORTUNITIES AND LIMITS OF REBALANCING THE EUROZONE VIA WAGE POLICIES: THEORETICAL CONSIDERATIONS AND EMPIRICAL ILLUSTRATIONS FOR THE CASE OF GERMANY

Eckhard Hein [1] Achim Truger [2]

ABSTRACT

In this paper we discuss the relationship between the current account rebalancing in the Eurozone, income distribution and wage policies with a focus on the main surplus economy, Germany. We will illustrate how and to which extent German wage policies could be able to contribute to a more balanced development of the Eurozone and to overcome the export-led mercantilist German model. Our analysis and our scenarios will be based on stylized econometric results for Germany, as they have recently been obtained in the empirical literature estimating the German demand and growth regime based on post-Kaleckian models. We will focus in particular on the relationship between nominal wages and functional income distribution, on the one hand, and between functional income distribution and domestic demand, on the other hand. We show that more expansionary wage policy can contribute to reducing the excessive German current account surplus, mainly through the domestic income-imports channel. However, wage policy alone will be overburdened with the task of rebalancing. For this, in particular more expansionary fiscal policies are required.

1 Eckhard Hein, Corresponding author. Berlin School of Economics and Law and Institute for International Political Economy (IPE) Badensche Str. 50-51, 10825 Berlin, Germany. Email: eckhard.hein@hwr-berlin.de

2 Achim Truger, Berlin School of Economics and Law and Institute for International Political Economy (IPE) Badensche Str. 50-51, 10825 Berlin, Germany Email: achim.truger@hwr-berlin.de

Opportunities and limits of rebalancing the Eurozone via wage policies: Theoretical considerations and empirical illustrations for the case of Germany[*]

Eckhard Hein and Achim Truger

Berlin School of Economics and Law
Institute for International Political Economy Berlin (IPE)

Abstract

In this paper we discuss the relationship between the current account rebalancing in the Eurozone, income distribution and wage policies with a focus on the main surplus economy, Germany. We will illustrate how and to which extent German wage policies could be able to contribute to a more balanced development of the Eurozone and to overcome the export-led mercantilist German model. Our analysis and our scenarios will be based on stylized econometric results for Germany, as they have recently been obtained in the empirical literature estimating the German demand and growth regime based on post-Kaleckian models. We will focus in particular on the relationship between nominal wages and functional income distribution, on the one hand, and between functional income distribution and domestic demand, on the other hand. We show that more expansionary wage policy can contribute to reducing the excessive German current account surplus, mainly through the domestic income-imports channel. However, wage policy alone will be overburdened with the task of rebalancing. For this, in particular more expansionary fiscal policies are required.

Keywords: Current account imbalances in the Eurozone, wage policies, distribution, exports, imports
JEL-code: E21, E 25, E 27, E 62, E 64, F 45, F 47, H 62

Corresponding author:
Prof. Dr. Eckhard Hein
Berlin School of Economics and Law
Badensche Str. 52
10825 Berlin
Germany
e-mail: eckhard.hein@hwr-berlin.de

[*] This paper has been prepared for the 14th Euroframe Conference on Economic Policy Issues in the European Union 'Growth and Inequality: Challenges for EU Economies', 9 June 2017, Berlin. It builds on our joint previous work (see Hein/Truger 2014, 2017). For assistance, we would like to thank Tobias Schäffer and Ryan Woodgate. The final version of the paper was produced while Eckhard Hein was a Visiting Research Professor at Sapienza University Rome in May 2017. He would like to thank the Sapienza University, and Claudio Sardoni in particular, for the invitation and the hospitality.

1. Introduction

In this paper we discuss the relationship between the necessary current account rebalancing in the Eurozone, income distribution and wage policies. In contrast to most approaches we do not (primarily) focus on the personal income distribution but on the functional income distribution and on the role of incomes and wages policy. The role of wages policies within a currency union have been discussed extensively – particularly from a Keynesian perspective. A simplifying, yet influential approach assumes (1) a direct and proportionate relationship between nominal unit labour costs and the price level in the individual member countries (Heine/Herr/Kaiser 2005, Herr 2009, 2014),[1] and (2) a direct and unambiguous dependence of net exports on relative price competitiveness (Flassbeck/Lapavitsas 2013, Flassbeck 2015, Sinn 2014). From that perspective the increasing current account imbalances before the global financial and economic crisis have been explained by an overly expansionary wage policy in the deficit countries (Sinn 2014) and an overly restrictive one in the surplus countries, in particular in Germany (Flassbeck/Lapavitsas 2013, Stockhammer/Onaran 2012).

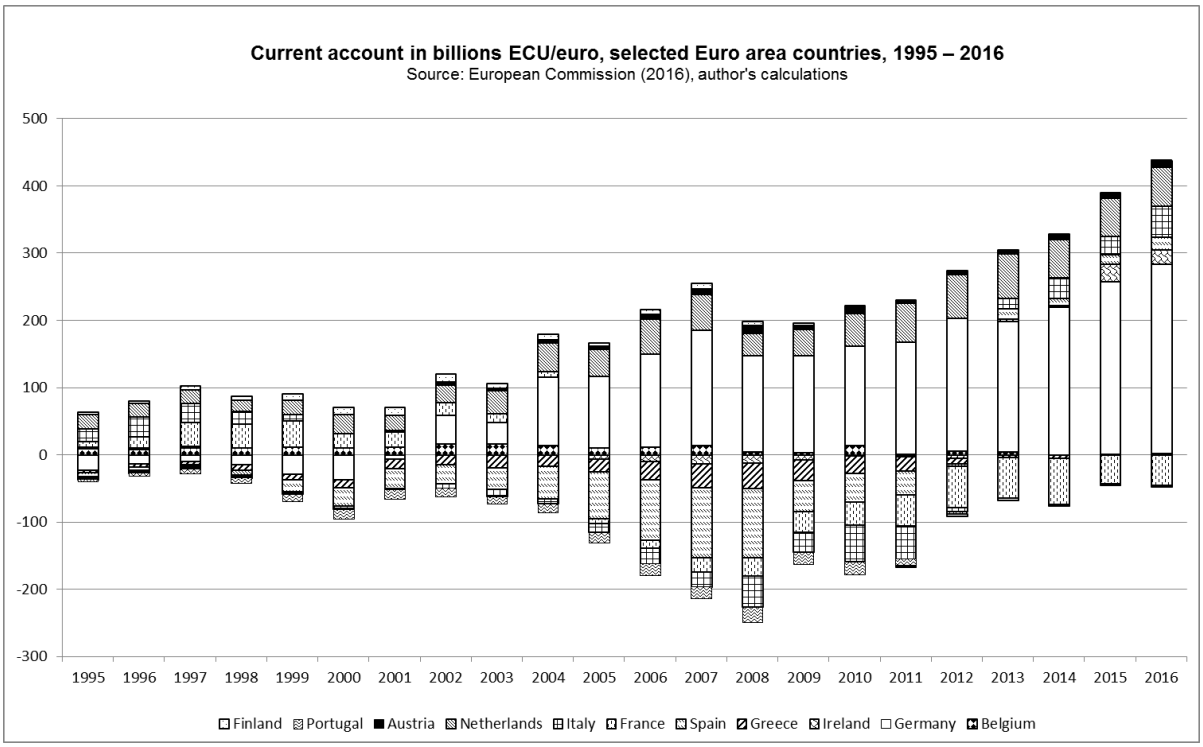
In order to cure the imbalances, therefore, a restrictive wage policy in the deficit countries and an expansionary wage policy in the surplus countries would be needed. This would directly correct the relative price competitiveness between the countries and therefore reduce the imbalances. Looking at the development of the current account balances since the crisis gives the impression that the previous deficit countries have gone through their necessary adjustment, because their deficits decreased or even turned into surpluses, whereas this adjustment in the surplus countries, particularly in Germany is still to be done (Figure 1). Hence, a strongly expansionary wage policy would have to trigger remarkably increasing inflation rates and a corresponding reduction of the export industries' price competitiveness in order to reduce the current account surpluses.

