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Wages and Nominal and Real Unit Labour Cost Differentials in EMU

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Gustav A. Horn and Andrew Watt

Abstract

This paper addresses the issue of current account imbalances of countries within a monetary union, now widely agreed to have been a major contributor to the persistent economic crisis in the EMU. In particular we focus on the role of wages for current account developments and a possible role for nominal incomes policies in limiting and correcting imbalances.

We set out why national current accounts remain important in a monetary union and examine the forces driving the current account balance. We present empirical evidence on current account developments in the Euro Area, focusing on countries in which a correction has occurred. Detailed counter-factual model-based simulations for Germany show that “wage policy” on its own is scarcely able to make an impact on its huge and destabilising surplus; what is needed is a combined approach in which nominal wages follow a wage norm (productivity plus ECB target inflation rate) while aggregate demand is managed (in this case stimulated) to fully utilise productive potential.

Against this analytical background we develop a proposal for institutional reform of the Euro Area, building on existing institutions. Key elements are: reinstating the Broad Economic Policy Guidelines as the conceptual framework guiding economic policy, expanding the remit of the Fiscal Council and the Productivity Boards to cover the entire policy mix, and substantially developing the EU Macroeconomic Dialogue in particular by setting up MEDs at Euro Area and Member State levels.

JEL Classification: D40, E31, L51.

Keywords: Germany, current account, Macroeconomic Imbalance Procedure, wages, inflation, productivity boards, Macroeconomic Dialogue, incomes policies, policy mix, EMU.

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CONTENTS

1.	The Abolition of Exchange rates in the Euro Area	5
2.	On the Importance of a Current Account Analysis.....	6
3.	Forces driving the current account balance	8
4.	The development of current accounts.....	15
5.	A Simulation Study for Germany	21
5.1.	Modelling foreign trade in the IMK Model of the German Economy	21
5.2.	A Simulation of Marginal Wage Increases	25
5.3.	A different wage regime	29
5.4.	A combination of higher wages and fiscal stimulus	31
6.	A feasible conceptual and institutional reform agenda for macroeconomic coordination and convergence in the euro area	33
7.	References	38
	Appendix Tables	41

LIST OF TABLES

Table 1	Test statistics for the estimations	22
Table 2	Macroeconometric simulations of wage and fiscal policy measures for 2001 to 2015	26

LIST OF GRAPHS

Graph 1	Structure of the German current account balance in % of GDP	7
Graph 2	Unit labour cost trends in the whole economy in the euro area	11
Graph 3	Labour productivity in the euro area.....	12
Graph 4	HICP in selected euro area countries.....	13

Graph 5	Real wages per hour in the euro area	14
Graph 6	Current accounts of EMU countries - medium sized economies	15
Graph 7	Current accounts of EMU countries - small economies	16
Graph 8	Current accounts of EMU countries - relatively small economies	16
Graph 9	Current accounts of EMU countries - relatively large economies	17
Graph 10	Inflation rates in rebalancing countries	18
Graph 11	Exports in rebalancing countries	19
Graph 12	Final demand in rebalancing countries	20
Graph 13	Impacts of a 1% wage increase on foreign trade	28
Graph 14	Impacts of a macroeconomically-oriented wage policy on foreign trade	30
Graph 15	Impacts of a macroeconomically-oriented wage policy on economic growth and the budget	32

APPENDIX TABLES:

Table A 1	Inflation correlation – total sample	41
Table A 2	Inflation correlation – pre crisis	41
Table A 3	Inflation correlation – crisis	41
Table A 4	Inflation correlation - post crisis	42
Table A 5	Exports - total	42
Table A 6	Exports - pre crisis	42
Table A 7	Exports - crisis	43
Table A 8	Exports - post crisis	43
Table A 9	Final demand - total	43
Table A 10	Final demand - pre crisis	44
Table A 11	Final demand - crisis	44
Table A 12	Final demand - post crisis	44

1. THE ABOLITION OF EXCHANGE RATES IN THE EURO AREA

The question whether current accounts play a major role for economic stability has become particularly urgent in the course of the European Monetary Union (EMU). Before that, it was an issue of minor concern since imbalances were supposed in theory to be – and in practice usually were – effectively constrained by appropriate exchange rate adjustments. Depending on the exchange rate regime, these adjustments were dramatic at times. A strong adjustment happened in particular when it had been temporarily suppressed by a pegged exchange rate regime. Such a regime requires exchange rates to be provisionally fixed (within very tight limits), but they may be subject to discretionary adjustments. Until the decision to adjust is taken any movement is suppressed. The emergence of current account imbalances is one major reason to take such a decision, but the pressure can be exacerbated by speculation on financial markets. All major pegged currency systems like the Exchange Rate Mechanism within the European Monetary System in the eighties and early nineties worked like this.

Occasional adjustments helped to keep current account balances limited, but at the cost of causing other problems. Strong exchange rate movements, which may be driven by speculation as much as by economic fundamentals, create uncertainty. That is seen as an obstacle for international trade and investment, reducing growth potential. Therefore two opposing ways to avoid dramatic exchange rate movements have been followed. The first is to return to a regime of flexible exchange rates. In Europe, Britain chose that way. The second is to abolish the different currencies altogether and create a single currency regime. That was the path taken with the establishment of the European Monetary Union (EMU), with the Euro as a common currency, for initially 11 and in the meantime 19 member countries.

The first way indeed seems to avoid the problems of a delayed adjustment process and thus removing one potential cause of current account imbalances. However, exchange movements tend to be unpredictable and if anything dominated by capital flows and not by trade (Priewe 2016). Against this backdrop it is far from guaranteed that a flexible exchange regime leads to a balanced current account. On top of this, a high volatility of flexible exchange rates creates severe uncertainty.

By permanently fixing exchange rates, the EMU avoids all this. But the problem of imbalanced current accounts within the EMU is not addressed. As it turned out, this negligence proved a major problem for the internal stability of the EMU. As will be shown below in more detail, imbalances widened sharply in the run-up to the crisis. To ensure a stable development, current account imbalances have to be limited. For, again as will be discussed in more detail, it is not the case that a current account imbalance between Euro Area countries is as inconsequential as that between two regions of a nation state. The Macroeconomic Imbalance Procedure (MIP) established in response to the crisis already states thresholds for deficits as well as surpluses that should not be trespassed (EU Commission 2017a). It is flawed, however, not least in being asymmetric: surpluses are treated with much more leniency than deficits. Moreover, the procedure that is supposed to ensure compliance and sanction violations has not proven effective so far.

Therefore it seems appropriate to explore further ways to limit the imbalances. This is the aim of this paper. Special emphasis will be laid on overcoming the huge German surplus which is essential for a stable EMU. Section 2 sets out why national current accounts remain important in a monetary union. Section 3 examines the forces driving the current account balance. Section 4 presents the empirical evidence on current account developments in the Euro Area. In sections 5 to 9 we present a counterfactual model-based simulations for Germany. Section 10 turns to policy, developing a proposal for institutional reform to ensure that national macroeconomic policy mixes are consistent and avoid generating dangerous imbalances.

2. ON THE IMPORTANCE OF A CURRENT ACCOUNT ANALYSIS

The current account is defined as:

$$(1) CA \equiv p_X X - p_M M + NFI + NTI, \text{ where}$$

X Exports, M Imports, p_X Export Prices, p_M Import prices, NFI Net Factor Income, NTI Net Transfer Income

The current account thus consists of different components. The first one is net exports. That is difference between the nominal value of exports and the nominal value of imports. As it turns out, it is the most important component driving the current account balance. The second component is net factor income on the income account; income payments are outflows, and income receipts are inflows. These values reflect profits from past investments abroad or debt service for foreign credits. In addition there are transfer incomes that result from individual or institutional transfers of money between the domestic economy and abroad. Remittances may be of importance in this component. The final component is current transfers. Current transfers take place when a foreign country provides currency to another country with nothing received as a return.

As an example the following graph shows the structure of the German current account. It is obvious that the dynamic of the balance is dominated by net exports. To a much lesser extent the primary income balance is of importance, while transfers play only a minor role. Interestingly the long term surplus of the German current account has led to a sign change with respect to primary incomes. Obviously foreign assets have increased over time such that since 2004 Germany receives more revenue from foreign assets than foreigners receive from assets in Germany.

A simplified way to describe the current account that neglects the components of lesser importance, is via aggregate savings:

$$(2) S = Y - C - G, \text{ where}$$

S Aggregate Savings, Y nominal GDP, C nominal Consumption, G Government Spending

Since,

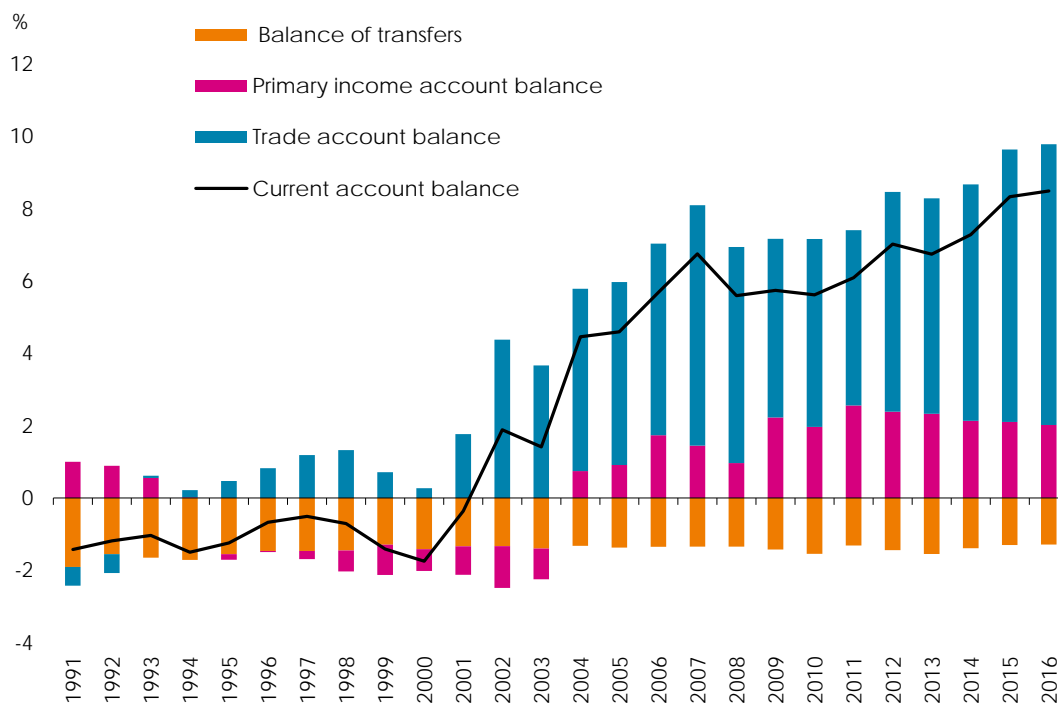
$$(3) Y = C + G + I + p_X X - p_M M \text{ one gets } p_X X - p_M M = S - I, \text{ where}$$

where NX is nominal Net Exports, I Investment

Thus the trade balance (net exports) equals, by definition, the sum of government saving less investment plus private saving less investment.

At the same time the current account balance a corresponding change in net foreign assets of an economy. A positive current account signifies a net increase of foreign assets and vice versa. This means that a country running a current account surplus accumulates financial claims against the rest of the world, while one running deficits takes on financial obligations, i.e. debt.

Graph 1 Structure of the German current account balance in % of GDP



Sources: Deutsche Bundesbank; Destatis; IMK calculations.

A balance that is positive some years and negative the next is not of concern, but if the balance shifts structurally in one direction over a long term period, problems may occur. It is quite obvious in case of a long term deficit. In this case the stock of foreign assets diminishes. Eventually there will be no further assets but a rising amount of debt. This will cause more debt servicing payments, further deteriorating the current account balance. As long as financial markets perceive firms and the state as solvent, credit will be available at decent interest rates. However, if that perception changes, because the debt level is increasing in a way perceived as unsustainable, rates may soar in a vicious circle where rising interest raise doubts about solvency raising rates again (“sudden stop”). In this setting default becomes a self-fulfilling prophecy. Balance is reattained by some combination of devaluation (if available) and a stabilisation recession to depress demand for imports and restore competitiveness.

That shows why current account imbalances are a threat to the economic stability of surplus countries, too. A default in a deficit country will automatically lead to a loss of assets in a surplus country; in effect the (net) exports will have been provided without payment. In the end both economies suffer. Therefore the principle of seeking broadly balanced current accounts over the medium run is a sound one. Within EMU, the target in the MIP to observe thresholds for deficits as well as for surpluses is in principle sensible with a view to macroeconomic stability. It remains to be seen whether the thresholds have been chosen appropriately.

However, whilst the targets are sensible, the economic processes to achieve them are far from obvious. There are basically two cases to consider. Firstly there are the balances between economies with floating exchange rates. It is usually assumed in this case that exchange rate movements wipe out any imbalance sooner or later. Given empirical evidence this is far from realistic, however (Obstfeld/Rogoff 2000, Williams 2006, Priewe 2016). Exchange rate movements are driven by many factors. The current account balance plays only a minor role if any. Hence one should not expect a quasi-automatic rebalancing process if exchange rates are flexible. The present debate on trade imbalance between the US and Europe stresses that point.

The second case is the trade balance between economies where exchange rates are fixed, and most importantly here those within the EMU. In the early stages of the currency union the lack of a nominal exchange rate was not seen as a serious problem (ECB 2003). The price mechanism was supposed to lead to a rebalancing process. It was reasoned that member countries facing a trade deficit would, because they have clearly lost competitiveness, suffer a relative bad economic performance that would cause relative subdued inflation compared to other member countries. On the contrast the enhanced competitiveness of surplus countries would boost activity, generating relatively high inflation rates: the resulting deterioration (gain) in relative competitiveness for surplus (deficit) countries would in the end lead to a rebalancing of the current account. This hope is still present (Wambach 2017).

This view found wanting during the Euro area crisis, however, because at least one countervailing force had not been appropriately considered: real interest rates. With nominal rates equalised across the currency area, differing inflation rates lead to differing real rates to the extent that inflation differentials are expected to prevail. Then significant changes in economic behavior affecting the current account balance will occur.

Economies with higher than average inflation rates experience below-average real interest rates. That spurs demand for credit especially in the real estate sector. The effect could trigger a build-up of a bubble, endangering the internal stability of the economy. Moreover, a boom in the real estate may lead to wealth effects that boost domestic demand, alongside the direct effects on credit-financed investment and consumption. Far from being curtailed, then, aggregate demand is boosted. This in turn pushes up nominal wage rises throughout the economy. This inflationary spiral leads, it is true, to diminishing competitiveness of domestic firms in relation to importing firms as well as those of exporting firms in relation to their foreign competitors within the currency area and, as long the exchange rate does not change, also in relation to those outside the currency union. In the end this should lead to a more negative current account via a mix of higher imports and lower exports. But for an extended period the decline in competitiveness is not corrected via a depressing effect on aggregate demand; rather its is masked by booming demand and apparent successes in terms of growth and employment.

The contrary is the case where inflation rates are lower than average. Here real interest rates are relatively high. That adversely affects investment and in particular the real estate sector; the above-mentioned mechanisms work in reverse and domestic demand is and the inflation rate stays below average. Here too competitiveness effects are masked by demand effects.

