Forum for Macroeconomics and Macroeconomic Policies

IMK Macroeconomic Policy Institute

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

FMM-WORKING PAPER

No. 10 · November, 2017 · Hans-Böckler-Stiftung

THE EFFECT OF INCOME DISTRIBUTION AND FISCAL POLICY ON GROWTH, INVESTMENT, AND BUDGET BALANCE: THE CASE OF EUROPE

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ABSTRACT

This paper develops a multi-country post-Kaleckian demand-led growth model that incorporates the role of the government. One novelty of this paper is to integrate cross-country effects of both changes in income distribution and fiscal policy. The model is used to estimate econometrically the effects of income distribution and fiscal policy on the components of aggregate demand in EU15 countries. The results show that a policy mix that combines the simultaneous implementation of a pro-labour wage policy, an expansionary fiscal policy and a progressive tax policy in all EU countries leads to a significant rise in the EU15 GDP. The impact of wage policies is positive but small; the overall stimulus becomes much stronger with fiscal expansion. This policy mix leads to an improvement in the budget balance in all the EU15 countries, suggesting that expansionary fiscal policy is sustainable when it is combined with wage and progressive tax policy.

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Keywords: Wage Share, Growth, European Multiplier, Demand Regime, Fiscal Policy

Acknowledgments: This paper is part of the project titled "An Investment and Equality-Led Sustainable Growth Model for Europe" which is carried out jointly by the Greenwich Political Economy Research Centre (GPERC), the Foundation for European Progressive Studies (FEPS), Think-tank for Action on Social Change (TASC) and Economic Council of the Labour Movement (ECLM). We would like to thank Engelbert Stockhammer, Mehmet Ugur, and Gary Dymski for helpful comments. The usual disclaimers apply.

JEL codes: E12, E22, E25, E62

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1. Introduction

The outbreak of the Great Recession and the sluggish growth in the aftermath in most European countries has rekindled interest in the effect of fiscal policy on growth, as evidenced in the vast literature on fiscal multiplier effects (Blanchard and Leigh, 2013; Gechert, 2015). Although it has been shown that austerity policies have negative effects on growth and private investment, contributing to the prolonged stagnation in Europe, fiscal contraction continues to be the dominant European strategy in the post-crisis era.

At the same time, inequality has increased significantly since the 1980s in all the major developed and developing countries with a simultaneous fall in the share of labour income in national income and a rise in top income shares (Stockhammer, 2017). The negative impact of inequality on growth has been well evidenced in empirical research based on both supply-side growth models (Barro, 2000; Daudey and Garcia-Penalosa, 2007; Berg et al., 2012) and post-Keynesian demand-led growth models (Naastepad and Storm, 2006; Hein and Vogel, 2008; Stockhammer et al., 2009; Onaran and Galanis, 2014; Onaran and Obst, 2016).

However, the combined effects of fiscal policy and income distribution on growth and fiscal performance have not yet been empirically investigated in the context of demand-led growth models. Theoretically, this issue has been explored in various Kaleckian models. Blecker (2002) and Palley (2014) have analysed how different tax rates on labour and capital income affect whether the growth regime of an economy is wage-led or profit-led. Mott and Slattery (1994), Commendatore et al. (2011), Seguino (2012), Dutt (2013), Palley (2013), and Hein (2016), amongst others, have studied the effects of income distribution and government expenditure on various macroeconomic variables, such as capital accumulation, labour productivity, inflation and public debt. Blecker (1999) has examined open economy issues within a Kaleckian model with government expenditure and taxes. However, in the Kaleckian literature there is still a lack of theoretical models with cross-country spill over effects of the joint effects of income distribution and fiscal policy as well as a detailed empirical analysis.

The novelty of this paper is twofold. First, we develop a post-Kaleckian theoretical model that incorporates the role of the government within an open economy context. The model moves beyond the above-mentioned Kaleckian models because (i) it is a multi-country model that allows the analysis of the interactions between countries and (ii) incorporates an explicit distinction

between different types of government expenditure. Second, we use this model in order to estimate econometrically the effects of income distribution and fiscal policy on the components of aggregate demand (AD) for each of the EU15[1] countries. We calculate a Europe-wide multiplier based on the responses of each country to changes in not only domestic but also other European countries' income distribution, taxation and government spending. Hence, we move beyond Onaran and Galanis (2014) and Onaran and Obst (2016) who presented the impact of simultaneous changes in income distribution in the G20 and the EU15 but did not incorporate the impact of public spending and taxes. From a policy perspective, the analysis of the paper can guide the development of a fiscal and wage policy mix conducive to equitable development.

The rest of the paper is organised as follows. Section 2 outlines the theoretical model. Section 3 presents the data and describes the estimation methodology. Section 4 presents the estimation results. Section 5 examines the effects of wage and fiscal policies on growth, private investment and the primary budget balance, and compares the effects when policies are implemented in one country in isolation versus simultaneously in all countries. Section 6 discusses wage and fiscal policy mixes and their implications for output, private investment, and primary budget balance. Finally, section 7 summarises and concludes.

2. A post-Keynesian/post-Kaleckian macro model with government

2.1 Structure of the model

Our multi-country demand-led growth model for the EU15 countries is based on the post-Kaleckian framework (see Bhaduri and Marglin, 1990); however, the behavioural functions also encompass standard Keynesian models (e.g. Blanchard, 2006). We integrate fiscal policy (tax rates, government expenditure, public debt) into the private sector open economy model presented in Onaran and Galanis (2014) and Onaran and Obst (2016) and model the effects of a change in the profit share and fiscal policy by means of analysing the country level effects on private aggregated demand: consumption, investment, exports and imports. We then simulate European

[1] EU15 refers to the 15 West European old member states of the EU, which includes the UK despite the Brexit decision. We keep the UK as part of our analysis for Europe, as policy coordination issues discussed in the paper can be implemented even when countries are not part of a political union, although we recognise the importance of a political union to facilitate such policy coordination.

interactions through integrating the effects of a change in income distribution as well as fiscal policy of other EU15 countries.

Consumption (C) is given by:

$$\log C = c_0 + c_r \log(1 - t_r)R + c_w(\log(1 - t_w)W + \log B + \log(OCT)) \quad (1)$$

where R denotes adjusted profits. W stands for adjusted wages, t_r denotes implicit tax rate (ITR) on capital income, t_w stands for ITR on labour income, B denotes social benefits in cash and OCT stands for other current transfers. Note that after-tax adjusted profits are equal to $R' = (1 - t_r)R$ and after-tax adjusted wages are given by $W' = (1 - t_w)W$. Compared to Onaran and Obst (2016), consumption function (1) has two new features: first, it includes ITR on capital income and ITR on labour income; second, it incorporates social benefits in cash and other current transfers, which augment the disposable income of households. We hypothesise that a more progressive tax system (which in this paper is captured by an increase in taxes on capital and a decrease in taxes on labour) supports a wage-led economic regime, whereas a more regressive tax system would help growth in a profit-led regime.

Private investment (I) is modelled based on two alternative specifications. Our first specification is:

$$\log I = i_a + i_y \log Y_p + i_\pi \log(1 - t_r)\pi + i_g \log G + i_d \log(D/Y) \quad (2)$$

where i_a is autonomous investment, $Y_p = Y - G$ denotes private demand, defined as GDP (Y) minus the government expenditure that is part of GDP (G), π denotes the adjusted profit share and D is the government debt. Note that the after-tax adjusted profit share is equal to $\pi' = (1 - t_r)\pi$. Compared to Onaran and Obst (2016), we make three extensions: first, we assume that firms consider after-tax profits in making investment decisions as widely assumed in the literature (Rowthorn, 1981; Blecker, 2002; Seguino, 2012); second, we include public debt as a ratio to GDP, which allows us to take into account possible financial crowding out effects (Dutt, 2013); third, we introduce total government expenditure in order to examine potential crowding-in effects that might stem from the fact that government expenditure can improve business environment and increase future output.

Our second alternative specification for investment is the following:

$$\log I = i_a + i_y \log Y_p + i_\pi \log(1 - t_r)\pi$$

$$+i_i \log I_g + i_{gc} \log G_c + i_{gi} \log G_i + i_d \log(D/Y) \quad (2')$$

where I_g represents the gross capital formation of the government. G_c denotes the government collective consumption and G_i is the government individual consumption ($G = I_g + G_c + G_i$). The difference between equation (2) and equation (2') is that the latter includes a disaggregation of government expenditure into different categories drawing broadly on Seguino (2012) who clusters government expenditure into investment in physical and social infrastructure in order to capture their different crowding-in effects. In equation (2') individual consumption comprises social transfers in kind provided to individual households. Collective consumption refers to collective goods and services that are provided by the government to all members of the society. Both collective and individual consumption include expenditures related to health, education and culture. Public investment includes, amongst others, investment in transportation, construction and other physical capital.

We expect that each of these types of expenditures have a different impact on private investment. However, due to severe data limitations with rather short time series and multicollinearity issues, this detailed specification is unlikely to capture potentially significant effects of different types of public spending; therefore, we present the empirical results of this specification only as a robustness check and interpret them as indicative results.

In order to integrate the effects of expansionary fiscal policy on growth in EU15 we define government expenditure as a fraction of GDP:[2]

$$G = \kappa_g Y \quad (3)$$

Likewise, for the components of government expenditure we have:

$$I_g = \kappa_{ig} Y \quad (3')$$

$$G_c = \kappa_{gc} Y \quad (3'')$$

$$G_i = \kappa_{gi} Y \quad (3''')$$

The total primary government expenditure (G_{tot}) is equal to:

$$G_{tot} = G + B + OCT \quad (4)$$

Taxes (T) are given by:

[2] We assume that the government decides on expansionary fiscal policy targets taking into account the share of government expenditure in national income rather than the absolute value.

$$T = t_w W + t_r R + t_c C \quad (5)$$

where t_c is ITR on consumption.

The debt of the government sector is:

$$D = D_{-1} + rD_{-1} - PB \quad (6)$$

where D_{-1} denotes the lagged stock of government debt, $PB = T - G_{tot}$ is the primary budget balance equal to taxes minus total primary government expenditure. For simplicity, we assume away the asset side of the government balance sheet.

The interest rate on government debt (r) is assumed to increase as the government debt-to-GDP ratio increases:

$$r = f((D/Y)_{-1}) \quad (7)$$

GDP is given by:

$$Y = C + I + G + NX \quad (8)$$

where net exports (*NX*) is equal to exports (*X*) minus imports (*M*).

We model the effects of distribution on net exports using a stepwise approach that follows Stockhammer et al. (2009), Onaran et al. (2011), and Onaran and Galanis (2014). We extend the specification of domestic and export prices by including ITR on consumption at home and abroad. Domestic prices (P) and export prices (P_x) are determined as follows:

$$\log P = p_0 + p_{ulc} \log(ulc) + p_{tc} \log(1 + t_c) + p_m \log P_m \quad (9)$$

$$\log P_x = p_{x0} + p_{xulc} \log(ulc) + p_{cf} \log(1 + t_{cf}) + p_{xm} \log P_m \quad (10)$$

where ulc denotes nominal unit labour costs. P_m stands for import prices and t_{cf} denotes ITR on consumption abroad.

Exports are given by:

$$\log X = x_0 + x_{pxm} \log(P_x/P_m) + x_{yrw} \log Y_{rw} + x_e \log E \quad (11)$$

where Y_{rw} is the GDP of the rest of the world and E is the exchange rate. Exports are a function of relative prices of exports to imports, the GDP of the rest of the world and exchange rate.

Imports are equal to:

$$\log M = m_0 + m_{ppm} \log(P/P_m) + m_y \log Y_p + m_g \log G + m_e \log E \quad (12)$$

Imports depend on domestic prices relative to import prices, the exchange rate and aggregate demand in which we include separately Y_p and G (see also Palley, 2009).

In parallel to the alternative investment specification, we also estimate an alternative specification for imports where we disaggregate government expenditure into the three different types as described above:

$$\log M = m_0 + m_{ppm}\log(P/P_m) + m_y\log Y_p + m_i\log I_g + m_{gc}\log G_c + m_{gi}\log G_i + m_e\log E \quad (12')$$

2.2 Effects of a change in the profit share and fiscal policy on aggregate demand, private investment and primary budget balance

The model presented above can be deployed to study the short-run effects of a change in profit share (π) and fiscal policy on aggregate demand, private investment and primary budget balance (the algebraic details are reported in Appendix A). An increase in π has both first-round and second-round effects on AD (see Appendix A.1). An increase in π tends to reduce consumption (since the propensity to consume out of wages is expected to be higher than the propensity to consume out of profits), increase investment (since it raises expected profitability as well as the availability of internal finance) and increase net exports (since the unit labour cost goes down). These are the first-round effects.

At a second stage, the change in output that has been caused by a rise in π has multiplier effects on AD. Note that any change in output affects private investment not only via its impact on the sales of firms, but also through its effect on the government debt-to-GDP ratio that affects the cost of borrowing. Regarding the effects of π on the primary budget balance, taxes on profits tend to increase, taxes on labour tend to decline and, since consumption declines and taxes on consumption tend to decrease. The government expenditure as a ratio to GDP does not change in response to the changes in output (since the government-to-GDP ratio is fixed as a policy decision).

Furthermore, we focus on three changes in fiscal policy (i) an increase in government expenditure-to-GDP ratio (κ_g), (ii) an increase in the ITR on capital income (t_r) and (iii) a decrease in ITR on labour income (t_w). When κ_g increases, net exports are negatively affected since the

government may buy goods and services from abroad.[3] The impact on investment is ambiguous since there are both crowding-in effects (a rise in government expenditure increases the sales of firms and improves business environment) and crowding-out effects (given that government indebtedness increases). However, since the rise in κ_g stimulates output, we also have some second-round effects. These second-round effects tend to reduce the government debt-to-GDP ratio, attenuating the crowding-out impact on investment. The primary budget balance tends to decrease because of higher spending. However, it can also increase: if output increases, tax revenues will also increase. The details are reported in Appendix A.2.

An increase in t_r affects consumption and investment directly. Consumption decreases since after-tax profits decline. Investment is adversely affected by lower after-tax profits. However, the overall effect on investment is ambiguous because a rise in t_r can either increase or decrease the debt-to-GDP ratio. The effect on primary budget balance is ambiguous as well: direct taxes increase but the taxes on consumption decline (see Appendix A.3). Similar channels apply when t_w decreases (see Appendix A.4).

All the effects mentioned above refer only to changes that are implemented in countries individually. However, drawing on Onaran and Obst (2016), our model can be applied to analyse the effects associated with changes that take place simultaneously in the EU countries. This is particularly important because of the high integration of the European economies. The related calculations are reported in Appendix B.