However, there are at least two problems with this simplifying approach: First a complete shifting of changes in unit labour costs into proportionate output price changes will happen only under the restrictive conditions of a closed economy in which all firms operate with the same technology and are simultaneously confronted with the same increase in nominal wages and thus in nominal unit labour costs. Under less restrictive assumptions, i.e. with some heterogeneity of firms or industries with respect to the production technology or the change in nominal wages, the shifting of average nominal unit labour cost changes into prices will always be incomplete and will therefore automatically induce a change in the functional income distribution, as Sylos-Labini (1979) had already made clear (Hein 2005, 2014, chapter 6). This conclusion is well confirmed by empirical evidence for several countries, including Germany (Onaran/Galanis 2014, Onaran/Obst 2016, Stockhammer/Hein/Grafl 2011). Second, price competitiveness does not seem to be the only explaining factor for European current account imbalances, non-price competitiveness and

[1] Herr (2009, 2014), following Keynes (1930), acknowledges that prices are composed of wages and capital costs, with the latter being calculated using the rate of interest and the capital stock. However, it is then assumed, that each rise in unit wage costs immediately feeds into the capital costs, such that wage costs and capital costs rise simultaneously and a proportional relationship between wage growth and inflation is then established.

growth differentials matter as well, as has been shown by using different types of empirical models (Arghyrou/Chortareas 2008, European Commission 2010, Gaulier/Vicard 2012, Stockhammer/Sotiropoulos 2014). German exports, in particular, seem to be mainly driven by high product quality leading to a high income elasticity of exports and therefore by the domestic demand dynamics in the importing countries (Horn et al. 2017, Horn/Lindner 2016, Kollmann et al. 2014, Schröder 2015, Storm/Naastepad 2015, Schulten 2015a, 2015b). Therefore, expansionary wage policy in Germany should not have a strong direct detrimental effect on German export growth, but should instead rather exert a relevant effect on functional income distribution, which will then influence domestic demand and in turn import growth, net exports and the current account.

Figure 1



Based on these findings and observations, this paper will try to illustrate how and to which extent German wage policies could be able to contribute to a more balanced development of the Eurozone and to overcome the export-led mercantilist German model. This model has considerably contributed to the grave current account imbalances within the Eurozone (and also within the global economy) prior to the crisis (Hein 2013/14, Hein/Truger 2011, 2012/13, Hein/Truger/van Treeck 2012), and has continued in a more or less unrestricted way even after the crisis (Dodig/Hein/Detzer 2015, Hein/Detzer 2016).

Our analysis and scenarios will be based on stylised econometric results for Germany, as they have recently been obtained in the empirical literature estimating the demand and growth regimes based on post-Kaleckian models. We focus in particular on those studies applying a single-equations estimation approach, i.e. Onaran/Galanis (2014), Onaran/Obst (2016) and Stockhammer/Hein/Grafl (2011). Where possible we will also draw on the results

of Hein/Vogel (2008, 2009) and Naastepad/Storm (2007). The numerical results of these studies are summarised in Appendix 1.[2] We are particularly interested in the relationship between nominal wages and functional income distribution, on the one hand, and between functional income distribution and domestic demand, on the other hand. The purpose of our paper is thus quite modest: We attempt to provide an illustration of the nominal wage growth, inflation and re-distribution required in order to rebalance the German current account, applying stylised econometric results and some assumptions about German investment-GDP ratios, as well as government deficit-GDP ratios.

In Section 2 we will outline the analytical framework and the assumptions for the scenario calculations presented in Sections 3 and 4. Section 3 presents the scenarios for a rebalancing strategy based purely on expansionary wage policies in Germany, while Section 4 also includes fiscal policy alternatives. Section 5 briefly summarises and concludes.

2. Analytical framework and method

The export driven mercantilist German growth model is mirrored in the development of the financial balances of the main macroeconomic sectors (private sector, public sector and foreign sector). The financial balance of the private sector is given by the difference between private saving (S) and private investment (I), the public financial balance is given by the difference of government revenues (T) and government spending (G). The foreign financial balance expresses the difference between the sum of domestic spending on imports and compensation of foreign production factors (M), which is equal to the foreign earnings for this, and the sum of domestic earnings through exports and the compensation for domestic production factors used abroad (X), which is equal to the foreign spending for these purposes. The sum of all financial balances must be equal to zero because every surplus must by definition be compensated by a corresponding deficit.

