

EURO – HOW BIG A DIFFERENCE

FINLAND AND SWEDEN IN SEARCH OF MACRO STABILITY

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The different monetary regime choices of two strikingly similar economies Finland and Sweden have created a particularly interesting testing ground for the benefits of the EMU. We assess the effects of the regime choice by simulating the behaviour of the Swedish economy with National Institute's Global Econometric Model (NiGEM) on the assumption that Sweden had joined the EMU in 1999. The simulation exercise suggests that the independent monetary regime reduced the impact of the global shock on Sweden, but cannot explain the growth gap between Sweden and Finland since 2012. Our results suggest that the different choices with regard to the EMU have not affected the macro-economic outcomes very much.

Keywords: Finland, Sweden, EMU, simulation, counter factual.

The euro crisis has rekindled questions about the advantages and disadvantages of membership in the European Monetary Union. While a rather wide consensus exists that a monetary union with appropriate institutions is an overwhelmingly positive thing for the tightly integrated core countries of the European Union, there is much less agreement about whether being part of monetary integration is beneficial for EU's peripheral economies. Many people would now argue that Greece should never have joined or been allowed to join the euro.

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In the Northern periphery of the EU, the different monetary regime choices of Finland and Sweden have created a particularly interesting testing ground for the benefits of the EMU. While Sweden is somewhat bigger and its economy is more versatile than that of Finland, the countries have many similarities. In both countries manufacturing is important, highly developed and globally oriented. The core of the euro area accounts for roughly the same share for the countries' foreign trade. Both have extensive social safety nets and the associated high tax levels. Labour unions are strong and play an important role in wage formation.

Importantly, both Finland and Sweden have a history of monetary instability. Periods of rapid inflation and devaluations to restore external competitiveness have been recurrent. The boom following financial liberalisation in the late 1980s and the subsequent financial crisis and deep recession in the early 1990s in both countries underlined the difficulty of monetary management with fixed but adjustable exchange rates and free capital movements. In both countries, monetary policy proved to be impotent in preventing the unsustainable boom. Similarly, both countries were forced to float their currencies after a period of costly defence of their exchange rates with very high interest rates. In both countries the quest for monetary stability accentuated at the same time as EMU membership was on the political agenda.

In Sweden, a key study, the influential Calmfors report, about the benefits and costs of joining the EMU came to the conclusion that the Swedish economy would not adjust smoothly to asymmetric shocks without an independent monetary policy and exchange rate flexibility, at least not without important institutional changes. The political cost of staying out from the beginning of monetary union with small influence on the development of the EMU was seen smaller than the benefits from staying out (SOU, 1996). In Finland, the economic risks were recognised, but it was assumed that wage formation and fiscal policies would evolve in ways which would ensure sufficient adjustment capacity (EMU-asiantuntijaryhmä, 1997). In addition, there was a strong political will to be in the core of the European Union. As a result, Sweden decided not to seek EMU membership while Finland decided to join from the beginning.

Now there is more than a decade of experience with the relative performance of the two economies since the creation of the EMU, including a major economic recession. It is therefore interesting to compare how the two countries have fared and speculate how they would have developed had they chosen different monetary regimes. In this paper we do this by first documenting the evolution of some key macroeconomic variables and then by simulating with a macroeconomic model what might have happened in Sweden had it chosen to join the EMU in 1999.

1. Much similarity in the real economy

The evolution of GDP and its main components in the first years since the beginning of the EMU does not differ much between the two countries. GDP grew by the same 3.2 per cent a year on average from 1998 to 2006 in both Finland and Sweden (Figure 1.a).²

In 2007 and 2008 Finland grew faster than Sweden, driven by rapidly expanding exports in the midst of the global boom. The strong Finnish export performance reflected the specialisation of the Finnish manufacturing in investment goods which were high in demand during the global boom. Correspondingly, the crash of global demand that started in the fourth quarter of 2008 hit Finland harder: Finland lost 8.5% of GDP in 2009 against Sweden's loss of 5.0%. Taken together, there was no difference in the cumulative GDP growth of the two countries in the first decade of the EMU until 2009. Both countries grew at the average rate of 2.2%. Also the initial recovery from mid-2009 to mid-2010 was fairly similar in the two countries.

However, since 2010 Sweden has grown faster, at least until the third quarter of 2012. The better growth performance has been driven by both stronger exports and stronger domestic demand. Over the past three years Swedish exports have continued to grow moderately, while Finnish exports have been more or less flat (Figures 1.b and 1.c). As a result of the better performance over the last few years, Sweden has grown somewhat faster than Finland in the EMU area as a whole, 2.6% vs. 2.1%. In per capita terms, the difference has been smaller, 2.1% vs. 1.8%.

2. Finnish and Swedish economies are compared at length in Korkman and Suvanto (2013).

Figure 1a. GDP in Finland and Sweden, quarterly data

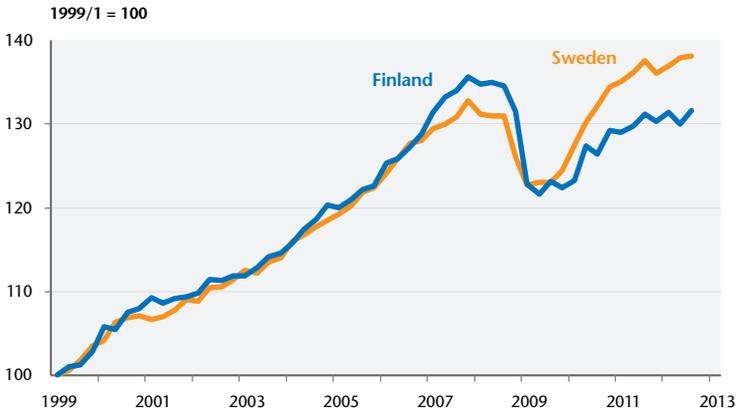


Figure 1b. Exports of goods and services in Finland and Sweden, quarterly data

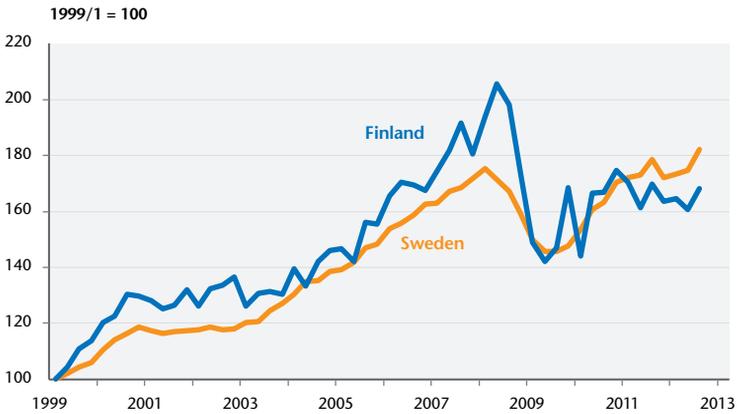
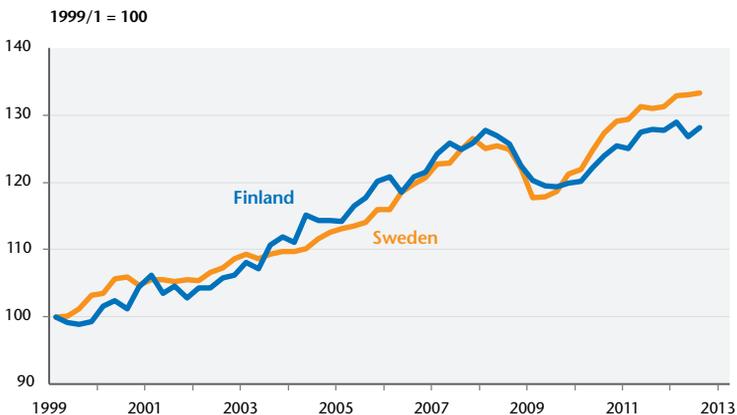


Figure 1c. Total domestic demand in Finland and Sweden, quarterly data



Sources: NiGEM, ETLA.

Thus the microeconomic benefits that Finland has been able to reap from joining the EMU in terms of reduced transaction costs and increased competition have not been large enough to compensate for other factors that have affected growth in the last 14 years. This is also consistent with the observation that Finland's trade with the (rest of the) euro area has not developed more favourably than that of Sweden. In fact, for both countries, the share of euro area exports out of total goods exports has declined by roughly the same amount in the euro period, reflecting the rapid growth of trade with the emerging economies.

Economic theory suggests that monetary policy should have little if any impact on medium-term growth but could have a more pronounced effect on output variability. Comparing the 13-year EMU period (1999-2012) with the preceding 13-year period (1985-1998), however, suggests that the change in the monetary regime was not very important in this respect, either. The standard deviation of the difference of quarterly GDP from its linear trend was almost identical for Finland (0.062 vs. 0.064) in these two periods containing a major slump each. In the case of Sweden, the standard deviation increased somewhat (from 0.032 to 0.044), but remained smaller than in Finland reflecting most likely the more diversified production structure of the Swedish economy.

2. Monetary stability has improved in both countries, but more so in Sweden

The inflation performance has also been pretty similar. Inflation was marginally faster in Finland than in Sweden in the EMU period until the third quarter of 2012 (Figure 2). Inflation was on average 1.8% in Finland and 1.5% in Sweden measured by the consumer price index and 2.0% and 1.5%, respectively, measured by the private consumption deflator.

Compared to a similar 13-year period before the EMU membership, the price stability of both countries improved. The decline in consumer price inflation was bigger in Sweden. Also the variability of inflation has declined in both countries although the degree of the decline depends on the exact inflation measure. The standard deviation of the consumer price index is almost identical in the

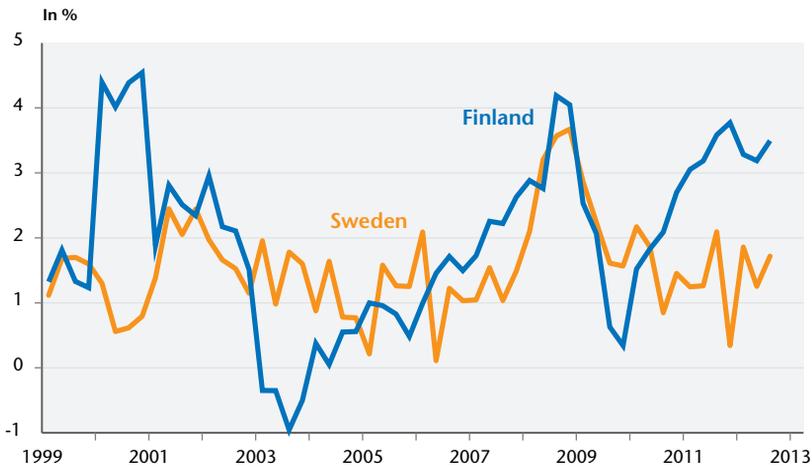
two countries in the EMU period while that of the private consumption deflator is higher for Finland (Table 1).

Table 1. Price and exchange rate stability before and after the start of EMU

		1985/1-1998/4		1999/1-2012/4	
		Sweden	Finland	Sweden	Finland
Inflation (national concept, annual change, per cent)	Mean	4.3	3.2	1.5	1.8
	Stdev	3.2	2.1	1.2	1.3
Private consumption deflator (annual change per cent)	Mean	4.9	3.4	1.5	2.0
	Stdev	3.3	2.0	0.7	1.3
Effective exchange rate, level	Stdev	6.6	6.3	4.3	4.8

Sources: NiGEM, ETLA.

Figure 2. Inflation, annual CPI change in Finland and Sweden, quarterly data



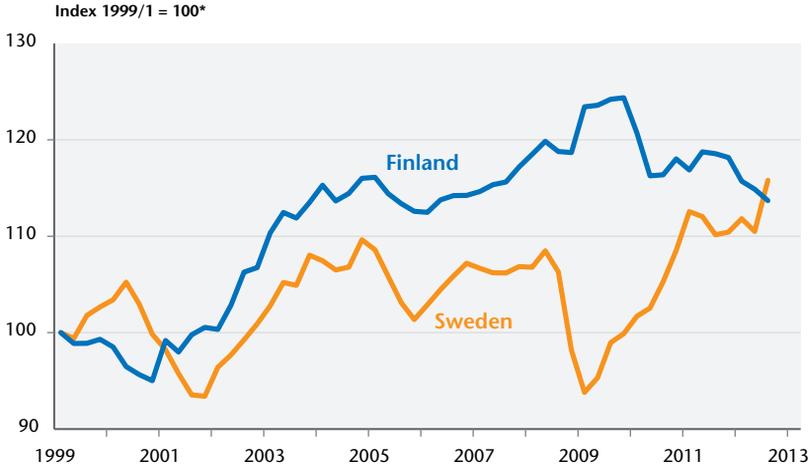
Sources: NiGEM, ETLA.

A similar overall picture emerges when looking at the external value of money. The standard deviation of the effective nominal exchange rate declined markedly in both countries from the pre-EMU period to the EMU period. Again, as with price stability, the decline was greater in Sweden.

The behaviour of the effective exchange rate is nevertheless interesting. While the overall variability as measured by standard deviation is smaller in Sweden, there is less cyclical variation in Finland. The Finnish effective exchange rate appreciated in the beginning of the EMU period quite substantially until 2004, and has remained relatively stable ever since. Coinciding with the

negative external demand shock in 2009, the Finnish effective exchange rate appreciated somewhat while the Swedish exchange rate depreciated substantially to recover more than fully in two years' time (Figure 3).

Figure 3. Effective exchange rate in Finland and Sweden, quarterly data



* Currency strengthens, when index numbers rise.

Sources: NIGEM, ETLA.

The effective exchange rate of Sweden has in fact followed very closely the bilateral exchange rate vis-à-vis the euro since the end of 2003. This suggests that the decision to remain outside the EMU has had indeed a major impact on the effective exchange rate.

3. What if Sweden had been in the EMU?

The comparison of the actual performances of the two economies above suggests that while average growth rates have been rather similar, Sweden has grown faster since the global crisis started. In terms of price and exchange rate stability Sweden seems to have fared better than Finland in the EMU period. Sweden's price and exchange rate stability also increased compared to that prevailing in the pre-EMU period.

If all other factors except the monetary regime had been the same for the two countries, one could conclude that EMU membership has not improved monetary stability or growth performance

of a peripheral Nordic country but perhaps weakened it. However, despite the many similarities all other factors cannot be assumed to have been precisely the same. One way to assess the importance of the monetary arrangement is to simulate the behaviour of the Swedish economy assuming that Sweden had joined the EMU. In what follows we do simulation exercises using the NiGEM model; a brief description of the model is provided in an Appendix 1.

Simulating Swedish EMU membership is easier and more reliable than simulating what might have happened in Finland had Finland chosen to stay outside the EMU. In a Swedish simulation, the alternative monetary policy and exchange rate reactions are fairly well known, as the likely impact of a Swedish EMU membership on both the monetary policy decisions of the ECB and the behaviour of the euro exchange rates can be assumed to be negligible. On the other hand, if we assumed that Finland had been outside the EMU, we would have to specify the monetary policy rule of the Bank Finland, make assumptions about how the markka exchange rate would have behaved and also assumptions about changes in risk premiums. None of these is straightforward.

In the simulation of the Swedish EMU-membership we fixed the Swedish central bank rate at the same level as the ECB steering rate and euro exchange rate at the value prevailing in the beginning of 1999 (about 9.5 kroner per one euro). Money market rates were equalised with those of the rest of the euro area. On the other hand, we did not make any adjustments to the long-term rates; Swedish long rates have already stayed close to the German ones implying no potential for reduced risk premiums. As the exchange rates in the NiGEM are USD rates, we calculated the respective counterfactual USD rate of krona by using the actual krona exchange rate vis-à-vis the USD and the fixing of the euro rate. Naturally, the evolution of Sweden's effective exchange deviates from that of Finland and other euro area countries to the extent Swedish trade patterns differ.

The simulation period was from the first quarter of 1999 to the third quarter of 2012, when we assumed backward looking economic agents. As a robustness check we also run the model with forward looking expectations, in which case the simulation period extended to 2020. Most of the reported results are based on the simulation with backward looking expectations. Using forward-

looking expectations would, in general, smooth the evolution of the economy as e.g. long-term interest rates change less. Consumers are on the other hand myopic at their best, which implies relatively small differences in consumption by expectations.

The counterfactual suggest that tying the Swedish monetary policy to that of the euro area had allowed Sweden to grow somewhat faster in the first years of the EMU. The cumulative “growth gain” as a member of the monetary union is 6.6% of 2011 GDP by the first quarter of 2006, *i.e.* 0.8% per year, assuming backward looking expectations (Figure 4).

Figure 4. Simulated GDP level and deviation from the baseline in Sweden, quarterly data

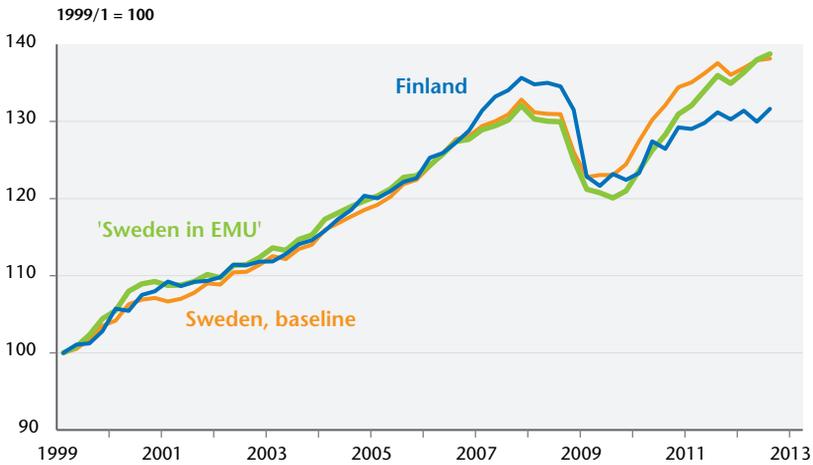


The rest of the period (after the first quarter of 2006) had been less successful for the EMU membership. The cumulative loss since 1999 was 7.7%, *i.e.* 1.2% per year. EMU membership had reduced GDP particularly in the midst at the global crisis in 2009–2010. Thus over the whole EMU period the EMU-Sweden had grown at almost the same rate as it did in reality. Assuming forward-looking expectations would smoothen the development, but the results remain qualitatively the same.