These considerations show that automatic rebalancing of current accounts is far from obvious. On the contrary, if the real interest rate effect dominates, imbalances will increase over time. Then the danger of a sudden stop of credit triggering a foreign debt crisis is imminent.

3. FORCES DRIVING THE CURRENT ACCOUNT BALANCE

Theories of international trade typically assume a tendency towards trade balance (Dekle, Eaton, Kortum 2007). However empirical evidence reveals that substantial deficits and surpluses are common. These are not of just short term nature as could be assumed. Rather they are persistent and long term. Some observers nevertheless interpret these as equilibria (Sachverständigenrat 2017, Kasten 2). Economic equilibria are not seen as harmful since actors see no incentive to change. There is no need for policy action in this case.

Nevertheless, the question arises: What forces are behind this? One obvious candidate is a not “well-behaved” exchange rate mechanism, in the sense of not adjusting in such a way as to balance the current account. But why should this be the case, if exchange rate movements are dominated by financial market transactions, rather than trade. The volume of the former is much greater than that of the latter. Even the argument that financial market flows are influenced by trade such that there is an

indirect trade impact is not convincing, since financial market transactions follow their own idiosyncratic logic.

Still, many scholars see exchange rate adjustment as the tool to rebalance the current account (Obstfeld /Rogoff 2005). The idea behind this is that exchange rates determine the (relative) price of traded goods. Thus demand for exports as for imports crucially depend on the exchange rate.

The main instrument to bring the adjustment about is monetary policy. By fixing the nominal interest rate monetary policy can influence exchange rates to some extent. A higher interest rate will induce financial inflows that may – other things being equal – lead to appreciation. However other things being equal is a very strict assumption in this case, since it assumes that trading partners accept this monetary policy move and do not react with higher interest rates themselves.

This argument is clearly not relevant within a currency union like the EMU. Here other forces to rebalance the current account must be considered. In a currency union the current account of each member country is determined by relative prices or the real exchange rate with other member countries and aggregate demand. Foreign demand is influencing exports and domestic demand imports. For exports X one gets:

$$(4) X = X\left(\frac{p^e}{p^*}, D^*\right)$$

where p^e is the domestic price level, p^* is foreign price level, and D^* foreign demand

In an oligopolistic price setting environment and with a pricing to market approach (Krugman 1986 and Stephan 2005) relative prices are the result of production cost developments, the foreign price level and mark-ups in the respective countries.

$$(5) p_i^e = \alpha_i(ULC_i + UCC_i) + \beta_i p^*$$

with p_i^e export prices of country i ,

α Mark up on cost country i , ULC Unit Labour costs, UCC Unit Capital Costs,

β Mark up on foreign price level for country i , p^* foreign price level

The relative price level for country i is as follows:

$$(6) \frac{p_i^e}{p^*} = \frac{\alpha_i(ULC_i + UCC_i)}{\alpha^*(ULC^* + UCC^*)} + \beta_i$$

Since capital costs were, before the crisis in the EMU, roughly the same across all member countries and pricing to market is frequently not considered, (6) was – mostly implicitly – mainly used in a simplified version (Stockhammer 2011, Bibow 2012, Flassbeck/Lapavitsas 2013, Bofinger 2015, Sinn 2014):

$$(7) \frac{p_i^e}{p^*} = \frac{\alpha_i(ULC_i)}{\alpha^* ULC^*}$$

For imports M one gets:

$$(8) M = M\left(\frac{p}{p^*}D\right)$$

where p is the domestic price level and D domestic demand.

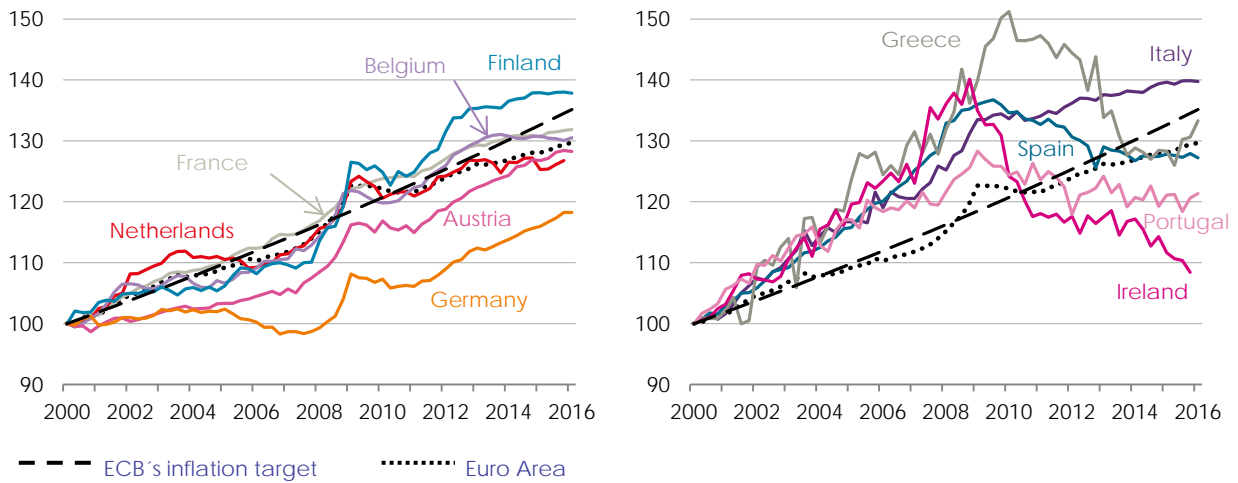
In this setting unit labor costs are of central importance. Therefore they are seen as the key policy instrument to influence the current account balance in the absence of nationally specific monetary policy. The productivity component of ULC is usually not seen as a relevant policy instrument, although there is a close connection to public as well as private investment, albeit in the longer run. Thus nominal wages are seen as the decisive instrument for the adjustment of real exchange rates to balance the current account within a currency union.

Consequently an inappropriate wage formation process and outcomes are seen as the major driver behind the emergence of current account imbalances (e.g. Allsopp/Watt 2003, Horn et al. 2005, Stockhammer 2011, Bibow 2012, Watt 2012, Flassbeck/Lapavitsas 2013, Bofinger 2015, Wren-Lewis 2015). According to this reasoning wages have moved in a way that changed real exchange rates dramatically leading to diverging export and import performances in the different member countries. To avoid this, the real exchange rate should remain more or less unchanged from its equilibrium value. All other things equal that requires ULC movements to be the same over the medium run across all member states. The question is, at which growth rate. The benchmark is the inflation target of the ECB of close to but not higher than 2% in the medium run. This implies that, in the longer run ULCs rise by the same value as inflation. This stabilises the functional income distribution while assisting the central bank in achieving its main policy goal, increasing its scope to focus on the subsidiary aims of growth and employment.

This in turn defines the leeway for nominal wage increases: wages should rise at a rate 2 percentage points higher than medium-run productivity growth. This can be considered a “golden wage rule” (Watt 2007, 2010). A weaker increase will tend to lead to a real depreciation and a stronger to a real appreciation.

The past has shown that this benchmark was rarely met by Member States.

Graph 2 Unit labour cost trends¹ in the whole economy in the euro area
2000q1=100



¹ Unit labour costs (in persons; Portugal in hours).

Sources: Macrobond (Eurostat); IMK calculations (data as of 16.06.2016).

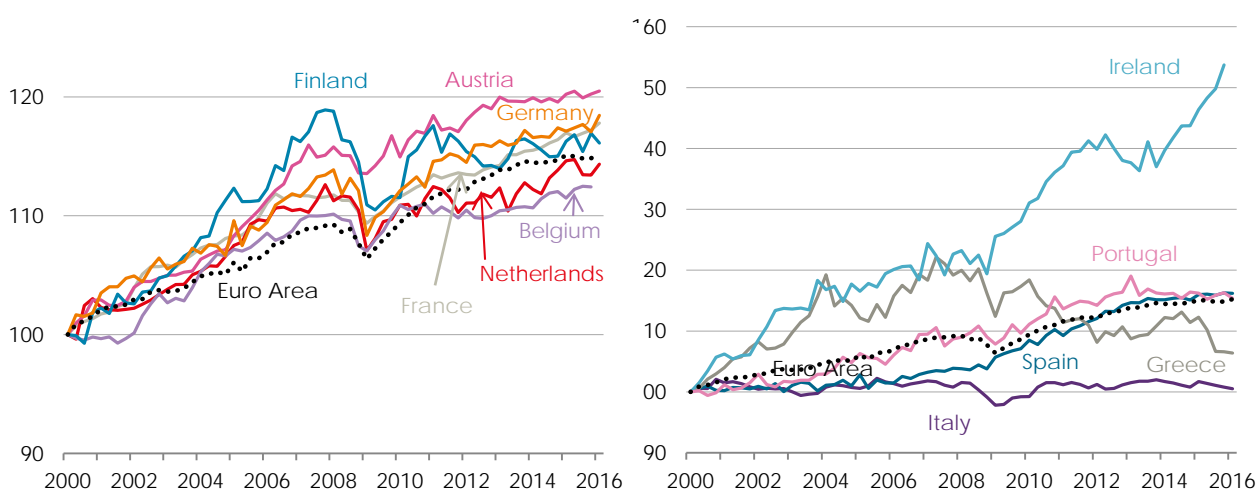
The dashed black line shows how ULC should have moved to keep real exchange rates constant while being compatible with the ECB's inflation target.¹ Obviously this was not the case for many countries over extended periods. Only in the Netherlands and in particular in France and Belgium did wages stay close to the benchmark before the crisis. Notably in Germany, and to a much lesser extent in Austria, ULC remained constantly below the benchmark. On the other hand countries like Greece, Spain, Italy, Portugal and Ireland were well above the benchmark. The former depreciated and the latter appreciated in real terms. This was associated with improving and deteriorating current account balances, respectively.

From this many scholars draw the conclusion wages had moved inappropriately with respect to a balanced current account. In the former economies wage rises were too low, whereas in the latter they were too high (Horn et al. 2005, Stockhammer 2011, Bibow 2012, Watt 2012, Flassbeck/Lapavitsas 2013, Höpner und Lutter 2014, Bofinger 2015, Wren-Lewis 2015).

A glance at the two components of ULC corroborates that view to a considerable extent.

¹ We do not explicitly address here the issue of whether the starting point (2000) represented an "equilibrium", but empirically current account imbalances at that time were rather small.

Graph 3 Labour productivity¹ in the euro area
2000q1=100



¹ The calculation of labour productivity for all countries is in hours, seasonal and calendar adjusted.

Sources: Macrobond (Eurostat); IMK calculations (data as of 16.06.2016).

Productivity growth in Germany was slightly above average but not much. In Austria the productivity growth rate was a bit higher. However the fastest increases before the crisis were in Finland where ULC increased much faster than in Germany, and in Greece and Ireland, two countries with ULC growth above the benchmark. The heterogeneous picture is confirmed at the upper end of ULC movements: in contrast to Greece and Ireland, the Italian economy showed only a very weak rise as did to some extent the Spanish economy up to the crisis; Portugal was close to average.

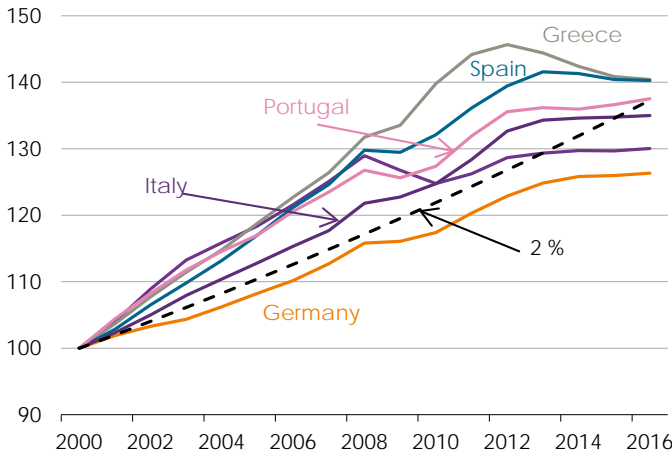
These findings are in line with a view that wages were the driving force behind real exchange rate movements and not productivity (see also Bussière et al 2005). Moreover an argument in terms of productivity differences would be logically flawed. After all, while there might be some room for “reverse causality”, wages are, at the macro level, supposed to adjust to different productivity developments. Consequently diverse productivity developments cannot be an argument in favor of diverse ULC movements, except in the short run. Wages should ultimately compensate for any diversity in productivity developments.

Against this view many objections from different perspectives were raised (e.g. Storm and Naastepad 2015). A major objection refers to the price formation process. It is far from obvious that wage outcomes drive inflation (and it is relative prices of goods and services that are decisive for competitiveness). First of all, equation (5) shows that price changes are not exclusively the result of wage changes. Capital costs may play a role. But before the crisis this was no issue within EMU since capital costs were more or less the same across member countries. Since then diverging uncertainty and corresponding risk premia between member countries also caused (nominal) capital costs to diverge. Whilst the German economy is seen as a safe haven for capital with respectively low interest rates and capital costs, the Greek economy – to take the opposite extreme – is burdened with high uncertainty and relatively high interest rates. Simply to offset this, German wages would have to rise more strongly and Greek wages by less than the benchmark. The adjustment burden on wages is increased under these circumstances.

Furthermore the pricing to market (PTM) effect is mostly neglected in research that focuses on wages as balancing mechanism. PTM happens when when firms orientate their product prices not just to their own changing cost base but also to the prevailing prices in the sales market in question. Presently

pricing to market should make balancing easier. Firms charge relatively lower prices in markets with subdued inflation and higher in those with a stronger price adjustment. Given that the German economy presently has a relatively high inflation rate compared e.g. to Greece PTM gives foreign firms a chance to charge higher prices leading to increased import spending from Germans. On the other hand German firms may face difficulties to charge high prices in countries with subdued inflation that leads to lower export yields. Both tendencies are favourable for a rebalancing of the German current account and thus support the wage adjustment process.

Graph 4 HICP in selected euro area countries (2000=100)

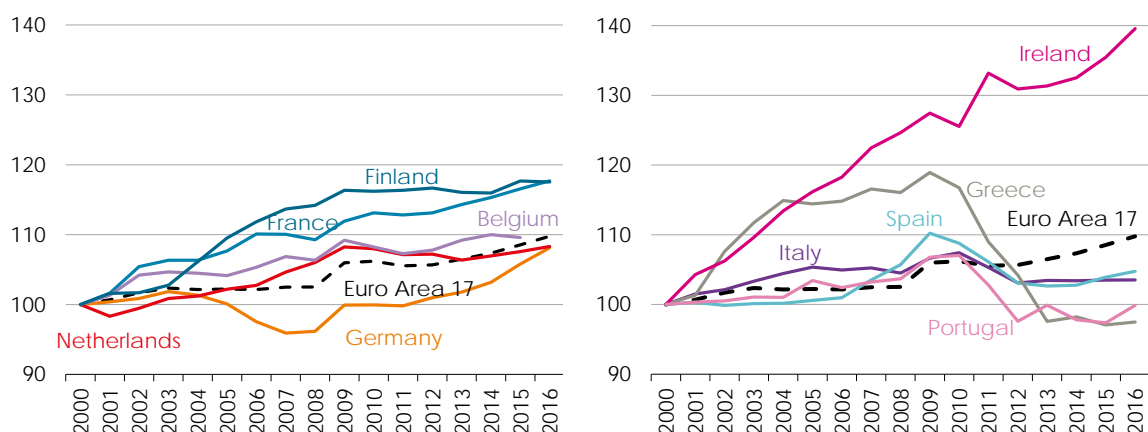


Sources: AMECO.