Furthermore, we analyse the effects of a policy mix that combines wage and fiscal policies (see Appendix C). We consider three policy mixes: (a) A pro-labour wage policy combined with an increase in government spending; (b) an increase in t_r combined with a decrease in t_w (c) a policy mix that combines (a) and (b).

3. Data and estimation methodology

The data used in the econometric estimation refers to EU15 countries and mostly comes from the annual macro-economic database of the European Commission (AMECO) and the OECD national

[3] An increase in public spending produces an increase in the wages of the public sector employees, affecting the wage share. For simplicity, we assume away this effect. If this effect was taken into account, an increase in public spending would provide a further boost to economic activity via consumption.

accounts, in most cases for the period between 1960 and 2013. The tax rates are based on Eurostat data for most countries for the period of 1965-2012. The definitions of all variables and sources are in Appendix D.

In our econometric estimations, we focus only on the components of government expenditures that are part of GDP. These are the gross capital formation, the individual consumption expenditure and the collective consumption expenditure of the general government. On average, G_i G_C and I_g constitute roughly 50 per cent of total government expenditure in our sample. An important part of the remaining government expenditures are social benefits in cash and other current transfers. These have been included in our theoretical model (see section 2) but not in our empirical estimations due to limited data availability (e.g. social benefits in cash start only in 1995 for most EU15 countries). Moreover, in our econometric estimations we include only the tax revenues, which are the biggest part of government revenues, leaving aside other revenue streams such as property income or national insurance payments.

We estimate separate single equations for consumption, investment, exports, imports, domestic prices and export prices. We choose the single equation approach (SEA) approach because it allows a clearer interpretation of the results and permits us to deal with the fact that the time period of our sample is quite short. However, the main limitation of the SEA approach is that it might introduce some bias resulting from endogeneity issues, which might arise from the fact that the wage share and the government expenditure-to-GDP ratio are arguably a function of output. These could be tackled by using a VAR or an instrumental variable method. However, as discussed in Onaran and Obst (2016), these methods have their own limitations. Most importantly, it is necessary to have a large number of observations, which is not the case in our sample. Hence, we have chosen to use a SEA approach, which is also in line with the fact that our model is a short-run one, and we have reasonably assumed that the time lag of the impact of output on distribution and government expenditure is longer than one year.

Unit root tests suggest that most of our variables are integrated of order one.[4] The profit share is stationary in Denmark. Greece. Spain. Sweden and the UK. Hence we use this variable in its level in these countries. We first estimate error-correction models (ECM). If no cointegration is

[4] Results are available upon request.

found, the equations are estimated in differences. We start with general specifications and only keep those variables, which are statistically significant. In order to test for autocorrelation we use the Breusch-Godfrey test. In the case of autocorrelation, either we keep the lagged dependent variable or add an AR(1) term. As outlined in Onaran and Obst (2016), we derive the long-term coefficients (elasticities) using two different methods depending on whether there is a short-run (differenced form) or a long-run relationship (ECM) among the variables.

4. Estimation results

The estimation results for our consumption function (equation 1) are given in Table 1. The hypothesis that the marginal propensity to consume (MPC) out of profit income is larger than the propensity to consume out of wage income is confirmed in all countries.

Table 1

Table 2 presents the effects on private investment based on equation (2). There are positive statistically significant effects of government expenditure in 9 EU countries: Austria, Finland, Greece, Germany, Ireland, the Netherlands, Portugal, Spain, and Sweden. This represents the vast majority of our sample and hence indicates the importance of fiscal expansion for the stimulus of private investment. There is only one country (France) in which the effects of government expenditure on private investment are negative.[5]

Table 2

We find strong and significant accelerator effects of private demand on private investment in all countries. Regarding the after-tax profit share, the effects are more varied. It has no statistically significant effect in 9 countries: Austria. Denmark. Finland. Germany. Greece. Ireland. Portugal. Spain and the UK.[6] In these cases, the effects are treated as zero when we calculate the total effects on excess demand. We find significant negative effects of an increase in public debt on private

[5] We also found negative significant effects for the UK in the full sample 1960-2012 in some specifications. However, when running a robustness check with a reduced sample prior to the crisis (1960-2007) the significant negative effects in the UK do not hold true. Hence, we report the specification where government expenditure is insignificant and dropped. For France the negative effects of government expenditure hold true also in the reduced sample, hence we keep the original estimation.

[6] When we compare our results to previous findings in the empirical literature (Onaran and Obst. 2016) we find a general breakdown of the profit-investment nexus since the start of the Great Recession in 2007. Taking after-tax profits this issue becomes even more apparent. Only 5 EU countries have a statistically significant profitability effect.

investment, which represents evidence of crowding out effects in 8 countries: Belgium, Finland, France, Ireland, Portugal, Spain, Sweden and the UK.

Appendix E reports the estimations for investment specification (2'), which decomposes the government expenditure in G_i, G_C and I_g. As outlined in section 2, this specification is theoretically our preferred one but due to the short time series data and multicollinearity issues, the estimated coefficients are not used for the policy analysis in the next sections. The results show that public investment has significant positive effects on private investment in the majority of the EU15 countries. Individual and collective government consumption expenditures have significant positive effects on private investment in some countries (G_C in Denmark, Greece, the Netherlands, Sweden, and G_i in Austria, France, Ireland, Italy, and Portugal), but in some other countries the effects are either insignificant or even negative.

The estimation results for domestic prices, export prices, exports, and imports are reported in Tables 3 to 6. The results are in line with our expectations; however, there are no significant effects of export prices relative to import prices on exports in Belgium, Ireland, Luxembourg, the Netherlands and Portugal. We also find no statistically significant effects of domestic prices relative to import prices on imports in Denmark, Finland, Germany, Greece, Luxembourg, and the UK. An increase in government expenditure leads to an increase in imports in 6 countries: Belgium, Germany, Ireland, Portugal, Sweden, and the UK. Regarding ITR on consumption, we find statistically significant effects on domestic prices in 7 countries: Finland, Ireland, Italy, Portugal, Spain, Sweden, and the UK. Concerning export prices we find statistically significant effects in only 3 countries: Denmark, Germany and Italy.

Table 3

Table 4

Table 5

Table 6

We have run a series of robustness checks for consumption and investment estimations.[7]. For consumption, we have checked the robustness of our results using different sample sizes: 1960-2007; 1980-2007; 1980-2012. Our results are robust except for Spain. Here, we find either

[7] Results are available upon request.

insignificant or perverse effects of profit income on consumption for the full sample, which is at odds with our previous estimations and the empirical literature (Onaran and Obst, 2016).[8] Hence, we have kept the full sample for all EU15 countries, but Spain, where estimation is based on the pre-crisis period. In the case of investment, the results are robust if we estimate specification 2 for the pre-crisis period of 1960-2007.

5. Effects of wage and fiscal policies

Using our econometric estimations, we simulate the effects of a 1%-point decrease in the profit share (π) on aggregate demand, private investment, and primary budget balance (policy 1; see Appendices A and B for details). We consider both the case in which this decrease takes place only in one country individually and the case in which the profit share decreases in all countries in the EU15 simultaneously.

Table 7 presents the results. Column A reports how excess demand changes as a response to an individual decline in the profit share of a country, which is the sum of the partial effects of the profit share on consumption, investment, government expenditure and net exports as a ratio to GDP. These partial effects are presented in Table F in Appendix F (note that the government expenditure/GDP does not change when π declines). Three points are worth mentioning. First, in the majority of countries the positive partial effects of a decrease in π on consumption are higher in comparison with the results presented in Onaran and Obst (2016). This is explained by the incorporation of taxes rates in the model, which tends to increase the differences in the propensities to consume out of wages and profits. Second, the partial effect on investment of an increase in π is either positive or statistically insignificant. Third, all countries, except Belgium, exhibit a wage-led demand regime. Interestingly, incorporating the effects of π on net exports does not change the nature of the demand regime compared to the domestic demand regime.

Table 7

Column B reports the multipliers, which capture the second-round effects of the change in demand induced by the decline in π. With the exception of Luxemburg, the multipliers are above

[8] Estimating a reduced sample size (1960-2007) shows that the perverse effects are driven by the significant reduction of ITR on capital from 42% to 26% during the crisis period.

one and range between 1.14 (Ireland) and 5.05 (Greece).[9] In comparison to the multipliers estimated in Onaran and Obst (2016), where fiscal policy was not taken into account, the multipliers reported in Table 7 are higher for all countries. Note that the incorporation of fiscal policy tends to increase the multiplier because a rise in output increases G (since κ_g is fixed) and decreases the government debt-to-GDP ratio. Both of these effects increase private investment. However, it also tends to decrease the multiplier because a rise in G increases imports.

Column C shows the effects of a 1%-point fall in π on demand and output after the multiplier effects. The countries in which the positive growth effects of a decline in π are stronger are Greece. Spain and Germany.

Most importantly, when the decline in π takes place in all countries simultaneously (Column G), the growth effects are reinforced. In addition, the only country (Belgium) in which aggregate demand was profit-led, also exhibits now wage-led growth. Overall, a simultaneous decline in the profit share in all countries leads to an increase in the EU15 GDP by 1.64%.[10]

Column D refers to private investment. A 1% fall in π improves private investment in the majority of EU15 countries (with the exception of Belgium, Italy, and the Netherlands). When this fall takes place in all countries simultaneously (Column H), private investment improves in all countries. On average, private investment in the EU15 increases by 0.50%-points as a ratio to GDP.

A fall in π leads to an improvement in the primary budget balance in all countries (Column E). These positive effects are reinforced when π declines simultaneously in all countries (Column I). A 1%-point simultaneous fall in π leads to an improvement in the primary budget balance of all countries due to the fact an increase in the wage share has positive effects on GDP. The effects range from 0.05%-points (UK) to 0.9%-points (Spain).

Finally, we analyse the extent to which a wage stimulus in the EU15 countries would exert inflationary pressures. Prices increase by roughly 1.3% following an isolated decline in π by 1%-point (Column F) and by 1.5% if π declines simultaneously in all countries (Column J). Hence, the rise in inflation because of a wage stimulus is quite moderate.

[9] Stockhammer et al. (2009) find multipliers ranging between 1.38 and 2.69 for the Euro area.
[10] Onaran and Obst (2016) found a decline in EU15 GDP by 0.30% following a 1% fall in the wage share in Europe.

We now turn to the effects of fiscal policy. Policy 2 captures the increase in the government expenditure-to-GDP ratio (κ_g) by 1%-point. The effects of this policy are presented in Table 8. An increase in κ_g in each country individually increases GDP significantly. As shown in Column C. the effect ranges from roughly 0.56% (Luxemburg) to 7.83% (Greece). The effects become much more positive when all countries increase government expenditures simultaneously (Column F). This is due to high cross-country spill-over effects.[11] Overall, the EU15 GDP increases by 3.71%.

Table 8

An increase in government expenditure also leads to a rise in investment (Column D), indicating that the crowding-in effects overpower the crowding-out effects. Again, the effect is stronger when fiscal policy is implemented in coordination as opposed to in isolation (Column G). However, as shown in Column E. a 1%-point increase in κ_g leads to a deterioration of the primary budget in almost all countries (the only exception is Spain). The reduction ranges from 0.47%-points (Austria) to 0.98%-points (Greece). This reduction is, however, lower when government spending increases in all countries simultaneously (see Column H).

Policy 3 refers to a 1%-point increase in ITR on capital income (t_r). Its effects are reported in Table 9. As a result of an isolated rise in t_r, output decreases in all countries except in Finland (Column C). This reduction is slightly stronger when t_r increases simultaneously in all countries (including Finland). Overall. EU15 GDP would decrease by 0.31%. As expected, a higher t_r reduces consumption and private investment and improves the primary budget balance (see Columns G and H).

Table 9

Table 10 shows the effects of policy 4, which captures a 1%-point decrease in ITR on labour income (t_w). This policy has a significant positive effect on consumption, which leads to both higher output and private investment. When it is implemented simultaneously in all countries, it causes, on average, an increase in the EU15 GDP by 1.68% (see Column F) and an increase in the EU15 private investment by 0.56%-points (see Column G). Interestingly, the primary budget

[11] The empirical significance of spill-over effects as well as the importance of coordination of fiscal policies is also confirmed in Auerbach and Gorodnichenko (2013).

balance improves as a result of policy 4 (see Columns E and H). The strong positive effects on consumption result in a significant increase in the revenues that come from the taxation of consumption. This counterbalances the decrease in the taxes on labour.

Table 10

6. Policy mix scenarios for egalitarian growth and sustainable fiscal policies

In this section, we set out the effects of three policy mixes: (a) a combination of pro-labour wage policy and expansionary fiscal policy based on a 1%-point increase in the pre-tax wage share and a 1%-point increase in public spending (policy mix 1); (b) a combination of a progressive tax policy based on a 1%-point fall in the tax rate on wages and a 1%-point increase in the tax rate on profits (policy mix 2), and (c) a policy mix that combines policies 1-4 (policy mix 3). The effects are presented in Table 11. We consider only the case in which these policy mixes are implemented simultaneously in all countries.

Table 11

Column A shows that a combined increase in the wage share and government expenditure has large positive effects on output of each national economy with values ranging between 2.40% (Ireland) and 13.45% (Greece). Overall, the EU15 GDP would increase by 5.35%.

Column B presents the impact of policy mix 2. The positive effects of a fall in the ITR on labour income on consumption outweigh the negative effects of a rise in the ITR on capital income on private investment as well as consumption. All countries experience positive effects with values ranging between 0.52% (Ireland) and 3.14% (Spain). Overall. EU15 GDP increases by 1.37%.

The effects of policy mix 3 are strongest in Finland (12.04%), Greece (15.29%), and Spain (16.15%) (see Column C). As shown above, in these countries there are large differences in MPC, no significant effect of π on private investment and the crowding-in effects on private investment are strong. Overall, the EU15 GDP increases by 6.72%, which is significantly higher than the other cases, illustrating the importance of a more comprehensive policy mix of wage, taxation and investment policies.

Policy mix 3 also leads to higher private investment in all countries (see Column D). The effects are strongest in countries with significant positive effects of government expenditure on private investment; for instance, it increases by 3.63%-points in Austria or 5.92%-points in Finland. The

effects are weaker in countries without significant positive effects of government expenditure on private investment but with significant negative effects of public debt, such as in Belgium (0.98%-points) or in the UK (0.94%-points).