$$(1) \qquad S - I + T - G + M - X = 0 .$$

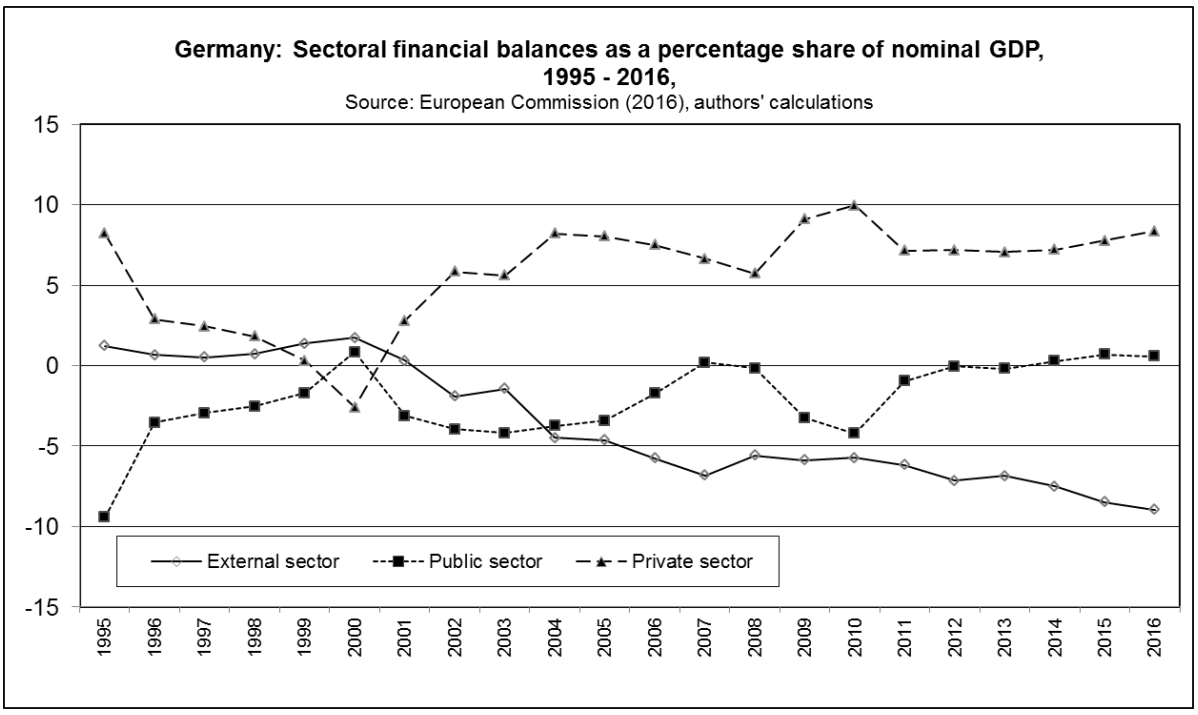
The permanently positive private sector balance in combination with balanced or slightly positive public sector financial balance since the beginning of the 2000s have required a considerably negative foreign sector financial balance (Figure 2), which is equivalent to the German current account surplus. Prior to the crisis it amounted to 7 percent of nominal GDP and has increased to almost 9 percent in the meantime. On the one hand, this large current account surplus means an increase in foreign assets held by German domestic sectors and hence an increase of Germany's net international investment position vis-à-vis the rest of the world. As a mirror image, the rest of the world increases its liabilities with respect to Germany and witnesses a deterioration of its net international investment position. On the other hand, the German current account surplus has been mainly the result of a rising

[2] Hein (2014, chapter 7) has presented a general overview of the estimation results of demand regimes for several countries based on a post-Kaleckian distribution and growth model in the tradition of Bhaduri/Marglin (1990) and Kurz (1990).

surplus in the net exports of goods and services – which means an export of unemployment (Horn et al. 2017).

A reduction of Germany's high current account surplus or the highly negative foreign sector financial balance, respectively, will only be possible if the surplus of the private sector financial balance is reduced by consuming more (and consequently saving less) and/or investing more, or if the surplus in the public sector financial balance is reduced significantly by accepting considerable budget deficits. The latter is currently prevented by the German debt brake which was written into the constitution in 2009, constrains the federal government's structural balance to -0.35 percent of GDP and requires the federal states and local authorities to balance their structural balance from 2020 onwards. The European Fiscal Compact limits the German structural government deficit to 0.5 percent of GDP. Given these institutional constraints we will focus on the possibilities for a reduction of the high private sector financial surplus by a more expansive German wage policy as a first step.

Figure 2



The private sector financial balance is influenced by income distribution, because private consumption and savings depend on income distribution. Following Kalecki (1939, 1954, 1968), we neglect potential direct effects of the functional income distribution, hence the real wage rate of the profit share, on private investment. As Laski/Walther (2015) and Osiatynski (2015) have pointed out, it is difficult to see, how redistribution at the expense of labour should directly stimulate investment, if a lag between investment decision and investment spending is taken into account, as in Kalecki's work. In the case of Germany, this argument seems to be supported by a number of empirical macroeconomic estimates of investment functions, based on the theoretical models in the tradition of Bhaduri/Marglin (1990) and Kurz (1990). These estimations have mostly found no or only insignificant direct

effects of the profit share or the wage share on business investment (Hein/Vogel 2008, 2009, Onaran/Obst 2016, Stockhammer/Hein/Grafl 2011).[3] We can therefore focus on the effects of distribution on consumption and saving for which stable econometric results have been found in the case of Germany. Distinguishing the propensity to save out of profits (s_Π) from the propensity to save out of wages (s_w), private saving depends on nominal GDP (Y), the profit share (h) or, respectively, the wage share (1-h= Ω) and the functional propensities to save as follows:

$$S = s_W(1-h)Y + s_\Pi hY, \qquad 0 \le s_W < s_\Pi \le 1. \tag{2}$$

The propensity to save out of wages should be generally smaller than the propensity to save out of profits, because the latter includes firms' retained earnings. Furthermore, profits usually flow disproportionately towards high income households with a relatively lower marginal propensity to consume. Equations (1) and (2) establish a connection between the functional income distribution, i.e. the profit share, the investment ratio (I/Y), the budget balance ratio [(T-G)/Y] and the current account balance ratio [(X-M)/Y] with given functional propensities to save:

$$h = \frac{\frac{I}{Y} - \frac{T-G}{Y} + \frac{X-M}{Y} - s_W}{s_\Pi - s_W}. \tag{3}$$

Equation (3) explains the level of the profit share, and therefore the wage share, given the propensities to save out of profits and wages, for different levels of investment-GDP ratios, government budget balance-GDP ratios and current account balance-GDP ratios, that satisfies equation (1). As is clear from equation (3), the profit share and the current account balance ratio are positively related to each other. Cet. par., any reduction in the current account balance ratio thus requires a reduction in the profit share. Or, seen from the other perspective, cet. par., any reduction in the profit share means a reduction in the current account balance ratio. Of course, this relationship is derived from an accounting identity and a saving function, and is hence open for different theories regarding causalities. What we will argue below is that the profit share can be affected by domestic wage policies, and that this will then affect the current account-GDP ratio through the net export-GDP ratio. The channels through which this will happen are, first, a reduction of price competitiveness associated with rising nominal wages, triggering rising real wages and a falling profit share, which will directly dampen exports and also raise imports.[4] Second, a falling profit share and

[3] However, it has to be admitted that Onaran/Galanis (2014) and Naastepad/Storm (2007) have found small significant direct effects of the profit share or of real wage growth on investment in Germany. See Appendix 1 for the detailed results.

[4] For the detailed results of the relevant studies see Appendix 1. In these estimations, the main effect of the distribution-price competiveness channel is on exports, with only small or hardly any effects on imports. However, we have to stress that the estimated coefficients only capture the direct effects through changes in price competitiveness of redistribution on exports and imports and thus net exports. They do not yet include

rising wage share will increase domestic demand and thus, indirectly, the demand for imports. Both channels will therefore reduce net exports and hence the current account-GDP ratio in the medium to long run. Given the recent econometric results on the determinants of the German current account and German exports, in particular, we hold that the indirect redistribution-domestic demand-imports channel is the dominant one in Germany, without denying potential effects of redistribution on exports.[5]

Although redistribution at the expense of profits and in favour of wages will reduce the net export-GDP ratio and the current account-GDP ratio, assuming the other ratios and saving propensities to be constant, the level of GDP will not remain unaffected. Empirical estimates suggest that aggregate demand and GDP in Germany are wage led (Naastepad/Storm 2007, Hein/Vogel 2008, 2009, Stockhammer/Hein/Grafl 2011, Onaran/Galanis 2014, Onaran/Obst 2016). Therefore, a decrease of the profit share and an increase of the wage share aiming at rebalancing the German economy will also go hand in hand with a (slightly) higher GDP. This means, we may have level effects too, which cannot be seen in the ratios of equation (3), which has to hold for all levels of GDP, of course.[6]