A more important point is the role of firms’ mark-up on unit costs. In the period up until the crisis, mark-ups increased steadily in most countries so that consumer price increases outstripped the rise in ULC. Prices, then, were driven more by “profit inflation” than by wage inflation. If that is the case, the transmission of wage development into inflation is at least sluggish and may not even be close to proportional in the medium run. But a less than proportional impact means that the functional distribution of income will shift, in this case in favour of profits. Since it is prices that are decisive for the current account balance, the rebalancing power of wage policy would be rather limited in this case.

In the light of the interdependence between wage and price movements, the question arises to what extent wage developments are rather a *reaction* to a prior price inflation (Watt 2012: 102). If inflation starts to rise, nominal wages tend to follow, generating a spiral that escapes simple assertions of causal direction. Real wages – which is what is ultimately of prime interest to workers and wage bargainers – are, at the end of the day, unaffected. But competitiveness is eroded while at the same time the real interest rate (if the inflationary spiral is more than just temporary) falls, stimulating demand. Thus it can, for instance, occur that in the years up to the crisis nominal wages and nominal unit labour costs grew much faster in Spain than Germany, while the pace of real wage growth was broadly similar. So was the change in *real* unit labour costs: the share of national income going to profits rose in both countries: wages struggled to keep up with prices in both cases, but the spiral twisted much faster in Spain than Germany.

Graph 5 Real wages per hour in the euro area
Salary per hour deflated by HICP (2000=100)



Sources: Macrobond (Eurostat); own calculations.

Insofar it remains to be seen whether a policy focus on wages means starting at the wrong end of price movements. It rather may have been a profit inflation showing up in an increased mark-up that deteriorated competitiveness. Wages just tried to follow inflation in order to maintain purchasing power of employees. In this case wage coordination would imply a severe restraint on purchasing power and may for an extended period have only a limited impact on price inflation.

A further objection against an active use of incomes (wage) policies draws on institutional arguments (Horn 2016). In order to influence wage formation one needs institutions. In Germany, the Scandinavian countries, the Netherlands and Austria as well as some others, there exists a more or less centralised wage bargaining process between trade unions and employers associations. They would be the addressee of respective recommendations. In France the government can play a guiding role through the statutory minimum wage which is incorporated via employment contracts into the wage-setting of an appreciable share of the labour force. But whom to address when wage formation is decentralised? In this case it is very difficult if not impossible to subject wages to aggregate stability targets. It is highly doubtful whether an active wage policy then can make a contribution to a re-balancing of a current account. Nominal wages are in such countries endogenous to the business cycle, and national demand-side (i.e. fiscal) policy needs to be deployed to influence nominal wages (and prices) indirectly (Allsopp/Watt 2003).

The heterogeneity of wage-setting mechanisms in the EMU member countries is certainly a drawback for its use as co-ordination process. This argument is emphasised by some who strongly advocate in favor of the need for a wage co-ordination and whose conclusion is then that it cannot be co-ordinated within the Euro area and so one should give up the joint currency (Höpner und Lutter 2014). However, this underplays the fact that different systems can to some extent generate similar outcomes and, more importantly, neglects the possible recourse to fiscal policy.

A different line of arguments casts a seemingly far more fundamental doubt on wages as an adequate co-ordination tool. In line with equations (4) and (8) demand also plays a major role determining exports and imports. There are also strong indications that their impact may be greater than those of relative prices and thus wages (EU Commission 2010, Feigl and Zuckerstätter 2014, Horn and Lindner 2016, Wyplosz 2013). They show that the movement of the current account balance is mainly driven by foreign demand (exports) or domestic demand (imports). From a policy perspective, then, a structural surplus in the current account primarily reflects a structural lack of domestic demand leading to too low imports, whereas a deficit points to structurally too high domestic demand leading to too high imports. (And, secondarily, also external demand trends, irrespective of relative prices,

influencing the export side.) However, wages and demand are not independent. Excessive or inadequate domestic demand could be the result of too low or too high wage settlements. And an important determinant of the pace of aggregate demand growth is the real interest rate. But as we have seen, in a monetary union with a single nominal interest rate this is determined by the pace of price and ULC growth. The phenomena are theoretically expected to be correlated, whatever the direction of causality, and they are in practice inextricably intertwined.

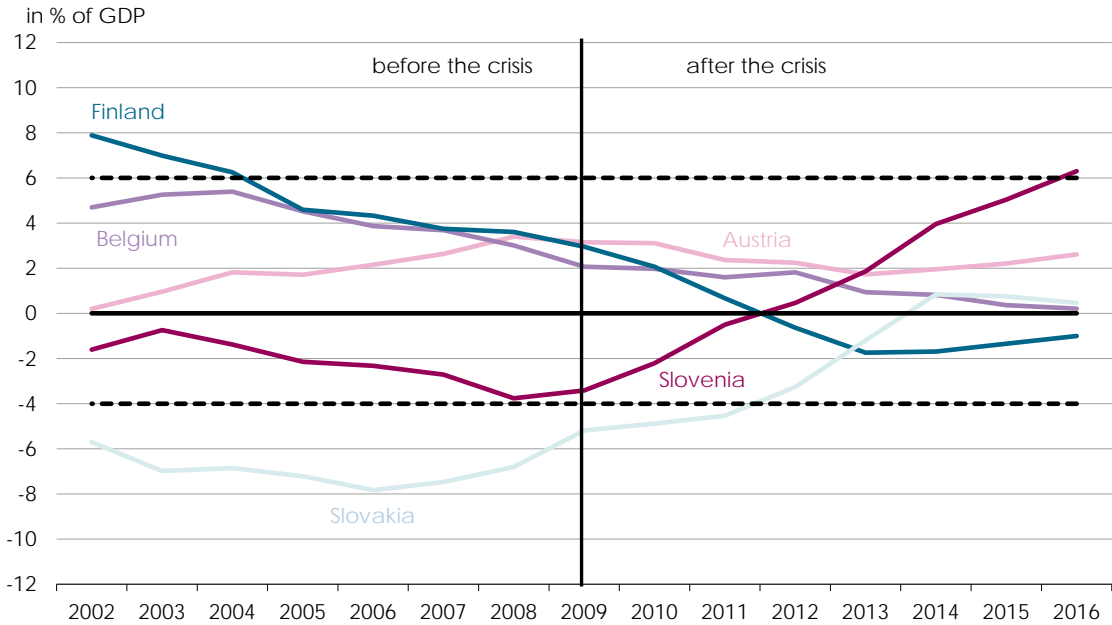
In the following these different lines of arguments will be analysed in several ways. First we present case studies of current account developments with special emphasis on reversals of high or surpluses or deficits. Then we will apply a simulation model to quantify the impact of wage policy and demand policies in the case of Germany. Building on these analyses policy proposals are made in the final section.

4. THE DEVELOPMENT OF CURRENT ACCOUNTS

Since the start of the currency union the limits of surpluses and deficits agreed upon for the Macroeconomic Imbalance Procedure (MIP) – introduced in 2011 – have been trespassed by a considerable number of member countries. For a proper assessment one should distinguish between developments before the crisis and thereafter. While some countries have transgressed repeatedly, it is true that the imbalances were larger before the procedure was introduced. At this stage we take the MIP threshold values as given, although we are critical of them, notably because of their asymmetry (see below).

There are several cases to be observed. First of all there is not an insignificant group of countries where the current account was within agreed limits all the time; among them are France, Italy, Belgium, Austria and Slovenia. Large as well as small countries have proved able to tread a path raising no severe current account balance problems.

Graph 6 Current accounts of EMU countries - medium sized economies in % of GDP 3 year moving average



Sources: AMECO; own calculations.

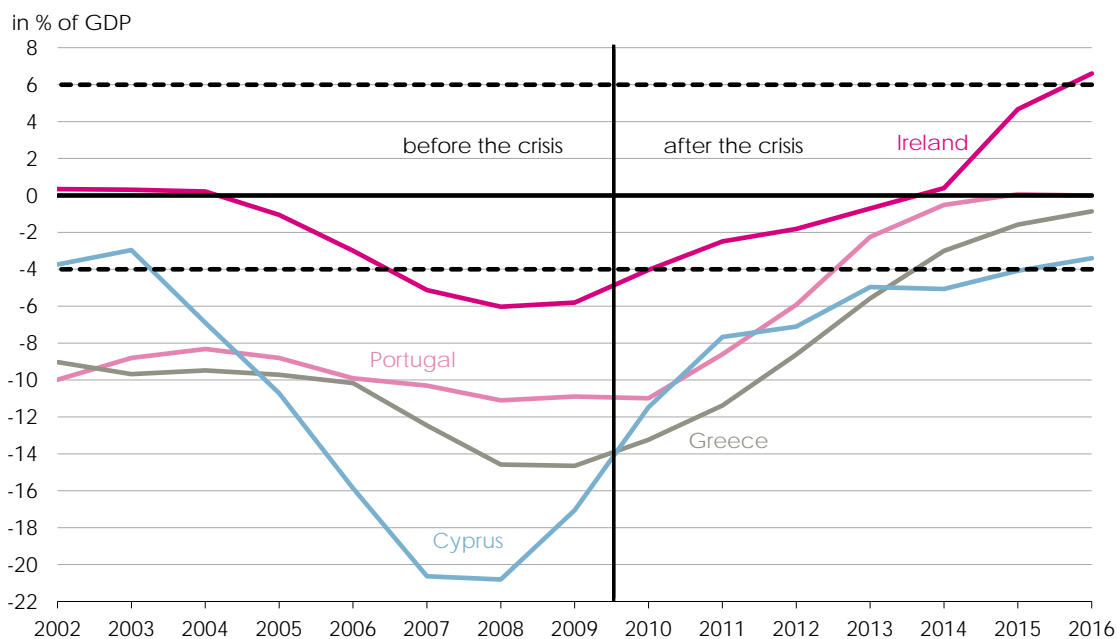
Graph 7 **Current accounts of EMU countries - small economies**
in % of GDP 3 year moving average



Sources: AMECO; own calculations.

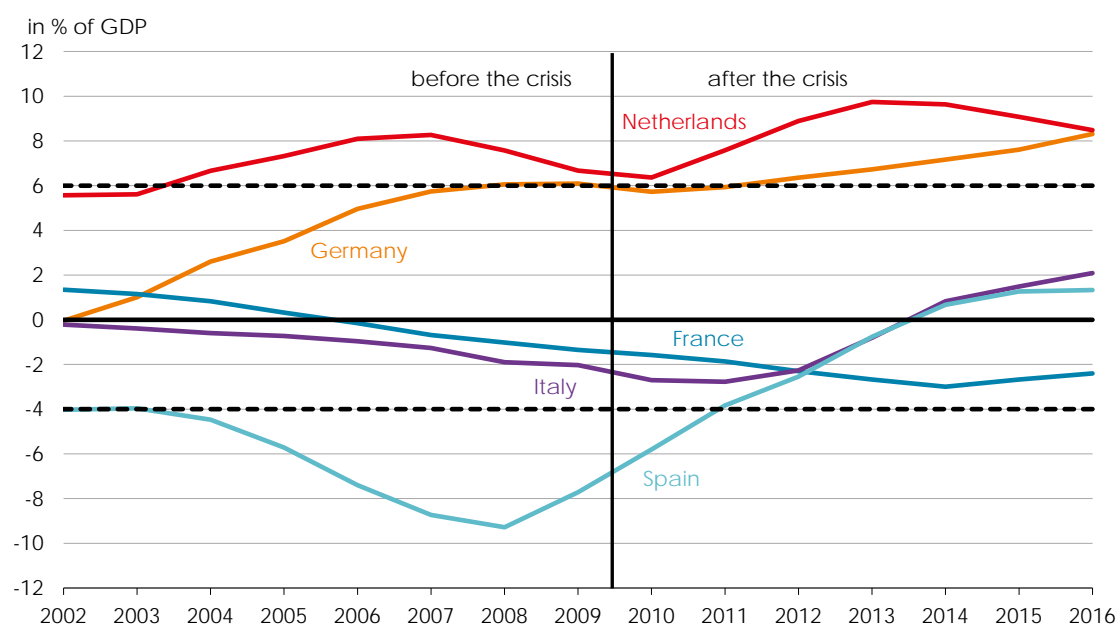
A second group of countries violated the threshold retrospectively because they trespassed limits showing high deficits before the crisis, but were well within them afterwards. Firstly, these were countries like the Baltics and Slovakia; but at the time they were not members of the EMU and they were on a path of integration into the global markets. They succeeded to turn high deficits into low ones even small surpluses after the crisis hit. Another group also transgressed limits with high deficits before the crisis when they were already a member of EMU. These were the crisis countries Spain, Greece, Portugal, Ireland and Cyprus. Their high and persistent deficits were one trigger of the Euro area crisis due to the high external indebtedness to which they inevitably led. The reduction of their deficits was accompanied by severe economic recessions.

Graph 8 **Current accounts of EMU countries - relatively small economies**
in % of GDP 3 year moving average



Sources: AMECO; own calculations.

Graph 9 Current accounts of EMU countries - relatively large economies



Sources: AMECO; own calculations.

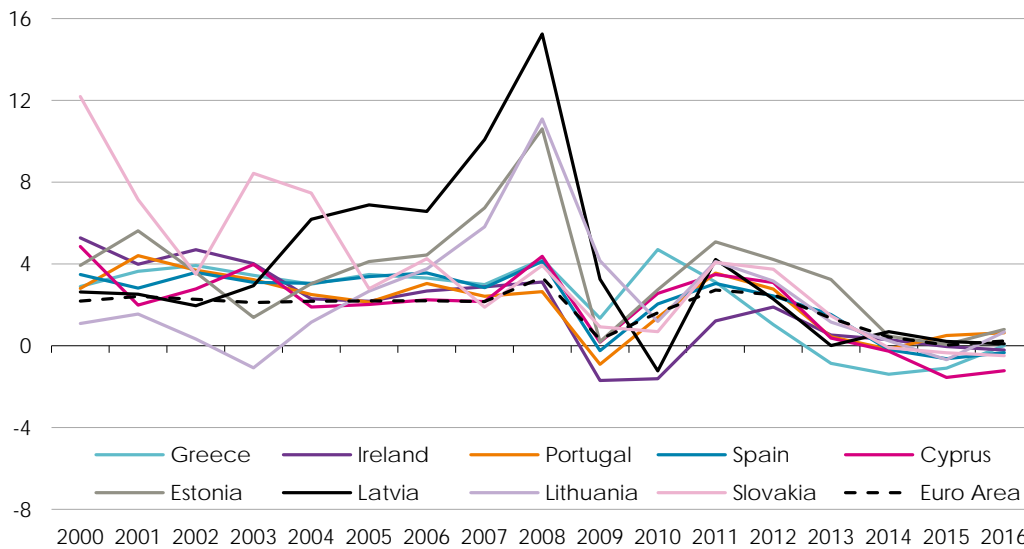
There is a fourth group of countries that show surpluses above limits. This is notably Germany, but also the Netherlands and, until recently, Luxemburg. Germany is by far the most important country in this group given its weight, but the Netherlands showed a higher surplus, exceeding the threshold for almost the entire period. Up to date in Germany there is no sign of a turnaround towards a smaller foreign trade surplus and in the Netherlands only a very limited correction from extremely high levels.