Finally, we estimate the impact of policy mix 3 on the primary budget balance-to-GDP ratio (see Column E). This policy mix increases the primary budget balance in all countries. On average, the budget balance in the EU15 countries improves by 0.86%-points.

7. Conclusion

This paper developed a multi-country post-Kaleckian theoretical model augmented by a government sector. The model was estimated for EU15 countries and the results were used to examine the effects of wage and fiscal policies on growth, investment and budget balance.

The empirical analysis has shown that a simultaneous decline in the wage share in a highly integrated European economy leads to a decline in growth. There is room to stimulate demand in an economic climate of sluggish growth: a 1%-point simultaneous increase in the wage share at the European level could lead to an increase in EU15 GDP by 1.64%.

The negative effects of a fall in the wage share on consumption overpower the positive effects on investment in 14 European countries. When considering after-tax income, the differences in marginal propensity to consume out of wage versus profit income are significantly larger in the majority of the EU15 countries, compared to the previous empirical literature. Moreover, the general breakdown of the profit-investment nexus becomes even more apparent, when investment is estimated as a function of after-tax profits. Hence, domestic demand is clearly wage-led in the EU15. Interestingly, integrating the foreign sector does not lead to a change in the impact of distribution on demand since domestic demand is strongly wage-led. Therefore, in isolation, without the international spill-over effects, we find 14 countries to be wage led and 1 country to be profit-led.

We find evidence for both crowding-in and crowding-out effects of fiscal spending on private investment. On the one hand, government expenditure enhances private investment in 9 EU15 countries. On the other hand, public debt has a negative effect on private investment in 8 countries. However, the negative effects of public debt are small compared to the positive effects of public spending, indicating that private investment is overall positively affected by fiscal expansion.

As an outcome of a wage-led recovery scenario, the majority of the countries would experience increasing prices but by well below 2%. This implies that if the inflation rate is initially close to 0%, a wage stimulus in the EU15 would not lead to an inflation rate higher than the ECB target inflation rate of 2%. In fact, it would help keep the European economy away from deflation.

A combined and simultaneous change of a 1%-point increase in the pre-tax wage share and 1%-point increase in public spending leads to an increase in the EU15 GDP by 5.35% and hence indicates the importance of a comprehensive policy mix that combines wage-led and public investment policies in Europe. The impact of egalitarian wage policies are positive but small; however when mixed with the much stronger impact of fiscal expansion, the overall stimulus is much more effective in achieving both targets of income equality and strong job creation.

The hypothesis that a more progressive tax system potentially stimulates demand is confirmed in our empirical estimations. A redistributive tax policy leads to an increase in EU15 GDP by 1.37%. The positive effects of a reduction of the tax rate on wages significantly induce consumption and thus outweigh the negative effects on investment spending (and consumption demand) due to an increase in the taxation of profit income.

Finally, we simulated the impact of a combined policy mix that includes a pro-labour wage policy, an expansionary fiscal policy and a progressive tax policy. As expected, this policy mix leads to much stronger growth effects and increases the EU15 GDP by 6.72%.

We also analyse the impact of expansionary fiscal policy on the primary budget balance. A combined policy mix leads to an improvement in the budget balance in all the EU15 countries. The positive multiplier effects on demand and growth lead to a rise in taxes that outweighs the adverse effects of higher government spending on the budget balance. On average, the budget balance improves by 0.69%-points in the EU15 countries. Hence, expansionary fiscal policy is sustainable when wage and public spending policies are combined with progressive tax policy; the impact is stronger when these policies are implemented in a coordinated fashion across Europe due to strong positive spill-over effects on demand.

Overall, our analysis shows that the incorporation of taxes on capital and labour in the post-Kaleckian open economy model increases the likelihood of a wage-led demand regime. In addition, the integration of public spending increases the multiplier effects and amplifies the wage-led outcome. This highlights the importance of the combination of fiscal policy with policies

targeting a more equal income distribution. This combination is important not only for achieving higher growth, higher investment and more sustainable fiscal stances, but also for achieving other crucial social and environmental targets, such as low carbon emissions and gender equality. The combined use of fiscal and wage policies for the achievement of these targets can be the subject of future research.

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Table 1. *Consumption: dependent variable* dlog*C (equation 1)*

	c	$dlog(1-t_r)R$	$dlog(1-t_w)W$	$dlog(C_{-1})$	$AR\,1$	DW	R^2	Sample
A	0.010	0.113	0.588			2.073	0.544	1971-2012
	(3.760) ***	(3.792) ***	(5.950) ***					
B	0.015	0.094	0.289			1.638	0.339	1971-2012
	(5.795) ***	(2.152) **	(4.071) ***					
DK	0.007	0.087	0.519			1.668	0.211	1971-2011
	(1.434)	(1.987) **	(3.089) ***					
FIN	0.017	0.106	0.439			1.814	0.553	1966-2012
	(5.386) ***	(4.455) ***	(6.445) ***					
F	0.014	0.086	0.515			1.608	0.535	1971-2012
	(6.307) ***	(3.100) ***	(5.802) ***					
D	0.005	0.067	0.381	0.419		1.810	0.634	1966-2012
	(1.576)	(1.731) *	(3.711) .***	(3.726) ***				
GR	0.018	0.190	0.399		0.375	1.957	0.735	1972-2013
	(3.396) ***	(3.902) ***	(5.619) ***		(2.102) **			
IRL	0.011	0.129	0.457			1.989	0.472	1971-2012
	(2.036) **	(3.110) ***	(5.058) ***					
I	0.014	0.112	0.311		0.568	1.890	0.657	1972-2012
	(2.867) **	(4.810) ***	(3.596) ***		(3.855) ***			
L	0.016	0.103	0.350			1.741	0.350	1961-2013
	(4.087) ***	(3.451) ***	(4.920) ***					
NL	0.000	0.095	0.338	0.519		1.921	0.668	1971-2012
	-(0.040)	(3.340) ***	(3.673) ***	(4.878) ***				
P	0.018	0.089	0.574			1.821	0.591	1971-2012
	(4.495) ***	(5.287) ***	(6.867) ***					
E	0.009	0.072	0.753			2.449	0.847	1961-2007
	(3.510) ***	(2.136) **	(15.132) ***					
S	0.010	0.019	0.236	0.258		1.865	0.282	1962-2012
	(2.640) **	(0.666)	(2.701) ***	(1.924) *				
UK	0.011	0.072	0.626		0.310	2.038	0.682	1967-2012
	(3.268) ***	(4.288) ***	(6.761) ***		(2.051) **			

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. Since there are no data for ITR on capital income in Luxemburg, the regression for this country is estimated based on the pre-tax income. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 2. *Private investment: dependent variable* dlog *I (equation 2)*

	c	$\text{dlog}(1-t_r)\pi_{-1}$	$\text{dlog}(1-t_r)\pi$	$\log(1-t_r)\pi$	$\text{dlog}Y_p$	$\text{dlog}Y_{p-1}$	$\text{dlog}I_{-1}$	$\text{dlog}G$	$\text{dlog}G_{-1}$	$\text{dlog}D/Y$	$\text{dlog}(D/Y)_{-1}$	$\log I_{-1}$	$\log Y_{p-1}$	$\log G_{-1}$	$\log(D/Y)_{-1}$	$AR1$	DW	R^2	Sample
A	-0.017	0.138			1.285			0.630		-0.168							1.935	0.570	1971-2013
	-(1.415)	(1.433)			(4.131) ***			(1.724) *		-(1.612)									
B	-0.004	0.397			1.429					-0.393							1.607	0.640	1970-2012
	-(0.402)	(2.667) ***			(5.137) ***					-(2.766) ***									
DK	0.075			0.064	2.342												2.245	0.754	1961-2012
	(0.855)			(1.142)	(10.928) ***														
FIN	-0.510		-0.027		1.344					-0.140	-0.231	-0.483	0.265	0.336	-0.105		1.884	0.915	1972-2012
	-(3.811) ***		-(0.394)		(6.958) ***					-(2.436) **	-(4.213) ***	-(5.203) ***	(3.081) ***	(3.925) ***	-(4.063) ***				
F	0.017	0.177			1.390				-0.528	-0.335							1.975	0.912	1978-2013
	(2.638) ***	(3.002) ***			(9.538) ***				-(3.076) ***	-(5.365) ***									
D	-0.364	0.0002			1.642		0.187		0.327			-0.217	0.217				2.001	0.792	1962-2012
	-(3.457) ***	(0.002)			(10.578) ***		(2.228) **		(1.808) *			-(2.974) *	(3.397) ***						
GR	0.033			0.084	1.696			0.498								-0.259	2.090	0.615	1961-2013
	(0.585)			(1.613)	(7.160) ***			(1.829) *								-(1.648) *			
IRL	0.184	0.171				0.575				-0.440		-0.445	0.161	0.280	-0.124		1.721	0.629	1971-2012
	(1.038)	(0.970)				(1.339)				-(4.148) ***		-(3.262) *	(1.958) *	(1.915) *	-(3.007) ***				
I	-0.018	0.129			1.374											0.333	1.924	0.640	1962-2012
	-(2.251) **	(1.722) *			(8.303) ***											(2.413) **			
L	-0.029	0.160			1.728												2.410	0.273	1963-2013
	-(1.420)	(0.675)			(4.172) ***														
NL	-0.033	0.254			1.549			0.538									1.802	0.578	1962-2013
	-(2.979) ***	(2.644) ***			(7.732) ***			(1.864) *											
P	-1.979	-0.069			2.424	0.717		0.588				-0.622	0.993		-0.179		2.074	0.728	1974-2012
	-(3.969) ***	-(1.398)			(6.286) ***	(1.838) *		(1.965) **				-(3.732) **	(3.684) ***		-(2.510) **				
E	-1.301			0.094	2.565				0.408		-0.231	-0.359	0.500			0.398	1.770	0.939	1972-2013
	-(2.528) **			(1.171)	(13.832) ***				(2.518) **		-(3.408) ***	-(3.792) **	(3.540) ***			(2.291) **			
S	0.164			0.152	1.617			1.235		-0.206							1.629	0.772	1971-2013
	(1.869) *			(2.206) **	(7.229) ***			(2.465) **		-(2.593) ***									
UK	-0.659			0.053	1.697						-0.203	-0.388	0.403				2.173	0.785	1972-2012
	-(2.377) **			(1.321)	(9.743) ***						-(2.392) **	-(3.680) **	(3.542) ***						

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. Since there are no data for ITR on capital income in Luxemburg, the regression for this country is estimated based on the pre-tax capital income. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 3. *Price deflator: dependent variable* dlog*P (equation 9)*

	c	$\mathrm{dlog}P_m$	$\mathrm{dlog}P_{m-1}$	$\mathrm{dlog}P_{-1}$	$\mathrm{dlog}(ulc)$	$\mathrm{dlog}(ulc)_{-1}$	$\mathrm{dlog}(1+t_c)$	$AR1$	DW	R^2	Sample
A	0.005	0.146		0.453	0.286				1.920	0.851	1962-2013
	(2.433) **	(3.715) ***		(5.320) ***	(4.952) ***						
B	0.019	0.158	0.129			0.214		0.573	2.139	0.813	1962-2013
	(3.985) ***	(6.721) ***	(4.197) ***			(2.456) ***		(3.662) ***			
DK	0.008	0.183		0.465		0.249			2.029	0.865	1962-2013
	(2.423) **	(5.266) ***		(4.037) ***		(2.698) ***					
FIN	0.009	0.236		0.198	0.416		0.742		1.966	0.860	1966-2012
	(2.299) **	(5.712) ***		(2.128) **	(5.399) ***		(2.336) **				
F	0.004	0.094		0.633		0.194			1.795	0.907	1962-2013
	(1.718) *	(3.580) ***		(4.635) ***		(1.624) *					
D	0.017		0.032		0.366			0.697	2.105	0.841	1962-2013
	(4.498) ***		(1.635) *		(7.781) ***			(8.452) ***			
GR	0.019	0.462			0.423 0.000				1.758	0.810	1962-2013
	(2.870) ***	(6.435) ***			(5.932) ***						
IRL	0.030		0.235			0.334	1.003	0.404	2.120	0.753	1971-2012
	(2.418) **		(2.872) ***			(2.512) **	(2.309) **	(2.727) ***			
I	0.028	0.084			0.445		0.909	0.902	2.404	0.958	1971-2012
	(1.333)	(4.292) ***			8.934 ***		(3.251) ***	(11.479) ***			
L	0.024	0.523		-0.482	0.345				1.651	0.479	1962-2013
	(4.180) ***	(5.076) ***		-(3.605) ***	(3.284) ***						
NL	0.007	0.152		0.448		0.255			1.997	0.801	1962-2013
	(2.492) **	(4.599) ***		(3.656) ***		(2.687) ***					
P	0.005	0.206	0.199			0.668	0.768		1.645	0.921	1981-2012
	(0.982)	(3.418) ***	(3.584) ***			(9.214) ***	(1.870) *				
E	0.025		0.078		0.430		0.640	0.857	2.257	0.944	1981-2012
	(1.971) **		(2.700) ***		(5.281) ***		(2.335) **	(7.580) ***			
S	0.011	0.156	0.225			0.407	0.628		1.590	0.846	1971-2012
	(3.032) ***	(3.915) ***	(5.372) ***			(6.697) ***	(2.553) **				
UK	0.002	0.036		0.380	0.558		0.565		2.136	0.945	1966-2012
	(0.769)	(1.206)		(7.491) ***	(12.119) ***		(1.708) *				

