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Rebalancing the Euro Area: The Costs of Internal Devaluation

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Rebalancing the Euro Area: The Costs of Internal Devaluation

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ABSTRACT *This paper investigates the economic costs of rebalancing current account positions in the Euro area by means of internal devaluation. Internal devaluation relies on wage suppression in the deficit countries. Based on an old Keynesian model we estimate a current account equation, a wage-Phillips curve and an Okun's Law equation. All estimations are carried out for a panel of twelve Euro area members. From the estimation results we calculate the output costs of reducing current account deficits. Greece, Ireland, Italy, Portugal and Spain (GIIPS) had, on average, current account deficits of 8.4% of GDP in 2007. To eliminate these current account deficits, a reduction of GPD by some 47% would be necessary. Trade imbalances can be resolved in two ways: deflationary adjustment in the deficit countries or inflationary adjustment in the surplus countries. The economic costs of deflationary adjustment to those countries are equivalent to the output loss of the Great Depression. An adjustment of the surplus countries would increase growth and it would come with higher inflation, but it would allow rebalancing without a Great Depression in parts of Europe.*

1. Introduction

The Euro area is suffering from substantial internal trade imbalances.[1] These are widely recognized as important contributing factors to the crisis of the Euro system because persistent current account deficits come with increasing external liabilities. The present economic policy regime essentially aims at rebalancing the Euro area by means of internal devaluation and/or by fiscal contraction in the deficit countries; in short, there would be a deflationary adjustment.

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[1]The Euro area overall has in the past decade had close to balanced current account, that is it rarely exceeded $\pm 1\%$ of GDP. However, individual Euro member states have had substantial deficits or surpluses. In this sense the Euro area has had on aggregate *internal* imbalances. Of course, member states have had substantial surpluses or deficits with the rest of the world.

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The paper aims at estimating the costs of rebalancing via internal devaluation. This strategy tries to achieve the necessary adjustment via reduction of unit labour costs in the deficit countries. We calculate how much output loss is necessary in order to eliminate the current account deficit for the GIIPS countries (Greece, Ireland, Italy, Portugal and Spain). To identify these effects quantitatively the paper takes an old Keynesian approach. First, we estimate a current account equation as a function of domestic demand and of unit labour costs (ULC). Second, we estimate a traditional wage Phillips curve, where ULCs are explained by unemployment, import prices and lagged ULCs. Third, we estimate an Okun's Law relation, where changes in unemployment are explained by changes in growth. The model uses annual data for the panel of Euro area member states for the Euro period (1999–2011).

Combining the effects of these equations allows us to identify direct as well as indirect effects of demand on the current account balance. The direct effect is that a decrease in demand will reduce imports and thereby improve the current account. The indirect effect is that the decrease in demand will lead to an increase in unemployment, which reduces wage inflation and thus price inflation. Our results indicate that the economic costs of this adjustment to the GIIPS countries, which are those that ran current account deficits before the outbreak of the crisis, are equivalent to the output loss of the Great Depression. An adjustment of the surplus countries would increase growth and it would come with higher inflation, but it would allow rebalancing without a Great Depression in parts of Europe.

Two clarifications about the scope of this paper are in order. First, we investigate the costs of rebalancing trade imbalances in the Euro area by means of internal devaluation. We assert that a substantial rebalancing will be necessary within Europe, but no claim is made that this balancing will by itself solve the private and sovereign debt problems that Europe is facing. Second, in estimating the effects of internal devaluation by means of panel estimation we treat the countries in isolation. In other words, we do not investigate the possible second round deflationary effects that, say, wage suppression and demand contraction in Spain will have in Germany. This is, of course, a very important issue, but it will have to be a subject of a different paper.

The paper is structured as follows. Section 2 discusses the imbalances and the economic policy regime of the Euro area. Section 3 outlines the old Keynesian model on which our estimations are based. Section 4, 5 and 6 present the literature review and our results on the current account equation, the Phillips curve and the Okun's law relation respectively. Section 7 calculates the total costs of rebalancing implied in these estimates. Finally, Section 8 concludes by indicating policy implications.

2. Imbalances, the EU Economic Policy Regime and Growth Models[2]

Economic performance of the Euro area is characterized by a (cumulative) divergence across countries, in particular between Germany (and some related

[2]This section builds on Stockhammer (2011a, 2012a).