Particularly interesting for our analysis are those economies that, after severe imbalances, achieved a turnaround to a more balanced current account. This leads us to focus on the Baltic States, the Euro Area crisis countries (Greece, Cyprus, Spain, Portugal and Ireland) and Slovakia.

Starting with the Baltic states one obvious way to balance the current account was not taken. Although not being a member of the currency union they did not depreciate their currency in nominal terms to improve their competitiveness. Given that, they faced the same restrictions as any member country of the currency union. This leads to the question were there any differences in the way these countries adjusted to a more balanced current account? To assess this at least to some extent a simple correlation analysis combined with a visual inspection of data will be provided: the number data of points is insufficient to perform a proper econometric analysis. Consequently results derived here will not tell anything about causalities. They rather show more or less interesting co-movements.

Three variables are taken into consideration: inflation, exports and final demand. Inflation rate movements should show whether a rebalancing of a current account deficit goes along with a disinflation process. If that is in general the case, such a finding could suggest that a rebalancing process necessarily involves an improvement of price competitiveness. Following the same reasoning, exports should make a major contribution to rebalance the current account. This requires a competitive domestic supply as well as sufficient foreign demand. Final demand shows whether the external balance has been influenced by a lack or a surge of domestic demand. To overcome a deficit situation domestic demand needs to be restrained in order to decrease imports.

Graph 10 Inflation rates in rebalancing countries

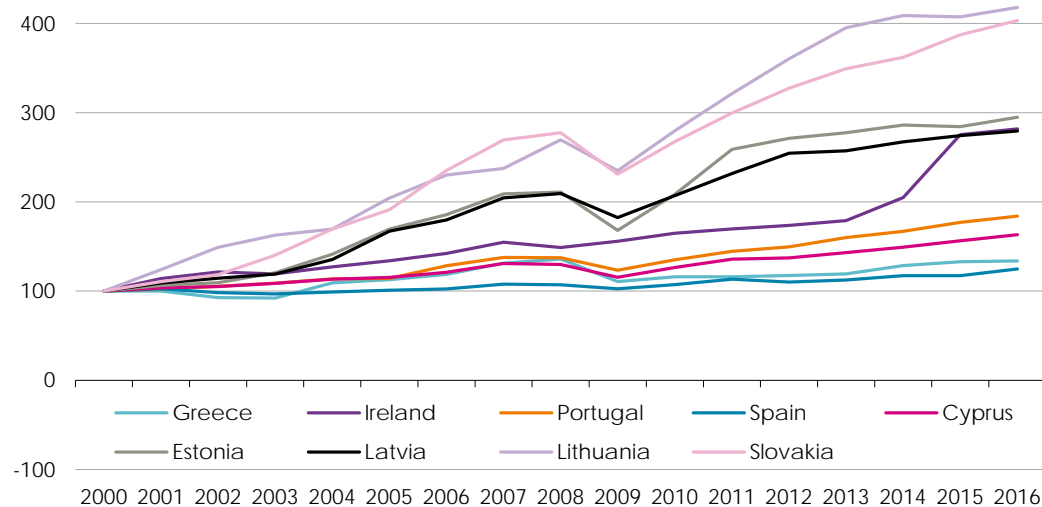


Source: AMECO.

Starting with inflation rates one indeed sees that immediately after the beginning of the crisis inflation started to decline sharply. The inflation rates of those economies that showed very high values before the crisis declined to values close to the Euro area average – which itself has fallen markedly – or even below. Thus a rebalancing process starting from a deficit clearly did go along with a disinflation process in these countries. The correlation analysis (Tables in the Appendix) reveals however that there is not a completely harmonised movement. Whilst inflation rates in the Baltic states are highly correlated among each other throughout the whole sample, those of Slovakia and the other crisis economies, show divergent movements. The only exception during which a wide spread co-movement is visible is the acute initial crisis phase between 2008 and 2010. Then in all countries but one, inflation fell markedly. A particular outlier is Greece. Their price movements were not closely in line with other countries, moving relatively sluggishly, only subsequently to fall all the more dramatically. Nevertheless, remedying a deficit in the current account appears to involve a disinflation process.

In all these countries exports increased but with large differences in extent.

Graph 11 Exports in rebalancing countries
2000=100

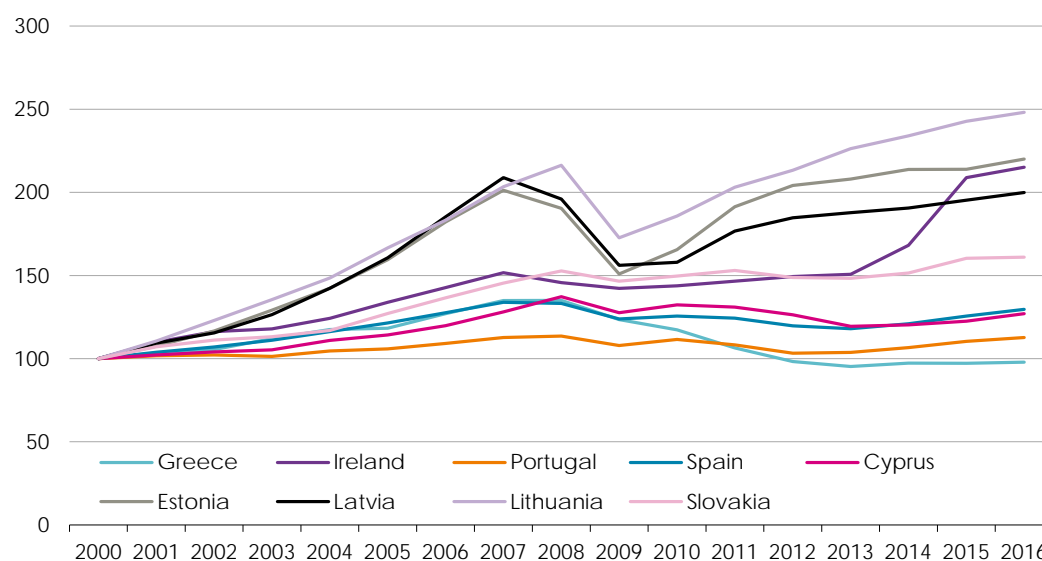


Sources: AMECO; own calculations.

Exports performed remarkably better in the Baltics, Slovakia and Ireland than in the southern Euro Area members. Correlation between export growth rates were over the whole sample particularly high in the Baltics again. Before the crisis correlation was rather low among all other economies. But the downturn during the great recession was general. The changes were highly correlated with the notable exception of Ireland, where hardly any export downturn took place. This diverging development continued after the crisis, when exports in Ireland rose much more strongly than elsewhere. This is closely related to special transfers of profits of subsidiaries of global firms to Ireland exploiting the low Irish taxes. (Ireland is in a number of regards a “special case”, cf. Joebges 2017) In any case it helped to balance the Irish current account leading even to a high surplus in due course. After the crisis, exports of the Baltics states as well as Slovakia continued to rise strongly, whereas a much slower and not highly correlated development was seen in Spain, Portugal and Greece. In these countries export growth contributed much less to a rebalancing of the current account.

Whilst inflation show only minor differences, final demand trends proved to be significantly diverse between countries that rebalanced their current account, although not as much as exports (note scale difference)

Graph 12 Final demand in rebalancing countries
2000=100



Source: AMECO.

We may distinguish between two groups of countries and two countries in between. The first group are the Baltics with a relatively dynamic final demand that was highly correlated among these countries. That shows that here exports (rather than a depression of imports) made the overwhelming contribution to the rebalancing. Final demand decreased significantly during the crisis but recovered very fast afterwards. The contrary is the case in the second group consisting of Spain, Portugal, Greece and Cyprus. The break-down of final demand during the crisis was modest, but so was the recovery. In Greece it did not recover at all. Hence in these countries a subdued final demand curtailing imports was the main force behind the current account rebalancing. This basically reflects the austerity approach to fiscal policy and wage restraint.

In between these developments are Ireland and Slovakia. They showed a medium-sized surge of final demand in recent years. Here both forces, strong exports and a cautious domestic demand, influenced the current account.

Taking these findings together show that there are basically two different strategies to equilibrate the current account. The first is to foster exports. The second is to curb domestic final demand. Both strategies may support each other and different policy tools can achieve either or both effects simultaneously. They both require a marked (relative) disinflation process. This can be achieved directly by wage and profit restraint. To curb final domestic demand restrictive fiscal policy approach will normally be needed which will work directly on demand and indirectly by bringing about restrained nominal income growth.. All these strategies involve an increase in unemployment.

In the following chapter these different strategies will be explored in more depth. We turn, though, now to a surplus country: Germany.

5. A SIMULATION STUDY FOR GERMANY

As outlined above, Germany's high surpluses are often blamed on wage trends. "Wage dumping" is said to have boosted German exports thanks to improved price competitiveness, whilst at the same time curbing private household demand for imports, thereby causing a sharp rise in the trade and current account surpluses. In this chapter we will investigate the role played by *wages* in quantity and price movements in Germany's foreign trade (see Horn et al. 2017). In particular, we will consider whether, all else being equal, Germany's high trade (and consequently current account) surpluses could have been prevented by higher wage increases and thus a significant curbing of the improvement in Germany's price competitiveness following the introduction of the euro. We explicitly ignore the part played by exchange rate fluctuations in Germany's foreign trade imbalances, since we want to show just the impact that alternative wage trends would have had in the case of the given exchange rate developments.

We take special consideration of the fact that the balance of trade is based on *nominal* values which are the product of *quantities* and *prices* (see eq. (1)). What this means is that changes in domestic price levels affect the balance of trade in two different respects. On the one hand, a change in relative prices causes an adjustment in export and import volumes; on the other hand, it has a direct impact on export prices. Consequently, in a scenario where a rise in domestic price levels is followed by a rise in export prices, the export volume will fall (quantity effect), but the higher export prices will, for their part, have the effect of increasing the export value (price effect).

The quantitative impact of various variables on Germany's foreign trade was calculated using econometric methods. The next section discusses the equations for exports and imports of goods and the corresponding prices. The estimates for exports and imports of services and the corresponding prices are based on the IMK Model of the German Economy (Rietzler 2012). This model primarily exhibits Keynesian features and is based on error correction equations.

Simulations using the IMK model will subsequently be employed to investigate the role played by nominal wages in Germany's external balance trend. Basing the simulations on this model ensures that the complex feedback effects and interactions in the German economy are taken into account.

5.1. MODELLING FOREIGN TRADE IN THE IMK MODEL OF THE GERMAN ECONOMY

The IMK model is a structural, macroeconomic model for Germany used for both short-term forecasting and economic simulations. It ensures that, as well as possessing a sound theoretical (specifically Keynesian) basis, the estimating equations are also well aligned with the data.

The estimations are specified as error correction models (ECMs). This has two key advantages: ECMs can be used to test for cointegration and estimate cointegration relationships and the error correction term (cointegration relationship) can be interpreted as an economically meaningful long-term relationship (i.e. a theoretically substantiated behavioural hypothesis).

The next section discusses the estimations for German exports and imports of goods and the corresponding foreign trade prices. In order to keep things manageable, only the error correction terms are shown in detail. The constants, centred seasonal dummies and, where relevant, impulse dummies that capture individual outliers are subsumed under the term "deterministics". The term "short-run dynamics" covers delayed changes in the response variables and both simultaneous and delayed changes in the explanatory variables. In both cases, ε represents the error term. The estimates are based on original values. The estimating periods are 1980 Q1-2016 Q2 for foreign trade volumes, 1986 Q1-2016 Q2 for export prices and 1991 Q1-2016 Q2 for import prices. All time series are logarithmised, so that the estimated coefficients can be interpreted as elasticities.

All the estimating equations are very well aligned with the data. The residuals are almost normally distributed and are free from autocorrelation up to lag 4. The only exception is the equation for goods imports, where there is second- and third-order autocorrelation in the residuals, although this is still within acceptable parameters. The CUSUM tests show no signs of parameter instability (**Table 1**).

Table 1 Test statistics for the estimations

	Equation for				
	Exports	Imports	Export prices	Import prices without PTM	Import prices with PTM
Adjusted R ²	0.79	0.83	0.86	0.87	0.89
Durbin-Watson statistic	2.03	1.96	1.91	2.16	2.15
LM test on 1 st -order correlation	[0.37]	[0.77]	[0.69]	[0.31]	[0.32]
LM test on 4 th -order autocorrelation	[0.49]	[0.02]	[0.87]	[0.72]	[0.77]
RESET test	[0.92]	[0.61]	[0.40]	[0.73]	[0.82]
Test on normality of residuals (Jarque-Bera)	[0.63]	[0.66]	[0.70]	[0.41]	[0.71]
CUSUM/CUSUM ²	stable	stable	stable	stable	stable

For residual and specification tests p-values are given in brackets.
Marginal probability of error in square brackets.

Four equations were estimated in order to investigate the role of the different influences on the balance of trade: two equations describing the *volume* of exported and imported goods and two equations describing the corresponding export and import *prices*.

The equations for exports and imports of goods are standard export and import demand functions. They are dependent on economic activity variables that reflect foreign and domestic demand and on relative export/import prices that reflect the price competitiveness of domestic/foreign exporters (Sawyer and Sprinkle 1999).

Goods exports (*XG*) are determined both by global trade (*global trade*) and the relative export price (*PEX-rel*), measured as the ratio of the German export goods deflator to the global export deflator. Since the latter is expressed in US dollars, it is converted into euros using the nominal external value of the euro against the US dollar.

$$\Delta \ln XG_t = -0.26 [\ln XG_{t-1} - 1.1 \ln \text{global trade}_{t-1} + 0.51 \ln \text{PEXrel}_{t-1}] + \text{deterministics} + \text{short-run dynamics} + \varepsilon_{1,t}$$

(-6.7) (-30.1) (5.0)

The cointegration relationship is highly significant (t values in brackets), meaning that there is a stable long-term relationship between exports, global trade and the price competitiveness indicator. In the event of deviations from the long-term equilibrium (referred to as “errors”), the error correction mechanism ensures that they are corrected by around 25% per quarter. After a year 70 % of deviations are corrected and after two years 90 % of the deviation are corrected.

Germany’s exports of goods respond very strongly to external demand. Accordingly, a 1% increase in global trade translates into an equivalent increase in German exports. This finding has already been reported in earlier studies (Clostermann 1996 and 1998, Deutsche Bundesbank 1998, Seifert 2000). A 1% rise in the relative export price causes German goods exports to fall by about 0.5%. The price elasticity of export demand is somewhat lower than in the other studies cited above.