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 4. *Export price deflator: dependent variable* $\mathrm{dlog}P_x$ *(equation 10)*

	c	$\mathrm{dlog}P_m$	$\mathrm{dlog}P_{m\,-1}$	$\mathrm{dlog}P_{x\,-1}$	$\mathrm{dlog}(ulc)$	$\mathrm{dlog}(ulc)_{-1}$	$\mathrm{dlog}(1+t_{cf})$	$\log P_{x\,-1}$	$\log(ulc)_{-1}$	$\log P_{m\,-1}$	$\log(1+t_{cf\,-1})$	$AR\,1$	DW	R^2	Sample
A	0.002	0.616			0.152								2.339	0.867	1961-2013
	(1.060)	(15.385) ***			(3.490) ***										
B	0.001	0.789			0.096								2.037	0.949	1961-2013
	(0.674)	(26.133) ***			(1.920) *										
DK	1.250	0.728					0.445	-0.630	0.384	0.213			1.989	0.922	1966-2012
	(3.965) ***	(18.834) ***					(1.661) *	-(4.344) ***	(4.262) ***	(3.904) ***					
FIN	-0.003	0.776			0.185								1.569	0.879	1961-2013
	-(0.811)	(15.279) ***			(2.612) ***										
F	-0.002	0.528		0.142		0.248							1.875	0.956	1962-2013
	-(1.025)	(21.465) ***		(3.074) ***		(4.124) ***									
D	0.636	0.378			0.193		0.407	-0.267	0.133	0.089	0.325		1.778	0.926	1966-2012
	(2.543) ***	(13.884) ***			(3.118) ***		(3.013) ***	-(3.281) *	(3.683) ***	(2.157) **	(3.207) ***				
GR	1.115	0.828			0.154			-0.511	0.297	0.192			1.880	0.914	1961-2013
	(3.237) ***	(12.355) ***			(1.631) *			-(4.341) ***	(3.536) ***	(3.250) ***					
IRL	0.000	0.708			0.171								2.004	0.810	1961-2013
	(0.009)	(10.398) ***			(1.946) *										
I	-0.001	0.530		0.213		0.202	0.705					-0.470	2.028	0.962	1966-2012
	-(0.240)	(33.334) ***		(3.370) ***		(2.886) ***	(1.757) *					-(3.515) ***			
L	0.024		-0.001		0.322								1.800	0.076	1962-2013
	(2.389) **		-(0.006)		(1.704) *										
NL	0.002		0.229			0.370							2.008	0.171	1962-2013
	(0.251)		(1.877) *			(1.823) *									
P	0.211	0.666	-0.247	0.151		-0.235		-0.486	0.427	0.044			2.192	0.956	1966-2013
	(1.617)	(15.640) ***	-(2.640) ***	(1.296)		-(3.867) ***		-(6.498) ***	(7.425) ***	(1.937) *					
E	0.011	0.407		0.130		0.320						0.482	1.593	0.881	1962-2013
	(1.071)	(9.092) ***		(1.329)		(3.712) ***						(3.905) ***			
S	-0.002	0.716			0.172								1.928	0.877	1961-2013
	-(0.616)	(16.126) ***			(2.509) ***										
UK	0.558	0.577			0.136			-0.486	0.377	0.101			1.667	0.928	1966-2012
	(3.051) ***	(13.998) ***			(2.084) **			-(4.725) ***	(4.975) ***	(3.172) ***					

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 5. *Exports: dependent variable* dlog*X (equation 11)*

	c	$\text{dlog}(P_x/P_m)_{-1}$	$\text{dlog}(P_x/P_m)$	$\text{dlog}Y_{rw}$	$\text{dlog}E$	$AR\,1$	DW	R^2	Sample
A	-0.028		-1.728	2.314			1.778	0.676	1961-2013
	-(2.813) ***		-(5.717) ***	(9.008) ***					
B	-0.029		-0.185	2.315			1.876	0.669	1961-2013
	-(3.264) ***		-(0.728)	(10.045) ***					
DK	-0.004		-0.627	1.540			1.718	0.472	1961-2013
	-(0.483)		-(3.581) ***	(6.445) ***					
FIN	-0.068		-0.576	3.428		0.430	2.121	0.486	1962-2013
	-(3.074) ***		-(2.003) **	(6.415) ***		(3.077) ***			
F	-0.020		-0.439	2.155	0.158	0.371	2.194	0.725	1962-2013
	-(1.718) *		-(3.075) ***	(7.689) ***	(1.665) *	(2.684) ***			
D	-0.017	-0.379		2.136			2.022	0.372	1962-2013
	-(1.145)	-(1.876) *		(5.376) ***					
GR	-0.037	-0.729		2.917			1.664	0.305	1962-2013
	-(1.342)	-(1.805) *		(3.968) ***					
IRL	0.043		-0.178	1.041		0.351	1.896	0.189	1962-2013
	(2.223) **		-(0.903)	(2.155) **		(2.608) ***			
I	-0.053	-0.307		3.006			1.966	0.586	1962-2013
	-(3.811) ***	-(1.994) **		(8.285) ***					
L	-0.033	0.187		2.688		0.317	2.102	0.388	1963-2013
	-(1.621)	(0.789)		(4.893) ***		(2.064) **			
NL	-0.027		-0.290	2.445		0.559	2.194	0.725	1962-2013
	-(2.681) ***		-(1.318)	(10.955) ***		(4.761) ***			
P	-0.017	0.316		2.409		0.330	1.816	0.420	1963-2013
	-(0.799)	(1.354)		(4.401) ***		(2.383) **			
E	-0.012		-0.277	2.448			1.664	0.426	1961-2013
	-(0.815)		-(2.214) **	(6.029) ***					
S	-0.045		-0.508	2.715		0.497	2.037	0.575	1962-2013
	-(3.009) ***		-(2.915) ***	(7.877) ***		(3.832) ***			
UK	0.001		-0.518	1.174			1.562	0.453	1961-2013
	(0.152)		-(3.708) ***	(4.696) ***					

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 6. *Imports: dependent variable* dlog*M (equation 12)*

	c	dlog(P/P_m)	dlog(P/P_m)$_{-1}$	dlogM_{-1}	dlogY_p	dlogY_{p-1}	dlog$G$	dlogG_{-1}	dlog$E$	logM_{-1}	log(P/P_m)$_{-1}$	logY_{p-1}	logG_{-1}	AR 1	DW	R^2	Sample
A	-0.001		0.341		1.702										2.256	0.688	1962-2013
	-(0.091)		(1.985) **		(8.983) ***												
B	0.003		0.371	-0.291	1.293	0.584		0.299							2.111	0.740	1962-2013
	(0.436)		(3.794) ***	-(2.355) **	(7.379) ***	(2.373) **		(1.757) *									
DK	0.014		0.060		1.510										2.050	0.637	1961-2013
	(2.319) **		(0.498)		(8.823) ***												
FIN	0.003		0.135		1.496										2.342	0.760	1962-2013
	(0.474)		(1.273)		(12.448) ***												
F	0.014		0.169	-0.241	2.013										1.831	0.823	1962-2013
	(2.486) **		(2.388) **	-(3.460) ***	(11.838) ***												
D	0.012		0.072		1.504		0.284								1.548	0.661	1962-2013
	(1.699) *		(0.763)		(9.087) ***		(1.657) *										
GR	0.001	0.103			1.038	0.442									1.752	0.572	1962-2013
	(0.067)	(0.553)			(5.743) ***	(2.497) **											
IRL	-0.493		0.401		0.632	0.479	0.270		0.320	-0.206			0.307		1.859	0.678	1962-2013
	-(3.176) ***		(3.925) ***		(3.503) ***	(2.248) **	(1.835) *		(2.570) **	-(3.265) *			(3.246) ***				
I	-0.006	0.210			1.983										2.182	0.689	1961-2013
	-(0.710)	(2.329) **			(10.521) ***												
L	0.010	-0.025			1.230										2.146	0.490	1961-2013
	(1.107)	-(0.168)			(6.925) ***												
NL	-0.155	0.018	0.139		1.187										2.036	0.720	1962-2013
	-(1.064)	(3.951) ***	(1.821) *		(9.365) ***												
P	-4.574				1.221	1.816	0.726		-0.314	-1.051	0.597	1.816		0.896	1.828	0.716	1961-2013
	-(4.817) ***				(3.683) ***	(6.464) ***	(2.986) ***		-(2.598) ***	-(7.969) ***	(3.583) ***	(6.464) ***		(6.409) ***			
E	0.001		0.244		2.220										1.602	0.652	1962-2013
	(0.096)		(2.271) **		(8.222) ***												
S	-2.760				1.449		0.526			-0.481	0.223	0.621	0.202		1.971	0.763	1961-2013
	-(5.148) ***				(11.206) ***		(1.690) *			-(5.104) ***	(4.262) ***	(4.521) ***	(3.951) ***				
UK	-3.542		0.051		1.263		0.788			-0.541		0.787	0.220		2.119	0.782	1962-2013
	-(4.484) ***		(0.826)		(10.153) ***		(4.517) ***			-(4.633) ***		(4.720) ***	(2.806)				

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Table 7. *The effects of an isolated and a simultaneous 1%-point fall in the profit share (π)*

	Policy 1: An isolated 1-% point fall in π						**Policy 1**: A simultaneous 1%-point fall in π			
	Excess demand / *Y* (% points)	Multiplier	%-point change in output (d*Y*/*Y*)	%-point change in private investment (d*I*/*Y*)	%-point change in primary budget balance (d*PB*/*Y*)	Annual inflation (%) (dlog*P*)	%-point change in output (d*Y*/*Y*)	%-point change in private investment (d*I*/*Y*)	%-point change in primary budget balance (d*PB*/*Y*)	Annual inflation (dlog*P*)
	A	*B*	*C=(A*B)*	*D*	*E*	*F*	*G*	*H*	*I*	*J*
A	0.132	2.048	0.271	0.104	0.251	1.603	1.631	0.625	0.474	1.777
B	-0.213	1.153	-0.245	-0.328	0.135	0.405	0.512	0.015	0.225	0.700
DK	0.243	2.191	0.533	0.182	0.249	1.296	1.261	0.430	0.366	1.603
FIN	0.361	3.357	1.214	0.644	0.357	1.574	2.529	1.271	0.485	1.845
F	0.225	2.988	0.672	0.132	0.246	1.617	1.209	0.307	0.335	1.833
D	0.626	2.256	1.413	0.341	0.480	0.878	1.867	0.451	0.566	1.166
GR	0.473	5.055	2.391	1.064	0.252	1.217	3.522	1.568	0.255	1.452
IRL	0.215	1.140	0.245	0.094	0.214	0.764	0.602	0.202	0.220	0.875
I	0.042	1.718	0.071	-0.049	0.098	1.249	0.559	0.074	0.157	1.442
L	0.153	0.560	0.086	0.148	0.342	0.541	1.028	1.777	0.393	0.773
NL	0.131	2.760	0.361	-0.014	0.251	1.235	1.853	0.530	0.435	1.386
P	0.135	3.187	0.429	0.247	0.122	2.877	1.233	0.695	0.223	3.102
E	0.792	4.490	3.555	1.478	0.732	1.120	4.354	1.809	0.862	1.362
S	0.244	2.938	0.716	0.384	0.369	1.083	2.116	1.223	0.461	1.335
UK	0.471	2.238	1.055	0.227	0.017	1.836	1.386	0.300	0.048	2.066
EU15*						1.286	1.637	0.500	0.360	1.515

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

* Change in each country is multiplied by its share in EU15 GDP.

Table 8. *The effects of an isolated and a simultaneous 1%-point increase in government expenditure-to-GDP (κ_g)*

	Policy 2: An isolated 1%-point increase in κ_g					**Policy 2**: A simultaneous 1%-point increase in κ_g		
	Excess demand / Y (% points)	Multiplier	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)
	A	*B*	*C=(A*B)*	*D*	*E*	*F*	*G*	*H*
A	1.584	2.048	3.243	1.827	-0.467	4.842	2.440	-0.205
B	0.517	1.153	0.596	0.188	-0.929	2.134	0.746	-0.747
DK	1.000	2.191	2.191	0.747	-0.649	3.397	1.159	-0.456
FIN	1.354	3.357	4.547	2.520	-0.555	7.619	3.655	-0.254
F	0.416	2.988	1.242	-0.179	-0.794	2.350	0.089	-0.610
D	1.122	2.256	2.532	0.991	-0.522	3.464	1.216	-0.346
GR	1.548	5.055	7.828	4.032	-0.984	9.930	4.967	-0.980
IRL	1.013	1.140	1.155	0.841	-0.980	1.796	0.994	-0.970
I	1.000	1.718	1.718	0.432	-0.789	2.631	0.662	-0.677
L	1.000	0.560	0.560	0.968	-0.970	2.697	4.660	-0.854
NL	1.410	2.760	3.893	1.831	-0.519	7.028	2.975	-0.131
P	1.158	3.187	3.691	2.743	-0.537	5.138	3.428	-0.355
E	1.569	4.490	7.042	3.482	0.143	8.656	4.104	0.405
S	1.280	2.938	3.760	2.867	-0.754	6.229	4.230	-0.593
UK	0.637	2.238	1.426	0.252	-0.864	1.992	0.355	-0.810
EU15*						3.71	1.34	-0.486

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

* Change in each country is multiplied by its share in EU15 GDP.

Table 9. *The effects of an isolated and a simultaneous 1%-point increase in ITR on capital income (t_r)*

	Policy 3: An isolated 1%-point increase in t_r					**Policy 3**: A simultaneous 1%-point increase in t_r		
	Excess demand / Y (% points)	Multiplier	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)
	A	*B*	*C=(A*B)*	*D*	*E*	*F*	*G*	*H*
A	-0.087	2.048	-0.177	-0.068	0.226	-0.311	-0.119	0.204
B	-0.150	1.153	-0.173	-0.143	0.259	-0.299	-0.189	0.245
DK	-0.065	2.191	-0.142	-0.049	0.241	-0.243	-0.083	0.225
FIN	0.001	3.357	0.004	0.076	0.263	-0.255	-0.020	0.238
F	-0.083	2.988	-0.249	-0.089	0.209	-0.333	-0.109	0.195
D	-0.090	2.256	-0.202	-0.049	0.258	-0.280	-0.068	0.243
GR	-0.131	5.055	-0.662	-0.294	0.340	-0.836	-0.372	0.340
IRL	-0.057	1.140	-0.065	0.007	0.285	-0.118	-0.005	0.284
I	-0.126	1.718	-0.216	-0.076	0.286	-0.289	-0.095	0.277
L	-0.042	0.560	-0.023	-0.040	0.401	-0.201	-0.347	0.391
NL	-0.180	2.760	-0.498	-0.220	0.191	-0.750	-0.312	0.160
P	-0.039	3.187	-0.126	-0.037	0.245	-0.247	-0.094	0.230
E	-0.043	4.490	-0.194	-0.066	0.258	-0.343	-0.123	0.234
S	-0.027	2.938	-0.080	-0.050	0.288	-0.289	-0.166	0.275
UK	-0.059	2.238	-0.131	-0.013	0.251	-0.178	-0.021	0.247
EU15*						-0.31	-0.10	0.238

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

* Change in each country is multiplied by its share in EU15 GDP.