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Table 1. Current account positions and unit labour costs in the Euro area

	Current Account (% of GDP)	Unit Labour Costs
	2007	1999–2007
Germany	7.5	−1.68
Netherlands	6.7	19.08
Finland	4.1	9.10
Austria	3.5	4.53
Belgium	1.7	13.42
France	−1.0	15.91
Italy	−2.4	20.73
Ireland	−5.3	35.85
Portugal	−9.9	24.08
Spain	−10.0	28.26
Greece	−14.3	21.54
GIIPS (unweighted average)	−8.4	26.1

Source*:* AMECO.

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countries) and the GIIPS countries. Table 1 documents the current account positions in 2007 and the growth of unit labour costs from 1999 to 2007 for 11 Euro area economies. This section will discuss these divergences and the EU economic policy regime that allowed these imbalances to emerge.

The economic policy mix in the Euro area has been outlined in the Maastricht Treaty and thereafter updated in the Stability and Growth Pact (SGP) and the Fiscal Compact. It consists of the following elements. First, fiscal policy is national[3] and it is restricted in the short term; the budget deficit must not exceed 3% of GDP (except in severe recessions) and member states must aim at a balanced budget in the medium term. Second, monetary policy is centralized and is effectively inflation targeting. Third, financial markets are liberalized, internally as well externally; the EU thus foregoes any instruments to control credit growth or allocate credit. Fourth, there is a no bailout clause; neither national governments nor the ECB will support individual countries facing debt problems.[4] This is the only policy area where there has been any substantial movement since the crisis. Fifth, labour markets are supposed to be flexible. This part of the EU's policy regime requires labour markets to respond flexibly, efficiently and quickly to shocks because traditional national means of dampening shocks such as exchange rate policy, (national) monetary policy, and fiscal policy, have been given up or restricted.

The EU policy package is characterized by a strong belief in the efficiency and self-stabilizing properties of the market system and a strong distrust of state

[3]The EU budget is restricted in size (to 2% of GDP) and too small (and too inflexible) to serve a macroeconomic function such as providing an expansionary stimulus in the face of (symmetric) adverse shocks.

[4]Buiter & Rahbari (2010) offer an interesting discussion on what the bail out clause precisely states.

activity. From the very beginning Keynesian economists criticized its design (Arestis *et al*., 2001; Arestis & Sawyer, 2004; Bibow, 2007; Euromemo Group, 2010; Flassbeck & Spiecker, 2005; Hein & Truger, 2005; Huffschmid, 2005; Stockhammer & Onaran, 2012).[5] First, there is an excessive reliance on labour market flexibility in the adjustment to symmetric as well as to asymmetric shocks. Keynesians have long been sceptical of the beneficial effects of wage flexibility. Chapter 19 of the *General Theory* (Keynes, 1973) pointed out that labour markets are complex social institutions and wages have social norm aspects that make them unlikely to react flexibly in the face of unemployment. Even if they did, the effect of falling wages is not necessarily beneficial because they reduce consumption expenditures and may give rise to a debt-deflation spiral (also see Stockhammer, 2011b). Relying on wage flexibility would subject the EU to prolonged unemployment. Second, EU policy would create a deflationary bias. Within the EU, with some countries running trade deficits and others running trade surpluses, the burden of adjustment effectively falls on the country with trade deficits. Any adjustment made by surplus countries would have to be inflationary (to stimulate demand, imports and increase their unit costs),[6] whereas adjustment by deficit countries is deflationary as they have to dampen demand (to decrease imports) and lower their prices and wages (to restore competitiveness). As the ECB is committed to a low inflation target, an inflationary adjustment would likely be counteracted by monetary policy. Third, relying on wages as the adjusting variable will create downward pressure on them. With this deflationary bias and most of the traditional economic policy instruments constrained, EU member states would be prone to pursue wage restraint as a means of competitive (real) devaluation. Fourth, there has been no Plan B in case of a serious crisis. The effectiveness of monetary policy is limited in the case of severe crisis, but fiscal policy is limited by design in the EU. Moreover, the no bailout clause hampers fiscal policy in times of severe crisis exactly at the time when countries would be unable to use either monetary policy or exchange rate policies. The EU policy package has simply assumed that such a crisis would not occur. With hindsight all these criticisms have been vindicated.[7]

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[5]These references focus on recent contributions. There was also an earlier Keynesian criticism of the EMU project and the Maastricht Treaty, e.g. Godley (1992).