Looking at the simulated GDP and baseline GDP in levels highlights the role of the independent monetary regime (Figure 5). Retaining the krona appears to have mitigated the impact of the

global shock in 2009 somewhat and allowed Sweden to recover at a higher GDP level in 2010 and 2011. At the same time, comparing the Swedish simulated and baseline trajectories with the Finnish GDP baseline scenario suggests that other factors than the monetary regime have been the primary cause of the weaker GDP developments in Finland since mid-2010: Sweden does better in this period than Finland irrespective of the monetary regime, and the positive impact of the independent monetary regime on the Swedish GDP disappears completely by the second quarter of 2012.

Figure 5. Simulated and baseline GDP for Sweden and baseline GDP for Finland, quarterly data

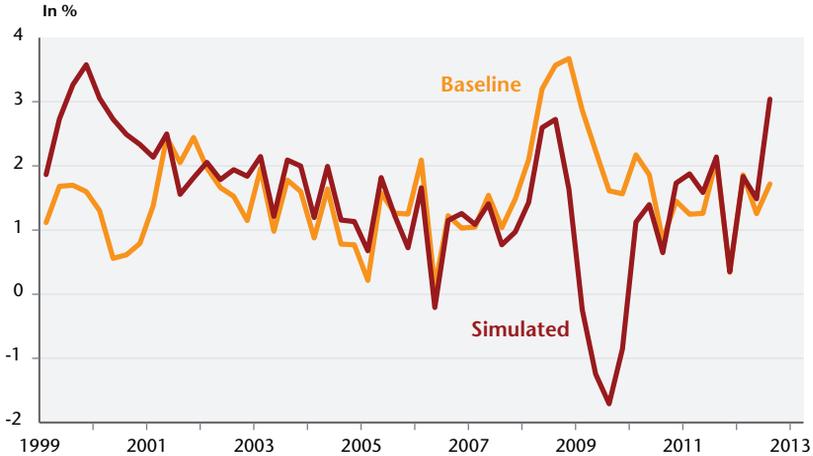


A plausible explanation for the weaker Finnish growth is the decline of the Nokia cluster and the weakening income generation capacity of the forest industry, compounded by high wage agreements just when the global crisis hit. Neither Nokia's difficulties nor the secular decline of demand for the types of paper in which the Finnish industry has specialised have much to do with the monetary regime.

Inflation had also been the same on average under the EMU scenario as with independent monetary policy; the average simulated inflation rate (private consumption deflator) in Sweden is the same 1.5% as it is in the baseline scenario. As with GDP, inflation

would have been stronger in the early years and lower in the midst of the global crisis had Sweden been part of the EMU (Figure 6).

Figure 6. Simulated and baseline inflation rate* in Sweden, quarterly data



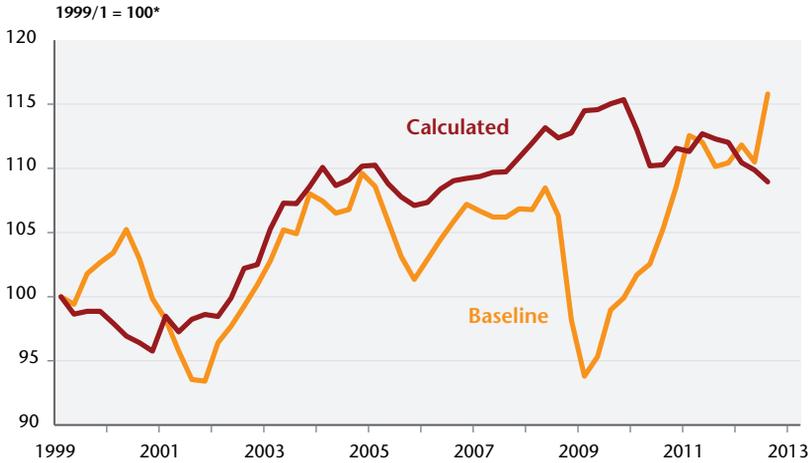
* Private consumption deflator.

Sources: NiGEM, ETLA.

The simulated effective exchange rate is stronger than the actual one for almost the whole period (Figure 7). A particularly wide gap emerges in the fourth quarter of 2008 and remains there until mid-2010. The only significant periods of a weaker simulated exchange rate are in 1999-2000 and in late 2012. On the other hand, the euro rates adopted as Swedish short-term interest rates have been in several periods both below and above the actual Swedish rates with a difference typically less than 1 percentage point (Figure 8). A membership in EMU had implied both the fixed euro exchange rate and short-term EMU interest rates.

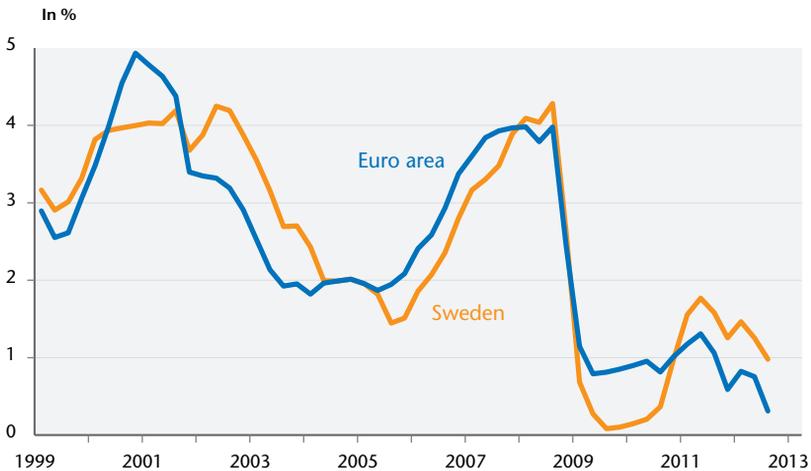
These growth patterns suggest that the stronger simulated growth until 2005/2006 is due to lower EMU interest rates. From 2006 onwards until 2011 both higher interest rates and a stronger currency contributed to the weaker growth in the counterfactual. The weaker growth performance of the EMU-Sweden in 2009 through early 2011 would seem to be associated at least as much with the exchange rate appreciation as with the interest rate development.

Figure 7. Calculated and baseline effective exchange rate in Sweden, quarterly data



* Currency strengthens, when index numbers rise.
Sources: NiGEM, ETLA.

Figure 8. Three-month interest rates in the euro area and in Sweden



Sources: NiGEM, ETLA.

This last observation is important as the monetary authorities probably have less influence on the exchange rate than on short-term interest rates. It is quite plausible that the weakness of the krona from late 2008 until 2010 reflected mainly market reactions to bad news on the Swedish economy, such as the state of the car

industry and Swedish banks' exposures to the Baltic economies. Riksbank itself argued at the time that the weakening reflected the general tendency of small currencies to weaken in times of financial turbulence, and denied any attempts to target any given level of the exchange rate (Riksbank, 2009). The evolution of the krona helped to stabilise the economy on this particular occasion but it is not obvious that expectations would always work in this way.

While the simulated GDP and inflation patterns look rather sensible, the evolution of the key demand and supply components is less plausible. Exports deviate very little from the baseline scenario; they are very insensitive to the significant exchange rate changes in 2008–2010. The weak growth in the simulated counterfactual in 2009–2011 is associated with both weaker domestic demand and a weaker current account. A relative increase in imports is thus associated with a weaker growth. The asymmetry of export and import reactions to the change in the effective exchange rate is doubtful and warns against drawing too far-reaching conclusions on the basis of this particular simulation.

An advantage of NiGEM over a single country model is that it allows analysing interactions between different countries. The Swedish EMU membership obviously has potential repercussions for the Finnish economy through trade reactions. The simulated impacts turned out to be modest, however. In the slump that started in late 2008, Finland had benefitted somewhat from the stronger Swedish imports.

4. Concluding remarks

The Swedish and Finnish GDP data do suggest that the different choices on the monetary regime have not been very important from a macroeconomic perspective. Until 2009 the average growth was almost identical. In 2009 and 2010, the independent monetary regime buffered the impact of the global shock on Sweden. The different monetary regimes cannot, however, explain the steadily increased growth gap anymore in 2012. Other factors, such as the decline of the Nokia cluster, are needed for that.

Our simulation exercise suggests that the stabilisation of Swedish output in 2009 and 2010 emanates at least as much from the reaction of the exchange rate as from the movements of the

short-term rates. It is not obvious that the foreign exchange market reactions would always be stabilising.

In any case, Sweden had achieved a lower average inflation rate in the EMU period and in fact improved its price stability more than Finland did, if compared to the years prior to the EMU. Thus, as a whole, monetary independence has not been detrimental to macroeconomic stability in Sweden. If anything, Sweden has fared somewhat better than it had done in the EMU and definitely better than Finland. As the Swedish economy is bigger and more versatile than that of Finland, this is not yet conclusive evidence that Finland would have achieved a similar outcome outside the EMU. Also, the proximity and closer economic links to Russia could make financial market conditions in a non-euro Finland more volatile than those in Sweden. Nevertheless, our observations do not support the argument that being part of the EMU is necessary for the macroeconomic stability of a small EU country with sound fiscal policies and resilient economic structures.

Interestingly, public opinions in both countries seem to support the monetary regime choices. In Sweden the support for joining the euro has declined strongly since the start of the Great Recession and has remained at around 10 per cent only since November 2011 (SCB 2013). In Finland, the support for the euro has at the same time been near all-time-high (Haavisto, 2013). One interpretation is that, as in the 1990s, economic arguments are predominant in Sweden and the euro crisis has added to the suspicions about the EMU, while political arguments continue to dominate in Finland.

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APPENDIX

National Institute Global Econometric Model (NiGEM)

National Institute Global Econometric Model (NiGEM) is a New Keynesian structural model describing economies in national accounts framework. It is based on estimated behavioural equations with a number of exogenous variables and identities. Demand determines production in the short-term.

Consumption is based on the real disposable income and real net housing and other wealth including foreign net assets. Investments consist of housing and business. Both depend on output, user costs, capital stock and changes in working-age population in forecasting, while in simulation it's past values.

The trade equations are function of competitiveness and demand. Exporters compete against each other *via* relative prices, while demand is given by the weighted world imports. Imports depend on import prices relative to domestic prices and on total demand. The trading system is closed so that the world trade balance sums to about zero.

Interaction between economies takes place through trade and competitiveness, interacting financial markets and international stocks of assets. Shifts in the domestic price level or the exchange rate feed into relative trade prices, allowing net trade to offset shifts in domestic demand.

The model provides number of options on expectation formation from backward-looking to forward-looking expectations on the USD exchange rate, long-term interest rates, wages and inflation. Consumption is either backward-looking or myopic looking only one quarter forward.

The model description of the Swedish and Finnish economies is similar to that of bigger economies, although less detailed.

More: <http://nimodel.niesr.ac.uk/>

THE EURO PLUS PACT

COMPETITIVENESS AND EXTERNAL CAPITAL FLOWS IN THE EU COUNTRIES¹

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The Euro Plus Pact was approved by 23 EU countries in March 2011. The Pact stipulates a range of quantitative targets meant to strengthen competitiveness and convergence with the ultimate aim of preventing the accumulation of unsustainable financial imbalances. This paper uses Granger causality tests and vector autoregressive models to assess the short-term linkages between changes in the relative unit labour cost and changes in the current account balance. The sample consists of data for 27 EU countries for the period 1995–2012. The main finding is that changes in the current account balance precedes changes in relative unit labour costs, while there is no discernable effect in the opposite direction. This suggests that the divergence in the unit labour cost between the countries in Northern Europe and countries in Southern and Central and Eastern Europe prior to the global financial crisis partly was the result of capital flows from the core of Europe to its periphery. The results also suggest that measures in the Euro Plus Pact to restrain unit labour costs may not have immediate effects on possible current account imbalances.

Keywords: European integration, policy coordination, unit labour costs, current account imbalances, economic crisis

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The global financial crisis had pronounced effects on all European economies from as early as 2008, leading to substantial output losses in most EU countries. In a short time the crisis metamorphosed into a debt crisis as lending dried up and growth prospects deteriorated. Governments in the geographical periphery had to seek assistance from the IMF, the European Commission and other official lenders. Given this background, European economic governance structures came under scrutiny and a host of reforms were adopted with the aim of reducing the probability of future crises occurring in individual countries. Among the reforms adopted were *Europe 2020*, a new growth strategy; the *Euro Plus Pact*, in part to ensure financial stability; and the *Fiscal Compact*, setting new fiscal targets.² This paper discusses the core component of the Euro Plus Pact and seeks to assess its likely effectiveness.

The preparation of the Euro Plus Pact can be traced back to the autumn of 2010 when the diverging economic fortunes of European countries in the euro area became very noticeable (*The Economist*, 2011; Groll and van Roye, 2011). Consultations between the German and French governments led to the *Competitiveness Pact*, which was unveiled in February 2011. After some alterations had been made and a new name given, the Euro Plus Pact was adopted at a European Council meeting on 25 March 2011 (European Council, 2011).³ All the euro area countries and the other EU countries except the Czech Republic, Hungary, Sweden and the United Kingdom signed up to the pact.

The goal of the Euro Plus Pact is to foster competitiveness and convergence among the participating countries with the aim of avoiding the build-up of financial and economic imbalances. The Pact stipulates a number of policy measures which should be applied for these goals to be reached, including a review of wage setting arrangements, indexation schemes, public sector wages and structural reforms to enhance productivity. There are also

2. The webpage <http://www.ecb.int/mopo/eaec/ecopolicy/html/index.en.html> depicts the many reforms and provides links to source material.

3. The word *plus* in the Euro Plus Pact is presumed to have two meanings. First, the Pact imposed new governance structures in addition to those in place at the time of its inception. Second, while participation in the Pact is compulsory for the euro area countries, other EU countries are also able to join.

measures to foster employment, enhance the sustainability of public finances and improve financial stability. The measures of the Pact must be applied by individual countries, but the *open method of coordination* entails the “naming and shaming” of countries that fall behind. The European Commission has been put in charge of monitoring and to that end collects and publishes various indicator variables, including movements in unit labour costs, which capture the progress of individual countries.

The rationale behind the Euro Plus Pact is evident in its original name, the Competitiveness Pact, and also in its current subtitle: “Stronger economic policy coordination for competitiveness and convergence” (European Council 2011, p. 13). Deteriorating competitiveness in individual countries is seen as a source of economic and financial instability. This view is directly stated in the conclusions from the European Council meeting at which the Euro Plus Pact was adopted (European Council 2011, p. 5):

The Euro Plus Pact [...] will further strengthen the economic pillar of EMU and achieve a new quality of policy coordination, with the objective of improving competitiveness and thereby leading to a higher degree of convergence [...].

The core of the Pact is the obligation of each participating country to retain competitiveness in order to avoid the build-up of financial imbalances, chiefly in the form of large current account deficits. This underlying economic “philosophy” is spelt out in Marzinotto (2011, p. 93):

Implicit to the design of the recent economic governance reform is the idea that southern European countries have accumulated large current account deficits because poor price competitiveness impeded them to export abroad.

The same point has been made by other commentators and analysts.⁴ The policy-making process meant that the Euro Plus Pact ended up including a large number of policy commitments regarding flexicurity, pension sustainability, health care, social benefits and tax policy coordination, but these measures are seen

4. One example is the succinct account in Gros (2011, p. 1): “The (relative) unit labour costs of GIP(S) countries Greece, Ireland, Portugal and Spain have increased: this is the fundamental cause of their problems as export performance must have been bad, pushing them into current account deficits.”

as instruments for improving competitiveness in individual member countries.

The Euro Plus Pact has been subject to several policy-oriented analyses, especially in the months prior to and right after its adoption in March 2011. The policy discussion has brought up many important points relating to its underlying economic philosophy and to its practical implementation. Groll and van Roye (2011) argue that it is the *level* of unit labour costs, not changes in these costs, which provides the most appropriate measure of the convergence that has been achieved. Gros and Alcidi (2011) make a similar point and explain that the indices of relative unit labour costs can convey very different messages depending on the base year and the length of the sample used. They also argue that important issues have been left out of the Euro Plus Pact because measures to address the issues are politically inconvenient for the core countries in the euro area.

Gros (2011) argues that the Euro Plus Pact is based on flawed economics as competitiveness indicators are weak predictors of future export performance; Estonia, for example, has had rapidly increasing relative unit labour costs but also strong export growth over extended periods of time. Wyplosz (2011) argues that it is inappropriate to focus on unit labour costs relative to euro area countries as more informative competitiveness measures would include all trading partners. Marzinotto (2011) is also critical of the underlying rationale of the Euro Plus Pact, but points out that a solution to the economic problems in the peripheral countries must include measures to strengthen their competitiveness.

Holinski *et al.* (2012) find that the capital flows from North European to South European countries in the period 1992–2007 led to the accumulation of imbalances as they cannot be explained by fundamentals such as differentials in productivity growth. De Grauwe (2011) argues that monetary unions are especially susceptible to fiscal crises as governments do not have access to inflationary financing and are therefore exposed to sudden changes in capital flows. Krugman (2012) states that “the roots of the euro crisis lie not in government profligacy but in huge capital flows from the core (mainly Germany) to the periphery during the good years. These capital flows fuelled a peripheral boom, and sharply rising wages and prices in the [recipient] countries relative to Germany”.

In the context of the Euro Plus Pact the question is whether weak competitiveness leads to capital inflows (current account deficits) or whether capital inflows lead to weak competitiveness. Obviously the policy conclusions differ depending on the answer to this question. We establish the direction of the relationship through the time dimension using Granger causality tests and vector autoregressive models comprising the two variables in question, i.e. changes in the relative unit labour cost and changes in the current account balance. In this way the paper can be seen to address the question: “What comes first, competitiveness or capital flows?”

The empirical analyses are undertaken using a panel dataset comprising approximately 15 years of data for 27 EU countries. The use of panel data makes reliable estimations possible in spite of the short time frame. The panel data estimations assume homogeneity of the slope coefficients across the countries in the sample, and the estimated slope coefficients or marginal effects may thus be seen as *average* values for all the countries in the sample. The Euro Plus Pact has been adopted by almost all EU countries and it is therefore reasonable to base assessments of the Pact on estimates of the average effects for 27 EU countries or different subsets of the 27 countries in the dataset.

This paper is the first to assess the contents of the Euro Plus Pact using an econometric analysis of the main causal assumption underlying the Pact. As such the paper contributes to the important discussion of economic governance in the euro area and the European Union at large. The issue discussed in the paper is, however, also of importance in its own right. The linkages between capital flows and the real exchange rate or other measures of competitiveness are widely debated, and there is a large literature that provides quantitative estimates of these linkages, particularly for emerging market economies (see the literature survey in Section 1). The paper contributes to this literature by providing estimates for the European Union and for different subsets of EU countries. The paper is also testing for linkages in both directions, not only in one direction as typically seen in the literature. Finally, the use of VAR models allows a more complete modelling of the dynamics, but is relatively unusual within this literature.