Table 10. *The effects of an isolated and a simultaneous 1%-point decrease in ITR on labour income (t_w)*

	Policy 4: An isolated 1%-point decrease in t_w					**Policy 4**: A simultaneous 1%-point decrease in t_w		
	Excess demand / Y (% points)	Multiplier	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)
	A	*B*	*C=(A*B)*	*D*	*E*	*F*	*G*	*H*
A	0.512	2.048	1.049	0.402	0.660	1.778	0.681	0.779
B	0.212	1.153	0.245	0.156	0.577	0.942	0.409	0.660
DK	0.407	2.191	0.892	0.304	0.599	1.439	0.491	0.687
FIN	0.220	3.357	0.739	0.496	0.585	2.147	1.016	0.723
F	0.375	2.988	1.121	0.441	0.690	1.594	0.555	0.769
D	0.581	2.256	1.311	0.317	0.741	1.722	0.416	0.819
GR	0.337	5.055	1.703	0.758	0.503	2.674	1.190	0.505
IRL	0.300	1.140	0.342	0.151	0.510	0.633	0.221	0.515
I	0.279	1.718	0.479	0.121	0.601	0.904	0.228	0.653
L	0.206	0.560	0.115	0.199	0.489	1.084	1.872	0.541
NL	0.521	2.760	1.439	0.525	0.690	2.873	1.049	0.867
P	0.391	3.187	1.246	0.763	0.714	1.903	1.074	0.796
E	0.610	4.490	2.738	1.159	0.971	3.487	1.448	1.093
S	0.240	2.938	0.706	0.462	0.486	1.845	1.091	0.560
UK	0.458	2.238	1.026	0.259	0.621	1.271	0.303	0.644
EU15*						1.68	0.56	0.753

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

* Change in each country is multiplied by its share in EU15 GDP.

Table 11. *The effects of a simultaneous change of the policy mix in all countries*

	Policy mix 1: A simultaneous 1%-point fall in π and a 1%-point increase in κ_g	**Policy mix 2**: A simultaneous 1%-point fall in t_w and a 1%-point increase in t_r	**Policy mix 3**: A simultaneous 1%-point fall in π. a 1%-point increase in κ_g and 1%-point fall in t_w and a 1%-point increase in t_r		
	%-point change in output (dY/Y)	%-point change in output (dY/Y)	%-point change in output (dY/Y)	%-point change in private investment (dI/Y)	%-point change in primary budget balance (dPB/Y)
	A	*B*	*C*	*D*	*E*
A	6.47	1.47	7.94	3.63	1.25
B	2.65	0.64	3.29	0.98	0.38
DK	4.66	1.20	5.85	2.00	0.82
FIN	10.15	1.89	12.04	5.92	1.19
F	3.56	1.26	4.82	0.84	0.69
D	5.33	1.44	6.77	2.02	1.28
GR	13.45	1.84	15.29	7.35	0.12
IRL	2.40	0.52	2.91	1.41	0.05
I	3.19	0.62	3.81	0.87	0.41
L	3.73	0.88	4.61	7.96	0.47
NL	8.88	2.12	11.00	4.24	1.33
P	6.37	1.66	8.03	5.10	0.89
E	13.01	3.14	16.15	7.24	2.59
S	8.35	1.56	9.90	6.38	0.70
UK	3.38	1.09	4.47	0.94	0.13
EU15*	5.35	1.37	6.72	2.30	0.86

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

* Change in each country is multiplied by its share in EU15 GDP.

Appendix A. Effects of isolated changes in profit share and fiscal policy on aggregate demand, private investment and primary budget balance

A.1 Effects of changes in profit share

The total effect of a change in profit share (π) in equilibrium aggregate demand (AD) is given by:

$$\frac{dY}{d\pi} = \frac{dC}{d\pi} + \frac{dI}{d\pi} + \frac{dNX}{d\pi} + \frac{dG}{d\pi} \tag{A1}$$

Dividing through by *Y*:

$$\frac{dY/Y}{d\pi} = \frac{dC/Y}{d\pi} + \frac{dI/Y}{d\pi} + \frac{dNX/Y}{d\pi} + \frac{dG/Y}{d\pi} \tag{A2}$$

and

$$\frac{dC/Y}{d\pi} = \frac{\partial C/Y}{\partial \pi} + \frac{\partial C}{\partial Y}\frac{\partial Y/Y}{\partial \pi} \tag{A3}$$

$$\frac{dI/Y}{d\pi} = \frac{\partial I/Y}{\partial \pi} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \pi} \tag{A4}$$

$$\frac{dNX/Y}{d\pi} = \frac{\partial NX/Y}{\partial \pi} + \frac{\partial NX}{\partial Y}\frac{\partial Y/Y}{\partial \pi} \tag{A5}$$

$$\frac{dG/Y}{d\pi} = \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \pi} \tag{A6}$$

The total effect of π on private investment/GDP is calculated as:

$$\frac{dI/Y}{d\pi} = \frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial \pi} + \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial (D/Y)}{\partial \pi} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \pi} = \frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial \pi} + \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \pi} - \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial \pi} - \frac{\partial T/Y}{\partial \pi} - \frac{D}{Y}\frac{\partial Y/Y}{\partial \pi}\right) + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \pi} \tag{A7}$$

Substituting equations (A3). (A7). (A5) and (A6) into (A2) and solving for $\frac{\partial Y/Y}{\partial \pi}$, we obtain:

$$\frac{\partial Y/Y}{\partial \pi} = \frac{\frac{\partial C/Y}{\partial \pi} + \frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial \pi} - \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial T/Y}{\partial \pi} + \frac{\partial NX/Y}{\partial \pi}}{1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y} - \frac{\partial NX}{\partial Y} - \frac{\partial G}{\partial Y} - \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y} - \frac{\partial T}{\partial Y} - \frac{D}{Y}\right)} \tag{A8}$$

In Equation (A8) the term $1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y} - \frac{\partial NX}{\partial Y} - \frac{\partial G}{\partial Y} - \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y} - \frac{\partial T}{\partial Y} - \frac{D}{Y}\right)$ captures the multiplier effect and has to be positive for stability. The effect of an isolated 1%-point increase in π on

percentage (%) change in AD is equal to the multiplier times the effect on excess demand ($\frac{\partial C/Y}{\partial \pi}+\frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial \pi}-\frac{\partial I/Y}{\partial (D/Y)}\frac{\partial T/Y}{\partial \pi}+\frac{\partial NX/Y}{\partial \pi}$).

The marginal effect of π on consumption/GDP is given by:

$$\frac{\partial C/Y}{\partial \pi}=\frac{\partial C/Y}{\partial R'}\frac{\partial R'}{\partial \pi}+\frac{\partial C/Y}{\partial W'}\frac{\partial W'}{\partial \pi}=c_r\frac{C/Y}{(1-t_r)R}(1-t_r)Y-c_w\frac{C/Y}{(1-t_w)W}(1-t_w)Y=c_r\frac{C}{R}-c_w\frac{C}{W} \quad \text{(A9)}$$

The marginal effect of the after-tax profit share on private investment/GDP is given by:

$$\frac{\partial I/Y}{\partial \pi'}=\frac{\partial I/Y}{\partial (1-t_r)\pi}=i_\pi\frac{I/Y}{(1-t_r)\pi} \quad \text{(A10)}$$

The marginal effect of π on after-tax profit share is given by:

$$\frac{\partial \pi'}{\partial \pi}=\frac{\partial (1-t_r)\pi}{\partial \pi}=1-t_r \quad \text{(A11)}$$

The marginal effect of debt-to-GDP ratio on private investment/GDP is given by:

$$\frac{\partial I/Y}{\partial (D/Y)}=i_d\frac{I/Y}{D/Y}=i_d\frac{I}{D} \quad \text{(A12)}$$

The marginal effect of π on taxes/GDP is given by:

$$\frac{\partial T/Y}{\partial \pi}=\frac{\partial (t_wW+t_rR+t_cC)/Y}{\partial \pi}=t_w\frac{\partial W/Y}{\partial \pi}+t_r\frac{\partial R/Y}{\partial \pi}+t_c\frac{\partial C/Y}{\partial \pi}=-t_w+t_r+t_c\left(c_r\frac{C}{R}-c_w\frac{C}{W}\right) \quad \text{(A13)}$$

The marginal effect of π on net exports/GDP is given by:

$$\frac{\partial NX/Y}{\partial \pi}=\frac{\partial X/Y}{\partial \pi}-\frac{\partial M/Y}{\partial \pi} \quad \text{(A14)}$$

where:

$$\frac{\partial X/Y}{\partial \pi}=\left(\frac{\partial \log X}{\partial \log P_x}\frac{\partial \log P_x}{\partial \log(ulc)}\frac{\partial \log(ulc)}{\partial \log(rulc)}\frac{\partial \log(rulc)}{\partial \log \pi}\right)\frac{X/Y}{\pi}=-\left(e_{XPx}e_{Pxulc}\frac{1}{1-e_{Pulc}}\frac{Y_f}{Y}\right)\frac{X/Y}{rulc}$$

$$\frac{\partial M/Y}{\partial \pi}=\left(\frac{\partial \log M}{\partial \log P}\frac{\partial \log P}{\partial \log(ulc)}\frac{\partial \log(ulc)}{\partial \log(rulc)}\frac{\partial \log(rulc)}{\partial \log \pi}\right)\frac{M/Y}{\pi}=-\left(e_{MP}e_{Pulc}\frac{1}{1-e_{Pulc}}\frac{Y_f}{Y}\right)\frac{M/Y}{rulc}$$

The marginal effect of π on debt-to-GDP ratio is given by:

$$\frac{\partial(D/Y)}{\partial\pi}=\left(\frac{\partial D}{\partial\pi}-\frac{\partial Y}{\partial\pi}\frac{D}{Y}\right)\frac{1}{Y}=\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial\pi}-\frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial\pi}-\frac{\partial T/Y}{\partial\pi}-\frac{D}{Y}\frac{\partial Y/Y}{\partial\pi} \tag{A15}$$

The marginal effect of output on consumption is given by:

$$\frac{\partial C}{\partial Y}=\frac{\partial C}{\partial R'}\frac{\partial R'}{\partial Y}+\frac{\partial C}{\partial W'}\frac{\partial W'}{\partial Y}=c_r\frac{C}{(1-t_r)R}(1-t_r)\pi+c_w\frac{C}{(1-t_w)W}(1-t_w)(1-\pi)=(c_r+c_w)\frac{C}{Y} \tag{A16}$$

The marginal effect of output on private investment is given by:

$$\frac{\partial I}{\partial Y}=\frac{\partial I}{\partial Y_p}\frac{\partial Y_p}{\partial Y}+\frac{\partial I}{\partial G}\frac{\partial G}{\partial Y}+\frac{\partial I}{\partial(D/Y)}\frac{\partial(D/Y)}{\partial Y}=i_y\frac{I}{Y_p}(1-\kappa_g)+i_g\frac{I}{G}\kappa_g+\frac{\partial I}{\partial(D/Y)}\frac{\partial(D/Y)}{\partial Y}=(i_y+i_g)\frac{I}{Y}+i_d\frac{I/Y}{D/Y}\left(\frac{\partial G}{\partial Y}-\frac{\partial T}{\partial Y}-\frac{D}{Y}\right) \tag{A17}$$

The marginal effect of output on net exports is given by:

$$\frac{\partial NX}{\partial Y}=-\frac{\partial M}{\partial Y}=-\left(\frac{\partial M}{\partial Y_p}\frac{\partial Y_p}{\partial Y}+\frac{\partial M}{\partial G}\frac{\partial G}{\partial Y}\right)=-\left(m_y\frac{M}{Y_p}(1-\kappa_g)+m_g\frac{M}{G}\kappa_g\right)=-(m_y+m_g)\frac{M}{Y} \tag{A18}$$

The marginal effect of output on government expenditure is given by:

$$\frac{\partial G}{\partial Y}=\frac{\partial\kappa_g Y}{\partial Y}=\kappa_g \tag{A19}$$

The marginal effect of output on taxes is given by:

$$\frac{\partial T}{\partial Y}=\frac{\partial(t_wW+t_rR+t_cC)}{\partial Y}=t_w\frac{\partial W}{\partial Y}+t_r\frac{\partial R}{\partial Y}+t_c\frac{\partial C}{\partial Y}=t_w(1-\pi)+t_r\pi+t_c(c_r+c_w)\frac{C}{Y} \tag{A20}$$

We calculate the total effects of π on primary budget balance/GDP as follows:

$$\frac{dPB/Y}{d\pi}=\frac{d(T-G_{tot})/Y}{d\pi}=\frac{\partial T/Y}{\partial\pi}+\frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial\pi}-\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial\pi} \tag{A21}$$

A.2 Effects of changes in government expenditure-to-GDP ratio

Total effects of a change in government expenditure/GDP (κ_g) on equilibrium AD is:

$$\frac{dY}{d\kappa_g}=\frac{dC}{d\kappa_g}+\frac{dI}{d\kappa_g}+\frac{dNX}{d\kappa_g}+\frac{dG}{d\kappa_g} \tag{A22}$$

Dividing through by *Y*:

$$\frac{dY/Y}{d\kappa_g} = \frac{dC/Y}{d\kappa_g} + \frac{dI/Y}{d\kappa_g} + \frac{dNX/Y}{d\kappa_g} + \frac{dG/Y}{d\kappa_g} \tag{A23}$$

We know that:

$$\frac{dC/Y}{d\kappa_g} = \frac{\partial C}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A24}$$

$$\frac{dI/Y}{d\kappa_g} = \frac{\partial I/Y}{\partial \kappa_g} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A25}$$

$$\frac{dNX/Y}{d\kappa_g} = \frac{\partial NX/Y}{\partial \kappa_g} + \frac{\partial NX}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A26}$$

$$\frac{dG/Y}{d\kappa_g} = \frac{\partial G/Y}{\partial \kappa_g} + \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A27}$$

The total effect of κ_g on private investment/GDP is calculated as:

$$\frac{dI/Y}{d\kappa_g} = \frac{\partial I/Y}{\partial G}\frac{\partial G}{\partial \kappa_g} + \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial (D/Y)}{\partial \kappa_g} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} = \frac{\partial I/Y}{\partial G}\frac{\partial G}{\partial \kappa_g} + \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G/Y}{\partial \kappa_g} + \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} - \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} - \frac{D}{Y}\frac{\partial Y/Y}{\partial \kappa_g}\right) + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A28}$$

Substituting equations (A24). (A28). (A26) and (A27) into (A23) and solving for $\frac{\partial Y/Y}{\partial \kappa_g}$, we obtain:

$$\frac{\partial Y/Y}{\partial \kappa_g} = \frac{\frac{\partial I/Y}{\partial G}\frac{\partial G}{\partial \kappa_g} + \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial G/Y}{\partial \kappa_g} + \frac{\partial NX/Y}{\partial \kappa_g} + \frac{\partial G/Y}{\partial \kappa_g}}{1 - \frac{\partial C}{\partial Y} - \frac{\partial I}{\partial Y} - \frac{\partial NX}{\partial Y} - \frac{\partial G}{\partial Y} - \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y} - \frac{\partial T}{\partial Y} - \frac{D}{Y}\right)} \tag{A29}$$

The effect of an isolated 1%-point increase in κ_g on percentage (%) change in AD is equal to the multiplier times the effect on excess demand ($\frac{\partial I/Y}{\partial G}\frac{\partial G}{\partial \kappa_g} + \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial G/Y}{\partial \kappa_g} + \frac{\partial NX/Y}{\partial \kappa_g} + \frac{\partial G/Y}{\partial \kappa_g}$).