[6]This assumes a Phillips curve with a positive slope. The Phillips curve may, however, be relatively flat up to the point of full capacity utilization. In this case the adjustment in the surplus countries need not be inflationary, but could be inflation-neutral.

[7]A theoretical attempt to present in a Marxian fashion all these points as necessary moments within a specific organization of capitalist power can be found in Milios & Sotiropoulos (2010) and Sotiropoulos *et al*. (2013). They argue that the strategy of the euro corresponds to a mechanism for continuously exerting pressure for the reorganization of labour in the various member countries. In this sense, it is not just an income issue. Working people are being systematically attacked both at the 'centre' and at the 'periphery' of the Euro area in their conditions of production and reproduction. This strategy can be approached as an ideal design for the organization of capitalist power, the practical application of which has proved far from being perfect. The plan for the single currency very obviously generates strategic benefits for the collective capitalists of all the countries that participate in it.

The Euro member states have been characterized by two growth regimes (Stockhammer, 2011a). In one group of countries, growth was associated with increasing debt; this regime usually came with asset and/or property price bubbles. Typically these countries had current account deficits and capital inflows. In a second group of countries, net exports provided the main driving force for demand. The extreme case of this is Germany, where from 1999 to 2007 around three-quarters of GDP growth was due to net exports (not counting indirect effects via induced-export investment). Roughly half the net export surpluses are to Euro area members (Statistisches Bundesamt, 2012). Germany pursued this neo-mercantilist strategy aggressively, with average real wages stagnating in the decade prior to the crisis and one of the sharpest increases in wage inequality among the advanced economies (OECD, 2008).

Debt-led growth was made possible to a significant extent through European financial integration. The EU's policy (the Financial Services Action Plan) aimed at creating a single financial market for Europe (Grahl, 2009). In theory this means uniform interest rates across the Euro area; in practice it has translated into massive capital flows from Germany, France and the UK to the fast growing Southern European countries. This policy initially fostered non-residential investment, but also turned into a property boom and/or boost of the non-tradable sector, supported by domestic demand.[8]

These two growth models, according to Stockhammer (2011a, 2011b), mutually reinforced each other, at least during the formation of a bubble in debt-led economies. Fast growing Southern European economies ran current account deficits that allowed for German export surpluses. These surpluses were 'recycled' as private credit flows back to the Southern European countries, where they financed property bubbles and rising household debt.[9] In fact the situation differed by country, but a massive increase in *private* household debt (in Southern European countries) is the hallmark of this growth (de Grauwe, 2010). With the exception of Greece and Italy, public debt was declining.

European Monetary and Economic Unification has not only resulted in disappointing overall performance, but it has also led to increasing macroeconomic divergence within the Euro area member states. While there has been a conver-

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[8]There is a certain economic logic to this. The real interest rates that businesses face are the nominal interest minus the inflation rate. But the inflation in producer prices (at which a firm can sell its output) depends on its sector. A Spanish automobile producer's prices are set by the world market (and not by Spanish inflation), whereas the real estate market has a regional dynamic (the real interest is negative if nominal interests are, say, 3% and house prices rise by 10%). The same nominal interest meant quite different real interest rates for different sectors; given a regime that encouraged capital flows, this meant that finance would be channelled to real estate (or, more broadly, non-tradable) sectors.

[9]The term 'recycled surpluses' is used to highlight the relationship between (German) export surplus and (Southern European) financial liabilities. However, the term is potentially misleading as the there is no one-to-one correspondence between export surpluses (of one country) and financial assets of that country. German banks could invest their surpluses in American government paper (or subprime derivatives) and loan it to a French bank. And French banks may borrow from German banks and lend to Spanish households. Borio & Disyatat (2011) warn against confusing current account imbalances (a flow concept) and financial liabilities (a stock concept).

gence in inflation rates, this has led to an increasing divergence of unit labour costs (see Table 1) and resulted in sizable current account imbalances across the Euro area. These imbalances are mostly due to economic imbalances *within* the Euro area. Roughly speaking two-thirds of the external trade of Euro member states is within the Euro area.