With these qualifications, equation (3) will be used in order to calculate the redistribution requirements for different scenarios with different (target) values for the other ratios. After having identified the necessary redistribution for different scenarios we can then also determine the additional nominal wage growth required in order to achieve a certain target of redistribution. We write the wage share as the ratio of the average nominal wage rate (w) and the product of the price index (p) and the average real labour productivity (y):

$$\Omega = \frac{w}{py}. \tag{4}$$

The change of the wage share ($\Delta\Omega$) thus depends on the growth rates of the nominal wage rate, labour productivity and the price index as follows:

$$\Delta\Omega = \Omega\left(\hat{w} - \hat{y} - \hat{p}\right). \tag{5}$$

Nominal wage policy will only be able to influence the wage share if a change in unit labour cost growth ($\hat{w} - \hat{y}$) does not automatically cause a proportional change in the growth rate of the price index, hence in inflation. Changes in unit labour cost growth need to be passed on only incompletely to inflation:

---

the indirect effects via an increase of domestic demand on imports. That is why we cannot use these coefficients to directly calculate the required redistribution of income for a target level of the net export-GDP or the current account-GDP ratio.

[5] For the detailed results of those studies which have estimated the direct effects of redistribution on German exports see Appendix 1.

[6] These level effects, however, are small, as is shown in Appendix 1.

(6) $$\hat{p} = (1-\alpha)\hat{p}_0 + \alpha(\hat{w} - \hat{y}), \qquad 0 \leq \alpha \leq 1,$$

with $\hat{p}_0$ as the trend of inflation, which is given by the other cost factors and by changes in mark-ups and hence profit claims. Equation (6) can be derived from a simple Kaleckian mark-up pricing approach, in which firms mark-up unit variable costs composed of unit labour costs and unit material costs, each of which are assumed to be constant up to full capacity output, as is shown in Appendix 2. In what follows we assume that $\hat{p}_0 = 0$. Our results can therefore also be interpreted as being the deviation from an inflation trend determined by the other cost factors and the firms' mark-up. If the factor of transmission (α) is smaller than one, nominal wage policy is able to influence the wage share:

(7) $$\Delta\Omega = \Omega\left[(\hat{w} - \hat{y} - \hat{p}_0)(1-\alpha)\right].$$

Therefore, the connection between the pursued redistribution target, or to be more precise the target wage share growth, and the required nominal unit labour cost growth is:

(8) $$\hat{w} = \frac{\hat{\Omega}}{(1-\alpha)} + \hat{y} + \hat{p}_0 .$$

If we insert the nominal wage growth from equation (8) into equation (6) we get the (increase of the) inflation rate caused by the redistribution.

3. Model scenarios I: Rebalancing by means of German wage policy

The model calculations, which aim to reduce the German current account surpluses by way of redistribution in favour of wages, are conducted in two steps for every scenario. Firstly, we calculate the required profit share or wage share and hence the necessary shift in the functional income distribution based on the assumptions about the investment ratio, the public sector financial balance ratio, the target current account balance ratio and the functional propensities to save (equation 3). Secondly, additional assumptions about the degree of wage cost shifting and the growth of labour productivity are used to calculate the nominal wage growth (equation 8) required for redistribution and the associated inflation rate (equation 6). As we have already mentioned above, we will assume an inflation trend induced by the other cost factors and profit claims of $\hat{p}_0 = 0$, so that our results can be read as the required additional wage and price inflation for the re-distribution target.

For the investment ratio, the share of nominal gross fixed capital formation in nominal GDP, we first take the average for the years since the introduction of the euro (1999-2015). For the public sector financial balance as a share of the nominal GDP, we follow the requirements of the German debt brake and set it equal to -0.35 percent of GDP. For the target current account balance as a share of nominal GDP, we assume different values for the various scenarios.

Scenario A assumes a negative German current account balance of -2 percent of GDP, which allows the foreign sector to reduce its net negative international investment position in absolute terms. Scenario B assumes a balanced current account and therefore a less pronounced rebalancing. Scenario C assumes a moderately positive current account balance of +2 percent of GDP. This scenario takes into account that a successful economic catch-up-processes of the European periphery will mean higher relative growth rates in the foreseeable future leading to moderate current account deficits for the catching-up countries. This is reasonable and feasible if a stable, long-term oriented net capital inflow into these countries can be guaranteed by efficient regulation of and intervention in capital flows in order to avoid bubble growth, on the one hand. On the other hand, 'high road' development strategies are required for successful and sustainable catch-up, making use of public investment, both national and European, in infrastructure and education, as well as public development banks and funds (i.e. the European Investment Bank, the European Investment Fund, etc.) to support private investment in the respective countries (Hein/Detzer 2015). However, a current account balance of + 6% for Germany, which is considered as tolerable in the macroeconomic imbalance procedure by the European Commission, seems to be far too high and very difficult to reconcile with a rebalancing in the Eurozone.

For the propensities to save out of wages and profits, we can use the results from the econometric estimates for Germany, as referred to above (Naastepad/Storm 2007, Hein/Vogel 2008, 2009, Prante 2017, Stockhammer/Grafl/Hein 2011, Onaran/Galanis 2014, Onaran/Obst 2016). These estimates are based on the data of the income measures of national accounts, that is, the gross income from entrepreneurial activity and assets (i.e. including depreciation, retained earnings, interest, dividends, rents and leaseholds), i.e. profits, and employee compensation, i.e. wages, both before tax. The econometric estimates for the periods from the early 1960s or 1970s to the early 2000s found relatively stable differentials between the propensities to save out of profits and wages ranging from 32 percentage points (Hein/Vogel 2008) to 50 percentage points (Onaran/Galanis 2014), with an average of about 40 percentage points.[7] Although these differences are within a relatively narrow range, the levels of the estimated saving propensities differ considerably because of different data with respect to functional income distribution. For this reason, we have calculated the propensity to save from wages, consistent with the data and a difference between the two saving propensities of 40 percentage points, from equation (3) with the average values for the years 1999-2015, as follows:

$$(9) \qquad s_W = \frac{I}{Y} + \frac{X-M}{Y} - \frac{T-G}{Y} - h\left(s_\Pi - s_W\right).$$

[7] For the estimated differentials for the propensities to save out of profits and wages in Germany, which also provide the effects of a one percentage increase in the profit share on consumption as a percentage of GDP, see Appendix 1.

This results in a propensity to save out of wages of 6.6 percent and out of profits of 46.6 percent.[8]

In order to be consistent with the other variables and also the estimated results for the saving propensities, we have calculated the wage share as the share of the compensation of employees of nominal GDP at market prices and the profit share as the residual. In order to determine the necessary redistribution, we assume the average wage or profit share of the years 1999-2015, since we are not interested in the short-term cyclical but in the medium to long term changes. For the calculation of the necessary nominal wage increases, we expect a growth in labour productivity, defined as real GDP per employee, of about one percent in the long term. This is roughly the average for the 1990s and 2000s until the crisis (European Commission 2016).