The marginal effect of government expenditure on investment/GDP is given by:

$$\frac{\partial I/Y}{\partial G} = i_g \frac{I/Y}{G} \tag{A30}$$

The marginal effect of κ_g on government expenditure is given by:

$$\frac{\partial G}{\partial \kappa_g} = \frac{\partial \kappa_g Y}{\partial \kappa_g} = Y \tag{A31}$$

The marginal effect of κ_g on government expenditure/GDP is given by:

$$\frac{\partial G/Y}{\partial \kappa_g} = \frac{\partial(\kappa_g Y)/Y}{\partial \kappa_g} = \frac{Y}{Y} = 1 \tag{A32}$$

The marginal effect of κ_g on net exports/GDP is given by:

$$\frac{\partial NX/Y}{\partial \kappa_g} = -\frac{\partial M}{\partial \kappa_g} = -m_g \frac{M}{G} \tag{A33}$$

The marginal effect of κ_g on debt-to-GDP ratio is given by:

$$\frac{\partial(D/Y)}{\partial \kappa_g} = \left(\frac{\partial D}{\partial \kappa_g} - \frac{\partial Y}{\partial \kappa_g}\frac{D}{Y}\right)\frac{1}{Y} = \frac{\partial G/Y}{\partial \kappa_g} + \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} - \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} - \frac{D}{Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A34}$$

We calculate the total effects of κ_g on primary budget balance/GDP as follows:

$$\frac{dPB/Y}{d\kappa_g} = \frac{d(T - G_{tot})/Y}{d\kappa_g} = \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} - \frac{\partial G/Y}{\partial \kappa_g} - \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial \kappa_g} \tag{A35}$$

A.3 Effects of changes in ITR on capital income

Total effects of a change in ITR on capital income (t_r) on equilibrium AD:

$$\frac{dY}{dt_r} = \frac{dC}{dt_r} + \frac{dI}{dt_r} + \frac{dNX}{dt_r} + \frac{dG}{dt_r} \tag{A36}$$

Dividing through by *Y*:

$$\frac{dY/Y}{dt_r} = \frac{dC/Y}{dt_r} + \frac{dI/Y}{dt_r} + \frac{dNX/Y}{dt_r} + \frac{dG/Y}{dt_r} \tag{A37}$$

We know that:

$$\frac{dC/Y}{dt_r} = \frac{\partial C/Y}{\partial t_r} + \frac{\partial C}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \tag{A38}$$

$$\frac{dI/Y}{dt_r} = \frac{\partial I/Y}{\partial t_r} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \tag{A39}$$

$$\frac{dNX/Y}{dt_r} = \frac{\partial NX}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \tag{A40}$$

$$\frac{dG/Y}{dt_r} = \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \tag{A41}$$

The total effect of t_r on private investment/GDP is calculated as:

$$\frac{dI/Y}{dt_r}=\frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial t_r}+\frac{\partial I/Y}{\partial (D/Y)}\frac{\partial (D/Y)}{\partial t_r}+\frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_r}=\frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial t_r}+\frac{\partial I/Y}{\partial D/Y}\left(\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_r}-\frac{\partial T/Y}{\partial t_r}-\frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_r}-\frac{D}{Y}\frac{\partial Y/Y}{\partial t_r}\right)+\frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \quad \text{(A42)}$$

Substituting equations (A38). (A42). (A40) and (A41) into (A37) and solving for $\frac{\partial Y/Y}{\partial t_r}$, we obtain:

$$\frac{\partial Y/Y}{dt_r}=\frac{\frac{\partial C/Y}{\partial t_r}+\frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial t_r}-\frac{\partial I/Y}{\partial (D/Y)}\frac{\partial T/Y}{\partial t_r}}{1-\frac{\partial C}{\partial Y}-\frac{\partial I}{\partial Y}-\frac{\partial NX}{\partial Y}-\frac{\partial G}{\partial Y}-\frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y}-\frac{\partial T}{\partial Y}-\frac{D}{Y}\right)} \quad \text{(A43)}$$

The effect of an isolated 1%-point increase in t_r on percentage (%) change in AD is equal to the multiplier times the effect on excess demand ($\frac{\partial C/Y}{\partial t_r}+\frac{\partial I/Y}{\partial \pi'}\frac{\partial \pi'}{\partial t_r}-\frac{\partial I/Y}{\partial (D/Y)}\frac{\partial T/Y}{\partial t_r}$).

The marginal effect of t_r on consumption/GDP is:

$$\frac{\partial C/Y}{\partial t_r}=\frac{\partial C/Y}{\partial R'}\frac{\partial R'}{\partial t_r}=c_r\frac{C/Y}{(1-t_r)R}(-R)=-c_r\frac{C/Y}{1-t_r} \quad \text{(A44)}$$

The marginal effect of t_r on after-tax profit share is:

$$\frac{\partial \pi'}{\partial t_r}=\frac{\partial (1-t_r)\pi}{\partial t_r}=-\pi \quad \text{(A45)}$$

The marginal effect of t_r on taxes/GDP is:

$$\frac{\partial T/Y}{\partial t_r}=\frac{\partial (t_w W+t_r R+t_c C)/Y}{\partial t_r}=\frac{R}{Y}+t_c\frac{\partial C/Y}{\partial t_r} \quad \text{(A46)}$$

The marginal effect of t_r on debt-to-GDP ratio is:

$$\frac{\partial (D/Y)}{\partial t_r}=\left(\frac{\partial D}{\partial t_r}-\frac{\partial Y}{\partial t_r}\frac{D}{Y}\right)\frac{1}{Y}=\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_r}-\frac{\partial T/Y}{\partial t_r}-\frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_r}-\frac{\partial Y/Y}{\partial t_r}\frac{D}{Y} \quad \text{(A47)}$$

We calculate the total effects of t_r on primary budget balance/Y as follows:

$$\frac{dPB/Y}{dt_r}=\frac{d(T-G_{tot})/Y}{dt_r}=\frac{\partial T/Y}{\partial t_r}+\frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_r}-\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_r} \quad \text{(A48)}$$

A.4 Effects of changes in ITR on labour income

Total effects of a change in ITR on labour income (t_w) on equilibrium AD:

$$\frac{dY}{dt_w} = \frac{dC}{dt_w} + \frac{dI}{dt_w} + \frac{dNX}{dt_w} + \frac{dG}{dt_w} \tag{A49}$$

Dividing through by *Y*:

$$\frac{dY/Y}{dt_w} = \frac{dC/Y}{dt_w} + \frac{dI/Y}{dt_w} + \frac{dNX/Y}{dt_w} + \frac{d\,G/Y}{dt_w} \tag{A50}$$

We know that:

$$\frac{dC/Y}{dt_w} = \frac{\partial C/Y}{\partial t_w} + \frac{\partial C}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A51}$$

$$\frac{dI/Y}{dt_w} = \frac{\partial I/Y}{\partial t_w} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A52}$$

$$\frac{dNX/Y}{dt_w} = \frac{\partial NX}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A53}$$

$$\frac{dG/Y}{dt_w} = \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A54}$$

The total effect of t_w on private investment/GDP is calculated as:

$$\frac{dI/Y}{dt_w} = \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial (D/Y)}{\partial t_w} + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_w} = \frac{\partial I/Y}{\partial (D/Y)}\left(\frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_w} - \frac{\partial T/Y}{\partial t_w} - \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_w} - \frac{D}{Y}\frac{\partial Y/Y}{\partial t_w}\right) + \frac{\partial I}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A55}$$

Substituting equations (A51). (A55). (A53) and (A54) into (A50) and solving for $\frac{\partial Y/Y}{\partial t_w}$, we obtain:

$$\frac{\partial Y/Y}{\partial t_w} = \frac{\dfrac{\partial C/Y}{\partial t_w} - \dfrac{\partial I/Y}{\partial (D/Y)}\dfrac{\partial T/Y}{\partial t_w}}{1 - \dfrac{\partial C}{\partial Y} - \dfrac{\partial I}{\partial Y} - \dfrac{\partial NX}{\partial Y} - \dfrac{\partial G}{\partial Y} - \dfrac{\partial I/Y}{\partial (D/Y)}\left(\dfrac{\partial G}{\partial Y} - \dfrac{\partial T}{\partial Y} - \dfrac{D}{Y}\right)} \tag{A56}$$

The effect of an isolated 1%-point increase in t_w on percentage (%) change in AD is equal to the multiplier times the effect on excess demand ($\frac{\partial C/Y}{\partial t_w} - \frac{\partial I/Y}{\partial (D/Y)}\frac{\partial T/Y}{\partial t_w}$).

The marginal effect of t_w on consumption/GDP is given by:

$$\frac{\partial C/Y}{\partial t_w} = \frac{\partial C/Y}{\partial W'}\frac{\partial W'}{\partial t_w} = c_w \frac{C/Y}{(1-t_w)W}(-W) = -c_w \frac{C/Y}{(1-t_w)} \tag{A57}$$

The marginal effect of t_w on taxes/GDP is given by:

$$\frac{\partial T/Y}{\partial t_w} = \frac{\partial\left(t_w W + t_r R + t_c C\right)/Y}{\partial t_w} = \frac{W}{Y} + t_c \frac{\partial C/Y}{\partial t_w} \tag{A58}$$

The marginal effect of t_w on debt-to-GDP ratio is given by:

$$\frac{\partial\left(D/Y\right)}{\partial t_w} = \left(\frac{\partial D}{\partial t_w} - \frac{\partial Y}{\partial t_w}\frac{D}{Y}\right)\frac{1}{Y} = \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_w} - \frac{\partial T/Y}{\partial t_w} - \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_w} - \frac{D}{Y}\frac{\partial Y/Y}{\partial t_w} \tag{A59}$$

We calculate the total effects of t_w on primary budget balance/Y as follows:

$$\frac{dPB/Y}{dt_w} = \frac{d\left(T - G_{tot}\right)/Y}{dt_w} = \frac{\partial T/Y}{\partial t_w} + \frac{\partial T}{\partial Y}\frac{\partial Y/Y}{\partial t_w} - \frac{\partial G}{\partial Y}\frac{\partial Y/Y}{\partial t_w} \tag{A60}$$

Appendix B. Effects of simultaneous changes in profit share and fiscal policy on aggregate demand, private investment and primary budget balance

B.1 Effects of changes in profit share

We model a 1%-point increase in profit share on the percentage (%) change in GDP of each country as follows:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = E_{15x15}[\partial\pi]_{15x1} + H'_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1} + P_{15x15}[\partial\pi]_{15x1} + W_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1} \qquad \text{(B1)}$$

$E_{15\times15}$ is a matrix, whose diagonal elements are the effect of a change in π in country *j* on excess demand in country *j*:

$$E_{15\times15} = \begin{bmatrix} \frac{\partial C_1/Y_1}{\partial \pi_1} + \frac{\partial I_1/Y_1}{\partial \pi_1'}\frac{\partial \pi_1'}{\partial \pi_1} - \frac{\partial I_1/Y_1}{\partial (D_1/Y_1)}\frac{\partial T_1/Y_1}{\partial \pi_1} + \frac{\partial NX_1/Y_1}{\partial \pi_1} & 0 & \cdots & 0 \\ 0 & & \cdots & \vdots \\ \vdots & & \cdots & \vdots \\ 0 & 0 & \cdots & \frac{\partial C_{15}/Y_1}{\partial \pi_{15}} + \frac{\partial I_{15}/Y_{15}}{\partial \pi_{15}'}\frac{\partial \pi_{15}'}{\partial \pi_{15}} - \frac{\partial I_{15}/Y_{15}}{\partial (D_{15}/Y_{15})}\frac{\partial T_{15}/Y_{15}}{\partial \pi_{15}} + \frac{\partial NX_{15}/Y_{15}}{\partial \pi_{15}} \end{bmatrix}$$

where $\frac{\partial C_i/Y_i}{\partial \pi_i}$ is defined in equation (A9), $\frac{\partial I_i/Y_i}{\partial \pi_i'}$ is defined in equation (A10), $\frac{\partial \pi_i'}{\partial \pi_i}$ is defined in equation (A11), $\frac{\partial I_i/Y_i}{\partial (D_i/Y_i)}$ is defined in equation (A12), $\frac{\partial T_i/Y_i}{\partial \pi_i}$ is defined in equation (A13) and $\frac{\partial NX_i/Y_i}{\partial \pi_i}$ is defined in equation (A14).

Matrix $H'_{15\times15}$ reflects the national multiplier effects and hence shows the effect of an autonomous change in excess demand:

$$H'_{15\times15} = \begin{bmatrix} \frac{\partial C_1}{\partial Y_1} + \frac{\partial I_1}{\partial Y_1} + \frac{\partial NX_1}{\partial Y_1} + \frac{\partial G_1}{\partial Y_1} + \frac{\partial I_1/Y_1}{\partial (D_1/Y_1)}\left(\frac{\partial G_1}{\partial Y_1} - \frac{\partial T_1}{\partial Y_1} - \frac{D_1}{Y_1}\right) & 0 & \cdots & 0 \\ 0 & & \cdots & \vdots \\ \vdots & & \cdots & \vdots \\ 0 & 0 & \cdots & \frac{\partial C_{15}}{\partial Y_{15}} + \frac{\partial I_{15}}{\partial Y_{15}} + \frac{\partial NX_{15}}{\partial Y_{15}} + \frac{\partial G_{15}}{\partial Y_{15}} + \frac{\partial I_{15}/Y_{15}}{\partial (D_{15}/Y_{15})}\left(\frac{\partial G_{15}}{\partial Y_{15}} - \frac{\partial T_{15}}{\partial Y_{15}} - \frac{D_{15}}{Y_{15}}\right) \end{bmatrix}$$

where $\frac{\partial C_i}{\partial Y_i}$ is defined in equation (A16), $\frac{\partial I_i}{\partial Y_i}$ is defined in equation (A17), $\frac{\partial NX_i}{\partial Y_i}$ is defined in equation (A18), $\frac{\partial G_i}{\partial Y_i}$ is defined in equation (A19) and $\frac{\partial T_i}{\partial Y_i}$ is defined in equation (A20).