Although the response of export *volumes* to price rises is clearly negative, the picture is very different for nominal exports. Since, in the case described above, the price elasticity of export demand is lower than one, an increase in relative export prices leads to an increase in export earnings. Specifically, while a 1% rise in export prices causes a 0.5% drop in the export volume, the total export value nonetheless *increases* by 0.5%.

Import *volumes* (*MG*) are determined by domestic activity variables and the relative import price (*PIMrel*), measured as the ratio of the import goods deflator to Germany's total sales deflator. The GDP components with high import content were used as the activity variables. In the above case, these are private consumption (*consumption*), investment in plant and equipment (*investment*) and exported goods (*XG*). *S91Q1* is a step dummy that corrects for the effect of German reunification.

Private consumption is not significant in the cointegration relationship. This can be attributed to the fact that, during the estimating period used in the study, consumption in Germany experienced only weak growth, whereas imports of consumer goods grew much more strongly, at the same rate as overall goods imports. To account for this situation, private consumption was multiplied by a linear trend in the cointegration term.

$$\begin{aligned} \Delta \ln MG_t = & \\ & - 0.66 [\ln MG_{t-1} - 0.001(\ln consumption_{t-1} * trend) - 0.44 \ln XG_{t-1}] \\ & \quad \quad \quad (-8.6) \quad \quad \quad (-6.7) \quad \quad \quad (-8.2) \\ & - 0.35 \ln investment_{t-1} + 0.15 \ln PIMrel_{t-1} - 0.06 S91Q1] \\ & \quad \quad \quad (8.0) \quad \quad \quad (2.8) \quad \quad \quad (-3.5) \\ & + \text{deterministics} + \text{short-run dynamics} + \varepsilon_{2,t} \end{aligned}$$

The estimated coefficient for the consumption variable in the import demand function cannot be interpreted directly. Instead, a simulation is needed to establish the extent to which private consumption influences import demand. This reveals that a 1% increase in private consumption causes a 0.2% increase in demand for imported goods. This is a plausible finding, since the long-run elasticity of imports in relation to private consumption corresponds to the latter's import content.

The findings are similar for the other two activity variables. A 1% increase in investment in plant and equipment results in a 0.35% rise in imports, while a 1% increase in exported goods leads to a 0.44% rise in imports. In both cases, the long-run elasticity more or less corresponds to the import content of the relevant activity variables. Overall, imports to Germany are more dependent on the import demand of businesses than on that of households.

The finding that demand for imported goods is price-inelastic has been reported in several studies about Germany (for a survey see Stephan 2005). In our estimate, a 1% increase in the relative import price leads to a fall in real imports of just 0.15% and a corresponding 0.85% increase in nominal imports. As with exports, the positive price effect for imports outweighs the negative quantity effect, causing the overall nominal value to rise.

The cointegration relationship is highly significant, while the rate of correction following a deviation from the long-term equilibrium is substantially faster than for the export equation. Two thirds of the "errors" have already been corrected after just one quarter, meaning that the correction is fully completed in about a year.

Strategic pricing behaviour was modelled for foreign trade prices. It is assumed that exporters base their asking prices not only on their own costs but also on the prices of the foreign suppliers who compete with them in the same market. We refer to this behaviour as pricing to market (PTM), as defined by Krugman (1986). It is assumed that PTM is relevant to both German and foreign exporters

and should therefore be taken into account in the modelling of both the export price and import price equations.

The German export goods deflator (*PEX*) is determined by unit labour costs in Germany (*ULC*) – which reflect exporters’ production costs – and by import prices (*PIM*). The latter can be interpreted as costs for imported intermediate inputs or, in accordance with the PTM principle, as the price of foreign competitors’ products that influences how German exporters price their own products.

A stable and highly significant cointegration relationship exists between the export goods deflator, unit labour costs and import prices (t values in brackets).

$$\begin{aligned} \Delta \ln PEX_t = & \\ -0.20 [& \ln PEX_{t-1} - 0.32 \ln ULC_{t-1} - 0.44 \ln PIM_{t-1}] \\ (-5.2) & \quad (-20.8) \quad (-10.9) \\ + & \text{deterministics} + \text{short-run dynamics} + \varepsilon_{3,t} \end{aligned}$$

In our estimate, a 1% increase in unit labour costs in Germany only causes export prices to rise by approximately 0.3%. This demonstrates that changes in unit labour costs are not reflected one-to-one in prices – their effect is in fact much weaker.

Import prices, on the other hand, have a strong influence on export prices: a 1% increase in import prices causes export prices to rise by more than 0.4%. One key reason for the relatively high long-run elasticity of export prices in relation to import prices is that in addition to Germany being very dependent on raw material and energy imports, its exports contain a growing proportion of intermediate inputs imported from abroad. The rate at which price corrections occur is relatively slow – deviations from the long-term equilibrium are corrected by 20% a quarter, meaning that 60% of the error is corrected after one year. After two years, 80 % of the deviation is corrected.

A stable cointegration relationship exists between the import goods deflator (*PIM*), the costs of foreign producers – measured as the global export deflator (PEX^{global}) –, the oil price and a linear trend used in empirical studies to account for changes in the composition of the basket of goods (Clostermann 1996, p. 11).

$$\begin{aligned} \Delta \ln PIM_t = & \\ -0.19 [& \ln PIM_{t-1} - 0.40 \ln PEX^{global}_{t-1} - 0.05 \ln oil\ price_{t-1} + 0.003\ trend] \\ (-4.5) & \quad (-6.2) \quad (-3.6) \quad (7.5) \\ + & \text{deterministics} + \text{short-run dynamics} + \varepsilon_{4,t} \end{aligned}$$

In this estimate, a 1% increase in the production costs of foreign exporters translates into a 0.4% rise in import prices, while a 1% rise in oil prices causes import prices to go up by 0.05%. The rate at which price corrections occur is also rather slow for imports – deviations from the long-term equilibrium are corrected by just below 20% a quarter.

For the import price equation, it was necessary to take a decision about whether to add an additional variable for price levels in Germany to this established cointegration relationship, in order to represent the price levels of domestic competitors’ products in accordance with the PTM principle. Econometric analysis has shown that of all the price indexes investigated – total sales deflator, GDP deflator, private consumption deflator, consumer prices, producer prices and unit labour costs – only unit labour costs have a significant impact on import prices.

Using German unit labour costs as a proxy for the price levels of domestic competitors makes hardly any difference to the estimated coefficients of the other explanatory variables. In the “with PTM”

scenario, a 1% increase in unit labour costs in Germany makes it possible for foreign exporters to raise their selling prices by at least 0.3%.

$$\Delta \ln PIM_t =$$

$$-0.22 [\ln PIM_{t-1} - 0.38 \ln PEX_{t-1}^{global} - 0.08 \ln oil\ price_{t-1} - 0.32 \ln ULC_{t-1}] + 0.004 trend + \text{deterministics} + \text{short-run dynamics} + \varepsilon_{5,t}$$

(-5.3) (-6.2) (-4.3) (-2.7)
(7.8)

It might appear that there is little evidence to support the claim that foreign exporters engage in pricing to market based on what is happening in the German market, since the cointegration relationship exists even without the domestic price term.

However, it is perfectly plausible to suppose that the exceptionally weak growth in German unit labour costs in the decade before the financial and economic crisis was closely monitored by foreign exporters, particularly in the Euro area and that they took this trend into account when setting their own prices.

Both versions of the equation are used below to analyse the effect of including PTM in the import price equation on the simulation of real and nominal imports. It can be seen that although PTM makes almost no difference to the simulation outcome for real imports, it does affect nominal imports and thus also influences the response of the external balance.

In summary, the estimations reveal that real exports/imports of goods are determined by both external/domestic demand and by relative export/import prices. Consequently, foreign trade volumes cannot be explained by price variables or demand variables on their own.

It is also evident that unit labour costs have only a limited impact on export prices. It would therefore be wrong to suggest that changes in export prices are exclusively determined by changes in unit labour costs.

Finally, the price elasticities of export and import demand are both smaller than one, meaning that the price effect dominates the response of the nominal variables in both cases. Since the balance of trade is equivalent to the *difference* between nominal exports and imports, it is impossible to know in advance how changes in labour and unit labour costs will affect the nominal balance of trade and the external balance.

5.2. A SIMULATION OF MARGINAL WAGE INCREASES

As a first step two scenarios will be outlined that focus exclusively on marginally higher wage rises. A nominal one-off wage increase of 1% is specified for Scenarios 1 and 2. The difference between these two simulations concerns the import price equation – it is modelled with PTM in Scenario 1 and without PTM in Scenario 2. They serve to illustrate the channels through which the impacts of nominal wage changes operate in the model and the mechanisms through which the external balance is influenced. Scenario 2 looks at the effect on the external balance of including PTM in the import price equation. The simulation period is 2001 Q1 to 2015 Q4. **Table 2** shows the impact of the wage increases on a range of different model variables. The figures refer to the percentage change compared to the baseline scenario at the end of the simulation period in 2015. By this point in time, the variables have largely completed their adjustments.

Table 2

Macroeconometric simulations of wage and fiscal policy measures for 2001 to 2015
Change vs. baseline (%) in 2015

	Impact of a 1% wage increase		Macroeconomic wage policy ¹	
	with pricing to market (PTM)	without PTM	not budget neutral	budget neutral ²
	Scenario 1	Scenario 2	with PTM	with PTM
	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Results				
Real gross domestic product	0.1	0.2	1.7	3.7
Employment	0.1	0.1	1.3	3.0
Gross wages (per capita)	1.0	1.0	14.5	14.5
Total gross profits	-0.1	0.1	-1.0	8.5
Wage share ³	0.4	0.3	4.5	2.4
Unit labour costs	1.0	1.0	14.0	13.7
Private consumption price index	0.3	0.3	3.6	3.5
Export price index	0.5	0.3	6.3	6.2
Import price index	0.3	0.0	3.7	3.7
Transfers to private households	0.8	0.8	11.6	17.4
Real private consumption	0.4	0.5	5.4	8.4
Real government consumption	0.1	0.1	1.1	3.9
Real gross fixed capital formation	0.1	0.1	0.7	3.1
of which real public investment	0.1	0.1	1.1	38.6
Real exports	-0.2	-0.2	-3.0	-2.9
Real imports	0.1	0.2	1.4	2.8
Real net exports	-2.6	-2.6	-32.9	-42.6
Nominal gross domestic product	0.6	0.7	8.7	11.1
Nominal exports	0.2	0.2	3.2	3.1
Nominal imports	0.4	0.2	5.1	6.6
Nominal external balance	-0.7	-0.1	-7.9	-17.1
Nominal government revenue	0.8	0.8	11.4	14.2
Nominal government expenditure	0.7	0.7	10.3	14.3
<i>for information purposes only</i>				
Government's fiscal balance (nominal, change in bn EUR, surplus: +)	1.1	1.7	17.6	3.2
Net exports (real, change in bn EUR)	-4.4	-4.4	-56.0	-72.1
External balance (nominal, change in bn EUR)	-1.4	-0.2	-16.4	-35.2
Current account balance (nominal, estimated change as % vs. actual value for 2015) ⁴	-0.5	-0.1	-6.4	-14.0

¹ Annual wage growth of 2.65 %.

² In order to approximate budget neutrality, the appropriate increases were made in equal proportions to public investment, government consumption and transfer payments, in order to provide a stimulus.

³ Unadjusted.

⁴ The current account balance does not form part of the model. Since the lower external surpluses in the preceding years have the effect of reducing the primary income account surplus, the reduction in the current account surplus for 2015 is underestimated.

Source: Simulations using the IMK macroeconometric model.

The starting point for the alternative wage path is 2001, since Germany did not have a significant current account surplus at this time. The two scenarios model a constant 1% increase in (per capita) nominal gross wages. In other words, in Scenarios 1 and 2, from 2001 onwards wages are always 1% higher than the actual wage levels for the period 2001-2015.

The first impact of the increase in nominal wages is a higher level of private consumption than in the baseline simulation due to the growth in real disposable income. This in turn stimulates imports of goods. At the same time, the higher unit labour costs cause prices to go up, which has a dampening effect on the relevant quantities. This is particularly true of real investment in plant and equipment, which remains only slightly above the baseline in the long run, and of real exports – i.e. export volumes –, which decline compared to the baseline as a result of the higher prices. Taken by themselves, both of these effects dampen demand for imported goods. Overall, however, they are outweighed by the stimulating effect of private consumption, meaning that real imports increase.

Higher wages thus have a clear impact on *real* exports and imports. Export volumes fall and import volumes rise relative to the baseline, leading to a decline in real net exports in comparison with the baseline. However, this decline is only very small.

At the end of the simulation period in 2015, real net exports in Scenarios 1 and 2 are approximately 4 billion euros lower than in the baseline. This is equivalent to a decline of just 2.6% (**Table 2**). One of the key reasons for this phenomenon is the high import content of German exports. Taken in isolation, a reduction in the export volume immediately causes a reduction in the import volume. But price effects disturb this seemingly clear picture. In the case of exports, the rise in prices more than offsets the lower volume, causing export earnings to *increase* relative to the baseline simulation (**Table 2: columns 1 and 2**).

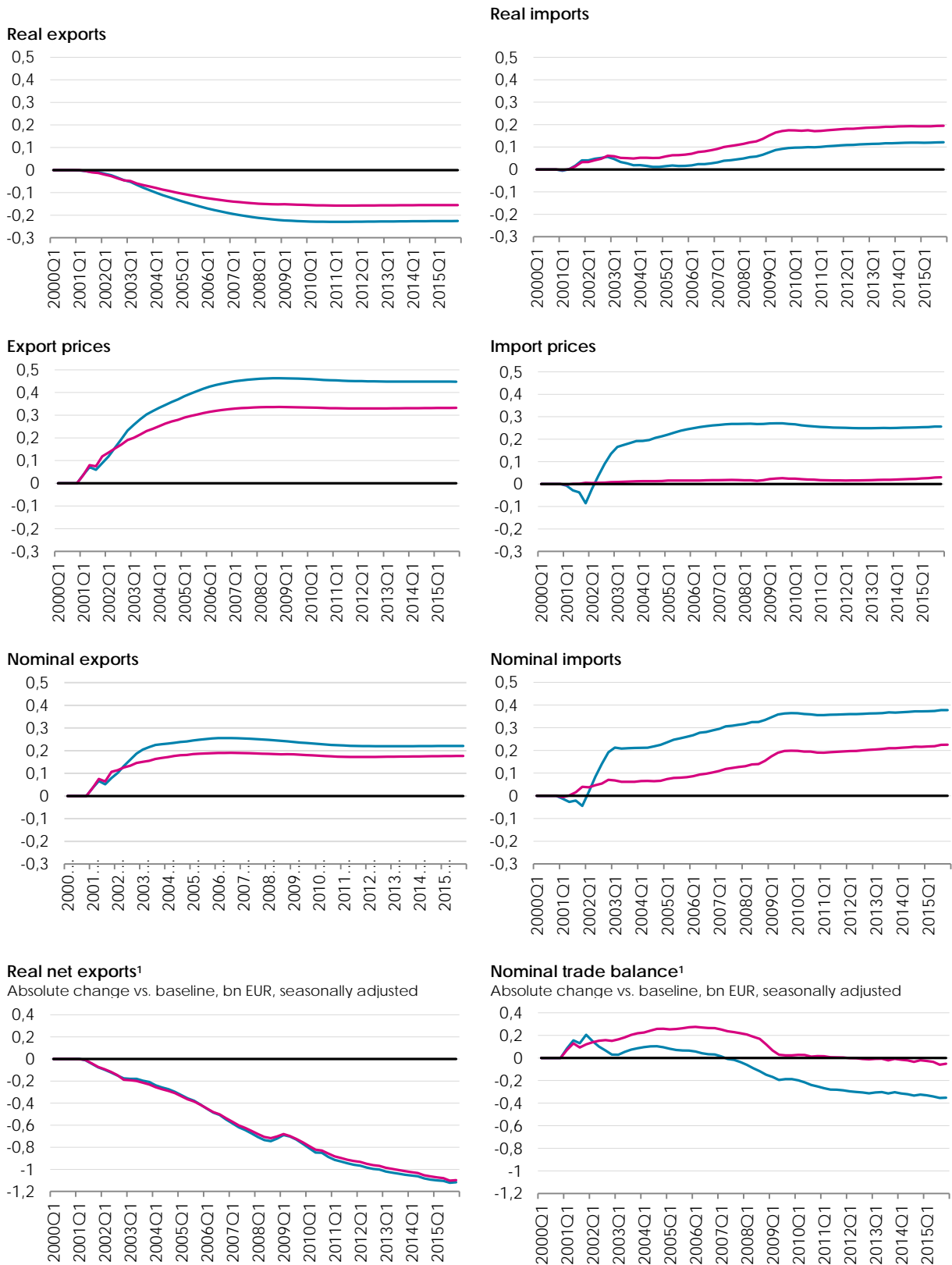
Nominal imports also rise, but only weakly. There are two reasons for this. Firstly, import volumes respond only weakly because they are subject to two opposing effects that largely cancel each other out. The income effect produced by the wage increase leads to a rise in private consumption that stimulates demand for imports. At the same time, however, the rise in prices dampens some key determinants of import demand (real investment) and even causes others to decrease (real exports). Secondly, as would be expected, import prices respond far less strongly than export prices.