For the link between wage or unit labour cost growth and inflation, it is again possible to use estimation results from the literature. Since we are interested in the distributional effect, the elasticity of the GDP price index with regard to nominal unit labour costs is of interest. The values for Germany for the estimated periods from the early 1960s and 1970s to the 2000s before and after the crisis are 0.62 (Onaran/Galanis 2014), 0.38 (Onaran/Obst 2016) and 0.42 (Stockhammer/Hein/Grafl 2011) respectively.[9] For the sake of simplicity, we shall assume $\alpha = 0.5$ for the following calculations.

The results of the wage policy rebalancing scenarios are given in Table 1. Scenario A, which is connected with an absolute debt relief for the periphery, would imply an almost utopian shift in the functional income distribution: the German wage share would have to rise from an average of 50.4 to 70.2 percent of GDP. This is obviously utopian, because since 1960 the maximum wage share has been 56.4 percent of GDP in 1981 (European Commission 2016). In view of the realistic way of shifting labour costs to prices to a degree of 50 percent and with a growth rate of labour productivity of 1 percent per year, (additional) growth of the nominal wages per capita and year, i.e. the nominal wage rate, would have to increase to 18.3 percent if the adjustment had to be taken place within 5 years. If the adjustment period is doubled to 10 years, the additional rate of nominal wage growth will still be 8.5 percent. The inflation rate should increase by 8.6 or 3.7 percentage points, which is obviously beyond all imagination.

[8] Note that we are using nominal GDP at market prices as a denominator for our functional income shares. Profits, the profit share and the propensity to save out of profits thus include depreciations.

[9] See also the values for the elasticity of the export price index with regard to nominal unit labour costs in Appendix 1, which are considerably smaller.

Table 1: Scenarios	**I: Rebalancing by wage policy**				**II: Leeway for fiscal policy**		
	A	**B**	**C**	**D**	**E**	**F**	**G**
Nominal gross fixed investment as share of nominal GDP (I/Y), in percent	20.2	20.2	20.2	22.5	20.2	22.5	22.5
Current account balance as share of nominal GDP [(X-M)/Y)], in percent	-2.0	0.0	2.0	2.0	2.0	2.0	2.0
Public sector financial balance as share of nominal GDP [(T-G)/Y], in percent	-0.35				-1.35	-1.35	-1.35
Saving rate out of wages (s_W), in percent	6.6	6.6	6.6	6.6	6.6	6.6	5.6
Difference between the saving rates out of wages and profits ($s_\Pi - s_W$), percentage points	40.0						41.0
Required profit share (h), in percent	29.8	34.8	39.8	45.6	42.3	48.1	49.4
Average profit share (h) 1999-2015, in percent	49.6						
Required wage share (Ω), in percent	70.2	65.2	60.2	54.4	57.7	51.9	50.6
Average wage share (Ω) 1999-2015, in percent	50.4						
Required increase wage share (Δ Ω), percentage points	19.8	14.8	9.8	4.0	7.3	1.5	0.2
Annual wage growth with adjustment after 5 years; $\hat{p}_0 = 0$, $\hat{y} = 0.01$, α = 0.5	18.3	14.3	10.1	4.9	7.9	2.5	1.2
Annual inflation rate growth with adjustment after 5 years; $\hat{p}_0 = 0$, $\hat{y} = 0.01$, α = 0.5	8.6	6.6	4.5	1.9	3.4	0.7	0.1
Annual wage growth with adjustment after 10 years; $\hat{p}_0 = 0$, $\hat{y} = 0.01$, α = 0.5	8.5	6.8	5.0	2.7	4.0	1.7	1.1
Annual inflation rate growth with adjustment after 10 years; $\hat{p}_0 = 0$, $\hat{y} = 0.01$, α = 0.5	3.7	2.9	2.0	0.9	1.5	0.3	0.0

Remarks:
Scenario A: absolute reduction of foreign indebtedness for the periphery
Scenario B: fast rebalancing
Scenario C: moderate rebalancing, since the economic catch-up-process in the periphery is accompanied by higher growth rates and small current account deficits
Scenario D: as C plus higher investment ratios as in the second half of the 1990s.
Scenario E: as C plus Golden Rule for public investments i.e. a higher budget deficit (1% of GDP) for higher public net investment to the same extent
Scenario F: D and E combined, Golden Rule and redistribution induce higher private investment as in D
Scenario G: F plus more equal structure of wages

Source: European Commission (2016), authors' calculations.

A decisive parameter for the amount of the necessary shift in the functional income distribution is the targeted extent of the rebalancing: Reducing the goal to a balanced current account (Scenario B) or even a moderately positive current account of 2 percent of GDP (Scenario C), the extent of the required redistribution is clearly reduced. Nevertheless, the extent of redistribution with required wage shares of 65.2 percent (scenario B) or 60.2 percent (Scenario C) remains quite unrealistic. For Scenario B this would mean additional annual wage inflation of 6.8 percent (adjustment within 10 years) or 14.3 percent (adjustment in 5 years) with additional price inflation of 2.9 or 6.6. percent. And for Scenario C wage inflation would have to rise annually by 5 or 10.1 percentage points and price inflation by 2 or 4.5 percent.

Scenario D seems more realistic, although still associated with a high target wage share in historical comparison of 54.4 percent. It assumes a significantly higher private investment ratio of 22.5 percent of GDP, as it existed in the second half of the 1990s. However, in view of the weakness of private investment demand prevailing since the beginning of the new millennium, it is unclear how such an increase in private investment activity should actually occur. And even if it were achieved, rebalancing would still require considerable additional nominal wage growth of 4.9 percent over five years or 2.7 percent over ten years, and additional price inflation would amount to 0.9 or 1.9 percentage points.

4. Model scenarios II: More leeway for government budget deficits

Since a rebalancing of the German economy by means of a shift in the functional income distribution and hence by aggressive wages policy alone seems to be highly implausible, it is obviously necessary to adopt alternative or additional economic policy measures for rebalancing. An obvious candidate would be fiscal policy, in particular, which could lead to a reduction in the public sector financial balance by way of accepting higher budget deficits, and a reduction in the balance of the private sector through a more uniform distribution of income (Truger 2013).[10]

Scenario E in Table 1 therefore illustrates the impact of the introduction of the so-called Golden Rule for public investment, according to which net public investment should be financed permanently through budget deficits (Truger 2015, 2016). It is assumed that this will permanently increase the government deficit ratio in Germany by 1 percent of GDP to a total of 1.35 percent of GDP. In itself, this is purely mathematically not enough for a rebalancing, since the required wage share with 57.7 percent is still well above the historical maximum. Additional annual wage inflation would be in the range of 4 to 7.9 percent, and additional annual price inflation in the range of 1.5 and 3.4 percent, depending on the period of adjustment.