Matrix $P_{15\times15}$ illustrates the effect of a change in trade partners' π on import prices and hence on net exports in each country.

$$P_{15\times15}=\begin{bmatrix} 0 & \frac{\partial NX_1/Y_1}{\partial \pi_2}\frac{M_{21}}{M_1} & . & \frac{\partial NX_1/Y_1}{\partial \pi_{15}}\frac{M_{151}}{M_1} \\ \frac{\partial NX_2/Y_2}{\partial \pi_1}\frac{M_{12}}{M_2} & . & . & .. \\ . & . & . & . \\ \frac{\partial NX_{15}/Y_{15}}{\partial \pi_1}\frac{M_{115}}{M_{15}} & \frac{\partial NX_{15}/Y_{15}}{\partial \pi_2}\frac{M_{215}}{M_{15}} & . & 0 \end{bmatrix}$$

where $\frac{\partial NX_i/Y_i}{\partial \pi_i}$ is defined in equation (A14).

Finally, matrix $W_{15\times15}$ shows effects of a change in trade partners' GDP on exports of each country.

$$W_{15\times15}=\begin{bmatrix} 0 & e_{XYrw,1}\frac{X_1}{Y_1}\frac{Y_2}{Y_w} & . & e_{XYrw,1}\frac{X_1}{Y_1}\frac{Y_{15}}{Y_w} \\ e_{XYrw,2}\frac{X_2}{Y_2}\frac{Y_1}{Y_w} & . & . & e_{XYrw,2}\frac{X_2}{Y_2}\frac{Y_{15}}{Y_w} \\ . & . & . & . \\ e_{XYrw,15}\frac{X_{15}}{Y_{15}}\frac{Y_1}{Y_w} & e_{XYrw,15}\frac{X_{15}}{Y_{15}}\frac{Y_2}{Y_w} & . & 0 \end{bmatrix}$$

where $e_{XYrw,i}=\frac{\partial \log X_i}{\partial \log Y_{rw,i}}=x_{Yrw}$ and Y_w denotes world GDP.

Solving equation (B1) for $\left[\frac{\partial Y}{Y}\right]_{15x1}$ gives us the equivalent of a European multiplier effect of profit share on the percentage (%) change in AD:

$$\left[\frac{\partial Y}{Y}\right]_{15x1}=(I_{15x15}-H'_{15x15}-W_{15x15})^{-1}(E_{15x15}+P_{15x15})[\partial\pi]_{15x1} \quad \text{(B2)}$$

We calculate the total effects of a simultaneous change in π (and consequently on *Y*) on private investment/GDP and primary budget balance/GDP as in Appendix A.1.

B.2 Effects of changes in government expenditure-to-GDP ratio

In order to take into account the simultaneous change in public spending we model the impact of a 1%-point increase in government expenditure-to-GDP on the percentage (%) change in GDP of each country as follows:

$$\left[\frac{\partial Y}{Y}\right]_{15x1}=Eg_{15x15}[\partial\kappa_g]_{15x1}+H'_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1}+W_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1} \quad \text{(B3)}$$

$Eg_{15\times15}$ is a matrix, whose diagonal elements is the effect of a change in κ_g in country j on excess demand $(C + I + NX + G)$ in country j:

$$Eg_{15\times15} = \begin{bmatrix} \frac{\partial I_1/Y_1}{\partial G_1}\frac{\partial G_1}{\partial \kappa_{g1}} + \frac{\partial I_1/Y_1}{\partial (D_1/Y_1)}\frac{\partial G_1/Y_1}{\partial \kappa_{g1}} + \frac{\partial NX_1/Y_1}{\partial \kappa_{g1}} + \frac{\partial G_1/Y_1}{\partial \kappa_{g1}} & 0. & 0 \\ 0 & \cdot\cdot & \cdot \\ \cdot & \cdot\cdot & \cdot \\ 0 & 0. & \frac{\partial I_{15}/Y_{15}}{\partial G_{15}}\frac{\partial G_{15}}{\partial \kappa_{g15}} + \frac{\partial I_{15}/Y_{15}}{\partial (D_{15}/Y_{15})}\frac{\partial G_{15}/Y_{15}}{\partial \kappa_{g15}} + \frac{\partial NX_{15}/Y_{15}}{\partial \kappa_{g15}} + \frac{\partial G_{15}/Y_{15}}{\partial \kappa_{g15}} \end{bmatrix}$$

where $\frac{\partial I_i/Y_i}{\partial G_i}$ is defined in equation (A30), $\frac{\partial G_i}{\partial \kappa_{gi}}$ is defined in equation (A31), $\frac{\partial G_i/Y_i}{\partial \kappa_{gi}}$ is defined in equation (A32) and $\frac{\partial NX_i/Y_i}{\partial \kappa_{gi}}$ is defined in equation (A33).

By solving equation (B3) for $\left[\frac{\partial Y}{Y}\right]_{15x1}$ gives us the equivalent of a European multiplier effect of government expenditure-to-GDP on the percentage (%) change in AD:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = (I_{15x15} - H'_{15x15} - W_{15x15})^{-1}(Eg_{15x15})[\partial \kappa_g]_{15x1} \qquad \text{(B4)}$$

We calculate the total effects of a simultaneous change in κ_g (and consequently on Y) on private investment/GDP and budget balance/GDP as in Appendix A.2.

B.3 Effects of changes in ITR on capital income

We consider a change in tax policy and hence model the impact of a 1%-point change in the ITR on capital income:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = Etr_{15x15}[\partial t_r]_{15x1} + H'_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1} + W_{15x15}\left[\frac{\partial Y}{Y}\right]_{15x1} \qquad \text{(B5)}$$

$Etn_{15\times15}$ is a matrix, whose diagonal elements are the effects of a change in t_r in country j on excess demand in country j:

$$Etn_{15\times15} = \begin{bmatrix} \frac{\partial C_1/Y_1}{\partial t_{r1}} + \frac{\partial I_1/Y_1}{\partial \pi_1'}\frac{\partial \pi_1'}{\partial t_{r1}} - \frac{\partial I_1/Y_1}{\partial (D_1/Y_1)}\frac{\partial T_1/Y_1}{\partial t_{r1}} & 0. & 0 \\ 0 & \cdot\cdot & \cdot \\ \cdot & \cdot\cdot & \cdot \\ 0 & 0. & \frac{\partial C_{15}/Y_{15}}{\partial t_{r15}} + \frac{\partial I_{15}/Y_{15}}{\partial \pi_{15}'}\frac{\partial \pi_{15}'}{\partial t_{r5}} - \frac{\partial I_{15}/Y_{15}}{\partial (D_{15}/Y_{15})}\frac{\partial T_{15}/Y_{15}}{\partial t_{r15}} \end{bmatrix}$$

where $\frac{\partial C_i/Y_i}{\partial t_{ri}}$ is defined in equation (A44), $\frac{\partial I_i/Y_i}{\partial \pi'_i}$ is defined in equation (A10), $\frac{\partial \pi_i'}{\partial t_{ri}}$ is defined in equation (A45), $\frac{\partial I_i/Y_i}{\partial (D_i/Y_i)}$ is defined in equation (A12), and $\frac{\partial T_i/Y_i}{\partial t_{ri}}$ is defined in equation (A46).

Solving equation (B5) for $\left[\frac{\partial Y}{Y}\right]_{15x1}$ gives us the equivalent of a European multiplier effect of a change in t_r on percentage (%) change in AD:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = (I_{15x15} - H'_{15x15} - W_{15x15})^{-1}(Etr_{15x15})[\partial t_r]_{15x1} \quad \text{(B6)}$$

We calculate the total effects of a simultaneous change in t_r (and consequently on *Y*) on private investment/GDP and budget balance/GDP as in Appendix A.3.

B.4 Effects of changes in ITR on labour income

Finally, we consider the impact of a 1%-point change in the ITR on labour income:

$$\left[\frac{\partial Y}{Y}\right]_{15\times1} = Etw_{15\times15}\left[\partial t_w\right]_{15\times1} + H'_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} + W_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} \quad \text{(B7)}$$

$Etw_{15\times15}$ is a matrix, whose diagonal elements are the effects of a change in t_w in country *j* on excess demand in country *j*:

$$Etw_{15\times15} = \begin{bmatrix} \frac{\partial C_1/Y_1}{\partial t_{w1}} - \frac{\partial I_1/Y_1}{\partial D_1/Y_1}\frac{\partial T_1/Y_1}{\partial t_{w1}} & 0 & \cdots & 0 \\ 0 & \ddots & & \vdots \\ \vdots & & \ddots & \\ 0 & \cdots & & \frac{\partial C_{15}/Y_{15}}{\partial t_{w15}} - \frac{\partial I_{15}/Y_{15}}{\partial D_{15}/Y_{15}}\frac{\partial T_{15}/Y_{15}}{\partial t_{w15}} \end{bmatrix}$$

where $\frac{\partial C_i/Y_i}{\partial t_{wi}}$ is defined in equation (A57), $\frac{\partial I_i/Y_i}{\partial (D_i/Y_i)}$ is defined in equation (A12) and $\frac{\partial T_i/Y_i}{\partial t_{wi}}$ is defined in equation (A58).

Solving equation (B7) for $\left[\frac{\partial Y}{Y}\right]_{15x1}$ gives us the equivalent of a European multiplier effect of a change in t_w on percentage (%) change in AD:

$$\left[\frac{\partial Y}{Y}\right]_{15\times1} = \left(I_{15\times15} - H'_{15\times15} - W_{15\times15}\right)^{-1} Etw_{15\times15}\left[\partial t_w\right]_{15\times1} \quad \text{(B8)}$$

We calculate the total effects of a simultaneous change in t_w (and consequently on Y) on private investment/GDP and budget balance/GDP as in Appendix A.4.

Appendix C. Effects of policy mix on aggregate demand, private investment and primary budget balance

C.1 Policy mix 1: Effects of changes in profit share and government expenditure-to-output ratio

The European multiplier effects of a 1%-point fall in π and 1%-point increase in κ_g in all countries on equilibrium AD of each national economy are calculated as follows:

$$\left[\frac{\partial Y}{Y}\right]_{15\times1} = E_{15\times15}[\partial\pi]_{15\times1} + P_{15\times15}[\partial\pi]_{15\times1} + Eg_{15\times15}[\partial\kappa_g]_{15\times1} + H'_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} + W_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} \quad \text{(C1)}$$

The European multiplier effect on equilibrium AD of each country is given by:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = (I_{15x15} - H'_{15x15} - W_{15x15})^{-1}((E_{15x15} + P_{15x15})[\partial\pi]_{15x1} + Eg_{15x15}[\partial\kappa_g]_{15x1} \quad \text{(C2)}$$

C.2 Policy mix 2: Effects of changes in ITR on capital and labour income

The European multiplier effects of a progressive tax policy based on a 1%-point increase in t_r and a 1%-point fall in t_w in all countries on equilibrium AD of each national economy are calculated as follows:

$$\left[\frac{\partial Y}{Y}\right]_{15\times1} = Etr_{15\times15}[\partial t_w]_{15\times1} + Etw_{15\times15}[\partial t_w]_{15\times1} + H'_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} + W_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} \quad \text{(C3)}$$

The total European multiplier effect on equilibrium AD of each country is given by:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = (I_{15x15} - H'_{15x15} - W_{15x15})^{-1}(Etr_{15x15}[\partial t_r]_{15x1} + Etw_{15x15}[\partial t_w]_{15x1}) \quad \text{(C4)}$$

C.3 Policy mix 3: Effects of changes in profit share, government expenditure-to-output ratio in ITR on capital and labour income

The European multiplier effects of the joined effect of all 4 policy changes in all countries on equilibrium AD of each national economy are calculated as follows:

$$\left[\frac{\partial Y}{Y}\right]_{15\times1} = E_{15\times15}[\partial\pi]_{15\times1} + P_{15\times15}[\partial\pi]_{15\times1} + Eg_{15\times15}[\partial\kappa_g]_{15\times1} + Etr_{15\times15}[\partial t_r]_{15\times1} + Etw_{15\times15}[\partial t_w]_{15\times1}$$
$$+ H'_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} + W_{15\times15}\left[\frac{\partial Y}{Y}\right]_{15\times1} \quad \text{(C5)}$$

The total European multiplier effect on equilibrium AD of each country is:

$$\left[\frac{\partial Y}{Y}\right]_{15x1} = (I_{15x15} - H'_{15x15} - W_{15x15})^{-1}((E_{15x15} + P_{15x15})[\partial\pi]_{15x1} + Eg_{15x15}[\partial\kappa_g]_{15x1} + Etr_{15x15}[\partial t_r]_{15x1} + Etw_{15x15}[\partial t_w]_{15x1}) \quad \text{(C6)}$$

Appendix D. Data sources and definitions

Symbol	Variable name	Definition	Source/variable construction	Time period
C	Private consumption (real)	Private final consumption expenditure at constant prices	AMECO (2016) (code: OCPH)	1960-2013
D	General government consolidated gross debt	Total gross debt at nominal value outstanding at the end of the year of the sector of general government	AMECO (2016) (code: UDGGL)	1960-2013
E	Exchange rate	Average of local currency per dollar, euro, and yen	World Bank World Development Indicators	1960-2013
G	General government expenditure	The sum of gross capital formation, individual consumption expenditure and collective consumption expenditure of the general government	$G = G_i + G_c + I_g$	1960-2013
G_c	Collective consumption expenditure of general government[1]	Expenditures for collective consumption (defence, justice, etc.) which benefit society as a whole, or large parts of society, and are often known as public goods and services	OECD, National Accounts (2016)	1970-2013
G_{ce}	General government consumption expenditure	General government consumption expenditure, consists of expenditure incurred by government in its production of non-market final goods and services (except gross fixed capital formation) and market goods and services provided as social transfers in kind	OECD, National Accounts (2016)	1970-2013
G_i	Individual consumption expenditure of general government[1]	Expenditures for individual consumption (health care, housing, education, etc.), reflect expenditures incurred by government on behalf of an individual household. This category of expenditure is equal to social transfers in kind from government to households and so includes expenditure by government on market goods and services provided to households	OECD, National Accounts (2016)	1970-2013
G_{tc}	Final consumption expenditure of general government	Final consumption expenditure of general government = individual consumption of general government + collective consumption of general government	AMECO (2016) (code: OCTG)	1960-2013
I	Private investment (real)	Total investment minus gross capital formation expenditure of general government	$I = I_t I_{pr} / I_{tcurr}$	1960-2013
I_g	Gross capital formation expenditure of general government[2]	Gross fixed capital formation consists of resident producers' acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-pro-duced assets realised by the productive activity of producer or institutional units. Fixed assets are produced assets used in production for more than one year.	$I_g = I_t (1 - I_{pr} / I_{tcurr})$	1960-2013
I_t	Total investment (real)	Gross fixed capital formation at constant prices, total economy	AMECO (2016) (code: OIGT)	1960-2013
I_{pr}	Private investment (current prices)	Gross fixed capital formation at current prices, private sector	AMECO (2016) (code: UIGP)	1960-2013
I_{tcurr}	Total investment (current prices)	Gross fixed capital formation at current prices, total economy	AMECO (2016) (code: UIGT)	1960-2013
M	Imports (real)	Imports of goods and services at constant prices	AMECO (2016) (code: OMGS)	1960-2013
M_{ji}	Imports from country j to country i	For each reporting country or group, all the trading partners are listed	IMF, Direction of Trade Statistics	1980-2012
P	GDP deflator	Price deflator gross domestic product at market prices	AMECO (2016) (code: PVGD)	1960-2013
P_m	Import price deflator	Price deflator imports of goods and services	AMECO (2016) (code: PMGS)	1960-2013
P_x	Export price deflator	Price deflator exports of goods and services	AMECO (2016) (code: PXGS)	1960-2013
R	Adjusted gross operating surplus (real)	Profit share times output at factor costs	$R = \pi Y_f$	1960-2013
$rulc$	Real unit labour costs	Wage share times output at factor costs over output	$rulc = w Y_f / Y$	1960-2013