It is here that we can observe the effect that modelling PTM as part of the import price equation has on the simulation results. If PTM is modelled (Scenario 1), the increase in wages causes import prices to rise and this in turn leads to an increase in export prices. If PTM is not modelled (Scenario 2), this channel is excluded. This is why the impact of higher wages on foreign trade prices is greater in Scenario 1 than in Scenario 2.

The fact that there is only weak growth in nominal imports, whereas nominal exports actually increase relative to the baseline means that, during the first few years, the nominal external balance in Scenario 1 shows little change compared to the baseline simulation. It is only later, once the price correction has been completed, that it begins to decline relative to the baseline. The total effect at the end of the simulation period is extremely small. In Scenario 1, the external balance for 2015 is just 1.4 billion euros below the baseline. This is equivalent to a 0.5% reduction in the current account surplus.

The increase in nominal imports is substantially smaller in Scenario 2 than in Scenario 1. This actually leads to a slight increase in the external balance versus the baseline during the first few years. In this instance, there is no decline in the external balance by the end of the simulation period.

Graph 13 **Impacts of a 1% wage increase on foreign trade**
Change vs. baseline (%), seasonally adjusted



— Scenario 1 — Scenario 2
Source: Simulation using the IMK model.

The simulation of a 1% rise in nominal wages was primarily intended to illustrate the channels through which the impacts operate. Even so, it shows that wage increases of the simulated magnitude are by far not enough to produce a reduction in the external balance. The dominance of the price effect as far as nominal exports are concerned means that the external balance remains at a similar level for a considerable time, leaving the current account imbalances unaltered.

5.3. A DIFFERENT WAGE REGIME

The approach to wage formation in the following scenario is based on the concept of a macroeconomically oriented wage policy. In this approach, aggregate wage increases should as a rule make full use of from trend productivity growth and the inflation target of the ECB (Horn and Logeay 2004, Herr and Horn 2012).

Wage increases of this order do not have an adverse impact on the ECB's inflation target in terms of labour costs, nor do they alter price competitiveness within the Euro area. If (per capita) nominal gross wages in Germany had risen by 2.65% per annum between 2001 and 2015 under a macroeconomically oriented wage policy regime, the per capita wage at the end of this period would have been approximately 15% higher than the actual value (**Table 2**).

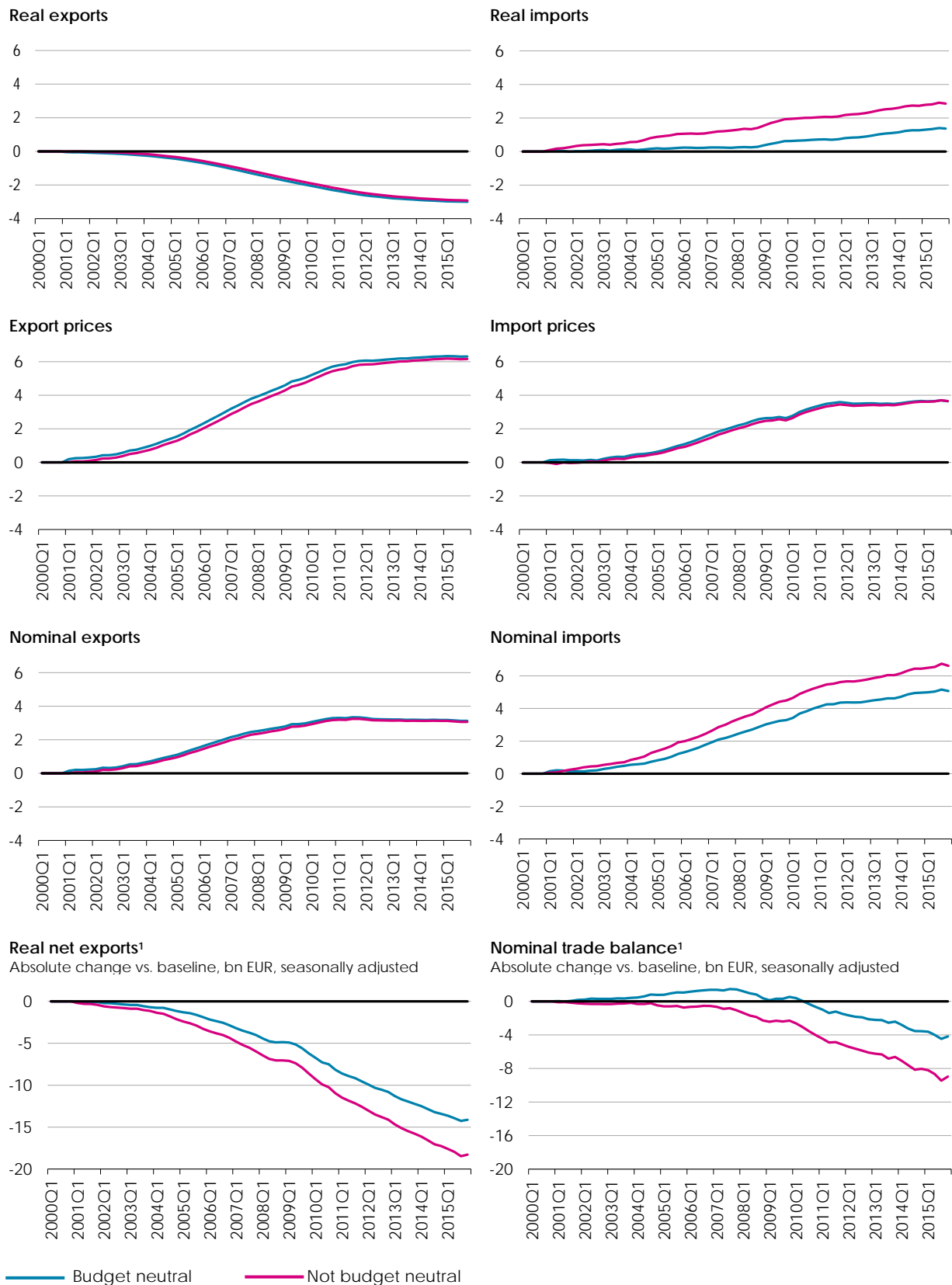
Admittedly, the resulting price increases – price levels would have been 3.6% higher at the end of the 15-year period – would have meant that part of this nominal wage increase would have been lost in real terms. Even so, real wages would have risen on average by an additional 0.7% per annum. These higher wage increases would have boosted real private consumption by an additional 5.4%. There would also have been small gains in economic growth and employment (**Table 2**). The limited impact of higher wages on prices means that real wages rise significantly while nominal profits decline slightly, resulting in a higher wage share. Nevertheless, nominal profits would still be only 1% lower than the baseline.

The impacts of higher wages on price competitiveness and foreign trade are of particular interest to this study. According to the simulation, unit labour costs in 2015 would have been 14% higher than the actual values. However, this increase would only have been partially reflected in export prices, which would have been just 6.3% above the baseline at the end of the 15-year period.

The resulting decline in price competitiveness would have translated into somewhat weaker growth in real exports, which would have been 3% lower than the baseline in 2015. However, this also means that even if wages had gone up by 2.65% per year across the whole economy, real exports would still have more than doubled during the simulation period. In the case of exports, the rise in prices once again more than offsets the fall in quantity, with the result that nominal exports increase by 3.2% more than the baseline.

At first glance, the fact that import prices rise by 3.7% relative to the baseline simulation may appear rather surprising. Since PTM is modelled in this scenario, foreign businesses take advantage of the scope provided by the somewhat higher price levels in Germany to introduce modest price increases of their own. As a result, relative import prices remain fairly constant and do not stimulate demand for imports. However, the stronger growth experienced by the domestic economy outweighs the negative impacts of lower export volumes on imports. Consequently, real imports end up 1.4% higher than the baseline, while the simulated increase in wages causes nominal imports to grow by an additional 5.1% (**Table 2**).

Graph 14 Impacts of a macroeconomically-oriented wage policy on foreign trade
Change vs. baseline (%), seasonally adjusted



¹ Quarterly figures. The figures in the main text and in Table 2 are annual figures calculated as the sum of the four quarterly figures for each year.

Source: Simulation using the IMK model.

If wages had gone up by 2.65% a year across the whole economy, the nominal trade surplus for 2015 would have been 16.4 billion euros lower than in the baseline, while the current account surplus for the same year would have been 6.4% lower. However, **Figure 14** shows that the reduction in the external balance occurs very gradually. This is because the export value increases compared to the baseline, while nominal imports grow more slowly than nominal exports for quite a few years. There is thus even a small increase in the external balance during this period – it is only from 2010 on that it falls relative to the baseline.

The results of the simulation indicate that although substantially higher wage growth causes a significant reduction in real net exports compared to the baseline (-32.9%), the declines in the nominal trade balance (-7.9%) and the current account balance (-6.4%) are modest (**Table 2**). Even if wages had grown by considerably more than they actually did, they would not have appreciably curbed the build-up of Germany's enormous current account surpluses. Higher wage growth is simply not enough to overcome the current account surplus.

However, there is one finding that opens an additional path of adjustment. The stronger wage growth has important consequences for the public finances – higher wages would also have led to higher government revenue from payroll taxes, indirect taxation and social security contributions. The only part of this additional revenue spent in Scenario 3 was the part stipulated by the relevant institutional rules. Public sector pay rose and pension expenditure was belatedly brought into line with the wage increases. Nevertheless, the government's fiscal balance would thus have been 17.6 billion euros higher in 2015.

5.4. A COMBINATION OF HIGHER WAGES AND FISCAL STIMULUS

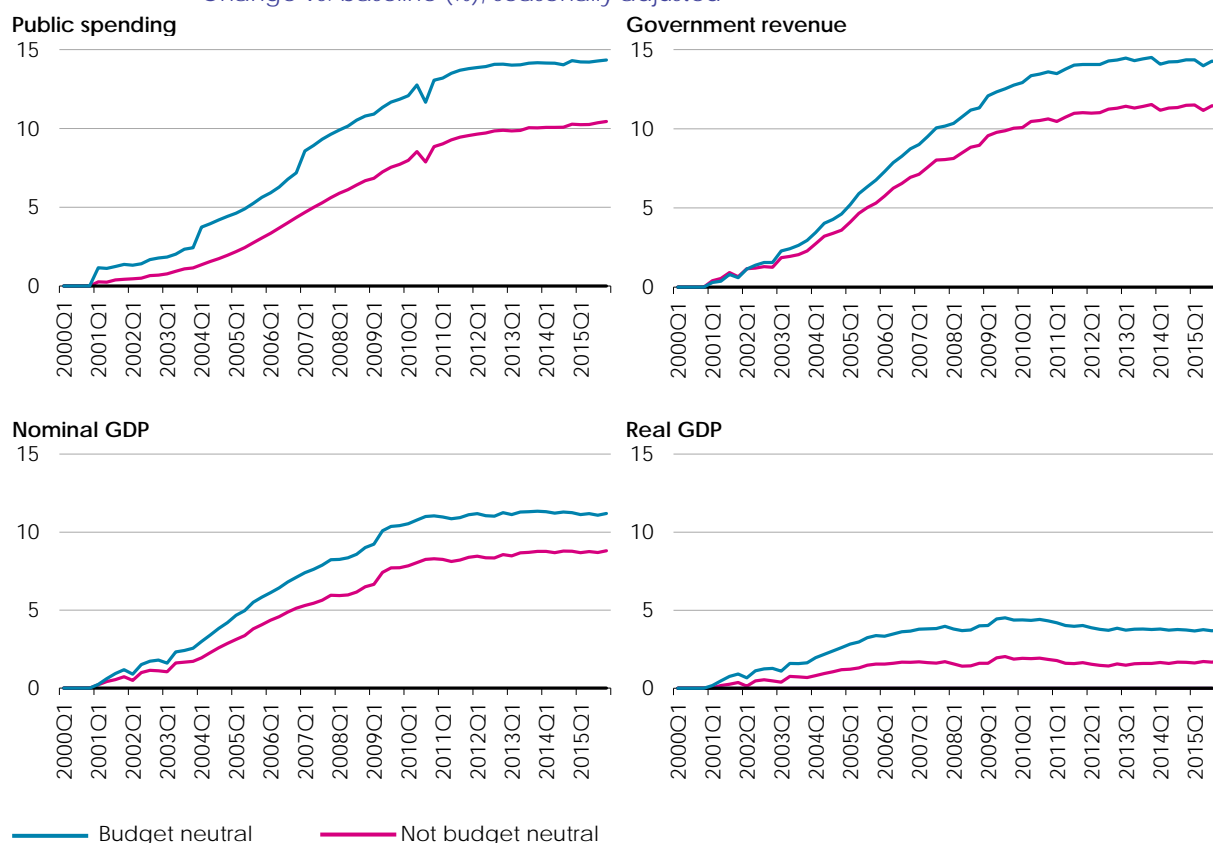
The findings of the first three model simulations make sobering reading. Even if nominal wages had risen by almost 15% above the status quo over a 15-year period, Germany's current account surplus in 2015 would have been just 6% lower. However, the fact that the public sector would have “profited” from this stronger wage growth significantly would have given it greater leeway for fiscal policy action. In other words, the state could have used the additional 17.6 billion euros at its disposal in scenario 3 to introduce targeted fiscal measures to stimulate imports without hurting exports.