The rest of the paper is organised as follows: Section 1 discusses the existing literature on the links between competitiveness and

capital flows. Section 2 presents the dataset, time series properties and various crossplots. Section 3 shows the results of simple Granger causality tests. Section 4 presents different VAR models and their impulse responses. Finally, Section 5 summarises the paper and draws some policy conclusions.

1. Competitiveness and external capital flows

This section reviews and discusses contributions to the literature on the linkages between external capital flows and competitiveness. The linkage from competitiveness to capital flows is discussed first, the linkage from capital flows to competitiveness afterwards. In each case some theoretical underpinnings are reviewed, followed by brief surveys of empirical and policy-oriented studies.

It is evidently a simplification to consider the linkages between competitiveness and external capital flows in isolation. There may for instance be factors that affect both the current account balance and the real exchange rate, e.g. the net foreign asset position, energy prices or economic policies (Obstfeld and Rogoff 1995; Ostry, 1988; Lartey 2008).⁵ In the discussion below it is argued, however, that there will likely be many cases in which either competitiveness or external capital flows are affected by largely exogenous or autonomous factors.

1.1. From competitiveness to capital flows

The theoretical starting point is the standard Keynesian model of an open economy in which net export is assumed to be a negative function of the real exchange rate, where the real exchange rate is defined as the price of domestic production relative to the price of foreign production measured in the same currency unit (Krugman and Obstfeld 2003, Ch. 16). The underlying assumption is that both domestic demand and export demand depend negatively – and strongly – on price. The Marshall-Lerner condition states that if the trade balance is initially in balance, the sum of the

5. The interaction between the two variables may also depend on the characteristics of the shocks affecting the economy, such as whether shocks are temporary or permanent and whether they are anticipated or unanticipated (Agenor, 1998).

numerical values of the price elasticities of domestic and foreign demand must exceed one in order for a real depreciation to improve the trade balance and hence the current account balance. The numerical elasticities might be small in the short term because of long-term contracts and sluggish substitution, which implies that the trade balance deteriorates in the short term and only improves in the longer term, the celebrated *j*-curve effect.

Changes in the real exchange rate, unit labour costs or other measures of competitiveness can be autonomous or independent in the sense that they are not influenced by changes in external capital flows. This would be the case when factors like nominal exchange rates, productivity and nominal wage rates change because of exogenous factors. An example of this is changes in trade union power or labour market institutions that may affect nominal wages and/or productivity without any impetus from external capital flows.

The link from competitiveness to the current account balance is also at the core of many concepts of an *equilibrium exchange rate* (Williamson 1985, 1994). The equilibrium exchange rate is then taken to be the real exchange rate – or another suitable competitiveness indicator – that is compatible with a desired current account balance. This is the idea behind the *Macroeconomic Balance Framework* developed by the International Monetary Fund to assess misalignment of the real exchange rate (Isard *et al.*, 2001; Isard, 2007). The real exchange rate is seen to be misaligned if it differs markedly from the estimated equilibrium value over a period of time. The real exchange rate is overvalued if it is associated with excessive current account deficits.

A large number of studies have tested the hypothesis of a link from competitiveness to current account developments, using datasets from both developed and developing economies. The overall conclusion is that the effect is non-existent or very subdued in the short term, but that the effect might be more pronounced in the longer term. There seems to be some heterogeneity across the sample countries.

Rose (1991) finds that the hypothesis of a link from the real exchange rate to the trade balance gains little support in a sample of five OECD countries and conjectures that the numerical import

and export price elasticities are small. Bachman (1992) finds that measures of competitiveness have very little explanatory power for the current account balance in the USA. Bahmani-Oskooee and Kara (2003) estimate co-integration models for nine industrialised countries and reach the conclusion that there is no consistent finding; the reaction of trade flows to changes in import and export prices varies substantially across the countries. Boyd *et al.* (2008) use a sample of eight OECD countries and find that there is an effect from the real exchange rate on the trade balance in most of the sample countries, but the effect occurs after a substantial delay, providing support for the *j*-curve effect.

After the outbreak of the global financial crisis, many studies have discussed a possible link from competitiveness to the trade balance or current account balance. The results are mixed and occasionally difficult to interpret. Zemanek *et al.* (2009) argue that a lack of competitiveness led to large current account deficits in some euro area countries prior to the global financial crisis. The empirical analysis suggests that structural reforms in the deficit countries may help strengthen the current account balance.

Belke and Dreger (2011) investigate the relative importance of competitiveness and income convergence for the current account in 11 euro area countries. The current account balance, the relative real effective exchange rate and the relative income level are all found to exhibit unit roots and to be co-integrated. An appreciation of the relative real effective exchange rate is associated with a worsening of the current account balance.

Some analytical studies have drawn attention to deteriorating competitiveness in countries in the geographical periphery of Europe. Fischer (2007) uses various concepts of real equilibrium exchange rates and finds that Germany gained competitiveness and several South European countries lost competitiveness between the introduction of the euro in January 1999 and the end of 2005. It is concluded that these developments to some extent reversed previously existing disparities. Dullien and Fritsche (2008) find that several South European countries experienced rapid increases in unit labour costs and, furthermore, that deviations from a long-term equilibrium level only closed very slowly. Jaumotte and Sodsriwiboon (2010) find that the real exchange rate in the South European euro countries was substantially overvalued

relative to its equilibrium value at the onset of the global financial crisis. The finding results, however, from current account balances being above levels deemed sustainable, and the analysis does not detect the direction of the linkage.

1.2. From capital flows to competitiveness

The direction from capital flows to competitiveness has a long history in the literature, starting with Böhm-Bawerk's (1924) famous statement that the capital balance rules the trade balance and not *vice versa*. Keynes emphasised the destabilising effects of external capital flows. In the Keynes-Ohlin controversy on wartime reparations, Keynes referred to a *transfer paradox*: the reparations to be paid by Germany after World War I, would worsen the competitiveness of the recipient countries through an appreciation of the real exchange rate, i.e. a negative terms-of-trade effect (Keynes, 1929).⁶

A similar effect may also be the result of increased prices or production of export products. The increased export revenue may lead to a real exchange appreciation, which worsens competitiveness in other export industries and in import-competing sectors (Corden, 1984). The mechanisms underlying this *Dutch Disease* are parallel to those of the *transfer paradox* as the export revenue amounts to a capital inflow.

This paper uses the term the *transfer effect* about the short-term phenomenon that increased capital inflows lead to real exchange rate appreciation and increased capital outflows lead to real exchange rate depreciation. The main theory explaining the transfer effect is based on short-term changes in demand for non-traded products (Sy and Tabarraei, 2009; Edwards, 1988; Corden and Neary, 1982).

The models typically assume two traded goods, an import good and an export good, and one non-traded good. Inflow of capital implies *ceteris paribus* that additional traded resources are available for domestic absorption, while outflow of capital implies that less traded resources are available. Consider an inflow of capital caused by an independent factor such as lower interest rates abroad. The

6. In the early 1940s, Keynes proposed a common currency, the *Bancor*, plus a clearing union in order to deal with excessive debit balances (Keynes, 1942, p. 20).

capital inflow makes additional resources available for domestic absorption such as consumption and investment, and the increased demand will typically be directed towards both traded and non-traded goods. While the prices of the traded goods are determined from abroad, the increased demand for the non-traded good drives up the price of the product and of production factors such as labour. The result of the capital inflow is an appreciation of the real exchange rate (the price of traded goods relative to the price of non-traded goods) or deteriorating competitiveness as measured by higher unit labour costs. A capital outflow will have the opposite effect as lower demand for non-traded goods will lead to a real depreciation or lower unit labour costs.

The effect of a capital inflow will reflect the characteristics of the economy. It will depend on how the increased demand is divided between traded and non-traded goods and it may also depend on the distribution between consumption and investment and the distribution of investment between the traded and non-traded sectors. *Ceteris paribus*, the real appreciation is likely to be smaller if the capital inflow is spent on productivity-enhancing investments in the non-traded sector.

It is possible that capital flows are autonomous and independent of the state of competitiveness of the economy. The financial fragility hypothesis by Minsky (1982, pp. 117-162) suggests that boom-bust cycles in financial markets can be the result of "euphoric expectations". This may be particularly relevant in the European case, where the introduction of the euro and integration of Central and Eastern Europe can be seen as triggers for the build-up of euphoric expectations in the Minsky sense. Gabrisch (2011) points out that the euphoric expectations may lead to capital inflows directed toward financial assets and real estate and, thus, set in motion an asset price boom. This can spread to the investment sector and other industries and also to unit labour costs, depending on how the labour market functions.

The empirical evidence is mixed. Calvo *et al.* (1993) show that countries in Latin America at different times experienced episodes of substantial capital inflows and the result was real appreciations. The capital inflows occurred in countries with very diverse economic conditions, suggesting that the capital flows were in large part driven by events outside the region. Calvo *et al.* (1996)

show that developments in both Asian and Latin American countries in the late 1980s and early 1990s were consistent with the transfer effect. The papers did not apply any econometric testing. Rajapatirana (2003) uses data for the period 1985-2000 and reaches the same conclusion as Calvo *et al.* (1996), but also finds that the real appreciation following net capital inflows was much larger in Latin American countries than in Asian countries, possibly because of different compositions of the capital flows.

Bakardzieva *et al.* (2010) found for a panel of emerging market economies (including Eastern European countries) that net total capital inflows led to an appreciation of the real effective exchange rate. The effects, however, differed depending on the type of capital flow. For most types of capital (portfolio investment, loans, foreign aid, remittances or income transfers), a capital inflow led to a real appreciation, but this was generally not the case for capital stemming from foreign direct investments.

Saborowski (2009) use a broad sample of 84 countries during the period 1990-2006 to investigate the effect of capital flows on the real exchange rate. The study finds that capital inflows in the form of FDI generally lead to an appreciation of the real exchange rate. Importantly, the tendency towards real appreciation is attenuated if the recipient country has a highly developed financial sector.

Morande (1988) tests whether real appreciation came before foreign capital inflows or *vice versa* in Chile. The analysis is based on small VAR models estimated on monthly data for the period 1977-1983. The conclusion is that the direction of the linkage is from capital inflows to real exchange rate appreciation.

The importance of capital flows on competitiveness has received only little attention in the debate on European governance reform. Perez-Caldenty and Vernengo (2012) argue that the large current account surpluses in the core euro countries contributed to the misalignment of real exchange rates within Europe. Schnabl and Zemanek (2011) similarly highlight current account trends within Europe and the possible destabilising consequences.

1.3. Direction of relationship

The literature on international competitiveness and the current account balance includes simple and straightforward theories

explaining causation in either direction. It is not possible *ex ante* to ascertain the direction of the linkage; only empirical studies on a concrete sample can provide such information. There are empirical studies that find a link from competitiveness to the current account balance and numerous other studies establishing a link in the opposite direction. It is noticeable, however, that very few empirical studies include tests that allow for linkages in both directions – a notable exception is Morande (1988) – and this omission limits the policy conclusions of the studies.

2. Data and time series properties

The dataset used in the empirical analysis is a panel of annual data from 1995 until 2012 for 27 EU countries (all except Croatia which joined in 2013).

The variables used in the empirical analysis follow directly from the discussion of the Euro Plus Pact in introduction. The Pact aims to restrain the growth of unit labour costs in order to prevent current account imbalances. The analyses therefore focus on these two variables. To keep the analyses simple and easily comprehensible, no other variables except country fixed effects are used. The parsimonious specifications should be seen as reduced form models. Section 5 discusses extensions of the analyses including the use of additional variables. The panel is unbalanced as observations of unit labour costs at the beginning of the sample are missing for some countries. All data were downloaded from the Eurostat database on 4 November 2013.

As is customary in the literature, the capital flow variable is taken to be the current account balance (Reinhart and Reinhart 2009). By definition, the sum of the current account balance, the financial account balance and the *reduction* in official reserves is nil (in the absence of errors and omissions), where the financial account balance is the sum of net foreign direct investment, net portfolio investment and net other investment (loans etc.). The current account balance is typically measured more precisely and more consistently than the financial balance and its components.⁷

7. A current account deficit is financed through a financial account surplus and/or a reduction in official reserves. Reinhart and Reinhart (2009) argue that the measure of capital flows should ideally be computed as the current account balance plus the *reduction* in official reserves. One argument for removing changes in official reserves is that they are the result of administrative, non-private, decision making.

The current account balance as a percentage of GDP is denoted CA (classifier *bop_q_gdp*). A current account surplus, $CA > 0$, is tantamount to a net capital outflow and indicates the accumulation of net foreign assets. A current account deficit, $CA < 0$, shows a net capital inflow and implies a deterioration of the net foreign asset position. In the baseline specifications, the change in the current account, $DCA = CA - CA(-1)$, is used.

The variable GRULC denotes the percentage *growth* of the unit labour cost in the individual EU country *relative* to the percentage growth of the *unit labour cost* in the EA12, i.e. the 12 first euro area countries, with the unit labour cost is expressed in terms of common currency units (ECU/EUR). The index of the nominal unit labour cost is defined as the ratio between the nominal compensation per employee and the productivity per employee (Eurostat classifier *nama_aux_ulc*⁸). The unit labour cost is converted to common currency units (ECU/EUR) using market exchange rates.⁹ An increase in the relative unit labour cost, $GRULC > 0$, signifies a worsening of competitiveness relative to the EA12, while a decrease in the relative unit labour cost, $GRULC < 0$, signifies an improvement in competitiveness relative to the EA12.

It is noticeable that the GRULC variable is a variable depicting changes in competitiveness relative to the EA12, not the entire group of EU and non-EU trading partners of a country. The CA variable, meanwhile, refers to the total current account balance of a country, not only towards to EA12. To examine the importance of the asymmetry in the country coverage of the two variables, we include real effective exchange rate indices, deflated using unit labour costs or consumer prices from the 37 largest trading partners of each country. The variable is GREER_ULC, which is the percentage change in the real effective exchange rate against

8. The unit labour cost is not available for Greece and Malta for 1996–2000 and for Romania for 1996–1999 due to missing source data. A few data points for early parts of the sample are downloaded from earlier versions of the Eurostat database.

9. For the euro area countries Eurostat expresses the nominal unit labour cost as “euro fixed” values for the years prior to the introduction of the euro, i.e. data in the national currency values are converted to EUR/ECU values using the irrevocably fixed exchange rate at the time of the introduction of the euro. The use of fixed conversion factors rules out comparison across countries and the euro fixed values are therefore converted into EUR/ECU values using the market exchange rates of the national currencies against EUR/ECU (classifier *ert_bil_conv_a*). For the 10 countries outside the euro area, the nominal unit labour cost is converted to ECU/EUR using the nominal exchange rates (classifier *ert_bil_eur_a*).

37 trading partners deflated using the unit labour cost in the total economy (classifier: *ert_eff_ic_a*). The variable is GREER_CPI which is the percentage change in the real effective exchange rate against 37 trading partners deflated using consumer price indices (classifier: *ert_eff_ic_a*).

The time series properties of the data series are important for the choice of empirical methodology. Table 1 shows the results of panel data unit root tests, with common and with country-specific roots, for the data series GRULC, CA and DCA. The result is that GRULC is panel stationary while CA has a unit root (although the PP-Fisher test suggests a borderline case), and DCA, the first difference of CA, is panel stationary. The analyses in this paper generally use the two stationary variables GRULC and DCA, but the possible borderline result for CA suggests that it is judicious to use this variable in robustness analyses.

Table 1. Tests of unit roots of panel data series, 1997–2012

	Levin, Lin, Chu ^a	Im, Pesaran and Shin ^b	ADF- Fisher ^b	PP- Fisher ^b
GRULC	-12.388 [0.000]	-9.198 [0.000]	192.688 [0.000]	249.950 [0.000]
CA	-0.940 [0.174]	-0.932 [0.176]	64.896 [0.147]	57.0726 [0.339]
DCA	-7.901 [0.000]	-7.902 [0.000]	165.069 [0.000]	309.707 [0.000]

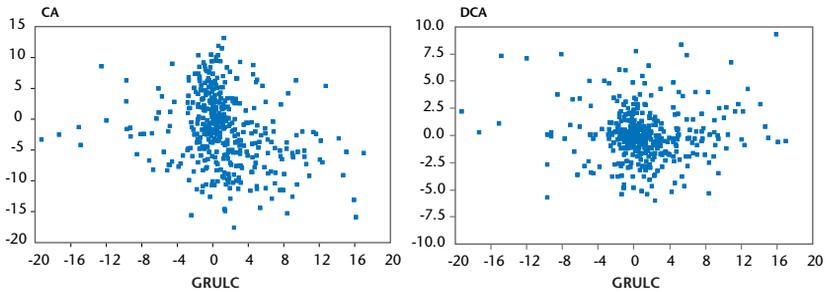
a. The test assumes a common unit root across the countries.

b. The test allows for different unit roots across the countries.

Notes: The null hypothesis is in all cases that the variable has a unit root. The tests allow for country-specific intercepts in the test regressions. The values in square brackets are *p*-values.

Figure 1 shows crossplots of the growth in the relative unit labour cost GRULC and the current account balance CA or the change in the current account balance DCA for 27 EU countries for the period 1995–2012, the scales being chosen so that a few extreme observations have been left out. Both crossplots exhibit weak negative correlations, but no clear patterns are apparent. Moreover, the possible directions of any possible linkages cannot be ascertained without econometric analysis.

Figure 1. Crossplots GRULC and CA or DCA; annual data 1997–2012, 27 EU countries



Note: GRULC is the change in the relative unit labour cost as a percentage, CA is the current account balance as a percentage of GDP, DCA is the change in the current account balance in percentage points of GDP. A small number of observations for which GRULC is below -20 percent or above 20 percent or CA is below -20 percent of GDP or above 20 percent of GDP have been omitted.

3. Granger causality tests

The discussion in Section 1 suggests that the possible effect of competitiveness on the current account is likely to occur with a time lag (*j*-curve effect) and, conversely, the possible effect of the current account on competitiveness may also appear with a time lag, especially in cases with a fixed exchange rate. It is therefore reasonable to identify the direction of causality using the time dimension, i.e. causality is associated with the lagged values of a variable having explanatory power over the other variable.¹⁰

This section presents the results of the Granger causality tests, which ascertain the time-based relationship between the two variables of interest, in this case between GRULC, the percentage growth in the relative unit labour cost, and DCA, the change in the current account balance in percentage points of GDP. The tests are carried out for a large number of specifications and for different country groups in order to examine the robustness of the results. The baseline Granger causality tests include annual changes in the relative unit labour costs and annual changes in the current account balance. The results therefore relate to the short or medium term horizon, while the long-term relation between the variables is not modelled.