However, assuming that the increase in public investment made possible by the Golden Rule may trigger a complementary increase in private investment to 22.5 percent of

[10] Also the previous determined advocates of a wage-led recovery strategy after the crisis for the Eurozone and the global economy have now acknowledged that the effects of – and maybe the conditions for – such an exclusive strategy have been overrated, and they are now recommending a mixed strategy of expansionary wage and fiscal policies (Onaran 2016, Obst/Onaran/Nikolaidi 2017).

GDP, as in the second half of the 1990s, the target wage share required for rebalancing at 51.9 percent is still noticeably higher than the average for the years 1999 to 2015, but still at a level similar to that achieved in the 1990s. As shown in Scenario F, the necessary moderate (additional) growth of the nominal wage rate of 1.7 percent over ten years, or 2.5 percent per year over a period of five years, also appears realistic, as does the additional annual price inflation of 0.3 or 0.7 percent, respectively.

If in addition, as in Scenario G, fiscal policy – for example through tax policy measures – could contribute to reducing the inequality in the personal income distribution, the required shift in the functional income distribution will even be substantially smaller. We have assumed that through such a measure the propensity to save out of wages falls from 6.6 percent to 5.6 percent, while the propensity to save out of profits remains constant at 46.6 percent. In this scenario, only a very small functional redistribution would be required to achieve the target current account balance of 2 percent of GDP, and the nominal wage growth above the inflation trend would have to only slightly exceed trend productivity growth. Additional inflation would be close to zero.

5. Conclusions

In this paper, we have examined the role of German wage policy in the rebalancing of the German economy, that is, in the reduction of the excessively high current account surplus, which should contribute to rebalancing the Eurozone and also the global economy. Based on recent empirical work, we have argued, first, that nominal wage policy also has a distribution effect. This means, second, that the indirect effects of wage policy via domestic demand on imports have to be taken into account. And third, we have argued, based on the recent literature, that in the case of Germany, the contribution of wage policy to rebalancing will be mainly through the indirect redistribution-domestic demand-imports channel and less through direct price competitiveness-exports channel.

In order to assess the required redistribution we have then used stylized econometric results for Germany, as they have recently been obtained in the empirical literature estimating the German demand and growth regime based on post-Kaleckian models. We have focussed in particular on the relationship between nominal wages and functional income distribution, on the one hand, and between functional income distribution and domestic demand, on the other hand. We have shown that a more expansionary wage policy can indeed contribute to reducing the excessive German current account surplus, mainly through the domestic income-imports channel, so that German exports should be hardly affected. However, wage policy alone will be overburdened with the task of rebalancing. In particular more expansionary fiscal policies are required, too. First, deficit-financed public investments can significantly contribute to rebalancing. Secondly, government redistribution policy can contribute to a more balanced development through an increase in private domestic demand. Since redistributive wage policies and expansionary fiscal policies will have positive level effects on GDP and employment, they will also improve the political conditions for a more expansionary and balanced German development in the long run.

Appendix 1

Results from econometric studies on the effect of changes in functional income distribution on 'excess demand' in Germany and of changes in nominal unit labour costs on the price indices of GDP and exports

The econometric studies on the effects of changes in functional income distribution on aggregate demand and real GDP in Germany, on which our simulations are based, have used a single equations estimations approach. The procedure of this approach can be described as follows.

From national accounting aggregate demand (Y) is the sum of consumption (C), investment (I), net exports (NX), as the difference between exports (X) and imports (M), and government expenditure (G). All variables are in real terms. In a general formulation, consumption, investment and net exports are written as functions of income (Y), the profit share (h), and some other control variables (Z_i) used in the estimations. The latter are assumed to be independent of output and distribution. Government expenditures are usually considered to be exogenous and thus independent of changes in functional income distribution. Equilibrium aggregate demand is then given as:

(A1.1) $$Y^* = C(Y,h) + I(Y,h,Z_I) + NX(Y,h,Z_{NX}) + G\,.$$

The profit share is taken to be exogenous – feedbacks of changes in aggregate demand and its components on functional income distribution are thus ignored. Total differentiation of equation (A1.1) yields:

(A1.2) $$dY^* = \frac{\partial C}{\partial Y}dY + \frac{\partial C}{\partial h}dh + \frac{\partial I}{\partial Y}dY + \frac{\partial I}{\partial h}dh + \frac{\partial NX}{\partial Y}dY + \frac{\partial NX}{\partial h}dh\,.$$

Rearranging and collecting terms gives:

(A1.3) $$\frac{dY^*}{dh} = \frac{\frac{\partial C}{\partial h} + \frac{\partial I}{\partial h} + \frac{\partial NX}{\partial h}}{1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y} - \frac{\partial NX}{\partial Y}} = \frac{1}{1-x}\left[\frac{\partial C}{\partial h} + \frac{\partial I}{\partial h} + \frac{\partial NX}{\partial h}\right],$$

with $x = \partial C/\partial Y + \partial I/\partial Y + \partial NX/\partial Y$. If the feedbacks of changes in the level of aggregate demand and income on consumption, investment and net exports, and hence the multiplier [1/(1-x)], are ignored, equation (A1.3) simplifies to:

(A1.4) $$\frac{dY}{dh} = \frac{\partial C}{\partial h} + \frac{\partial I}{\partial h} + \frac{\partial NX^r}{\partial h}\,.$$

Dividing by Y gives the percentage change of aggregate demand caused by a one percentage point change in the profit share:

(A1.5) $$\frac{\frac{dY}{Y}}{dh} = \frac{\frac{\partial C}{Y}}{\partial h} + \frac{\frac{\partial I}{Y}}{\partial h} + \frac{\frac{\partial NX^r}{Y}}{\partial h}.$$

Equations (A1.5) shows the effects of a change in the profit share on 'excess demand', not yet including the multiplier effects, as the sum of the partial effects on consumption, investment and net exports. If $\frac{\frac{\partial C}{Y}}{\partial h} + \frac{\frac{\partial I}{Y}}{\partial h} < 0$, domestic excess demand is 'wage led', if $\frac{\frac{\partial C}{Y}}{\partial h} + \frac{\frac{\partial I}{Y}}{\partial h} > 0$, domestic excess demand is 'profit led'. If $\frac{\frac{dY}{Y}}{dh} < 0$, total excess demand is wage led, and if $\frac{\frac{dY}{Y}}{dh} > 0$, total excess demand is profit led. Table A1.1 summarises the results which have been obtained for the German economy.