Current account deficits have to correspond to capital inflows. This means that the Mediterranean countries have experienced massive capital inflows for more than a decade. Indeed, the European Commission has encouraged the integration of capital markets within the Euro area and has thereby also encouraged capital flows. Consequently external financial assets have built up in the trade surplus countries, most of all Germany, and external liabilities have been accumulated in the trade deficit countries. The sectors accumulating debt have differed by country. In Greece, it was mostly the government sector; in Ireland, Portugal, and Spain it was the private sector, particularly the household sector (Lapavitsas *et al*., 2010a, 2010b).

Since the outbreak of the crisis European economic policy has, by and large, reinforced its orthodox orientation. A recent European Council (2012, p. 2) document 'endorsed priorities for fiscal consolidation and structural reform'; in other words: no active demand policy. Fiscal policy has tightened. The Fiscal Compact will bring more surveillance of deficit limits, and balanced budget requirements will be written into national law. Monetary policy has maintained its anti-inflation focus, but it has been forced to give more attention to financial stability, which it treats as synonymous with the survival of the big banks. The ECB did engage in a form of quantitative easing, but in contrast to the US and the UK, it has been focused on saving banks rather than supporting governments. This is also clearly reflected in the different compositions of the balance sheets of the Fed, the BoE and the ECB (Pisani-Ferry & Wolff, 2012). As regards wage policy, which is invariably discussed under the heading of improving competitiveness, the downward pressure on wages has increased with explicit calls for the decentralization of collective bargaining, reducing minimum wages and recommendations to reduce public sector pay.

3. A Basic Old Keynesian Model

The aim of this paper is to evaluate the costs of rebalancing within the Euro area. We ask the question: for a deficit country, how much must real output decline in order to reduce the deficit? We estimate a simple Keynesian model consisting of a current account equation, a traditional Phillips curve and an Okun's Law relationship. These three equations let us estimate the *direct* effects of demand on the current account as well as the *indirect* effects of demand via employment and wage costs on the current account. The model is old Keynesian in the sense that it is not based on any particular microfoundation; rather, it posits plausible macroeconomic relations. Its time horizon is short to medium run.

The current account (or net exports) is (in a simplified macroeconomic model) equal to exports minus imports. Exports depend on foreign demand and the domestic price level relative to the foreign price level. Imports depend on domestic demand and the relative price level. To keep things simple we focus on the

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domestic component and we regard unit labour costs as the prime determinant of relative prices. A richer model would consider foreign prices explicitly. For later calculations we need to express the current account equation in terms of differences:

$$\Delta \mathrm{CA} = a_1 \cdot \Delta \log(Y) + a_2 \cdot \Delta \log(\mathrm{ULC}) \tag{1}$$

where *CA* is the current account (as a percentage of GDP), *Y* is the real income and *ULC* the (nominal) unit labour costs.

The Phillips curve is a standard ingredient of macroeconomic models. While there is agreement on a Phillips curve in the short run across different schools of thought, views differ on the long-run properties of the Phillips curve. Monetarists and New Keynesians assume a vertical long-run Phillips curve, post-Keynesians argue that due to hysteresis effects, the Phillips curve will be endogenous or downward-sloping in the long run (Kriesler & Lavoie, 2007; Palley, 2003; Setterfield & Leblond, 2003; Stockhammer, 2008). However, the focus of our analysis is the short to medium run; thus long-run properties are not given further attention here. The wage Phillips curve has the form:

$$\Delta \log(\mathrm{ULC}) = b_1 \cdot \Delta U + b_2 \cdot \Delta \log(\mathrm{PM}) + b_3 \cdot \Delta \log(\mathrm{ULC}_{t-1}) \tag{2}$$

where *U* is the rate of unemployment and *PM* the import prices.

Okun's Law relates the growth of output to the rate of unemployment. As a behavioural function it is not contested (indeed it follows from a standard production function). In the short run it is usually interpreted as the change in the level of output determining the rate of unemployment. Since we focus on short to medium-run phenomena, this is the interpretation that we will use. Okun's Law relation takes the following form:

$$\Delta U = c_0 + c_1 \cdot \Delta \log(Y) \tag{3}$$

The model is Keynesian in that aggregate demand plays the active role. We ignore (or assume constant) a whole host of other factors, including demand from the rest of the world and productivity. A change in demand has a direct effect ($\Delta Y \rightarrow \Delta CA$) on the current account, but it also has an indirect effect ($\Delta Y \rightarrow \Delta U \rightarrow \Delta ULC \rightarrow \Delta CA$). Substituting equations (2) and (3) into equation (1), in equilibrium[10] we get

$$\frac{\partial \Delta \mathrm{CA}}{\partial \Delta \log(Y)} = a_1 \cdot + \frac{a_2 b_1 c_1}{1 - b_3} \tag{4}$$