10. Morande (1988) also tests for time-based (Granger) causality using different VAR models including variables such as the real exchange rate and external capital flows. The methodology is also related to the co-integration analysis in Belke and Dreger (2011) although the latter does not seek to identify the direction of causality.

The Granger causality test is performed in a model in which the dependent variable is explained both by one or more lags of itself and one or more lags of an independent explanatory variable (and possibly control variables). The Granger causality test is a standard Wald test with the null hypothesis that the coefficient or coefficients of the lagged independent explanatory variable are zero. The test statistic follows an F -distribution or, in the case of the System GMM estimation, asymptotically a χ^2 -distribution. If the null hypothesis is rejected, the lagged variable is said to *Granger cause* the other variable. Granger causation implies that an independent explanatory variable precedes and helps to explain the dependent variable, but no fundamental causation can be ascertained as the independent explanatory variable will typically not be exogenous.

To avoid that outliers affect the results unduly, a few extreme observations have been trimmed from the dataset. Observations in which GRULC is below -20 percent or above 20 percent and observations for which CA is below -20 percent of GDP or above 20 percent have been omitted. These observations typically relate to episodes of extreme economic or financial instability. In total, 10 observations have been omitted due to this trimming of the dataset. The results are generally not very sensitive to the specific choice of cut-off points; the results only change marginally if instead the low cut-off point is taken to be -15 percent and the high cut-off point to be 15 percent.

Table 2 shows the results of panel data estimations used to test whether lags of DCA have explanatory power towards GRULC when one or more lags of GRULC are included, i.e. to test whether GRULC Granger causes DCA. Column (2.1) shows a simple estimation with country fixed effects and one lag of both variables. The null hypothesis of no explanatory power of GRULC cannot be rejected. The same applies in Column (2.2) in which the fixed effects are omitted and the model is estimated using ordinary least squares. It is noteworthy that the estimation results in Columns (2.1) and (2.2) are so similar. This is the result of the country fixed effects generally be very small, ranging from -0.46 to 0.54. A Wald test cannot reject the null hypothesis that the fixed effects are redundant (i.e. all 0) as the F -distributed test statistic is 0.159 (p -value = 1.000).

Table 2. Panel data Granger causality tests. Dependent variable = DCA

	(2.1)	(2.2)	(2.3)	(2.4)	(2.5)	(2.6)
DCA(-1)	0.125 (0.069)	0.133 (0.099)	0.222 (0.071)	0.116 (0.088)	-0.032 (0.123)	0.188 (0.117)
DCA(-2)	..	..	..	-0.221 (0.045)	0.101 (0.043)	-0.273 (0.054)
GRULC(-1)	0.053 (0.047)	0.056 (0.038)	0.083 (0.044)	0.047 (0.038)	-0.016 (0.045)	0.053 (0.044)
GRULC(-2)	..	..	..	0.036 (0.032)	-0.046 (0.021)	0.055 (0.039)
Granger causality ^a	1.20 [0.270]	2.21 [0.138]	3.65 [0.056]	0.88 [0.427]	2.56 [0.113]	1.15 [0.359]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	408	408	408	383	220	138
Estimation	FE	OLS	System GMM	FE	FE	FE

a. The null hypothesis of the Granger causality test is that the lagged value(s) of the independent variable do(es) not Granger cause the dependent variable. The test statistic is F -distributed except in the System GMM estimation in which case it is χ^2 -distributed; the values in square brackets are p -values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

In a panel, the presence of the lagged dependent variable may lead to biased estimates when the model is estimated with OLS or fixed effects OLS (*Nickell bias*). This should not be a major problem in the present model as the coefficient of the lagged dependent variable is small and the country fixed effects are anyway economically and statistically insignificant. To assess this issue the model is estimated using the two-step System GMM methodology developed by Arellano and Bover (1995) and Blundell and Bond (1998).

The two-step System GMM estimations are undertaken using the Stata command `xtabond2`. The lagged dependent variable is instrumented, while the lagged independent explanatory variable is not instrumented. In the difference equation the instruments of the lagged dependent variable are, inter alia, expanding lags of its level lagged 2 and 3 years (truncated); in the level equation the instrument is the lagged difference of the dependent variable. The weighting is based on the $h(2)$ weighting matrix.

The estimated coefficients are qualitatively similar to those obtained using fixed effects least squares. The hypothesis of no

Granger causality can be rejected at the 5 percent level and the coefficient of $GRULC(-1)$ is *positive*, which taken at face value indicates that higher unit labour costs are followed by an increase in (an “improvement” of) the current account balance. Qualitatively similar results are attained with different truncations of the instruments and if the lagged independent variable is also instrumented. This confirms a possible bias due to inclusion of the lagged dependent variable is little importance.

The conclusion at this stage is that changes in relative unit labour costs do not appear to precede changes in the current account balance and, if any effect is present, then the higher unit labour costs may be followed by an improvement of the current account balance. Moreover, inclusion of the lagged dependent variable and possibly endogeneity of the lagged independent variable does not appear to bias the fixed effect results unduly so fixed effect estimation appears to be appropriate in this case.

The next step is to allow a richer dynamic structure of the model. Column (2.4) shows the results when two lags of both variables are introduced as explanatory variables. In this case Granger causality entails the rejection of the joint hypothesis that the coefficients of $GRULC(-1)$ and $GRULC(-2)$ are 0. The hypothesis cannot be rejected (p -value = 0.427), suggesting that the inclusion of two lags of changes in the unit labour cost does not change the results obtained previously. Column (2.5) shows the results when the sample is restricted to the EU15 countries, i.e. the first 15 EU countries from Western Europe. The result is that the null hypothesis cannot be rejected even at the 10 percent level, but it is noticeable the estimated coefficient of $GRULC(-1)$ and $GRULC(-2)$ in this case that are negative although numerically small. Column (2.6) shows the results when the sample is restricted to the 10 CEE countries and the overall picture is as for the full sample and the EU15 countries. The conclusion of the models with lags up to two years is again that changes in relative unit labour costs have no apparent effect on changes in the current account in the short term.

Table 3 shows the results when the opposite direction of Granger causality is investigated. To this end, the change in the relative unit labour cost, $GRULC$, is explained by autoregressive terms and lagged changes in the current account balance, DCA . Column (3.1) shows the results when one lag is included and the

panel is estimated using fixed effects. The lagged current account balance has substantial explanatory power; an increase in the change of the current account balance (“capital outflow”) of one percentage point of GDP is associated with 0.392 percent lower growth in the unit labour cost the following year, i.e. a considerable improvement in international competitiveness. By the same token, a capital inflow leads to deteriorating competitiveness the following year. Similar results follow from the OLS estimation in Column (3.2) and the System GMM estimation in Column (3.3).

Table 3. Panel data Granger causality tests. Dependent variable = GRULC

	(3.1)	(3.2)	(3.3)	(3.4)	(3.5)	(3.6)
DCA(-1)	-0.392 (0.104)	-0.381 (0.086)	-0.315 (0.139)	-0.289 (0.105)	-0.340 (0.116)	-0.312 (0.150)
DCA(-2)	..	..	..	-0.285 (0.079)	-0.344 (0.115)	-0.356 (0.104)
GRULC(-1)	0.097 (0.059)	0.129 (0.059)	0.159 (0.053)	0.088 (0.045)	0.184 (0.073)	0.057 (0.053)
GRULC(-2)	..	..	..	-0.127 (0.051)	-0.058 (0.042)	-0.150 (0.066)
Granger causality^a	14.24 [0.001]	19.71 [0.000]	5.13 [0.024]	10.29 [0.001]	5.62 [0.016]	9.60 [0.006]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	408	408	408	383	220	138
Estimation	FE	OLS	System GMM	FE	FE	FE

a. The null hypothesis of the Granger causality test is that the lagged value(s) of the independent variable do(es) not Granger cause the dependent variable. The test statistic is F -distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p -values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

Column (3.4) shows the results when two lags are included. The coefficients of the two lags of the current account variable are both negative. They are highly significant in both economic and statistical terms. The null hypothesis of no explanatory power of the two lags of the current account is rejected, i.e. changes in the current account Granger cause changes in the relative unit labour costs. Column (3.5) shows the results when the sample comprises the EU15 countries and Column (3.6) shows the results for the sample of CEE countries. In these samples too, the estimated coef-

ficients of the lagged changes in the current account balance are negative; changes in current account balance are found to Granger cause changes in the relative unit labour cost.

The conclusions from the Granger causality tests in Tables 2 and 3 are clear. Lags of GRULC do not help explain DCA in estimations in which lags of DCA are included. In other words, changes in the relative unit labour cost do not Granger cause changes in the current account balance. This holds across different samples of countries and across a number of estimation methodologies. In contrast to these results, lags of DCA appear in most cases to have substantial explanatory power over changes in GRULC in models where lags of GRULC are included. In other words, changes in the current account balance Granger cause changes in the relative unit labour cost. This implies that for instance an increasing inflow of capital (a deteriorating current account balance) leads to deteriorating competitiveness.

The estimations presented in Tables 2 and 3 were carried out using the change in the relative unit labour cost, GRULC, and the change in the current account balance, DCA. As argued earlier, it may also be of interest to test for Granger causality between GRULC and the *level* of the current account balance, CA. Tables A1 and A2 in Appendix A show the results when the estimations in Tables 2 and 3 are made using the level of the current account balance, CA, instead of its change, DCA.

In qualitative terms most of the results remain unchanged. Table A1 shows the results of estimations in which changes in the current account balance are explained by autoregressive terms and lagged changes in the relative unit labour cost. Lagged changes in the relative unit labour cost do not Granger cause the current account balance, irrespective of the sample or estimation method. Table A2 presents the results of estimations where the dependent variable is the change in the relative unit labour cost. In all specifications the level of the lagged current account balance is found to Granger cause changes in the relative unit labour cost at least at the 10 percent level of statistical significance. The rejection is stronger for the CEE countries than for the EU15 countries.

Another robustness test entails replacing the change in the relative unit labour cost, GRULC, by other measures of changes in competitiveness. Two measures are available, i.e. the change in the real effective exchange rate computed using the unit labour cost as deflator (GREER_ULC) and the change in the real effective exchange rate based on the consumer (GREER_CPI). The three variables are closely correlated; the correlation coefficient is 0.86 between GRULC and GREER_ULC and 0.64 between GRULC and GREER_CPI.

Tables B1 and B2 in Appendix B show the results when the GREER_ULC is the measure of changes in competitiveness. The results are qualitatively the same as when GRULC is used, i.e. competitiveness does not Granger cause changes in the current account, but changes in the current account do seem to Granger cause the competitiveness measure. The group of EU15 countries emerge as a partial exception to this picture, cf. the results in Column (B1.5), but it is noticeable that the estimated coefficients of the two lags of GREER_ULC are numerically small and take on different signs.

Tables C1 and C2 in Appendix C provide the results when the GREER_CPI is the measure of changes in competitiveness. The results are again qualitatively as when GRULC is used although the results are less clear for the group of EU15 countries. The results in Column (C2.5) suggest a negative relationship between lags of changes in the current account balance, but the individual coefficients are not statistically significant and the Granger causality test of the coefficients both being equal zero cannot be rejected. Further analysis (not reported) shows that the imprecisely estimated coefficients is largely attributable to events in five euro area crisis countries in 2012; the results change markedly if these five observations are excluded from the sample.

The upshot of the robustness analyses reported in Appendices B and C is that the specific choice of competitiveness measure generally is of little importance when assessing the relation between competitiveness and external capital flows. This result is in line with other studies. Dieppe *et al.* (2012) find that different measures of competitiveness are closely correlated within the euro area. Ca' Zorzi and Schnatz (2007) find that different measures of competitiveness are equally suitable for forecasting of export performance.

4. VAR models

This section extends the analysis in Section 3 by modelling changes in relative wage cost competitiveness and the current account balance in a vector autoregressive (VAR) model. This allows a deeper investigation of the interactions between the two variables over time. In particular, the reaction of the two variables to shocks can be computed using different assumptions for the temporal relation between the variables, including no lag between the change in one variable and the resulting change in the other variable. We will focus on changes in the relative unit labour cost, GRULC, and changes in the current account balance, DCA. Both variables are panel stationary.

Even allowing for simultaneous dependence between the two variables GRULC and DCA, the system can be reduced so as to contain only lags of the two variables as explanatory variables. Estimations are made using two lags and considering three different country samples: 27 EU countries (all except Croatia), the EU15 countries and the 10 CEE countries. The results of the system estimations, presented in Table 4, correspond to the results in Columns (2.4)-(3.4), (2.5)-(3.5) and (2.6)-(3.6). The panel VAR systems are estimated using fixed effect least squares as the method

Table 4. Estimation of panel VAR models, GRULC and DCA

	(4.1)		(4.2)		(4.3)	
	DCA	GRULC	DCA	GRULC	DCA	GRULC
DCA(-1)	0.116 (0.053)	-0.289 (0.077)	-0.032 (0.078)	-0.340 (0.124)	0.188 (0.085)	-0.312 (0.130)
DCA(-2)	-0.221 (0.052)	-0.285 (0.075)	0.101 (0.080)	-0.344 (0.127)	-0.273 (0.082)	-0.356 (0.125)
GRULC(-1)	0.047 (0.027)	0.088 (0.039)	-0.016 (0.040)	0.184 (0.063)	0.053 (0.040)	0.057 (0.060)
GRULC(-2)	0.036 (0.025)	-0.127 (0.036)	-0.046 (0.036)	-0.058 (0.058)	0.0555 (0.037)	-0.150 (0.056)
Time sample	1998-2012		1998-2012		1998-2012	
Countries	EU27		EU15		CEE	
Observations	383		220		138	

Notes: Standard errors are shown in round brackets. Country fixed effects are included in all estimations but are not reported.

is generally robust when the time dimension is not too short (Canova and Ciccarelli 2013). The estimations are undertaken in Eviews which does not allow for clustering of the standard errors; the ordinary standard errors are generally somewhat smaller than the clustered standard errors which entails that the confidence intervals of the presented impulse responses are relatively small.

The coefficient estimates are identical to those of the corresponding estimations in Tables 2 and 3 and the standard errors only differ slightly. Across all three country samples, the lags of GRULC exert little explanatory power on DCA, while lags of DCA exert substantial explanatory power on GRULC, both in statistical and economic terms.

This paper seeks to ascertain the most probable direction of the linkages between the two main variables of interest, GRULC and DCA. The VAR model allows a more sophisticated identification of cause and effect than the Granger causality tests in Section 3 which assumed very simple dynamic linkages between the two variables. We will consider three different identification schemes of the VAR models, which entail different causal dynamics between the two variables of interest.

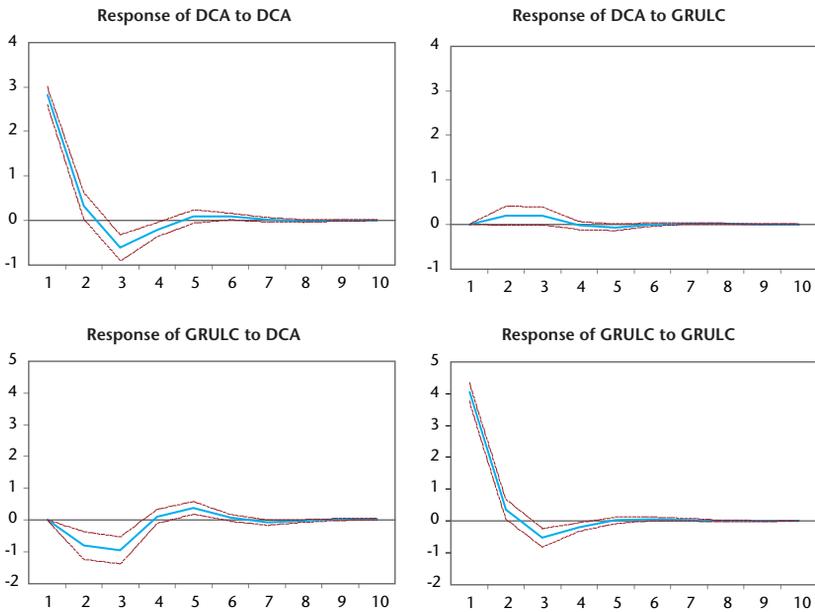
- a) There are no contemporaneous effects between the two variables, only lagged effects. This is a case of over-identification as all off-diagonal elements in the variance-covariance matrix are zero (non-orthogonalisation).
- b) GRULC can affect DCA contemporaneously, while DCA can only affect GRULC with a lag. This is a case of exact recursive identification based on Cholesky decomposition of the variance-covariance matrix.
- c) DCA can affect GRULC contemporaneously, while GRULC can only affect DCA with a lag. This is another case of Cholesky decomposition but with the opposite direction of temporal effects from those in b).

Figures 2-3 present impulse responses for model (4.1) estimated on the full sample of 27 EU countries using the three different identification schemes a)-c).

Figure 2 shows the impulse responses for identification scheme a) in which there are no contemporaneous effects. The upper left plot shows the impulse response of DCA to a one standard devia-

tion shock in DCA in period 1. The effect of the shock dies out relatively quickly but with some overshooting in the third and fourth years. The upper right plot shows the effect on DCA of a one standard deviation increase in GRULC. It follows that the effect is very subdued in both statistical and economic terms, and possibly with the “wrong” sign, i.e. a shock implying higher growth in relative unit labour cost has a positive effect on the change in the current account balance (an “improvement”).

Figure 2. Response of DCA and GRULC to innovations in GRULC and DCA, non-factorised innovations, 27 EU countries



(a) Non-factorised innovations

Note: The solid line depicts the impulse response and the dashed lines \pm two standard deviations. The standard deviation of GRULC is 4.4 percentage points and the standard deviation of DCA is 2.9 percentage points.