Table A1.1: Effects of a one percentage point change in the profit share on excess aggregate demand and its components

Study and time period	$\frac{\frac{\partial Y}{Y}}{\partial h}$	$\frac{\frac{\partial C}{Y}}{\partial h}$	$\frac{\frac{\partial I}{Y}}{\partial h}$	$\frac{\frac{\partial X}{Y}}{\partial h}$	$\frac{\frac{\partial M}{Y}}{\partial h}$	$\frac{\frac{\partial NX}{Y}}{\partial h}$
	A=B+C+F	**B**	**C**	**D**	**E**	**F=D-E**
Hein/Vogel (2008), 1960-2005	-0.32	-0.32	0	n.e.	n.e.	0
Hein/Vogel (2009), 1960-2005	-0.06	-0.42	0	n.e.	n.e.	0.36
Naastepad/Storm (2007)*, 1960-2000	negative	-0.39	positive	positive	0	positive
Onaran/Galanis (2014), 1960-2007	-0.03	-0.5	0.38	0.1	0	0.1
Onaran/Obst (2016), 1960-2013	-0.35	-0.4	0	0.05	0	0.05
Prante (2017)[#], 1960-2012	n.e.	-0.39 … -0.42	n.e.	n.e.	n.e.	n.e.
Stockhammer/Hein/Grafl (2011), 1970-2005	-0.27 … -0.17	-0.38 … -0.44	0	0.11 … 0.22	-0.02 … -0.05	0.13 … 0.27

Notes: n.e. not estimated, 0 no significance, * Naastepad/Storm (2007) provide results for the effects of real wage growth on GDP growth, and on growth contributions of demand aggregates. Numerical results are thus not comparable and we only provide the signs with respect to implied changes in profit shares. [#] Prante (2017) has only estimated the consumption function, controlling for different indicators of personal income distribution.

Only three studies out of this pool have estimated the nominal unit labour cost (ulc) elasticities of the price indices for GDP (p) and for export prices (p_X). The results are shown in Table A1.2.

Table A1.2: Nominal unit labour cost elasticities of the price indices for GDP and for export prices		
Study and time period	$\frac{\partial \ln p}{\partial \ln ulc}$	$\frac{\partial \ln p_x}{\partial \ln ulc}$
Onaran/Galanis (2014), 1960-2007	0.62	0.22
Onaran/Obst (2016), 1960-2013	0.38	0.22
Stockhammer/Hein/Grafl (2011), 1970-2005	0.42	0.37

Appendix 2

The rate of inflation derived from a Kaleckian pricing equation

Assume a simple Kaleckian pricing equation. In incompletely competitive goods markets firms mark-up unit variable costs, being composed of unit labour costs, i.e. the ratio of the nominal wage rate (w) and labour productivity (y), and unit material costs (μ), which are each assumed to be constant up to full capacity output. The mark-up (m) is determined by the degree of price competition in the goods market, overhead costs and the bargaining power of workers and trade unions, following Kalecki (1954) (Hein 2014, Chapter 5):

(A2.1) $$p = (1+m)\left(\frac{w}{y} + \mu\right), \quad m > 0.$$

Transforming equation (A2.1) into growth rates yields:

(A2.2) $$\hat{p} = (\hat{w} - \hat{y})\frac{(1+m)\frac{w}{y}}{p} + \hat{\mu}\frac{(1+m)\mu}{p} + \hat{m}\frac{m\left(\frac{w}{y} + \mu\right)}{p}.$$

Setting $\alpha = \frac{(1+m)\frac{w}{y}}{p}$, which is the share of nominal unit labour costs plus the mark up on unit labour costs in the price, and $(1-\alpha)\hat{p}_0 = \hat{\mu}\frac{(1+m)\mu}{p} + \hat{m}\frac{m\left(\frac{w}{y} + \mu\right)}{p}$, which is the part of inflation caused by changes in unit material costs and in the mark-up, we arrive at:

(A2.3) $$\hat{p} = (1-\alpha)\hat{p}_0 + \alpha(\hat{w} - \hat{y}), \qquad 0 \le \alpha \le 1,$$

which is used as equation (6) in the paper.

References

Arghyrou, M.G., Chortareas, G. (2008): Current account imbalances and real exchange rates in the Euro area, *Review of International Economics*, 16, 747-765.

Bhaduri, A., Marglin, S. (1990): Unemployment and the real wage: the economic basis for contesting political ideologies, *Cambridge Journal of Economics*, 14, 375-393.

Dodig, N., Hein, E., Detzer, D. (2016): Financialisation and the financial and economic crises: Theoretical framework and empirical analysis for 15 countries, in: Hein, E., Detzer, D. and Dodig, N. (eds.), *Financialisation and the Financial and Economic Crises: Country Studies*, Cheltenham: Edward Elgar.

European Commission (2010): Surveillance of intra-Euro-area competitiveness and imbalances. European Economy, Vol. 1/2010, Brussels: European Commission, Directorate-General for Economic and Financial Affairs.

European Commission (2016): AMECO Database, November 2016, Brussels: European Commission.

Flassbeck, H. (2015): Die deutschen Löhne – Konfusion von links bis rechts, *Sozialismus*, 42 (6), 13-15.

Flassbeck, H., Lapavitsas, C. (2013): *The Systemic Crisis of the Euro – True Causes and Effective Therapies*, Berlin: Rosa Luxemburg Foundation.

Gaulier, G., Vicard, V. (2012): Current account imbalances in the euro area: competitiveness or demand Shock?, *Banque de France: Quarterly Selection of Articles*, 27, 5-26.

Hein, E. (2005): Löhne, Verteilung und Wachstum: Ansätze in der Tradition Michal Kaleckis, in: Hein, E., Heise, A., Truger, A. (eds.), *Löhne Beschäftigung, Verteilung und Wachstum: Makroökonomische Analysen*, Marburg: Metropolis.

Hein, E. (2013/14): The crisis of finance-dominated capitalism in the Euro area, deficiencies in the economic policy architecture and deflationary stagnation policies, *Journal of Post Keynesian Economics*, 36 (2), 325–354.

Hein, E. (2014): *Distribution and Growth after Keynes: A Post-Keynesian Guide*, Cheltenham: Edward Elgar.

Hein, E., Detzer, D. (2015): Coping with imbalances in the Euro area: Policy alternatives addressing divergences and disparities between member countries, *Wirtschaft und Management, Schriftenreihe zur wirtschaftswissenschaftlichen Forschung und Praxis*, 22, 13-50.

Hein, E., Detzer, D. (2016): Financialisation, re-distribution and 'export-led mercantilism': the case of Germany, in: Gallas, A., Herr, H., Hoffer, F., Scherrer, C. (eds.): *Combating Inequality: Opportunities for Economic and Political Change*, London: Routledge.

Hein, E., Truger, A. (2011): Finance-dominated capitalism in crisis – the case for a Keynesian New Deal at the European and the global level, in Arestis, P., Sawyer, M. (eds.), *New Economics as Mainstream Economics*, *International Papers in Political Economy*, Basingstoke: Palgrave Macmillan.

Hein, E., Truger, A. (2012/13): Finance-dominated capitalism in crisis – the case for a global Keynesian New Deal, *Journal of Post Keynesian Economics*, 35 (2), 183-210.

Hein, E., Truger, A. (2014): Fiscal Policy and Rebalancing in the Euro Area: A Critique of the German Debt Brake from a Post-Keynesian Perspective, *Panoeconomicus*, 61 (2), 1-19.