In Scenario 4, the aggregate wage policy regime is supported by a more expansionary fiscal policy where the additional leeway provided by the improved budgetary position in Scenario 3 is primarily used to implement expansionary measures. Accordingly, from 2001 on, most of the additional government revenue generated in Scenario 3 is spent on exogenous stimuli designed to gradually increase public investment, government consumption and transfer payments to private households (assumed here to occur in equal proportions).

Since public investment and government consumption are components of the national product, the majority of fiscal policy measures have a direct impact on GDP. They induce demand and income effects which, as well as stimulating growth and employment and boosting imports, also generate additional government revenue that can potentially be used to further increase public spending.

For instance, a sustained increase in central government operating expenditure and spending on transport infrastructure and pensions would stimulate economic growth and result in higher government revenue. Since more funding than had originally been budgeted for would be available to regional and local government, they too could increase their spending, providing a further boost to growth. In Scenario 4, the increase in public spending is much greater than the initial stimulus, while nominal GDP is around 11% (almost 350 bn euros) higher than the baseline at the end of the simulation period.

Graph 15 **Impacts of a macroeconomically-oriented wage policy on economic growth and the budget**
Change vs. baseline (%), seasonally adjusted



Source: Simulation using the IMK model.

A fiscal policy geared towards long-term infrastructure improvement would deliver numerous benefits without increasing government debt. The fact that it would operate over a long period of time would allow it to provide a sustained stimulus to economic growth and create significantly more jobs, especially in the private sector. Just taking advantage of the fiscal policy leeway created by the alternative wage policy would have delivered an additional 3.7% boost to growth and a 3% rise in employment thanks to the combined effect of higher wages and an expansionary fiscal policy. Furthermore, in spite of the higher wage bill, corporate profits would still have risen by an additional 8.5%.

At the same time, this fiscal policy approach would have made a significant contribution to bringing the current account surpluses down by reducing the external balance. The nominal external balance would have fallen by approximately 35 billion euros compared to the baseline. This constitutes a further reduction of almost 20 bn euros compared to Scenario 3, where no fiscal policy support is provided. Consequently, the current account surplus for 2015 would have been 14% lower. Even so, this would still not have been enough to bring the current account surplus down to the EU limit of 6% of GDP. To achieve this, it would be necessary to reduce the surplus by somewhere between one fifth and one third.

Why does Scenario 4 produce a larger reduction in the current account surplus than Scenario 3? The first reason is that while the fiscal policy measures have no impact on real exports, they do affect real imports. This causes real net exports to decline by more than 40% over time (**Table 2**). Secondly, since the fiscal policy measures do not affect foreign trade prices, there is no change in the export value. The import value does rise, however, because real imports go up while import prices remain stable.

If Germany had adopted this combination of a macroeconomically oriented wage policy supported by fiscal stimuli (made possible without higher deficits by the higher nominal wages) during the period 2001-2015, its trade and current account surpluses would not have grown as strongly. Even so, this would still not have been enough to bring the current account surplus below the MIP ceiling of 6% of GDP. To achieve this, it would have been necessary to adopt a more expansionary fiscal policy.

Regarding implications for the Euro Area we can conclude that managing current accounts requires a sophisticated set of policy measures. The most promising is a combination of appropriate incomes and national aggregate demand policies deployed in each member state. Clearly the parameters and elasticities will differ between countries, depending on trade shares and different specialisations, but there is no reason to believe that this conclusion does not broadly hold for both surplus and deficit countries. The question is what institutional framework would be conducive to generating such outcomes.

6. A FEASIBLE CONCEPTUAL AND INSTITUTIONAL REFORM AGENDA FOR MACROECONOMIC COORDINATION AND CONVERGENCE IN THE EURO AREA

The years since the outbreak of the crisis have seen substantial institutional development and redesign. Unfortunately, though, these reforms have not resolved the fundamental problem of the weakness of instruments that can be deployed to bring about convergence and thus facilitate balanced growth. Some developments – such as the creation of the European Stability Mechanism, developments in the monetary policy field (like Outright Monetary Policy (OMT)), or Banking Union – are important in their own right and may be vital in dealing with future crises. They are not designed, however, to bring about the required medium-run convergence.

Worse, the rules governing national fiscal policy have been significantly tightened, primarily through the so-called Fiscal Compact. Yet this has merely intensified an undue preoccupation with (cyclically adjusted) budgets and with government debt ratios. The rules still fail to provide appropriate constraints on national fiscal policy for it to focus – where possible, in combination with incomes policy - on what should be its key function in a monetary union: keeping aggregate nominal demand broadly in line with the development of productive capacity and, as a corollary, helping to reduce internal macroeconomic imbalances and inflation differentials to a minimum.

Lastly, one institutional development has been conceived with the explicit aim of limiting divergence: the Macroeconomic Imbalance Procedure (MIP). Modelled procedurally on the fiscal governance framework, this involves evaluation of the potential for macroeconomic imbalances in each member state by the European Commission via a scoreboard of relevant indicators, such as unit labour cost growth, the current account and net international investment position and various credit-related indicators. For each numerical trigger, values have been defined. Countries identified as suffering from or being at considerable risk of such imbalances are subject to more intensive, also qualitative monitoring. Corresponding recommendations are issued to member states. As under the fiscal rules, member states that persistently fail to comply with recommendations and whose imbalances continue to increase can ultimately face sanctions.

The philosophy underpinning the MIP is very much in line with the analysis of the crisis and the risks to balanced growth adumbrated above. To that extent, the introduction of the MIP marks an important step forward. However, it suffers from some serious drawbacks. First, it exists alongside fiscal rules which may well mandate countries to pursue a very different fiscal policy from that implied by the MIP. Second, the numerical values attached to the indicators in the scoreboard clearly reveal the asymmetrical nature of the exercise. For the indicator nominal unit labour cost growth, most obviously, there is only an upper, no lower bound. The triggers with respect to the current account are

(minus) 4% for deficits but 6% for surpluses. Clearly, the focus is on bringing about policy change in buoyant economies with high and rising current account deficits. This imparts a potentially dangerous deflationary and anti-growth bias to the whole framework.

What is also noteworthy is that some elements of the institutional framework have *not* enjoyed reform in the wake of the crisis. We consider two of them to be particularly relevant. The first is the overall framework for the coordination of economic policy established by Article 121 of the Treaty on the Functioning of the European Union (TFEU) from 2007 and particularly the Broad Economic Policy Guidelines of the Member States and the European Union (BEPGs). The second is a little-known institution, the Macroeconomic Dialogue of the EU. As these are important elements in the reform concept presented in the last section, we describe each in turn here in its current form.²

Long before the introduction of the Euro, Treaty provisions that go back to the Rome Treaty setting up the European Economic Community – and now set out in Article 121 TFEU – have, in principle, provided the conceptual and legal framework for economic policy coordination. Member states are to see economic policy as a matter of common interest and to ensure their coordination in the Council, with a view to achieving the broad goals of the EU set out in Article 3 of the Treaty on the European Union (TEU); these include sustainable economic growth, full employment and price stability. Moreover, the BEPGs – which involve a monitoring, reporting and policy recommendation system similar to that of the Stability and Growth Pact (SGP) and now the MIP – provide, again in principle, the operational means to bring about a consistent macroeconomic policy-mix in the member states oriented towards these broad welfare goals. More specifically, the BEPGs have consistently insisted on the importance of wages adhering to a “golden rule”, that is real wages growing in line with (medium-run) productivity and nominal wages so as to be compatible with price stability. Moreover, the BEPGs have always taken account of the interdependence and thus the required coordination of the macroeconomic policies by saying that in general - given a mix of national fiscal and incomes policies compatible with price stability - monetary policy is called upon to do as much as it can to create conditions favorable for growth and employment. From a member state point of view, Country Specific Recommendations (CSR) can be made, depending on the situation, for a more or less expansionary or restrictive fiscal stance.

However, despite numerous tweaks to the procedures, the BEPGs have in practice taken a back seat to the fiscal rules. No country has seriously been threatened with sanctions, although these are foreseen in the Treaty, for failure to adjust economic policy to bring it in line with the BEPGs.

A more recent, and even less well-known, institution is the Macroeconomic Dialogue of the EU (EUMED), established at the behest of the European Council in Cologne in 1999 (Watt 2006). It brings together top-level representatives of the social partners (European Trade Union Confederation and three employer federations), the monetary authorities (the ECB plus one non-Euro Area central bank), a “Troika” of representatives of the ECOFIN Council (among them the president of the MED) and two representatives of the EU Commission. The goal is, while respecting the autonomy of actors, to improve mutual understanding among actors with a view to achieving a better balance between incomes policies (essentially: wage developments), monetary and fiscal policy stances.

In terms of the analysis sketched above over governance deficits and reform needs, it is obvious that the EUMED brings together the relevant actors and has the right thematic orientation: towards a consistent macroeconomic policy-mix among the three main relevant policy fields. However, located solely at EU level, it lacks both a specific orientation to the special needs of the Euro Area countries and, more fundamentally, an underpinning by representatives of national actors in each member state. For both incomes and fiscal policy, the national level is decisive. Meanwhile, until the crisis at least, the ECB was focused solely on Euro Area aggregates and had little interest in national developments. In short, it lacks the necessary clout.

² A more thorough treatment of both can be found in Koll 2013.

Alongside reforms that have already occurred, two institutional developments foreseen in the so-called Five Presidents' Report on completing Europe's economic and monetary union (European Commission 2015) are also relevant here. The report proposed to set up so-called competitiveness councils in each member state. They were to have a mandate to examine competitiveness issues in each country and to make expert recommendations to national governments. This proposal received a hostile reception, however, not least from national and European level trade unions which saw the councils as focusing one-sidedly on wage developments and threatening policy interventions in collective bargaining institutions and practices that, in many countries, are the legally autonomous responsibility of unions and employer federations. In the recommendation subsequently made by the EU Commission and accepted by the Council a change of name to "productivity boards" was accompanied by a substantial widening of thematic focus – to incorporate much broader issues determining productivity trends. At the same time, the initially foreseen competence of the boards was substantially watered down: they are now envisaged as playing a solely analytical role without the power to issue recommendations. In addition, the Five Presidents' Report foresaw the swift introduction of a Fiscal Council to serve in an advisory capacity on fiscal issues. Here, too, the remit is limited, but the institution is potentially important in bringing together independent expertise.

Meanwhile, the Committee on Constitutional Affairs of the European Parliament recently presented a blueprint for a far-reaching overhaul of the economic governance regime of the Euro Area (Rapporteur Guy Verhofstadt, European Parliament 2016). Its goal is to bring together fiscal and monetary instruments in a genuinely common European economic policy. To this end, the fiscal procedures focusing on deficits and debts, the MIP and the CSR are to be melded into a single so-called 'convergence code'. Overall responsibility will be accorded to an EU finance minister who is simultaneously one of only two vice-presidents of the EU Commission. On the basis of a collaborative procedure between member states and European-level institutions, this finance minister will ultimately make economic policy recommendations to each member state. These recommendations will be backed up by the threat of serious sanctions. Unlike the current system of – unused – financial penalties, the sanctions envisaged, following the approach of the Five Presidents' Report, amount to a denial or withdrawal of access to European 'public goods', notably to a putative common fiscal capacity for stabilisation purposes.

Lastly, the EU Commission published a 'White Paper on the Future of Europe' including five scenarios (EU Commission 2017b). Scenario 5 ('Doing much more together') is the most ambitious one. Regarding the macroeconomic dimension, it says: "Within the euro area, but also for those Member States wishing to join, there is much greater coordination on fiscal, social and taxation matters, as well as European supervision of financial services. Additional EU financial support is made available to boost economic development and respond to shocks at regional, sectoral and national level." This needs to be seen against the background of the Five Presidents' Report, in which a necessary precondition for setting up a macroeconomic stabilisation function for the euro area is convergence towards similarly resilient national economic structures. Scenario 3 ('Those who want more do more') could also be considered relevant for the considerations that follow to the extent that the Euro Area countries are considered as a group that needs further integration without this necessarily binding the non-members.

We consider the Verhofstadt proposals to constitute a coherent set of policy proposals to address the crucial concerns facing the Euro Area. However, the changes would necessitate quite substantial revision of the Treaties, involving a full ratification process by all member states. For this reason, a communitarisation of economic policy on this scale does not appear to be a realistic political option at the present juncture.

Rather, in order to make progress towards the goals set by the Five Presidents' Report and the White Paper, we propose a pathway of pragmatic conceptual and institutional development that takes existing regulations and institutions as a basis. It appears politically feasible, while at least substantially improving the coordination of member state economic policies with a view to achieving the necessary

convergence and reducing the potential for imbalances, tensions and crises. A more detailed exposition is in preparation (Koll/Watt 2017, see also Koll 2016). The main elements can be summarised as follows.

- The framework for the coordination of national economic policy is obtained by revitalising the procedures in Article 121 TFEU (in conjunction with Articles 120 and 119). This means that the BEPGs play the role of key coordination instrument. Conceptually they encompass the entire macroeconomic policy mix, and thus ensure transparency and coherence in a similar way to the idea of a convergence code proposed by the European Parliament.
- Complying with the rules of the BEPGs as described above will be helpful in meeting the fiscal rules and the MIP. Nevertheless, reforming the SGP in a way conducive to macroeconomic stabilisation and ensuring that the MIP operates in a symmetric way would improve the efficiency of the policy-mix in a consistent and goal-oriented manner and will be required sooner or later.
- The next element is to bring together at the level of the Euro Area macroeconomic expertise whose analyses can be put in the service of policy coordination. To this end, we propose that the Fiscal Council, already established in the wake of the Five Presidents' Report, should serve as the nucleus for an institution that is developed in a number of dimensions. Most importantly, its thematic area of competence needs to be substantially extended. Rather than focusing on budgetary issues more or less in isolation, its remit should be extended to the macroeconomic policy-mix as a whole. In other words, its focus should be the interaction between monetary, fiscal and 'incomes' policies (that is nominal wage developments, also paying regard to functional income distribution).
- Membership of the Council should be substantially increased, not only to allow for the much broader thematic reach proposed here, but also to ensure a degree of pluralism in theoretical approaches. The key task of this institution – which could be termed 'Advisory Council for Macroeconomic Convergence' – would be to produce quantitative macroeconomic scenarios for the Euro Area as a whole. In the current juncture, this also means thorough analysis of the continuing crisis and strategies to overcome it. These chart in a quantitative form alternative paths and these can be based on a range of different assumptions, that, however, all take account of the interactions between Euro Area monetary policies and fiscal and incomes policies at national level. In so doing, this offers a counterweight to a likely tendency of national councils (see next bullet point) to ignore the external impacts of national economic policy decisions on other actors, and indeed to consciously rely on 'race-to-the-bottom'-type strategies that are destructive for the European economy in aggregate. As the proposed name indicates, the role of the Council is purely analytical and advisory; it does not issue recommendations.
- Corresponding National Convergence Councils (or Boards) would be set up. These represent an institutional development of the already agreed Productivity Boards. Their remit and main task match those of the Euro Area-level Council. They should elaborate country-specific, forward-looking quantitative scenarios. Clearly monetary policy will here take the form of an exogenous factor and the focus will be on the interaction between fiscal and incomes policies. Here, too, the role is purely analytical.
- The point of the analyses and scenarios developed by the Euro Area and national convergence councils is to provide a coherent basis, taking account of relevant macroeconomic feedback effects, for action by governments and social partners, action that is coordinated via the BEPGs. What is needed is an appropriate mediation body. Here we propose to take as a basis the European Macroeconomic Dialogue (EUMED) whose basic features, and limitations, were described above. This is because, whatever its limitations, it has the required thematic focus and brings together the decisive actors around the table.