The following sections will discuss the econometric estimation of these three equations and then calculate the direct and indirect effects of demand on the current account. We estimate all three equations as a panel of 12 Euro area countries with annual data. We choose panel data for two main reasons. First, we are more concerned about heterogeneity over time than about heterogeneity across countries. Second, due to European integration (and globalization more

[10]In equilibrium $\Delta ULC_{\mathrm{t}} = \Delta ULC_{\mathrm{t-1}}$.

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broadly) some of the macroeconomic relations, namely the price elasticities of exports and imports, may have changed substantially. In that case, the panel method gives us the chance to estimate our equations for time periods that are too short to be estimated in a single-country context. The use of panel data may lead to some bias as we are pooling countries that may not be identical with respect to the relevant coefficients. However, it allows us to reduce the variance of our coefficient estimates. Simply put, with the panel estimation we may get the number wrong, but we are more likely to get the order of magnitude correct. The decision to work with annual data is closely linked to our decision to employ panel estimation. While we would not necessarily expect countries to have the exact same lag structure (as with quarterly data), we do expect them to have similar effects over longer time periods (thus the use of annual data).

We estimate all equations for three samples. The first covers the Euro period 1999–2011. We regard this as the most interesting sample for our question. Second, we report results for the longer period 1990–2011. Third, we restrict the latter sample to recession years in order to detect possible non-linearities in our behavioural equations, in particular for the Phillips curve. The recession-years-only sample, reduces sample size substantially (to 35 observations). These results are less reliable and are reported only as a robustness check to investigate whether effects are very different in recession years.

We use a standard fixed-effect estimator with sectoral fixed effects. Results are very similar if the fixed effects are dropped (which is to be expected given that our dependent variable is in difference form). Results are very similar if heteroscedasticity-consistent standard errors are used and if we correct for autocorrelation (which is not a major problem in most specifications).

Our data are from the AMECO database.[11] *Y* stands for the (real) GDP at 2005 prices; *ULC* is the nominal unit labour cost for the total economy (calculated as the ratio of compensation per employee to real GDP per person employed); *PM* is the price deflator for imports of goods and services; *CA* is the balance on current transactions with the rest of the world (based on national accounts) as a percentage of GDP; and *U* is the unemployment rate.

4. Current Account Equation

The empirical research on current account imbalances in the case of Euro Area has undergone two phases. Before the crisis, Blanchard & Giavazzi (2002) set the groundwork for the discussion. Using panel data for several groupings of OECD and EU countries since 1975, they show that current account positions have become increasingly related to the level of output per capita of the country both within the OECD as a whole and the EU (this tendency is stronger within the Euro area). Eichengreen (2010) recently described their view as the 'good imbalance' argument: the rise of persistent current account imbalances reallocates capital flows so countries with lower GDP per capita levels catch up to

[11]AMECO is the annual macroeconomic database of the European Commission's Directorate General for Economic and Financial Affairs (DG ECFIN).

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countries with higher GDP per capita. According to Blanchard & Giavazzi (2002), the fast growing economies at the periphery can rely on external savings to undertake additional domestic investment projects while they can increase their own consumption (reducing national savings). This was not perceived as a big problem since the resulting deterioration in the current account positions would be gradually offset by higher future income levels (outcome of the catching-up process).

Using this line of reasoning, several econometric papers explain current account positions with economic variables that (according to neoclassical theory) affect saving and investment, such as: income per capita, demographic variables, government balance, old age dependency ratios, real interest rates, net foreign asset position and variables that capture the institutional structure of the society (for a summary see Barnes *et al*., 2010). Ahearne *et al*. (2009), using panel specifications (with annual data for the period before the crisis, 1981–2005), agree with the above perspective of 'good imbalances' pointing out that the EMU, by eliminating exchange rate risk, has boosted intra-European (but not extra-European) financial flows from high-income to low-income countries of the Euro area. Similar results are obtained by Lane (2010) and by Schmitz & von Hagen (2009). Current account imbalances are interpreted as signs of efficient capital allocation within the Euro area and are seen to promote economic convergence.