The lower left plot shows the impulse response of GRULC to a shock in DCA amounting to a one standard deviation in period 1. The result is a reduction of GRULC for two periods of approximately one percentage point in each period. The effect on GRULC accumulated over all 10 periods is -1.3 percentage points. In other words, a one percentage point increase in net capital outflows (increased capital outflow or reduced capital inflow) leads to a

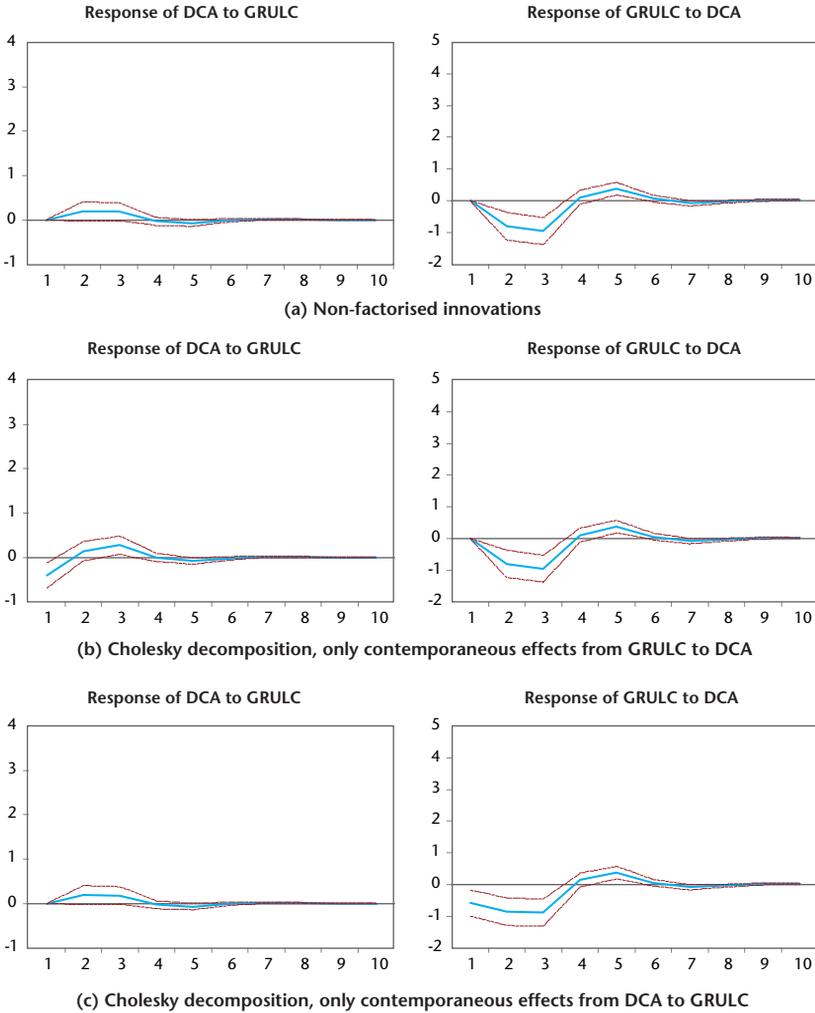
decrease of approximately 0.5 percent in unit labour costs over time. The magnitudes also seem to be significant in an economic sense. Finally, the lower right plot shows the impulse response of GRULC to a one standard deviation shock in GRULC.

Figure 3 presents impulse responses for each of the three identification schemes, a)-c), facilitating easy comparison across the identification schemes. To save space the autoregressive impulse responses are omitted as they resemble those shown in the upper left and lower right plots in Figure 2 in all cases. The upper panel depicts impulse responses for identification scheme a) in which there are no contemporaneous effects. These are the same impulse responses that were presented in upper right and lower left panels in Figure 2.

The centre panel presents the impulse responses for identification scheme b) in which GRULC can affect CA immediately, while the reverse is ruled out. The left plot depicts the response of DCA to a one standard deviation increase in GRULC in period 1. In this case the immediate response is negative, although the effect is not statistically significant at the 5 percent level, while the response is positive in periods 2 and 3 and subsequently dies out. Thus, a possible negative effect on DCA of a one-deviation-increase in GRULC is imprecisely determined and is anyway reversed already from the following period. The right plot shows the response of GRULC to a shock in DCA; the dynamics resemble the dynamics of the corresponding impulse responses in the non-orthogonalised model.

The bottom panel shows the impulse responses for identification scheme c), which assumes that DCA can affect GRULC immediately while effects in the opposite direction take place with a lag. It follows from the left plot that GRULC has little effect on DCA and the previously observed “wrong sign” also appears with this orthogonalisation. It follows from the right plot that a shock in DCA now has an immediate negative effect on GRULC, although not one that is statistically significant at the 5 percent level, and then negative effects the following two years as also observed with identification schemes a) and b).

Figure 3. Response of DCA and GRULC to innovations in GRULC and DCA, different identification schemes, 27 EU countries



Note: The solid line depicts the impulse response and the dashed lines \pm two standard deviations. The standard deviation of GRULC is 4.4 percentage points and the standard deviation of DCA is 2.9 percentage points.

The conclusion from the impulse responses in Figure 3 is that irrespective of the identification scheme, the main results from Section 3 also apply in the VAR model. First, changes in the relative unit labour cost generally have little effect on the current account balance. In most cases the effect appears to be positive, implying that improved competitiveness leads to larger net capital inflows,

i.e. a “worsening” of the current account balance.¹¹ The exception is identification scheme b) where GRULC can affect CA contemporaneously, but the negative effect is short-lived and not statistically significant. Second, changes in the current account balance seem to affect the relative unit labour cost. Increasing current account deficits, signifying increasing capital inflows, are followed by deteriorating competitiveness in the form of the unit labour cost increasing faster than it does in the core euro area countries.

The results obtained are robust not only to the choice of identification scheme, but also to the sample of countries, the time sample and the measure of capital flows. We will briefly discuss some of the robustness analyses we have undertaken.

Country samples. The impulse responses for the sample of EU15 countries and for the sample of CEE countries take the same shape as those for the full sample presented in Figures 2 and 3. This point is illustrated in Figure D1 in Appendix D in which the impulse responses for the CEE countries, cf. Column (4.3) in Table 4, are shown. It is noticeable that the effect of a one standard deviation DCA shock on GRULC is somewhat larger for the sample of CEE countries than for the full sample.

Time samples. We have re-estimated the VAR models in Table 4 using the time sample 1998-2007, i.e. the sample end before the outbreak of the global financial crisis. The lower number of observations reduces the precision with which the coefficients are estimated, but otherwise the changes are small. The impulse responses depict the previously observed pattern of directions (not shown).¹²

Measures of capital flows. We estimated a VAR model with GRULC and the current account balance CA (instead of changes in the current account balance, DCA). The impulse responses using identification schemes a)–c) are reproduced in Figure E1 in Appendix E. The results are essentially as before; changes in the

11. The impulse responses with the “wrong” sign would be consistent with an improvement in competitiveness making the country more attractive as an investment destination and leading to capital inflows. The effect is, however, statistically insignificant in all three identification schemes.

12. A further reduction of the sample to include only the EU15 countries is a partial exception as the effect on GRULC of changes in DCA is slower and less pronounced than when the full sample is used.

relative unit labour cost have no or counter-intuitive effect on the current account balance, whereas innovations in the current account balance affect changes in the relative unit labour cost. The use of real effective exchange rate indices as measures of competitiveness also leads to impulse responses entailing the same qualitative results.

5. Final comments

The Euro Plus Pact adopted in March 2011 establishes monitoring by the European Commission of a number of variables presumed to predicate financial imbalances in individual EU countries. The chief target variable of the Pact is the development of competitiveness as measured by changes in the relative unit labour cost in common currency terms.

The paper uses Granger causality tests and VAR models to analyse the short-term dynamics between changes in the relative unit labour cost and the current account balance. The conclusions of the empirical analyses are robust to a number of sample and specification changes and can be summarised in two points. First, there is little or no effect from changes in the relative unit labour cost on changes in the current account balance (or the level of the current account balance). Second, there is a relatively strong and statistically significant link from changes in the current account balance on changes in the growth of the relative unit labour cost within a horizon of 1–3 years.

These conclusions are consistent with a situation in which capital flows in large part depend on events outside the individual country, i.e. capital flows exhibit a substantial exogenous component. The results are thus in line with findings on other datasets, cf. Calvo *et al.* (1996), Kim (2000), Lipschitz *et al.* (2002) and Jaumotte and Sodsriwiboon (2010). A country may experience a positive “confidence shock” and become a major recipient of capital inflows. An inflow of capital leads to a nominal appreciation if the country has a floating exchange rate or drives up domestic wages and prices. The net result, irrespective of exchange rate regime, is a real exchange rate appreciation or deteriorating international wage cost competitiveness. The opposite may be a negative confidence shock that leads to a capital outflow, which

over time improves competitiveness through lower wages and prices and/or a depreciating nominal exchange rate. The interpretation is consistent with findings based on other dataset, *cf.* Saborwoski (2009) and Bakardzieva *et al.* (2010).

The finding that capital flows are likely to entail changes in competitiveness in the short term while the reverse effect is subdued or non-existent suggests that current account developments may be an important indicator of future macroeconomic performance. The same conclusion is reached by Giavazzi and Spaventa (2010) and Jaumette and Sodsriwiboon (2010). The findings, however, raise the question of whether the Euro Plus Pact targets the messenger of economic imbalances rather than (one of) the underlying causes. Countries subject to large capital inflows experience upward pressure on relative unit labour costs, while countries with large capital outflows will experience downward pressure on relative unit labour costs. The developments in unit labour costs are endogenous and partly determined by capital flows. This may suggest that the Euro Plus Pact may have limited ability to impact unit labour costs and even if it is possible, this may have little effect on the accumulation of current account imbalances.

The results of this paper should not be taken to imply that competitiveness does not matter for economic performance in the longer term. The relative unit labour cost or other measures of competitiveness may still signal the emergence of “imbalances” in individual economies. The argument of this paper is merely that competitiveness is an endogenous variable, which is determined by a whole range of factors in the individual economy and the surrounding economic environment. One such factor is international capital flows, proxied in this paper by the current account balance, and this factor seems to have substantial explanatory power in the sample of EU countries (see also De Grauwe, 2011; Holinski *et al.*, 2012).

The analysis in this paper provides clear results that are largely robust to different samples and specifications. Even so, the analysis may be substantiated or extended in a number of ways. First, additional variables could be included in the VAR model in order to model the adjustment processes in more detail. A richer specification of the VAR may also be a way to investigate the underlying

economic mechanisms behind the identified linkages between the two variables. Second, quarterly data might make it easier to establish the direction of the linkages and estimate the adjustment patterns for different innovations. Third, it might be possible to ascertain the linkages between international competitiveness and capital flows using other means of identification such as instrumentation and event studies. Fourth, it could be useful to divide capital flows into different components, including foreign direct investment, portfolio investment and loans etc., as this would provide information on whether different components affect competitiveness in different ways (Bakardzhieva *et al.* 2010). It may also be expedient to consider a measure of capital flows in which changes in the official reserves are eliminated (Reinhart and Reinhart 2009). Finally, it may be possible to undertake analyses of linkages between competitiveness and capital flows in individual countries in cases where long data series are available.

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APPENDIX A. Additional Granger causality tests

Table A1. Panel data Granger causality tests. Dependent variable = CA

	(A1.1)	(A1.2)	(A1.3)	(A1.4)	(A1.5)	(A1.6)
CA(-1)	0.125 (0.069)	0.133 (0.099)	0.222 (0.071)	0.116 (0.088)	-0.032 (0.123)	0.188 (0.117)
CA(-2)	..	..	..	-0.221 (0.045)	0.101 (0.043)	-0.273 (0.054)
GRULC(-1)	0.053 (0.047)	0.056 (0.038)	0.083 (0.044)	0.047 (0.038)	-0.016 (0.045)	0.053 (0.044)
GRULC(-2)	..	..	..	0.036 (0.032)	-0.046 (0.021)	0.055 (0.039)
Granger causality ^a	1.20 [0.270]	2.21 [0.138]	3.65 [0.056]	0.88 [0.427]	2.56 [0.113]	1.15 [0.359]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	408	408	408	383	220	138
Estimation	FE	OLS	System GMM	FE	FE	FE

a. The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F-distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p-values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

Table A2. Panel data Granger causality tests. Dependent variable = CGRULC

	(A2.1)	(A2.2)	(A2.3)	(A2.4)	(A2.5)	(A2.6)
CA(-1)	-0.243 (0.080)	-0.123 (0.040)	-0.136 (0.057)	-0.477 (0.108)	-0.293 (0.125)	-0.713 (0.111)
CA(-2)	..	..	..	0.199 (0.095)	0.324 (0.150)	0.151 (0.096)
GRULC(-1)	0.090 (0.062)	0.119 (0.057)	0.183 (0.069)	0.086 (0.047)	0.209 (0.065)	0.017 (0.045)
GRULC(-2)	..	..	..	-0.128 (0.049)	-0.044 (0.042)	-0.170 (0.062)
Granger causality ^a	9.23 [0.005]	9.39 [0.002]	5.61 [0.018]	10.00 [0.001]	2.74 [0.099]	24.10 [0.000]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	408	408	408	382	220	138
Estimation	FE	OLS	System GMM	FE	FE	FE

a. The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F-distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p-values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

APPENDIX B. Alternative competitiveness measure

Table B1. Panel data Granger causality tests. Dependent variable = DCA

	(B1.1)	(B1.2)	(B1.3)	(B1.4)	(B1.5)	(B1.6)
DCA(-1)	0.090 (0.070)	0.098 (0.097)	0.183 (0.077)	0.088 (0.086)	-0.002 (0.116)	0.177 (0.118)
DCA(-2)	..	..	..	-0.235 (0.043)	0.113 (0.041)	-0.283 (0.051)
GREER_ULC(-1)	0.041 (0.048)	0.045 (0.037)	0.065 (0.046)	0.032 (0.038)	0.041 (0.018)	0.046 (0.049)
GREER_ULC(-2)	..	..	..	0.030 (0.036)	-0.073 (0.022)	0.067 (0.047)
Granger causality ^a	0.73 [0.401]	1.54 [0.215]	2.05 [0.152]	0.42 [0.660]	11.58 [0.001]	1.02 [0.399]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	410	410	410	388	222	139
Estimation	FE	OLS	System GMM	FE	FE	FE

^a The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F -distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p -values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

Table B2. Panel data Granger causality tests. Dependent variable = GREER_ULC

	(B2.1)	(B2.2)	(B2.3)	(B2.4)	(B2.5)	(B2.6)
CA(-1)	-0.344 (0.107)	-0.335 (0.077)	-0.275 (0.145)	-0.291 (0.108)	-0.234 (0.129)	-0.332 (0.162)
CA(-2)	..	..	..	-0.206 (0.077)	-0.258 (0.144)	-0.288 (0.099)
GREER_ULC(-1)	0.122 (0.059)	0.153 (0.058)	0.163 (0.067)	0.139 (0.052)	0.259 (0.052)	0.083 (0.063)
GR EER_ULC(-2)	..	..	..	-0.121 (0.049)	-0.054 (0.032)	-0.155 (0.072)
Granger causality ^a	11.38 [0.003]	19.18 [0.000]	3.60 [0.058]	7.77 [0.002]	2.88 [0.090]	9.06 [0.007]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	410	410	410	388	222	139
Estimation	FE	OLS	System GMM	FE	FE	FE

^a The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F -distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p -values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

APPENDIX C. Alternative competitiveness measure

Table C1. Panel data Granger causality tests. Dependent variable = DCA

	(C1.1)	(C1.2)	(C1.3)	(C1.4)	(C1.5)	(C1.6)
DCA(-1)	0.082 (0.069)	0.089 (0.096)	0.173 (0.074)	0.091 (0.085)	-0.008 (0.122)	0.196 (0.109)
DCA(-2)	..	..	..	-0.250 (0.042)	0.128 (0.045)	-0.328 (0.032)
GREER_CPI(-1)	0.021 (0.047)	0.034 (0.043)	0.028 (0.045)	0.018 (0.046)	0.068 (0.016)	0.010 (0.063)
GREER_CPI(-2)	..	..	..	-0.018 (0.028)	-0.095 (0.029)	0.017 (0.037)
Granger causality ^a	0.20 [0.661]	0.65 [0.422]	0.39 [0.532]	0.25 [0.782]	19.85 [0.000]	0.13 [0.876]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	410	410	410	388	222	139
Estimation	FE	OLS	System GMM	FE	FE	FE

a The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F-distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p-values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

Table C2. Panel data Granger causality tests. Dependent variable = GREER_CPI

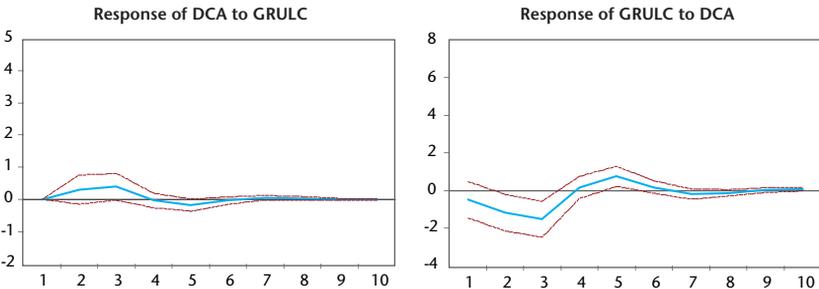
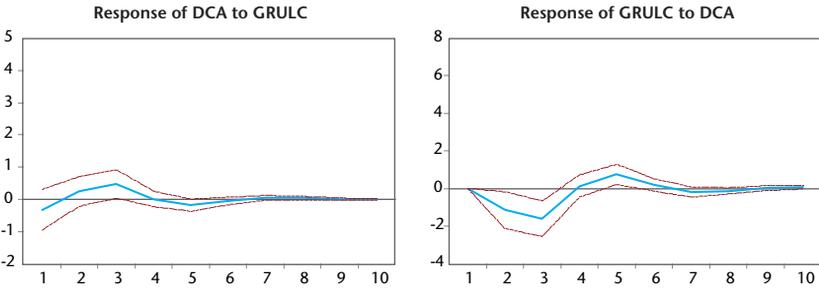
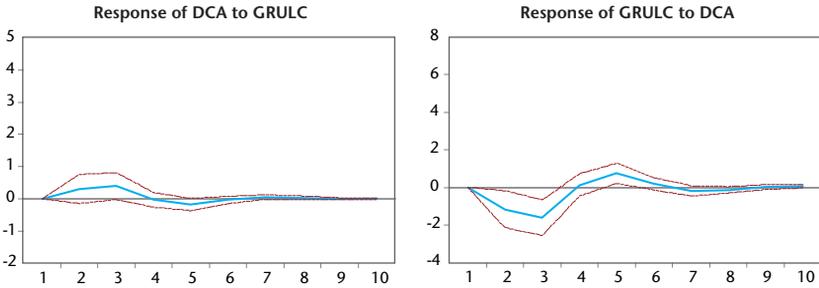
	(C2.1)	(C2.2)	(C2.3)	(C2.4)	(C2.5)	(C2.6)
DCA(-1)	-0.181 (0.049)	-0.177 (0.053)	-0.193 (0.061)	-0.194 (0.046)	-0.102 (0.114)	-0.226 (0.052)
DCA(-2)	..	..	..	-0.116 (0.047)	-0.035 (0.092)	-0.165 (0.068)
GREER_CPI(-1)	0.029 (0.105)	0.140 (0.094)	0.137 (0.067)	0.122 (0.055)	0.225 (0.039)	0.051 (0.082)
GREER_CPI(-2)	..	..	..	-0.099 (0.035)	-0.081 (0.041)	-0.113 (0.059)
Granger causality ^a	13.88 [0.001]	11.07 [0.001]	9.86 [0.002]	9.32 [0.001]	0.40 [0.679]	10.07 [0.005]
Time sample	1997-2012	1997-2012	1997-2012	1998-2012	1998-2012	1998-2012
Countries	EU27	EU27	EU27	EU27	EU15	CEE
Observations	410	410	410	388	222	139
Estimation	FE	OLS	System GMM	FE	FE	FE

a The null hypothesis of the Granger causality test is that the lagged value(s) of the independent explanatory variable do(es) not Granger cause the dependent variable. The test statistic is F-distributed except in the case of the System GMM estimation in which it is χ^2 -distributed; the values in square brackets are p-values.