- However, the EUMED has as its point of reference the EU as a whole. The new body needs to be tailored to the specific needs of the Euro Area and at the same time be given the necessary underpinning at national level that is currently lacking. This will require substantial development of the basic EUMED architecture along the following lines:
 - First, a Macroeconomic Dialogue must be established at the level of the Euro Area (EUROMED). A pragmatic and effective way to achieve this would be to informally extend, at least twice a year, the meetings of the Eurogroup by bringing in representatives of the peak European social partner organisations. Unlike in the EUMED where member states are only represented by a “Troika” of ECOFIN Council, this would ensure full representation (finance minister) of all the Euro Area member states.
 - Second, in each member state a Macroeconomic Dialogue at National Level (MEDNAT) is to be set up, also with top-level representatives of monetary (the national central bank) and fiscal policy as well as the social partners.
- In both the EUROMED and the MEDNATs, the report of the respective convergence council serves as the point of departure for an evaluation of and a cooperative orientation of the relevant policies within the macroeconomic policy-mix.³
- Discussions within the different MEDs would be geared to maintaining the autonomy and independence of the various actors. Results should give guidance in formulating the final BEPGs.
- At the same time, actions and policies are framed according to agreed basic guidelines. Clearly central is the need to limit the size of both negative and positive output gaps (while seeking to expand productive potential). Nominal wages and profits should increase in a way that is consistent with balanced non-inflationary growth and, where appropriate, they should help to correct any macroeconomic (current account) imbalances that have arisen, again in a symmetrical fashion.
- A notable benefit of this institutional enrichment and deepening is that national actors’ ‘ownership’ of the country-specific recommendations that come out of this inclusive and consultative process is substantially greater than now. Already there is provision in the treaty for sanctions in the case of repeated failure to respect recommendations. This principle is to be retained, while at the same time more effective instruments need to be designed, along the lines of those envisaged in the Verhofstadt report (withdrawal of access to public goods).

The conceptual and institutional reforms that we have briefly set out here all take as their basis existing institutions. No changes to the treaties are initially required (although reform of the fiscal rules would be necessary at some point). The reforms would by no means solve all problems relating to economic governance but they would mark a milestone on a path towards achieving the degree of coherence and convergence that EMU requires if it is to achieve the required combination of dynamism and stability

• ³ In the case of monetary policy in the narrow sense, at national level this is more or less a given; however national macroprudential policy from the national central bank (where appropriate in conjunction with other government agencies) can be an important tool for maintaining balanced economic developments and for correcting imbalances.

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APPENDIX TABLES

Table A 1 Inflation correlation – total sample

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	0.49	0.71	0.82	0.77	0.59	0.48	0.36	0.51
Ireland	0.49	1.00	0.81	0.76	0.68	0.51	0.39	0.07	0.78
Portugal	0.71	0.81	1.00	0.85	0.74	0.60	0.34	0.14	0.68
Spain	0.82	0.76	0.85	1.00	0.89	0.75	0.58	0.38	0.67
Cyprus	0.77	0.68	0.74	0.89	1.00	0.65	0.46	0.37	0.74
Estonia	0.59	0.51	0.60	0.75	0.65	1.00	0.79	0.80	0.30
Latvia	0.48	0.39	0.34	0.58	0.46	0.79	1.00	0.85	0.21
Lithuania	0.36	0.07	0.14	0.38	0.37	0.80	0.85	1.00	-0.05
Slovakia	0.51	0.78	0.68	0.67	0.74	0.30	0.21	-0.05	1.00

Table A 2 Inflation correlation – pre crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1,00	0.19	0.63	0.21	-0.23	-0.16	-0.50	-0.39	-0.35
Ireland	0.19	1,00	0.56	0.24	0.77	-0.17	-0.79	-0.53	0.58
Portugal	0.63	0.56	1,00	-0.13	0.03	0.02	-0.71	-0.41	0.20
Spain	0.21	0.24	-0.13	1,00	0.33	-0.34	-0.28	-0.19	0.02
Cyprus	-0.23	0.77	0.03	0.33	1,00	-0.46	-0.54	-0.51	0.73
Estonia	-0.16	-0.17	0.02	-0.34	-0.46	1,00	0.51	0.84	-0.45
Latvia	-0.50	-0.79	-0.71	-0.28	-0.54	0.51	1,00	0.86	-0.61
Lithuania	-0.39	-0.53	-0.41	-0.19	-0.51	0.84	0.86	1,00	-0.61
Slovakia	-0.35	0.58	0.20	0.02	0.73	-0.45	-0.61	-0.61	1,00

Table A 3 Inflation correlation – crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1,00	0.40	0.88	0.81	0.84	0.59	0.13	0.10	0.32
Ireland	0.40	1,00	0.78	0.86	0.83	0.98	0.96	0.95	1.00
Portugal	0.88	0.78	1,00	0.99	1.00	0.90	0.58	0.55	0.73
Spain	0.81	0.86	0.99	1,00	1.00	0.95	0.69	0.66	0.82
Cyprus	0.84	0.83	1.00	1.00	1,00	0.93	0.65	0.62	0.79
Estonia	0.59	0.98	0.90	0.95	0.93	1,00	0.88	0.86	0.96
Latvia	0.13	0.96	0.58	0.69	0.65	0.88	1,00	1.00	0.98
Lithuania	0.10	0.95	0.55	0.66	0.62	0.86	1.00	1,00	0.97
Slovakia	0.32	1.00	0.73	0.82	0.79	0.96	0.98	0.97	1.00

Table A 4 Inflation correlation - post crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	0.64	0.95	0.81	0.83	0.81	0.93	0.92	0.83
Ireland	0.64	1.00	0.81	0.88	0.94	0.85	0.74	0.85	0.93
Portugal	0.95	0.81	1.00	0.87	0.90	0.86	0.93	0.93	0.92
Spain	0.81	0.88	0.87	1.00	0.96	1.00	0.82	0.95	0.98
Cyprus	0.83	0.94	0.90	0.96	1.00	0.94	0.89	0.97	0.99
Estonia	0.81	0.85	0.86	1.00	0.94	1.00	0.79	0.95	0.97
Latvia	0.93	0.74	0.93	0.82	0.89	0.79	1.00	0.90	0.87
Lithuania	0.92	0.85	0.93	0.95	0.97	0.95	0.90	1.00	0.96
Slovakia	0.83	0.93	0.92	0.98	0.99	0.97	0.87	0.96	1.00

Table A 5 Exports - total

	Cyprus	Greece	Ireland	Portugal	Spain	Estonia	Latvia	Lithuania	Slovakia
Cyprus	1.00	0.68	0.24	0.56	0.76	0.34	0.49	0.15	0.28
Greece	0.68	1.00	0.31	0.64	0.75	0.33	0.65	0.21	0.58
Ireland	0.24	0.31	1.00	0.24	0.31	-0.24	0.07	-0.14	-0.05
Portugal	0.56	0.64	0.24	1.00	0.90	0.53	0.52	0.40	0.75
Spain	0.76	0.75	0.31	0.90	1.00	0.58	0.67	0.44	0.69
Estonia	0.34	0.33	-0.24	0.53	0.58	1.00	0.75	0.54	0.79
Latvia	0.49	0.65	0.07	0.52	0.67	0.75	1.00	0.65	0.71
Lithuania	0.15	0.21	-0.14	0.40	0.44	0.54	0.65	1.00	0.52
Slovakia	0.28	0.58	-0.05	0.75	0.69	0.79	0.71	0.52	1.00

Table A 6 Exports - pre crisis

	Cyprus	Greece	Ireland	Portugal	Spain	Estonia	Latvia	Lithuania	Slovakia
Cyprus	1.00	0.49	0.71	0.82	0.77	0.59	0.48	0.36	0.51
Greece	0.49	1.00	0.81	0.76	0.68	0.51	0.39	0.07	0.78
Ireland	0.71	0.81	1.00	0.85	0.74	0.60	0.34	0.14	0.68
Portugal	0.82	0.76	0.85	1.00	0.89	0.75	0.58	0.38	0.67
Spain	0.77	0.68	0.74	0.89	1.00	0.65	0.46	0.37	0.74
Estonia	0.59	0.51	0.60	0.75	0.65	1.00	0.79	0.80	0.30
Latvia	0.48	0.39	0.34	0.58	0.46	0.79	1.00	0.85	0.21
Lithuania	0.36	0.07	0.14	0.38	0.37	0.80	0.85	1.00	-0.05
Slovakia	0.51	0.78	0.68	0.67	0.74	0.30	0.21	-0.05	1.00

Table A 7 Exports - crisis

	Cyprus	Greece	Ireland	Portugal	Spain	Estonia	Latvia	Lithuania	Slovakia
Cyprus	1.00	0.83	0.22	0.99	0.99	1.00	0.98	0.89	0.97
Greece	0.83	1.00	-0.35	0.89	0.89	0.88	0.93	0.99	0.94
Ireland	0.22	-0.35	1.00	0.11	0.11	0.13	0.02	-0.25	-0.02
Portugal	0.99	0.89	0.11	1.00	1.00	1.00	1.00	0.94	0.99
Spain	0.99	0.89	0.11	1.00	1.00	1.00	1.00	0.93	0.99
Estonia	1.00	0.88	0.13	1.00	1.00	1.00	0.99	0.93	0.99
Latvia	0.98	0.93	0.02	1.00	1.00	0.99	1.00	0.96	1.00
Lithuania	0.89	0.99	-0.25	0.94	0.93	0.93	0.96	1.00	0.97
Slovakia	0.97	0.94	-0.02	0.99	0.99	0.99	1.00	0.97	1.00

Table A 8 Exports - post crisis

	Cyprus	Greece	Ireland	Portugal	Spain	Estonia	Latvia	Lithuania	Slovakia
Cyprus	1.00	-0.01	-0.28	0.20	0.70	0.42	-0.12	-0.08	-0.24
Greece	-0.01	1.00	0.51	-0.23	-0.11	-0.44	-0.34	-0.53	-0.61
Ireland	-0.28	0.51	1.00	0.16	0.12	-0.44	-0.34	-0.71	-0.21
Portugal	0.20	-0.23	0.16	1.00	0.74	0.39	-0.01	0.24	0.43
Spain	0.70	-0.11	0.12	0.74	1.00	0.63	0.11	0.06	0.26
Estonia	0.42	-0.44	-0.44	0.39	0.63	1.00	0.80	0.72	0.74
Latvia	-0.12	-0.34	-0.34	-0.01	0.11	0.80	1.00	0.76	0.83
Lithuania	-0.08	-0.53	-0.71	0.24	0.06	0.72	0.76	1.00	0.79
Slovakia	-0.24	-0.61	-0.21	0.43	0.26	0.74	0.83	0.79	1.00

Table A 9 Final demand - total

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	0.33	0.69	0.85	0.68	0.38	0.54	0.52	0.65
Ireland	0.33	1.00	0.52	0.54	0.18	0.20	0.33	0.22	0.49
Portugal	0.69	0.52	1.00	0.82	0.74	0.36	0.42	0.50	0.68
Spain	0.85	0.54	0.82	1.00	0.77	0.66	0.76	0.73	0.80
Cyprus	0.68	0.18	0.74	0.77	1.00	0.45	0.49	0.60	0.74
Estonia	0.38	0.20	0.36	0.66	0.45	1.00	0.95	0.89	0.51
Latvia	0.54	0.33	0.42	0.76	0.49	0.95	1.00	0.88	0.63
Lithuania	0.52	0.22	0.50	0.73	0.60	0.89	0.88	1.00	0.67
Slovakia	0.65	0.49	0.68	0.80	0.74	0.51	0.63	0.67	1.00

Table A 10 Final demand - pre crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	-0.43	0.36	0.51	0.47	0.42	0.46	-0.76	-0.27
Ireland	-0.43	1.00	0.45	0.15	0.16	-0.20	0.14	0.35	0.81
Portugal	0.36	0.45	1.00	0.78	0.91	0.28	0.67	-0.30	0.43
Spain	0.51	0.15	0.78	1.00	0.82	0.70	0.98	-0.23	0.47
Cyprus	0.47	0.16	0.91	0.82	1.00	0.38	0.70	-0.23	0.29
Estonia	0.42	-0.20	0.28	0.70	0.38	1.00	0.81	-0.07	0.31
Latvia	0.46	0.14	0.67	0.98	0.70	0.81	1.00	-0.19	0.51
Lithuania	-0.76	0.35	-0.30	-0.23	-0.23	-0.07	-0.19	1.00	0.53
Slovakia	-0.27	0.81	0.43	0.47	0.29	0.31	0.51	0.53	1.00

Table A 11 Final demand - crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	-0.40	0.59	0.67	0.92	0.41	0.56	0.78	0.95
Ireland	-0.40	1.00	0.50	0.41	-0.02	0.67	0.53	0.25	-0.10
Portugal	0.59	0.50	1.00	0.99	0.85	0.98	1.00	0.96	0.81
Spain	0.67	0.41	0.99	1.00	0.90	0.95	0.99	0.99	0.86
Cyprus	0.92	-0.02	0.85	0.90	1.00	0.73	0.84	0.96	1.00
Estonia	0.41	0.67	0.98	0.95	0.73	1.00	0.98	0.89	0.67
Latvia	0.56	0.53	1.00	0.99	0.84	0.98	1.00	0.95	0.79
Lithuania	0.78	0.25	0.96	0.99	0.96	0.89	0.95	1.00	0.94
Slovakia	0.95	-0.10	0.81	0.86	1.00	0.67	0.79	0.94	1.00

Table A 12 Final demand - post crisis

	Greece	Ireland	Portugal	Spain	Cyprus	Estonia	Latvia	Lithuania	Slovakia
Greece	1.00	0.53	0.93	0.83	0.58	-0.82	-0.80	-0.83	0.41
Ireland	0.53	1.00	0.66	0.68	0.49	-0.50	-0.33	-0.40	0.84
Portugal	0.93	0.66	1.00	0.91	0.60	-0.73	-0.64	-0.64	0.67
Spain	0.83	0.68	0.91	1.00	0.86	-0.50	-0.40	-0.62	0.75
Cyprus	0.58	0.49	0.60	0.86	1.00	-0.18	-0.11	-0.56	0.56
Estonia	-0.82	-0.50	-0.73	-0.50	-0.18	1.00	0.97	0.82	-0.18
Latvia	-0.80	-0.33	-0.64	-0.40	-0.11	0.97	1.00	0.84	0.02
Lithuania	-0.83	-0.40	-0.64	-0.62	-0.56	0.82	0.84	1.00	-0.07
Slovakia	0.41	0.84	0.67	0.75	0.56	-0.18	0.02	-0.07	1.00

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