(continued from the previous page)

Symbol	Variable name	Definition	Source/variable construction	Time period
t_c	Implicit tax rate (ITR) on consumption[3]	All consumption taxes divided by the final consumption expenditure of private households on the economic territory	European Commission, Eurostat	1965-2012
t_{cf}	Implicit tax rate (ITR) on consumption abroad	Weighted average calculated by multiplying t_c in country j with the share of exports (in total exports) of country i that are exported to country j		1965-2012
t_r	Implicit tax rate (ITR) on capital[4]	Revenue from all capital taxes divided by all potentially taxable business and capital income in the economy	European Commission, Eurostat	1965-2012
t_w	Implicit tax rate (ITR) on labour[5]	Sum of all direct and indirect taxes and employees and employers social contributions levied on employed labour income divided by the total compensation of employees working in the economic territory	European Commission, Eurostat	1965-2012
ulc	Unit labour costs	Real unit labour cost times prices	$ulc = rulcP$	1960-2013
W	Adjusted compensation of employees (real)	Wage share times output at factor costs	$W = w\,Y_f$	1960-2013
w	Adjusted wage share	Compensation per employee as percentage of GDP at factor cost per person employed	AMECO (2016) (code: ALCD0)	1960-2013
X	Exports (real)	Exports of goods and services at constant prices	AMECO (2016) (code: OXGS)	1960-2013
X_{ji}	Exports from country i to country j	For each reporting country or group, all the trading partners are listed	IMF, Direction of Trade Statistics	1980-2012
Y	GDP in market prices (real)	Gross domestic product at 2010 market prices	AMECO (2016) (code: OVGD)	1960-2013
Y_f	GDP at factor costs (real)	Gross domestic product at market prices minus taxes on production and imports, plus subsidies	AMECO (2016) (code: UYGD)	1960-2013
Y_p	Private demand	Output minus government expenditure	$Y_p = Y - G$	1960-2013
Y_{rw}	GDP of the rest of the world (real)	Calculated from world GDP (in constant 2005 US$) - own GDP (in constant 2005 US$)	World Bank World Development	1960-2013
Y_w	World GDP (real)	World GDP in constant 2005 US$	World Bank World Development	1960-2013
κ_g	Government expenditure-to-GDP ratio	Government expenditure over GDP	$\kappa_g = G/Y$	1960-2013
π	Adjusted profit share	One minus wage share	$\pi = 1 - w$	1960-2013
π'	After-tax adjusted profit share	Adjusted profit share times one minus the tax rate on capital income	$\pi' = (1 - t_r)\pi$	1960-2013

Notes:

1. OECD data is linked with AMECO online data on General Government Final Consumption Expenditure.

2. Data for Austria starts in 1995 and for Luxembourg in 1990. For Belgium, Denmark, Italy, Ireland, the Netherlands, Spain and Sweden it starts in 1970. We have extended the data back to 1960 in these countries assuming the ratio of general government gross capital formation to total investment stayed constant.

3. For Germany and the UK we have calculated data from 1970 back to 1965 using growth rates based on consumption tax rates provided in the study by Mendoza et al. (1997). For Sweden from 1980 to 1970. For Austria and Finland from 1980 back to 1965. Data starts only in 1980 in Greece, Portugal and Spain. The tax rates are based on the dataset provided in Eurostat extended by Onaran et al. (2012) which itself draws on the data reported by the European Commission (2000) with data ranging between 1970 and 2007. We extend dataset in Onaran et al. (2012) to 2012 using the growth rate of the data provided by Eurostat (2015).

4. For Luxembourg, there is no data on ITR on capital. For Greece, data is not available after 2007 and for Denmark 2012 is unavailable. For Austria and Sweden, we have calculated data back from 1970 to 1980, for Germany and the UK from 1965

to 1970, and for Finland from 1965 to 1979 using growth rates based on capital tax rates provided in the study by Mendoza et al. (1997). Data starts only in 1980 in Greece, Portugal, and Spain.
5. For Germany and the UK we have calculated data back from 1970 to 1965, for Austria and Finland from 1980 to 1970 and 1965 respectively, and for Sweden from 1980 to 1970 using growth rates based on labour tax rates provided by Mendoza et al. (1997). Data starts only in 1980 in Greece, Portugal, and Spain.

Appendix E

Table E. *Private investment: dependent variable d*log*I* (see equation 2')

	c	$\text{dlog}\pi_{-1}$	$\text{dlog}\pi$	$\text{log}\pi$	$\text{log}\pi_{-1}$	$\text{dlog}Y_p$	$\text{dlog}Y_{p-1}$	$\text{dlog}I_{-1}$	$\text{dlog}I_g$	$\text{dlog}I_{g-1}$	$\text{dlog}G_c$	$\text{dlog}G_{c-1}$	$\text{dlog}G_i$	$\text{dlog}G_{i-1}$	$\text{dlog}(D/Y)$	$\text{dlog}(D/Y)_{-1}$	$\text{dlog}I_{-1}$	$\text{log}Y_{p-1}$	$\text{log}\pi_{-1}$	$\text{log}I_{g-1}$	$\text{log}G_{c-1}$	$\text{log}G_{i-1}$	$\text{log}(D/Y)_{-1}$	DW	R^2	Sample
A	-0.030	0.245				1.367			0.166				0.649											1.880	0.619	1971-2012
	-(3.273) ***	(2.451) **				(5.382) ***			(2.187) **				(2.348) **													
B	0.735					1.528			-0.178							-0.610	-0.315		0.181	-0.189		0.529		1.983	0.866	1971-2012
	(3.329) ***					(8.176) ***			-(2.634) ***							-(4.562) ***	-(6.328) ***		(2.706) ***	-(3.076) ***		(6.565) ***				
DK	0.041				0.042	2.303	0.503			0.168	0.482			-0.761										1.955	0.828	1972-2012
	(0.409)				(0.670)	(10.203) ***	(2.024) **			(1.840) *	(1.992) **			-(2.315) **												
FIN	-0.231		0.008			1.370				0.170					-0.122	-0.256	-0.473	0.265				0.287	-0.094	2.033	0.927	1972-2012
	-(2.182) **		(0.123)			(7.548) ***				(2.642) ***					-(2.269) **	-(4.842) ***	-(5.587) ***	(3.247) ***				(4.262) ***	-(4.235) ***			
F	-1.233	0.103				1.421	0.389						1.128		-0.384		-0.207			-0.229		0.720	-0.150	2.120	0.941	1979-2012
	-(3.777) ***	(1.689) *				(8.281) ***	(2.848) ***						(3.375) ***		-(5.091) ***		-(3.393) *			-(3.649) ***		(3.986) ***	-(3.134) ***			
D	-0.017	0.017				1.651						-0.351												1.518	0.658	1972-2007
	-(2.414) **	(0.141)				(7.343) ***						-(2.114) **														
GR	-1.519			0.030		1.648	1.142				0.338						-0.841	1.156		0.176		-0.290	-0.188	1.881	0.862	1971-2012
	-(2.411) **			(0.204)		(5.463) ***	(3.879) ***				(2.066) **						-(5.532) ***	(3.829) ***		(2.439) **		-(2.327) **	-(3.677) ***			
IRL	-0.015	0.420				0.681							0.550		-0.296									1.893	0.570	1971-2012
	-(0.564)	(2.789) ***				(1.660) *							(1.929) *		-(2.671) ***											
I	-0.011	0.043				1.590					-0.535		0.443			-0.222								1.891	0.747	1971-2012
	-(2.017) **	(0.572)				(9.131) ***					-(1.944) *		(1.846) *			-(1.810) *										
NL	-0.226	0.009				1.716	1.036		0.276		0.735						-0.412			0.197	0.373			2.146	0.794	1971-2012
	-(2.633) ***	(0.092)				(8.466) ***	(3.181) ***		(2.374) **		(2.970) ***						-(4.681) ***			(3.232) ***	(5.427) ***					
P	-0.022	0.018				1.790		-0.286						0.677	-0.229	-0.264								2.038	0.697	1975-2012
	-(1.203)	(0.383)				(3.882) ***		-(2.130) **						(2.500) **	-(1.678) *	-(2.282) **										
E	0.694				0.104	1.934	-0.594			0.114					-0.250	-0.382	-0.253			-0.087	0.298		-0.039	1.654	0.964	1972-2012
	(6.293) ***				(1.766) *	(7.822) ***	-(2.311) **			(4.120) ***					-(3.642) ***	-(5.190) ***	-(6.005) ***			-(4.503) ***	(6.064) ***		-(2.012) **			
S	0.093				0.103	1.761		0.414	0.458			0.451												2.056	0.861	1972-2012
	(1.299)				(1.882) *	(12.270) ***		(6.018) ***	(3.978) ***			(2.725) ***														
UK	-0.238				-0.017	1.287		0.168		0.062					-0.314		-0.728	0.800			-0.256		-0.066	2.142	0.860	1971-2012
	-(0.875)				-(0.408)	(7.891) ***		(1.635) *		(2.026) **					-(4.384) ***		-(5.192) ***	(5.131) ***			-(2.900) ***		-(2.505) ***			

Note: t-statistics are reported in the parentheses, *, **, and *** stand for 10%, 5%, and 1% significance levels respectively. Since there are no data for ITR on capital income in Luxemburg, the regression for this country is estimated based on the pre-tax capital income. A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom

Appendix F

Table F. *The effects of a 1%-point increase in the profit share (π) on excess demand*

	Consumption	Investment	Exports									Imports				Net exports
	$\partial(C/Y)/\partial\pi$	$\partial(I/Y)/\partial\pi$	e_{Pulc}	$1/(1-e_{Pulc})$	e_{Pxulc}	e_{xPx}	e_{Xrulc}	$rulc$	Y_f/Y	X/Y	$\partial(X/Y)/\partial\pi$	e_{MP}	e_{Mrulc}	M/Y	$\partial(M/Y)/\partial\pi$	$\partial(NX/Y)/\partial\pi$
	A	*B*	*C*	*D*	*E*	*F*	*G=(D*E*F)*	*H*	*I*	*J*	*K=-(G*I*J/H)*	*L*	*M=(C*D*L)*	*N*	*O=-(M*I*N/H)*	*P=(K-O)*
A	-0.534	0.000	0.524	2.099	0.152	-1.728	-0.551	0.599	0.874	0.291	0.234	0.341	0.375	0.306	-0.168	0.402
B	-0.165	0.335	0.214	1.272	0.096	0.000	0.000	0.603	0.897	0.491	0.000	0.287	0.078	0.487	-0.057	0.057
DK	-0.424	0.000	0.465	1.870	0.338	-0.627	-0.397	0.582	0.866	0.305	0.180	0.000	0.000	0.261	0.000	0.180
FIN	-0.369	0.000	0.518	2.076	0.185	-0.576	-0.221	0.608	0.890	0.230	0.074	0.000	0.000	0.244	0.000	0.074
F	-0.463	0.160	0.529	2.121	0.289	-0.439	-0.269	0.602	0.869	0.161	0.062	0.136	0.153	0.163	-0.036	0.098
D	-0.689	0.000	0.366	1.577	0.333	-0.379	-0.199	0.600	0.913	0.207	0.063	0.000	0.000	0.195	0.000	0.063
GR	-0.572	0.000	0.423	1.734	0.377	-0.729	-0.476	0.547	0.908	0.125	0.099	0.000	0.000	0.179	0.000	0.099
IRL	-0.335	0.000	0.334	1.501	0.171	0.000	0.000	0.588	0.896	0.455	0.000	0.401	0.201	0.456	-0.140	0.140
I	-0.207	0.086	0.445	1.802	0.257	-0.307	-0.142	0.586	0.913	0.165	0.037	0.210	0.169	0.165	-0.043	0.080
L	-0.153	0.000	0.232	1.303	0.322	0.000	0.000	0.521	0.930	1.190	0.000	0.000	0.000	0.999	0.000	0.000
NL	-0.367	0.170	0.461	1.855	0.370	0.000	0.000	0.634	0.916	0.428	0.000	0.139	0.119	0.385	-0.066	0.066
P	-0.443	0.000	0.668	3.011	0.090	0.000	0.000	0.638	0.913	0.161	0.000	0.568	1.143	0.194	-0.317	0.317
E	-0.858	0.000	0.430	1.754	0.320	-0.277	-0.155	0.614	0.913	0.149	0.034	0.244	0.184	0.144	-0.039	0.074
S	-0.535	0.120	0.407	1.687	0.172	-0.508	-0.147	0.517	0.815	0.273	0.063	0.464	0.319	0.273	-0.137	0.200
UK	-0.547	0.000	0.558	2.264	0.207	-0.518	-0.243	0.612	0.890	0.199	0.070	0.000	0.000	0.198	0.000	0.070

Note: A = Austria. B = Belgium. DK = Denmark. FIN = Finland. F = France. D = Germany. GR = Greece. IRL = Ireland. I = Italy. L=Luxemburg. NL = Netherlands. P = Portugal. E = Spain. S = Sweden. UK = United Kingdom.

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