Notes: Standard errors are clustered along the cross section and are shown in round brackets. A constant term is included in all estimations but not shown.

APPENDIX D. Impulse responses for VAR model with CEE countries

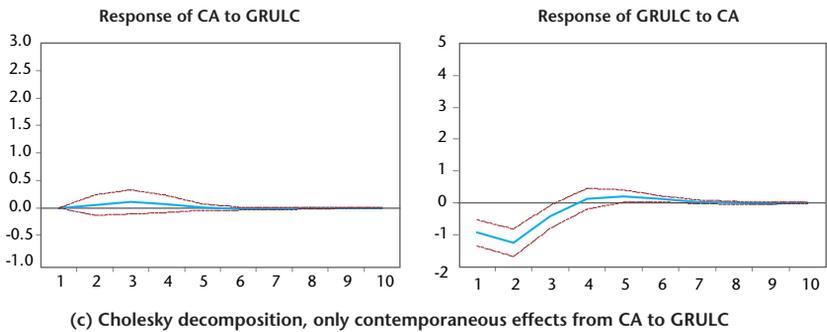
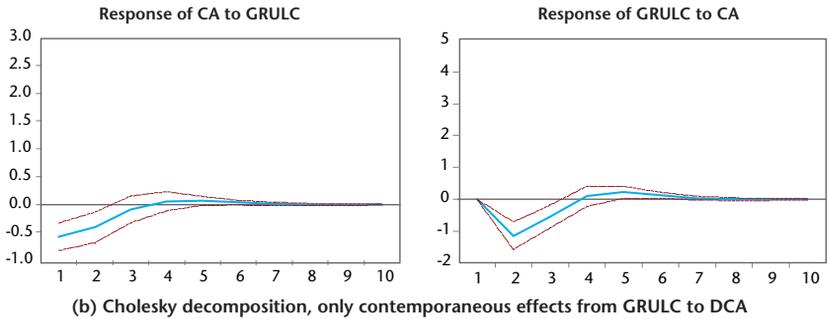
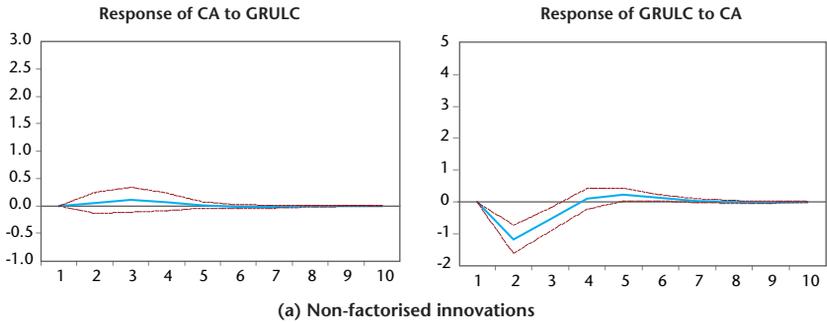
Figure D1. Response of DCA and GRULC to innovations in GRULC and DCA, different identification schemes, CEE countries



Notes: The solid line depicts the impulse response and the dashed lines \pm two standard deviations. The standard deviation of GRULC is 6.2 percentage points and the standard deviation of DCA is 3.9 percentage points.

APPENDIX E. Impulse responses for VAR model with CA variable

Figure E1. Response of CA and GRULC to innovations in GRULC and CA, different identification schemes, all countries



Notes: The solid line depicts the impulse response and the dashed lines \pm two standard deviations. The standard deviation of GRULC is 4.4 percentage points and the standard deviation of CA is 5.8 percentage points.

REFORM OPTIONS FOR THE EU'S SYSTEM OF OWN RESOURCES

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In the negotiations on the EU's budget for 2014 to 2020 member countries almost exclusively focused on individual direct benefits in terms of net financial positions. Indirect benefits from EU membership, EU enlargement and introduction of the euro as well as benefits from EU expenditures other than direct transfers to member states (i.e. expenditures with "European value added", which indirectly benefit all member states and the EU as a whole, e.g. expenditures for research and development, education, green technologies and energy) were neglected. As a result potential indirect benefits from expanding the overall volume of the EU budget volume, to adjust it to the growing challenges the EU is facing, played a minor role in individual countries' views on a desirable EU budget: as did the "European value added" which could be realised by a shift of expenditures away from expenditure categories mainly benefiting individual countries directly (e.g. common agriculture payments) to expenditure categories which indirectly benefit member states and the EU as a whole (e.g. expenditures for research and development, education, or green technologies and energy).

A fundamental reform of EU expenditures towards a sustainable structure requires a fundamental reform of the EU's system of own resources. Only by replacing a substantial part of national contributions by own EU taxes can the narrow focus on financial flows to and from the EU budget be broadened to include also indirect benefits for individual member countries and the EU as a whole. After reviewing the most important deficits of the EU's current system of own resources, the paper establishes criteria for "good" EU taxes and applies these to a number of candidates for EU taxes (e.g. a tax on financial transactions or on carbon dioxide emissions) to assess their suitability as new revenue sources for the EU.

Keywords: EU budget, EU taxes, EU system of own resources, European public goods

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The EU Treaty foresees an annual budgetary procedure for the EU budget. For several reasons, such as securing budgetary discipline, expenditure control or to support the implementation of longer-term spending priorities, the multi-annual financial framework (MFF), a multi-annual planning process into which annual budgets are embedded, was introduced in 1988. A unanimously adopted Council Regulation after obtaining consent of the European Parliament establishes the financial framework within which annual budgets will be set up. This procedure not only aims at facilitating budgetary planning over the longer term, but also at reining in recurrent political debates on the allocation of expenditure.

The negotiations on the EU's MFF for the period 2014 to 2020 appeared – considering, *inter alia*, the veto threats uttered by several member states at relatively early stages of the negotiation process – to be even more conflict-ridden than those on the preceding four MFFs, which were already increasingly tedious and protracted. Starting point of the negotiations was the European Commission's proposal presented in the end of June, 2011. This draft envisaged for the whole seven-years-period a total volume of commitment appropriations of € 1.025 billion (in constant 2011 prices) or 1.05 percent of EU27-GNI. This proposal was updated in July 2012, primarily to account for the accession of Croatia mid-2013, to € 1,045 billion (1.08 percent of GNI). In relation to GNI, the proposed volume of the MFF 2014-2020 would have fallen short of the preceding one for the period 2007 to 2013, which for the whole period foresaw commitment appropriations of 1.12 percent of GNI.

After several negotiation rounds in the Council of Ministers in the European Union and in the European Council a special EU summit exclusively dedicated to the EU budget, which was scheduled for the end of November 2012, should bring about the desired compromise between the European Council, the European Commission and the European Parliament. This summit, however, was interrupted without results and the negotiations were postponed to another special EU summit scheduled to the beginning of February 2013. This new negotiation round was based an alternative proposal presented by the President of the European Council,

Herman Van Rompuy, immediately before the beginning of the meeting of the European Council in November 2012 which included cutting the original European Commission's Proposal to € 80 billion. In June 2013 finally a compromise acceptable for the European Commission as well as the European Parliament could be reached. It was agreed on a total volume of commitment appropriations of € 960 billion (1.0 percent of EU-GNI) for the next MFF period. Thus, in relation to GNI, the volume of the next MFF is significantly lower than that for the period 2007 to 2013.

Most prominent and debated issues in the negotiations up to now in particular are the overall budget volume, the structure of expenditures, and the continuation of the rebates for (some) net contributor countries. Hereby fundamental need for reform concerning the composition of expenditures as well as the system of rebates is acknowledged in academia and to a large extent also in the EU institutions (European Commission, European Parliament, European Council). At the same time, however, this need for reform is ignored by many representatives of EU member countries in the European Council against the background of their country-specific interests in the concrete negotiations.

In contrast to the reform areas mentioned above, the system of own resources of the EU hardly seems to have been addressed seriously in the negotiations. It is, however, one of the most important obstacles to reform. A fundamental redesign is a central precondition to achieve a negotiation results from which individual member countries as well as the EU as a whole will benefit. In face of weak economic growth and particularly of surging youth unemployment, however, member states' agreement on a future-oriented EU budget would be an important economic impulse as well as an urgently needed signal for European policy's capacity to act to fight the current crisis.

1. The EU's expenditures: challenges and shortcomings²

Without doubt there is an increasing need to support national policies by effective measures on the EU level. The overall EU budget volume at least should be held constant, if not be increased

2. See for this section Schratzenstaller (2013a).

compared to the preceding MFF – in any case, a decrease of total expenditures, as finally agreed on, is inappropriate considering the increasing challenges the EU is facing, in particular, recent and imminent enlargement rounds, structural problems of the Southern peripheral countries, the financial and economic crisis and its consequences (record youth unemployment, debt crisis in some highly indebted member states), and the increasingly pressing long-term challenges (climate change and energy transition, demographic change, increasing income and wealth inequality and risk of poverty). Already the last MFF's 2007-2013 volume fell short of the preceding one. The volume of the available funds thus cannot keep up with the long-term increase of tasks and the corresponding financing needs. In this context the European Commission's top-down approach to keep the EU budget's overall volume below about 1 percent of EU GNI at the outset in their original proposal for the MFF 2014-2020 must be regarded as problematic, as it renders an agreement on a higher overall budget volume highly improbable.

Moreover restructuring expenditures is required to support a more dynamic, inclusive and ecological growth and development path for the EU (socio-ecological transition)³ more effectively than the new MFF does. Within the last MFF 2007-2013, common agricultural policy and structural funds together accounted for almost 80 percent of total expenditures (see Table 1). Common agricultural policy (42 percent of total expenditures) predominantly preserved existing (production) structures and pursuing social goals (income support) within the so-called first pillar. Structural and cohesion policy (36 percent of total expenditures) focused too strongly on a traditional infrastructure policy favouring material (large-scale) infrastructure. Less than 10 percent of the last EU budget was dedicated to competitiveness (i.e. research and innovation) and infrastructure. As "richer" member countries to a substantial extent benefit from subsidies within common agricultural policy and cohesion policy, funds were not redistributed to the "poorer" member states in a focused and targeted way.

3. The analytical foundations of a more dynamic, socially inclusive and ecologically sustainable growth and development path for Europe are elaborated in the WWWforEurope project (www.foreurope.eu).

**Table 1. Expenditure structure – MFF 2007 to 2013 and MFF 2014 to 2020
(Commitment appropriations, in current prices 2011)**

	MFF 2007-2013		European Commission Proposal		Van Rompuy Proposal November 2012		Agreement June 2013	
	In billion €	In %	In billion €	In %	In billion €	In %	In billion €	In %
Competitiveness and Infrastructure	91.5	9.2	164.3	15.7	139.5	14.4	125.6	13.1
Cohesion Policy	354.8	35.7	339	32.4	320.1	32.9	325.1	33.9
Sustainable Growth: Natural Resources (CAP)	420.7	42.3	390	37.3	372.2	38.3	373.2	38.9
Security and Citizenship	12.4	1.2	18.8	1.8	16.7	1.7	15.7	1.6
Global Europe	56.8	5.7	70	6.7	60.7	6.2	58.7	6.1
Administration	56.5	5.7	63.2	6.0	62.6	6.4	61.6	6.4
Compensation	0.9	0.0	0.003	0.0	0.003	0.0	0.003	0.0
Total in € billion	993.6	100.0	1 045.3	100.0	971.9	100.0	960	100.0
Total in % of GNI	1.12	–	1.08	–	1.01	–	1.0	–

Source: Own compilation.

In its original proposal for the MFF 2014 to 2020, which in the updated version from July 2012 foresees commitment appropriations of € 1,045 billion or 1.08 percent of EU-GNI, the European Commission envisaged a slight reduction of the share of common agricultural policy in overall expenditures from about 42 percent in the MFF 2007-2013 to about 37 percent and a slight shift from the first pillar to the potentially more sustainable second pillar (rural development). A slightly shrinking share of total expenditures (32 percent) should be reserved for structural and cohesion funds. Thus common agricultural policy and cohesion policy were planned to still reach about 70 percent of total expenditures. The share of funds explicitly reserved for research and innovation according to this proposal should have remained below 10 percent of total expenditures; total expenditures for competitiveness and infrastructure should be increased to over 14 percent.

The new MFF for 2014 to 2020, which was agreed on in June 2013, dedicates 13 percent of the total sum to competitiveness and infrastructure, 34 percent to cohesion policy and another 39 percent to agricultural policy, which implies only minor shifts in the current composition of expenditures. In contrast, strength-

ening the EU budget's role as an instrument to support socio-ecological transition in the EU, which goes beyond the Europe 2020 strategy and is targeted more intensely on combining economic dynamics with ecological and social goals, requires the following key elements:

- Stronger reduction of the expenditure share of common agricultural policy, reinforcing the shift of agricultural expenditures to a second pillar of common agricultural policy which is based on ecological and employment goals;
- Reinforcement of “greening” of direct payments within the first pillar of common agricultural policy, i.e. linking a significant part of direct payments to the fulfilment of certain ecological conditions by the receiving farmers and cutting direct payments if these conditions are not fulfilled;
- Stronger focus of cohesion funds on “poorer” member countries and corresponding reduction of funds for “richer” member countries (Aiginger *et al.*, 2012);
- Stronger coupling of cohesion funds with climate objectives and employment goals.

Linking cohesion funds with efforts to improve competitiveness and with the indicators applied within the EU's new economic governance (macroeconomic imbalances), to create a link between the Euro crisis and the EU budget (Becker, 2012).

Stronger increase of expenditure share for research and innovation with a specific focus on ecological and social aspects.

2. Alternative revenue sources for the EU

Against the background of this reform debate, which dates back to before the current financial negotiations, some long-term trends of the level and composition of EU revenues and potential inherent problems are of immediate interest. This leads to the question of how to assess the most substantial reform proposal in the current debate, which has been advocated for years notably by the European Commission, namely to attribute own tax revenues to the EU and to finance part of the EU budget through dedicated EU taxes and to review particular taxes in the light to their possible qualification as EU taxes.

2.1. Volume and composition of EU revenues

The EU, lacking tax sovereignty, does not have the right to raise taxes or contributions in order to finance its own tasks. Rather, tax sovereignty within the EU is assigned to the member countries at the national level or in some cases the sub-national level. Some (very small) part of national tax revenues that member states raise for the financing of their own budgets is transferred to the EU. The EU currently has essentially three revenue sources: traditional own resources (agricultural tariffs, sugar customs duties, general tariffs), VAT-based own resources and GNI-based own resources.⁴ EU expenditure must be financed exclusively from own resources, with the option of running a budget deficit being excluded by the EU Treaty.

The financing system of the EU has been changed six times through own resources decisions by the European Council and the European Parliament since 1970. Since then *ad hoc* national contributions by member states were increasingly replaced by a system of own resources and vanished completely in 1982 (European Commission, 2011a). These own resources accrue to the EU directly, without any further decisions required at the national level. Total revenues are limited by a ceiling for EU own resources.

Until 1980, the traditional own resources, which were introduced in 1968, were the only financial source of the EU. They are collected by member states on behalf of the EU and directly transferred to the EU budget (minus a discount of 25 percent remaining with member states to cover the cost of revenue collection⁵). VAT-based own resources were introduced in 1979, originally as a residual financing source with a uniform call rate from a harmonised tax base which is limited to 50 percent of national GNI (capping). At its introduction, the (maximum) call rate was fixed a 1 percent. In 1985 it was raised to 1.4 percent and between 1995 and 1999 reduced in steps to 1 percent again. For 2002 and 2003 it was cut to 0.75 percent and for the years from 2004 to 2006 to 0.5 percent. The MFF 2007 to 2013 provides for a call rate of

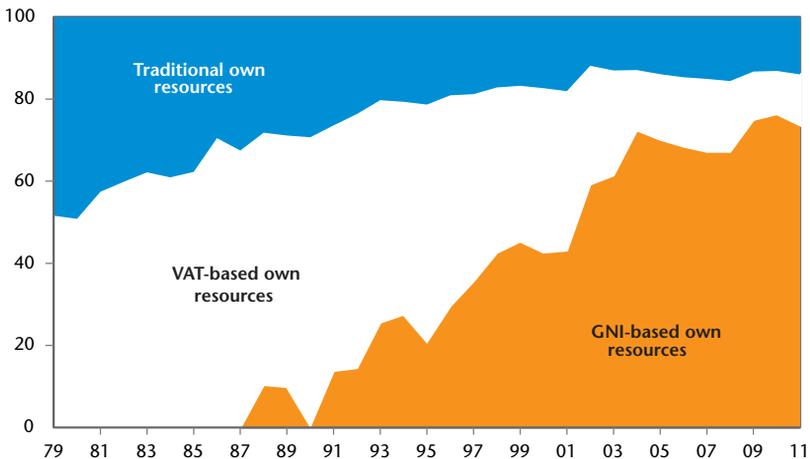
4. This revenue source was originally calculated on the basis of GNP (gross national product), but since 2002 it is determined on the basis of GNI (gross national income).

5. This flat-rate deduction was 10 percent until 2000. One of the European Commission's proposals for reforming the system of own resources is to reduce the rate from its current level of 25 percent to the original level again (European Commission, 2010).