Hein, E., Truger, A. (2017): Rebalancing im Euroraum: Zu den Möglichkeiten und Grenzen der Lohnpolitik, in: Schulten, T., Dribbusch, H., Bäcker, G., Klenner, C., (eds.), *Tarifpolitik als Gesellschaftspolitik: Strategische Herausforderungen im 21. Jahrhundert, Beiträge zu Ehren von Reinhard Bispinck*, Hamburg: VSA, 97-111.

Hein, E., Truger, A., van Treeck, T. (2012): The European financial and economic crisis: Alternative solutions from a (post-)Keynesian perspective, in: Arestis, P., Sawyer, M. (eds.), *The Euro Crisis. International Papers in Political Economy*, Basingstoke: Palgrave Macmillan.

Hein, E., Vogel, L. (2008): Distribution and growth reconsidered – empirical results for six OECD countries, *Cambridge Journal of Economics*, 32, 479-511.

Hein, E., Vogel, L. (2009): Distribution and growth in France and Germany – single equation estimations and model simulations based on the Bhaduri/Marglin-model, *Review of Political Economy*, 21, 245-271.

Heine, M., Herr, H., Kaiser, C. (2005): Überforderte Lohnpolitik – Löhne im Spannungsfeld von Verteilung, Preisen und Beschäftigung, in: Hein, E., Heise, A., Truger, A. (eds.), *Löhne Beschäftigung, Verteilung und Wachstum: Makroökonomische Analysen*, Marburg: Metropolis.

Herr, H. (2009): The labour market in a Keynesian economic regime: theoretical debate and empirical findings, *Cambridge Journal of Economics*, 33 (5), 949-965.

Herr, H. (2014): An analytical framework for the post-Keynesian macroconomic paradigm, *Izmir Review of Social Sciences*, 1 (2), 73-105.

Horn, G., Lindner, F. (2016): Die deutschen Leistungsbilanzüberschüsse: hohe Wettbewerbsfähigkeit oder zu schwache Nachfrage?, *Wirtschaftsdienst*, 96 (11), 801-805.

Horn, G., Lindner, F., Stephan, S., Zwiener, R. (2017): Zur Rolle der Nominallöhne für Handels- und Leistungsbilanzüberschüsse: Eine ökonometrische Analyse für Deutschland, IMK Report 125, Düsseldorf: Macroeconomic Policy Institute (IMK) in the Hans Boeckler Foundation.

Kalecki, M. (1939): *Essays in the Theory of Economic Fluctuations*, London: George Allen and Unwin.

Kalecki, M. (1954): *Theory of Economic Dynamics*, London: George Allen & Unwin.

Kalecki, M. (1968): Trends and business cycles reconsidered, *Economic Journal*, 78, 263-276.

Keynes, J.M. (1930): *A Treatise on Money*, 2 Volumes, *The Collected Writings of J.M. Keynes*, Vol. V and VI, London, Basingstoke: Macmillan, 1971

Kollmann, R., Ratto, M., Roeger, W., in't Veld, J., Vogel, L. (2014): What drives the German current account? And how does it affect other EU member states?. European Economy, Economic Papers, No. 516, Brussels: European Commission, Directorate-General for Economic and Financial Affairs.

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

Laski, K., Walther, H. (2015): Kalecki's profits equation after 80 years, in: Toporowski J., Mamica L. (eds), *Michał Kalecki in the 21st Century*, Basingstoke, UK: Palgrave Macmillan.

Naastepad, C.W.M., Storm, S. (2007): OECD demand regimes (1960-2000), *Journal of Post Keynesian Economics*, 29, 211-246.

Obst, T., Onaran, Ö., Nikolaidi, M. (2017): The effects of income distribution and fiscal policy on growth, investment and budget balance: the case of Europe, Post Keynesian Economics Study Group, Working Paper 1703.

Onaran, Ö. (2016): Wage- versus profit-led growth in the context of globalization and public spending: the political aspects of wage-led recovery, *Review of Keynesian Economics*, 4 (4), 458-474.

Onaran, Ö., Galanis, G. (2014): Income distribution and growth: a global model, *Environment and Planning A*, 46, 2489 – 2513.

Onaran, Ö., Obst, T. (2016): Wage-led growth in the EU15 member-states: the effects of income distribution on growth, investment, trade balance and inflation, *Cambridge Journal of Economics,* 40 (6), 1517-1551.

Osiatynski, J. (2015): Review of Eckhard Hein, *Distribution and Growth after Keynes: A Post-Keynesian Guide, Ekonomista*, 6, 921–926.

Prante, F.J. (2017): Macroeconomic effects of personal and functional income inequality – theory and empirical evidence for the US and Germany, Institute for International Political Economy (IPE), Working Paper, 83/2017.

Schröder, E. (2015): Eurozone imbalances: Measuring the contribution of expenditure growth and expenditure switching, Working Paper 08/2015, Department of Economics, The New School for Social Research, New York.

Schulten, T. (2015a): Exportorientierung und ökonomische Ungleichgewichte in Europa: Welche Rolle spielt die deutsche Lohnentwicklung?, *Sozialismus,* 42 (4), 42-46.

Schulten, T. (2015b): Replik auf Heiner Flassbeck, *Sozialismus*, 42 (6), 16-17.

Sinn, H.-W. (2014): Austerity, growth and inflation: Remarks on the Eurozone's unresolved competitiveness problem, *The World Economy*, 37 (1), 1-13.

Stockhammer, E., Hein, E., Grafl, L. (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.

Stockhammer, E., Onaran, Ö. (2012): Rethinking wage policy in the face of the euro crisis: Implications of the wage-led demand regime, *International Review of Applied Economics*, 26 (2), 191-203.

Stockhammer, E., Sotiropoulos, P. (2014): Rebalancing the Euro area: The costs of internal devaluation, *Review of Political Economy*, 26 (2), 210–233.

Storm, S., Naastepad, C.W.M. (2015): Crisis and recovery in the German economy: the real lessons, *Structural Change and Economic Dynamics*, 32, 11-24.

Sylos-Labini, P. (1979): Prices and income distribution in manufacturing industry, *Journal of Post Keynesian Economics*, 11, 3-25.

Truger, A. (2013): Steuerpolitik im Dienste der Umverteilung: Eine makroökonomische Perspektive, *Vierteljahrshefte zur Wirtschaftsforschung,* 82 (1), 43-59

Truger, A. (2015): Implementing the Golden Rule for Public Investment in Europe – Safeguarding Public Investment and Supporting the Recovery, Working Paper-Reihe der AK Wien/Materialien zu Wirtschaft und Gesellschaft 138, Wien: Kammer für Arbeiter und Angestellte Wien.

Truger, A. (2016): The Golden Rule of Public Investment – a necessary and sufficient reform of the EU fiscal framework? IMK Working Paper No. 168, Düsseldorf: Macroeconomic Policy Institute (IMK) in the Hans Boeckler Foundation.

Impressum

Publisher: Hans-Böckler-Stiftung, Hans-Böckler-Straße 39, 40476 Düsseldorf, Germany
Contact: fmm@boeckler.de, www.fmm-macro.net

FMM Working Paper is an online publication series available at:
https://www.boeckler.de/imk_108537.htm

ISSN: 2512-8655