0.3 percent. In the context of financing the “UK rebate”, some net contributors have been granted for the period 2007 to 2013 only a reduction of the call rate (Germany 0.15 percent, Sweden and the Netherlands 0.1 percent, Austria 0.225 percent). The GNI-based own resource exists since 1988. As a residual financing source they serve to balance the budget subject to the own resources ceiling; as a consequence, the call rates (which are identical for all member states) are updated each year. Both the kind and the scope of the generation of own resources as well as the taking over of own tasks by the EU have to be voted by unanimity by the European Council and by all member states according to their respective constitutional provisions. The current EU expenditure ceiling, which is equal to the revenue ceiling, is set at 1.29 percent of aggregate EU GNI (commitment appropriations) and 1.23 percent (payment appropriations), respectively. In practice, this ceiling is never reached. As a rule, actual payments by member states fall markedly below the ceiling: In 2010, for example, they amounted to 0.97 percent of GNI; in the second half of last decade they fluctuated around 0.9 percent of GNI.

Since the end of the 1970s a remarkable structural shift can be observed for the composition of the EU’s own resources (Figure 1).

Figure 1. Composition of EU revenues from own resources



Source: European Commission, 2012.

Traditional own resources received directly by the EU have greatly lost in importance due to the fall of custom revenues in the course of trade liberalisation and EU enlargement: whereas in 1980 they accounted for almost 50 percent of total revenues, their share has since fallen steadily, declining to about 20 percent in the mid-1990s to about 15 percent since 2005. Thus the financing of the EU budget is increasingly resting on direct contributions from member states' national budgets. The share of revenues from the VAT-based own resource reached its peak at 70 percent in 1986 and 1990, to shrink steadily afterwards to 12 percent in 2011. In parallel, the share of revenues from the GNI-based own increased continuously from 10 percent in 1988 to 74 percent in 2011.

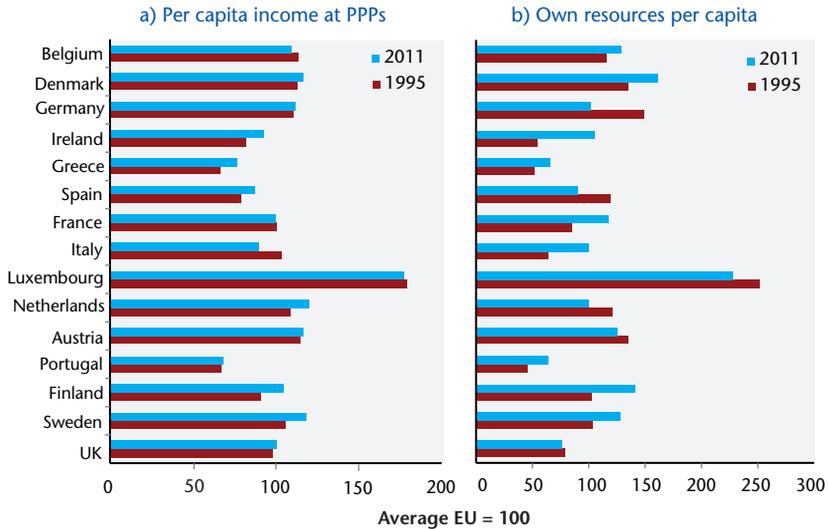
This development is caused by two Council Decisions, from 1992 (effective as of 1995) and 1999 (effective as of 2002), which have shifted the bulk of financing from the VAT-based towards the GNI-based own resource component. Part of this move were the above-mentioned stepwise cuts in the call rate for the VAT-based own resource to meanwhile 0.3 percent of the harmonised VAT base which itself had been reduced to 50 percent of national GNI over the same period. One motive of this move from VAT-towards GNI-based own resources was to widen the financial scope of the EU budget, the easing of the financial burden for the economically weaker member states another: while contributions on the basis of VAT have a tendentially regressive effect, the contributions linked to GNI better reflect a country's economic capacity (Deutsche Bundesbank, 1999).

Whether in this way the economically weaker member states have actually been exonerated cannot be examined and evaluated in detail here. However, the trend of GNI per capita is not necessarily parallel to that of national contributions per capita, as can be illustrated by the example of "old" member states (Figure 2): For 8 old member states, per capita incomes compared to the EU15 average increased (decreased), while their own resources contributions per capita decreased (increased) in 2011 compared to 1995.

Until 2011, the EU budget rose to a total of € 120 billion, compared to € 67.8 billion in 1995. Since 1995, Germany's share in total own resources fell from 31.4 percent to about 20 percent, partly because the country's share in aggregate EU GNI declined, but partly also due to a reduction of the contribution burden

through various correction mechanisms (see below). Also the contribution by France and the UK to total own resources payments have slightly fallen during the last 15 years. At the same time, the share of “poorer” countries as Spain, Italy and Portugal has (slightly) risen.

Figure 2. GNI and national contributions of EU member states, per capita



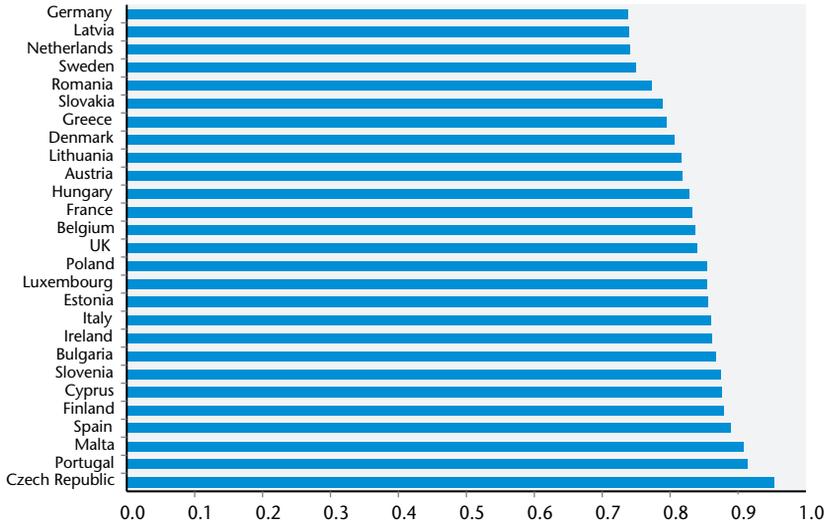
Sources: European Commission (2012), own calculations.

The gross contribution, i.e. total payments made to the EU, is the most straightforward measure of a country’s contribution to the financing of the EU budget. Deducting traditional own resources delivers the national contribution, consisting of VAT- and GNI-based own resources. The national contribution (Figure 3) is more appropriate than the gross contribution for comparisons between member states, since it reflects the resources actually raised by individual member states. Figure 3 shows national contributions as percent of GNI (including the UK rebate) for 2011. The national contribution is lowest in Germany, with 0.74 percent of GNI, and highest in the Czech Republic (0.95 percent of GNI) in 2011.

In the political debate and in EU budget negotiations, the net contribution position, as recorded in the national balance of payment statistics, plays a more important role than the national contribution. As the balance of financial transfers (VAT- and GNI-

based own resources) paid to the EU and transfers received from the EU budget, it expresses a member state's financial net benefit or cost from the EU budget.

Figure 3. VAT- and GNI-based own resources (national contributions) of EU member states in 2011, as percent of GNI



Source: European Commission, 2012.

Apart from the fact that the net contribution position alone cannot by far capture the entire economic impact of European integration upon member states – beyond direct transfers from the EU budget, EU membership carries a number of indirect economic effects, such as potential access to new markets –, the calculation of this indicator is subject to a certain margin of uncertainty.⁶

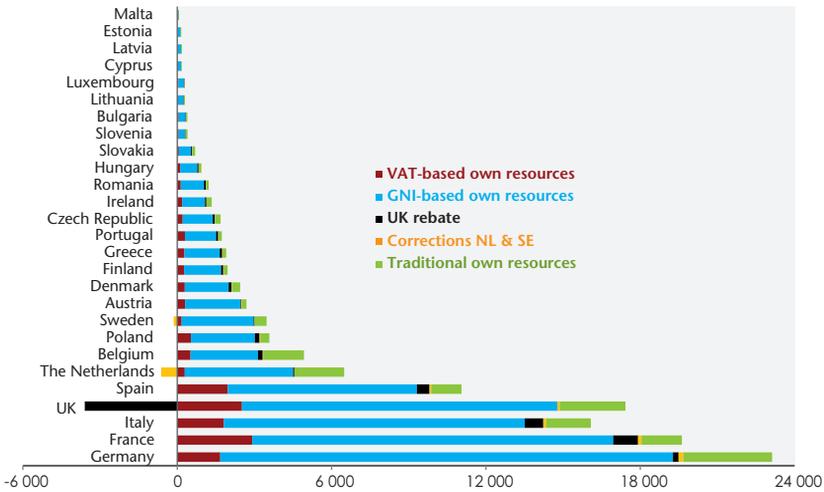
Since its introduction, the “UK rebate” has been a topical issue in the context of the net contribution position. In 2011, the rebate amounted to € 3.6 billion. Following a decision of the European Council of Fontainebleau in 1984, the UK is reimbursed two thirds of its annual net contribution. The special provision was successfully negotiated by former Prime Minister Margaret Thatcher at a time when the UK had a relatively low per capita income within the EU. Due to its comparatively small agricultural sector, the

6. See Clemens and Lemmer (2006) for details.

country received considerably less in EU agricultural payments than, for example, France. The adjustment in favour of the UK is financed by the other member states according to their levels of GNI. Since 2001, a special clause applies for the traditionally most important net contributor countries Germany, Austria, Sweden and the Netherlands, which pay only 25 percent of their normal financing share of the UK rebate (Clemens and Lemmer, 2006).

The impact of the UK rebate on the distribution of own resource payments in absolute terms is shown in Figure 4. The rebate moves the UK down from the second to the fourth largest contributor.

Figure 4. Own resources payments to the EU in 2011, in billion €



Source: European Commission, 2012, own calculations

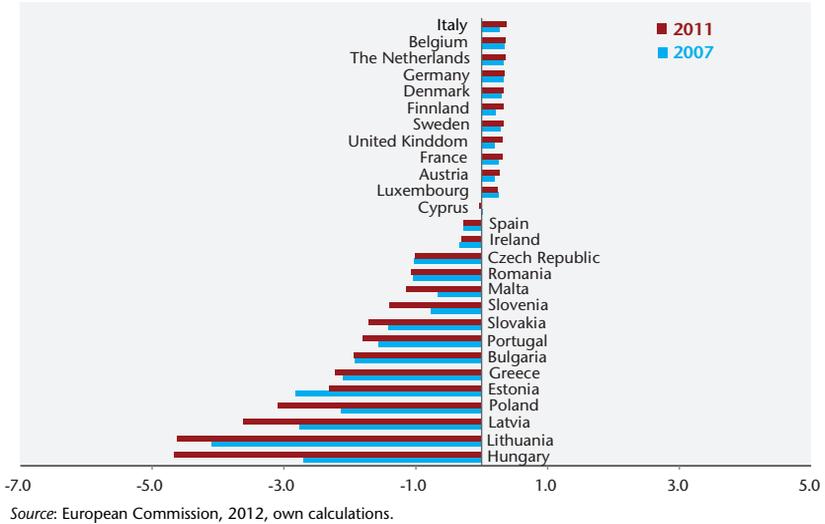
In relative terms, the UK’s national contribution of 0.84 percent of GNI is on rank 14 (see Figure 3). The termination or at least reduction of the UK rebate which has been claimed for some time by almost all other member states is subject to the UK’s consent which is unlikely to be obtained without a far-reaching overhaul of EU common agricultural policy.

In 2011 as well as during the period 2007 to 2011, 11 of the 27 member states were net contributors.⁷ In the period 2007 to

7. Cyprus net position amounted to practically zero, with a net contribution of 0.02 percent of GNI in the period 2007 to 2011 and of -0.04 percent of GDP in 2011.

2011, the largest net contributors in relation to their GNI are Germany, Belgium, the Netherlands and Denmark (Figure 5).

Figure 5. Net contributions by member states, as percent of GNI



2.2. Problems and need for reform in the current system of own resources

The financing system of the EU in the design which has evolved over more than 60 years since the foundation of the European Coal and Steel Community (ECSC) in 1952 is characterised by a number of shortcomings rooted in the low and still decreasing revenue autonomy of the EU. While the correction of these shortcomings has been on the political agenda for some time, the required unanimity vote in financial matters has so far stood in the way of a fundamental reform. However, the growing resistance notably on the part of net contributors, which makes negotiations on the MFF and also on the yearly budgets increasingly tedious, adds to the pressure to seek alternatives to the existing system of own resources. This section briefly presents the most important problematic aspects and effects of the current system of own resources.⁸

8. While their presentation is structured somewhat differently, the aspects elaborated in this section are mainly those addressed in European Commission (2011a) and several related academic studies cited there.

2.2.1. Increasing controversiality of size and structure of EU budget

Since the EU can neither raise its own taxes nor (according to Article 311 of the Treaty on the Functioning of the European Union) incur debt, its revenue autonomy has been curtailed from the outset. Meanwhile, it has become negligible since the traditional own resources have greatly lost in importance. As presented in more detail above, now the own resources of the EU consist primarily of member states' contributions paid directly from national budgets. Thus the EU budget has increasingly become the subject of political conflict, as most clearly revealed by the "net contributor debate". Reaching an agreement on the MFF is becoming more and more difficult, particularly with economic divergences widening in the last (and future) enlargement rounds. This carries the risk of the EU budget becoming chronically under-financed against the challenges facing the EU in the future. Such risk is witnessed by the current MFF 2007 to 2013 as well as by the proposal for the next MFF 2014 to 2020, each setting expenditures to decline as a ratio of EU GNI, rather than being at least held constant as warranted by the current and future tasks of the EU.

2.2.2. Increasing neglect of "European value added" and dominance of national interests

The predominance of national contributions narrows down the focus of member states on monetary net returns from the EU budget, i.e. the relation between national contributions to the budget and monetary returns from the individual policy areas (common agricultural policy, structural and cohesion policy, research and innovation, etc.) (European Commission, 2011a; Becker, 2012). Benefits of EU membership beyond pure financial flows related to the EU budget, however, do not play much of a role as evaluation and decision criteria of member states (Richter, 2013). Within the EU with its increasing divergences and therefore national interests, such a perspective focusing on individual country-specific monetary costs and benefits inevitably aggravates the EU budget's controversiality and increasingly hinders compromises. It is an essential reason that particularly net contributor countries, whose gross contributions exceed transfers received from the EU budget, urge a limitation of the EU budget's volume. Moreover it furthers the tendency of member states to support the

preservation of those expenditure categories promising to maximise individual country-specific transfers received from the EU budget, instead of pushing an expenditure structure from which a maximal benefit for the EU as a whole (what the European Commission calls “European value added”, see European Commission, 2011c), may be expected. The focus on individual national interests is also enforced by the increasing public attention for questions of EU policy (Becker, 2012). The distributional conflicts as well as the “net contributor debate” more recently have been aggravated by the (potential) burden from the EU rescue package the largest part of which falls upon Eurozone countries.

In this context it should be recalled that the financial resources at the disposal of the EU also serve to finance various “European public goods”, i.e. goods or activities with positive cross-border external effects⁹ and with European value added (European Commission, 2011c), respectively. In particular this concerns expenditures in the areas of research and innovation, education, transport infrastructure, and climate/energy policy, decided upon at the EU level. Securing fiscal equivalence (i.e. a correspondence of revenue and expenditure responsibility) would require assigning to the EU also the taxes necessary to finance these expenditures.

2.2.3. No contribution by the system of own resources to EU policies

Moreover, the lack of tax autonomy at the EU level runs counter to the long-term trend of deeper integration. Despite an increase in negative cross-border externalities (e.g. environmental damage) caused by ever closer economic integration of member states, policy refrains from using taxes at the European level to influence economic agents' behaviour. Thus potential benefits of a rather powerful market-based policy instrument are foregone. In general, the current revenue system hardly contributes or supports EU policies (European Commission, 2011a).

2.2.4. Increasing complexity of the system of own resources and political legitimacy

In addition, the system of own resources is characterised by a considerable degree of complexity and lack of transparency. While

9. Consider in this context also the evolving debate about “global public goods” (see, e.g., Kaul *et al.*, 1999).

the three revenue sources as such are easy to understand, their implementation is not. This is mainly caused by the UK rebate and the various mechanisms for its correction. In addition, the concrete design of the VAT-based own resource, particularly the determination of the tax base, is often criticised as rather complicated.

Moreover, the structural adjustments made since the early days of the European Community are the result of political compromises (such as the correction mechanism for the financing of the “UK rebate”). Apart from the resulting administrative burden, this trend also undermines political credibility and the legitimacy for national financial contributions, since the population of the individual member states is less and less able to identify its own contribution to the financing of the EU budget and the relationship between revenue and expenditure.

2.2.5. Equity concerns

Not least, within the group of net contributing countries which in the period from 2007 to 2011 included 11 member states, a “rebate from the rebate” for the UK was granted to the 4 countries which traditionally are the most important net contributors only, despite the fact that these are not necessarily – in relative terms – carrying the largest net contribution burdens (see Figure 5). Therefore the complete elimination of the correction mechanism for the UK rebate is an important element of a more simple, transparent and equitable system of financing the EU budget: The more, as the initial reason to grant a rebate to the UK in the first place – relatively low economic prosperity and high net contributions – has disappeared during the last 30 years (Economic Commission, 2011a).

From an equity perspective it may also be considered problematic that the poorer member states which are on the one hand benefiting from cohesion policy over-proportionately contribute to financing the various correction mechanism to alleviate the net contribution burden of the richer countries on the other hand (European Commission, 2011a). It may also be criticised that capping individual VAT-based resource payments by limiting the part of the harmonised VAT base on which the call rate is applied to 50 percent of GNI does not necessarily alleviate the burden for the poorer countries, as there is no clear relationship between a country’s GNI and the size of the VAT base.

2.3. Options for a fundamental reform of the system of own resources of the EU

2.3.1. Current state of the political discussion

The MFF 2007 to 2013 has not brought about any fundamental changes for the system of own resources. The own resources ceiling was confirmed to 1.24 percent of GNI (for payment appropriations) and 1.31 percent of GNI (for commitment appropriations), respectively. Also the “UK rebate” was maintained, as well as the correction mechanisms for its financing in favour of Germany, Austria, Sweden and the Netherlands (“rebate from the rebate”). The UK therefore in principle continues to benefit from its rebate. The call rate for the VAT-based own resource was generally reduced from 0.5 to 0.3 percent, with several net contributors benefiting from a lower rate in the period 2007 to 2013 only (Austria 0.225 percent, Germany 0.15 percent, the Netherlands and Sweden 0.10 percent). In addition, Sweden and the Netherlands may reduce their GNI-based annual gross contributions by € 150 million and € 605 million (in constant 2004 prices), respectively in the period from 2007 to 2013 only.

In December 2005, the European Commission has been invited by the European Council to undertake a revision of the EU budget in the form of a “mid-term review”, which should also include a review of the system of own resources, and to report to the European Council by 2008/09. This review should feed into the preparations for the next MFF. In this way, the need for reform of the EU financing system, generally felt across member states and the European institutions, has been taken up, without however an actual announcement or commitment to such reform being given. The European Commission’s publication of its Communication on the EU Budget Review (European Commission, 2010) as one core principle of the EU budget puts forward a reformed financing system. According to the European Commission, new own resources could substitute the VAT-based own resource and a part of the GNI-based resource.

In its proposal for the own resources decision (part of the whole package related to the MFF) the European Commission (2011b and 2011d) suggests three elements of the reform of the current system of own resources: firstly the simplification of member states’

contributions by eliminating the VAT-based own resource, compensated secondly by the introduction of new own resources (preferably a financial transaction tax and a new VAT resource), and thirdly the reform of correction mechanisms by implementing a new system of lump sums to replace all pre-existing correction mechanisms.

The European Parliament, which according to the Lisbon Treaty for the first time has a right to co-decision on the MFF and which only after lengthy negotiations only agreed to the new MFF 2014-2020 has been demanding for some time now a reform of the system of own resources which includes the reform of the existing VAT-based own resource and the introduction of an EU tax, i.e. a genuine own resource (particularly a financial transaction tax). Up to now, however, the European Council refuses to negotiate about a reform of the system of own resources and about the introduction of an EU tax in particular.

In the longer-term perspective, budgetary leeway is to be created for the financing of tasks ranking high in the Europe 2020 strategy through further shifts in the expenditure structure, notably the already initiated restraint on agricultural spending. Given the conflicting interests of member states it is nevertheless doubtful whether such shifts will progress at sufficient speed in order to create the necessary budgetary room for manoeuvre. All the more so, since agricultural spending will (have to) remain a major responsibility for the EU, albeit with substantial adjustments towards organic farming, preservation and development of rural areas and promotion of tourism, reflecting the changing role of agriculture. Against this background, conferring a certain degree of tax autonomy upon the EU appears to be an option worth exploring, by substituting own EU tax revenues for part of national financial contributions which face growing resistance, particularly with net contributors.

2.3.2. Key elements of a reform of the system of own resources

Starting from the above criticism of the EU system of own resources, reform options have been considered for some time at the EU level. Following up on agreements reached in the context of the last few financial frameworks, the European Commission in the meantime has submitted several reports on the functioning of

the system of own resources (European Commission, 1998 and 2004); the most recent one in 2011 (European Commission, 2011a). These documents also discuss the pros and cons of various financing alternatives. In principle, two alternative reform strategies to address the existing shortcomings of the system of own resources may be envisaged (European Commission, 2004):

- Reforms within the existing system of own resources with the aim of streamlining it (in practice, this would lead to the elimination of the VAT-based own resource so that, given the ongoing loss in importance of traditional own resources, the budget would in the long run be financed almost entirely by GNI-based own resources);
- Introduction of dedicated EU taxes, as a (partial) compensation for the existing revenue sources. This option, favoured by the European Commission, would assign some degree of tax autonomy to the EU.

The criticism advanced against the current system of own resources advises in favour of the latter reform strategy conferring to the EU some degree of tax autonomy in combination with a reform of key features of the existing system of own resources along the following lines:¹⁰

- Elimination of VAT-based own resources;
- Attribution of dedicated taxes to the EU to compensate for the abolition of VAT-based own resources and in recognition of the arguments in favour of EU tax autonomy;
- Reinforcement of own EU tax revenues through GNI-based own resources;
- Reform of the correction mechanism to finance the UK rebate.

2.3.3. Evaluation of potential EU taxes as a central pillar of a fundamental reform of the system of own resources

Starting from these key elements, the following considerations are devoted to a crucial aspect in the debate on alternative revenue sources for the EU budget, i.e. the question what kind of taxes

10. These key features are also mentioned by the European Commission who nevertheless pleads in favour of the revenue-neutral introduction of a new own revenue source which should cover up to 50 percent of total expenditure (European Commission, 2004).

would lend themselves for the establishment of an own EU tax sovereignty (or as a supplementary or alternative revenue source) (see also Richter, 2006).

One basic assumption is that financing the EU budget entirely or at least primarily through own taxes is for the time being neither meaningful nor possible under the existing framework conditions. One argument against is the existing ban on incurring debt, which requires an additional revenue source to balance the budget in case actual tax revenues fall short of projections. In addition, financing all EU responsibilities entirely by own taxes would require much deeper integration of the EU member states than is presently the case, leading more towards a federal state.

Weighing up between dedicated EU taxes on the one hand and GNI-based own resources on the other hand is an issue beyond pure economic reasoning: It is rather a political decision of member states to what extent they see the Community eventually moving towards a federal state that in the end needs its own legal framework for fiscal relations and an own tax sovereignty. This is also a crucial factor for the degree and factual implementation of the tax autonomy conferred to the EU.¹¹ It may either be confined to the power to decide on how to allocate its own resources, or it may extend to legislative powers in tax matters. In the first case, the EU would receive a certain fraction of national tax revenues or be granted the right to levy a supplementary rate on a given tax base, with the right of decision on tax bases and national tax rates essentially remaining with the member states. In the second case the EU would acquire the right to determine tax base and rate, with member states possibly having the right to levy a supplement.

In its reports on the operation of the EU own resources system, the European Commission establishes seven criteria for the evaluation of own resources (European Commission, 2004):

- visibility and simplicity;
- financial autonomy;
- contribution towards an efficient allocation of economic resources;
- yield;

11. For elaboration of this point, see Becker (2005).

- cost efficiency with regard to tax administration;
- revenue stability;
- equitable gross burden.

These criteria may be applied only partially or in modified form for the following assessment of the suitability of different taxes as financial sources for the EU budget. They will be supplemented by further criteria developed by the theory of fiscal federalism as a yardstick for assigning different taxes to the different levels of government (see, e.g., Musgrave, 1983; Gordon, 1983; Inman and Rubinfeld, 1996; McLure, 2001). Thus, for the assessment of whether a certain tax may qualify as EU tax, the following criteria may be formulated (see also European Commission, 1998 and 2004):

- Degree of regional attribution: the lower the possibility to determine the share of individual member states in the tax base/tax revenues, or the lower the identity between the country where tax revenues accrue and the country of residence of tax subjects, the higher the suitability as EU tax.
- Cross-border negative externalities: the higher they are, the higher the qualification as EU tax, since the optimal tax rate from the national perspective is below the one from the European perspective.
- Mobility of the tax base: the higher it is, the higher in principle the qualification as EU tax, since centralisation may help to prevent a possibly harmful “race to the bottom”.
- Short-term volatility: the higher it is, the lower the qualification as EU tax; due to the ban on EU debt, the flow of own resources should be stable in the short term and as cyclically-insensitive as possible.
- Long-term yield (revenue elasticity): the higher it is, the higher the qualification as EU tax, since with European integration and given the long-term challenges the EU is facing progressing the range of tasks and therefore the financial needs will probably rise.
- Visibility: the more visible and perceptible a tax for the tax subjects, the higher its qualification as EU tax, since the link between tax payment and return from the EU budget is made transparent.

- Equity of gross burden at the national level: the closer the link between the tax base (and therefore the tax burden) and national income, the higher the qualification as EU tax.

The report on the functioning of the system of own resources by the European Commission of 1998 discusses eight kinds of potential own resources: CO2 or energy tax; modified value added tax; excises on tobacco, alcohol and mineral oil; corporate tax; tax on transport and telecommunication services; income tax; interest income tax; and a tax on the ECB gains from seigniorage (European Commission, 1998). The European Commission's report of 2004 limits itself to three options, namely the combination of GNI-based own resources with revenues from energy tax, value added tax or corporate tax. In its latest report on the operation of the system of own resources (European Commission, 2010), the European Commission mentions taxes on the financial sector (financial transaction tax and financial activity tax, revenues from auctioning under the greenhouse gas Emissions Trading System, a charge related to air transport, an EU VAT, an EU energy tax and an EU corporate income tax) as potential candidates for new own resources; where the preferred options put forward in further documents and statements related to the MFF package are the financial transaction tax and an EU VAT. Table 2 gives an overview of the candidates for new own resources mentioned in the European Commission's various reports on the functioning of the system of own resources and options for its reform.

Table 2. Candidates for new own resources according to the European Commission

European Commission 1998	European Commission 2004	European Commission 2010
CO2 or energy tax modified value added tax excises on tobacco, alcohol and mineral oil EU corporate income tax tax on transport and telecommunication services income tax; interest income tax tax on ECB gains from seigniorage	EU energy tax EU value added tax EU corporate income tax	taxes on the financial sector (financial transaction tax and financial activity tax) revenues from auctioning under the greenhouse gas Emissions Trading System charge related to air transport EU VAT EU energy tax EU corporate income tax

Source: Own compilation.

Table 3 contains key features and potential revenues of the candidates (except revenues from auctioning under the greenhouse gas Emissions Trading System) included in the European Commission's latest documents on the operation of the system of own resources and options for its reform. Altogether the potential revenues of the various candidates may contribute to a considerable extent to financing the EU budget.

Table 3. Potential EU taxes

Tax base (tax)	Key features	Potential revenues per year	In % of EU expenditures per year ¹
Financial transactions (Financial Transaction Tax – FTT)	0.1% tax rate on transactions of bonds and shares, 0.01% tax rate on transactions of derivatives,	€ 20 billion (by 2020)	15
	0.1% tax rate on transactions of bonds, shares and foreign currency, 0.01% tax rate on transactions of derivatives	€ 50 billion (by 2020)	36
Sum of profit and remuneration of financial institutions (Financial Activities Tax – FAT)	5% tax rate on sum of profit and remuneration of financial institutions according to the addition-method FAT applied at source, no fully harmonized tax centrally collected at EU level, but revenue-sharing between member states and EU	€ 24.6 billion (2009)	18
Charge related to air transport (Departure Tax or Flight Duty Tax)	Tax on passengers flying from an EU airport, differentiated according to distance and class of travel (Departure Tax), tax on flights (Flight Duty Tax) decentralized or centralized collection possible	€ 20 billion (by 2020)	15
Consumption (EU Value Added Tax – VAT)	1% tax rate on goods and services subject to standard tax rate, decentralized collection and transfer to EU	€ 20.9 billion to € 50.4 billion (2009)	15
Energy consumption CO2 emissions (EU Energy Levy, EU CO2 Levy)	Single EU tax rate on quantities of energy products released for consumption based on their energy content. Minimum rate of CO2-related taxation defined in revised ETD. Decentralized or centralized collection possible	No estimates available	–
Profits of incorporated firms (EU Corporate Income Tax – CIT)	Less than 2% tax rate on national corporate income tax base decentralized collection and transfer to EU.	€ 15 billion	11

1. Expenditures per year calculated as average of total expenditures for the period 2014 to 2020.

Sources: European Commission (2010, 2011a, 2011b); Own compilation.

Most revenue could be created by introducing a **general Financial Transaction Tax (FTT)** of 0.1 percent on transactions of bonds, shares and currency and of 0.01 percent on transactions of derivatives. According to a conservative estimate by the European Commission, the potential yield may reach about € 50 billion per year by 2020, which would cover about one third of the EU's annual expenditures according to the European Council's agreement of February 2013. In a version exempting currency transactions the FTT would still raise about € 20 billion or 15 percent of the EU's expenditures.

A **Financial Activities Tax (FAT)** of 5 percent on the sum of profits and remuneration of financial institutions, as an alternative tax on the financial sector, is expected to yield about € 25 billion per year and could thus finance about 18 percent of the EU's expenditures.

Revenues from charges related to air transport (a **Departure Tax** or **Flight Duty Tax**) and from an EU **Value Added Tax (VAT)** of 1 percent on the goods and services subject to the standard tax rate are estimated to reach a similar size, with about € 20 billion per year (15 percent of the EU's expenditures).

An EU **corporate income tax (CIT)** of less than 2 percent on the national corporate income tax base may yield about € 15 billion (11 percent of the EU's expenditures).

The evaluation of these taxes according to the criteria specified above (Table 4) gives only rough indications since it does not allow for a possible fine-tuning of the different criteria, but only distinguishes between "rather useful" or "rather less useful" as EU tax. For further considerations on the actual design of an own resources system which is based also on EU taxes as genuine own resources, the analysis of course needs to be refined. It would also have to consider administrative costs and the question at which level (national level or EU level) revenues would be collected. None of the taxes briefly discussed below is deemed an "optimal" EU tax, since all of them miss one or more of the criteria defined above. Which of the taxes will actually be selected along these criteria, and the weight to be attributed to each of them, is a political decision in the end.

According to the above criteria, charges on air transport would qualify best as EU taxes. They may internalise negative cross-border externalities (in this case climate-damaging emissions) and thereby reduce air traffic. Assigning these taxes to the EU would rein in the possibility of tax avoidance caused by tax rate differentials between member states. Their visibility for citizens as well as short- and long-term revenue stability and tax yield are further arguments in favour of assigning them to the EU level. In particular the tax avoidance to be expected speaks in favour of earmarking charges related to air transport entirely for the EU: a uniform tax rate should be fixed at the level of the EU and all revenues be channelled into the EU budget.

Table 4. Evaluation of options for EU taxes

	Regional attribution	Negative cross-border externalities	Mobility of tax base	Short-term volatility	Long-term yield (revenue elasticity)	Visibility	Equity of gross burden at national level
Financial Transaction Tax	+	+	+	-	+	-	-
Financial Activities Tax	+	+	+	-	+	-	-
Departure/Flight Duty Tax	-	+	+	+	+	+	-
Value Added Tax	-	-	-	-	+	+	?
Energy Levy/CO2 Levy	-	+	-	+	+	+	?
Corporate Income Tax	+	-	+	-	+	-	-

+ speaks rather in favour of being used as an EU tax. ... - speaks rather against being used as an EU tax.
 Source: Own.

Main arguments in favour of an FTT to be assigned to the EU are the impossibility of a regional attribution of such a tax and its prospective long-term yield. Moreover, unilateral implementation would be next to impossible, and considering the far-reaching integration of the European financial market, the FTT may also internalize negative cross-border externalities. In contrast to an EU CIT or VAT, differing national tax bases would not be an issue. Unfortunately, the current negotiations at the EU level about the introduction of an FTT do not make much progress: Apart from the fact that only 11 EU member states are willing at all – in principle –

to implement an FTT, several of these countries under the pressure of the financial lobbies are pushing very strongly for a very minimalistic (“light”) version of an FTT.

In favour of a partially centralised CIT may be argued that the growing disconnection between value added and corporate location on the one hand, and profit and its taxation on the other, undermines the possibility of regional attribution of the tax. Moreover, it can be expected that corporate tax competition in the EU will intensify further due to the high mobility of the tax base. The CIT is also characterised by a high yield in the longer term.

Taxes on energy consumption have the advantage of low short-term volatility and a high long-term elasticity. Moreover they can internalize cross-border externalities and are highly visible to citizens. It may be objected, however, that the use of the CO₂ tax is problematic because there is no link between the desirable growth of the EU budget and the desirable growth of ecological taxation.

The VAT appears as least suitable candidate. Only its long-term revenue elasticity and high visibility for citizens speak in its favour.

Altogether the most straightforward option for an own EU tax is the FTT which as a new tax has the additional advantage that national revenues would not be affected, which would be the case for charges on air transport and energy taxes which exist at least in some member states already. Thus it can be expected that choosing the FTT as EU tax will meet with less political resistance than options which imply redirecting national revenues to the EU budget.

From an administrative point of view, the FTT has the further advantage that (in contrast to the VAT or the CIT) there are no nationally differing tax bases that would need to be harmonised beforehand. It could cover a substantial share of total EU expenditures. If the aim is to extend the contribution of EU taxes even further, charges related to air transport would be another readily available solution, considering also that only few member states levy such charges at all and that they are exposed to permanent criticism as they are regarded as severe competitive disadvantage when implemented unilaterally at the national level.¹² The same holds for a CO₂ tax which some member states have introduced rather recently.

When designing a new financial framework for the EU resting on a certain degree of tax autonomy, including institutional aspects and political decision-making processes, a number of caveats need to be considered that are often emphasised by the opponents of EU taxes. A major concern is that an own tax responsibility of the EU would lead to permanent upward pressure on expenditure, all the more so as the EU budget is dominated by the goal of redistribution. Moreover, the assignment of (a certain degree of) tax autonomy to the EU would require to reinforce democratic legitimacy, i.e., to strengthen the powers of the European Parliament further as well as to tighten expenditure control and fight against fraud. It can also be expected that the process of unwinding the UK rebate system will cause considerable political controversy. Therefore, any major reform is likely to require a considerable lead time. In this context the problematic role of the unanimity rule as a major barrier for far-reaching reforms needs to be emphasised. It is one of the main reasons that member states prefer to agree on a minimum consensus and for their principally critical attitude towards ambitious reform proposals (Becker, 2012): By restricting themselves to incremental changes member states avoid the risk not to reach a final agreement.

3. Conclusions

There are many good reasons to substitute a substantial share of the existing own resources financing the EU budget by own EU taxes. Most remarkably, many proponents of a fundamental future-oriented reform of expenditure structures of the EU budget, which form the overwhelming majority among experts and politicians as well up to now appear to fail to realise that the current system of own resources is one – if not THE – most influential cause for the existing shortcomings of the expenditure side of the EU budget. Until now attempts to secure an expenditure size and structure which may more effectively than today support the EU's policy priorities as laid down in the Europe 2020 strategy and beyond has failed primarily because the influence of the design of the revenue system is widely underrated. However, without a

12. Austria therefore has just reduced the rates of its flight charge which was introduced in 2011 as part of the fiscal consolidation efforts.

reform of the system of own resources a volume and structure of EU expenditures adequate to cope with the current problems and future economic and societal challenges the EU is facing appears as improbable as the radical elimination of the existing system of rebates. Not the least advantage of those EU taxes which help to internalize negative externalities is that they would allow reducing national contributions financed by more distorting taxes levied by member states. Thus the introduction of such EU taxes may contribute to current efforts to improve the structures of national tax systems.

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