Other approaches use a similar econometric framework but offer a different interpretation and, to some extent, reject the idea of 'good imbalances.' Eichengreen (2010), using panel annual data for EU countries for the 1999–2009 period, provides evidence that the level of corruption is more significant as an explanation of intra-European imbalances than the growth differentials.[12] He argues that current account imbalances finally proved to be 'bad.' Convergence is conditional not only on the gap in per capital incomes, but also on the quality of domestic institutions. He argues that imbalances were driven mostly by 'domestic distortions' such as irrational asset booms and lack of fiscal discipline. Jaumotte & Sodsriwiboon (2010), working with panel data for 49 advanced and emerging countries (over the 1973–2008 period), provide evidence that the resulting current account imbalances do not necessarily imply optimal and sustainable foreign borrowing. Barnes *et al*. (2010), relying on econometric panel techniques of a sample of OECD countries, find that imbalances over the past decade cannot be fully explained by growth differentials and the institutional environment (the so-called 'fundamental economic factors'): the contribution of housing investment (non-tradables) also appears to be significant. Decressin & Stavrev (2009), referring to a sample of both Euro area and 13 other advanced economies, find what has changed with EMU is that the speed of adjustment of the current account has become significantly lower.

The literature discussed above explains the current account by means of a reduced form savings-minus-investment equation, but pays no explicit attention

[12]Cesaratto & Stirati (2011) cover a similar ground and suggest that labour market policies and German Neo-Mercantilism are more relevant.

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to the price competitiveness of a country. A second literature stream takes as its starting point that behavioural functions, exports and imports depend on differences in relative price levels (i.e., differences in price competitiveness and demand). Arghyrou & Chortareas (2008) highlight this. They use VAR techniques (based on quarterly data from 1975 to 2005) to identify long-run and short-run effects. They find that the relation between imbalances and real exchange rates appears to be substantial with the speed of adjustment subject to non-linear effects. Berger & Nitsch (2010), focusing on bilateral trade balances, argue that trade imbalances among Euro area members widened considerably, reflecting both growth differentials and divergent real exchange rates. The competitiveness channel is also emphasized by Belke & Dreger (2011): imbalances cannot be traced back to the catching-up process but the increase of unit labour costs.

Our current account equation is closer to the latter group. Current account imbalances are the outcome of macroeconomic export and import functions that depend on relative demand and relative costs. More technically, the (change in the) current account is a function of the (growth of) real GDP and of (the rate of growth of) nominal ULC. The current account equation thus takes the following form, where subscripts j and t denote country and time respectively; F_{j} stands for country fixed effects:

$$\Delta \mathrm{CA}_{j,t} = a_1 \cdot \Delta \log (Y_{j,t}) + a_2 \cdot \Delta \log (\mathrm{ULC}_{j,t-1}) + a_3 \cdot F_j + \varepsilon_{j,t} \tag{5}$$

In what follows we focus on the period 1999–2011. Table 3 summarizes the results for the current account equation. We consistently get statistically significant results. Between 1999 and 2011, a one percentage point increase in real GDP growth leads to a -0.14% point decline of the current account (as a ratio of GDP). A one percentage point increase in the growth of ULC leads to a -0.25% point decline of the current account. For the longer sample period (1990–2011), we get a similar effect for growth, but a substantially smaller ULC effect (-0.1). This may indicate that the impact of competitiveness has increased over time, possibly because of European integration. If we restrict the sample to recession years, the effect of GDP growth becomes statistically insignificant (and the coefficient very small), whereas the effect of ULC inflation remains statistically significant and of comparable magnitude. This may be interpreted as inflation effects being stronger in recession years. Most of our recession observations, however, lie in the Euro period, which may explain why results are similar to the Euro sample.

Our results are very similar using net exports (over GDP) instead of the current account as the dependent variable. Indeed, the current account and net exports are highly correlated over time, and for most countries they are also very close numerically. The major exception to this is Ireland, which has had consistently high net exports, but, in the run up to the crisis, had substantial current account deficits. The main reason for this discrepancy is the unusually high level of repatriated profits.

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Table 2. Overview of empirical literature on current account imbalances

Study	Dep. variable	Explanatory. Variables	Estimation Method	Sample	Notes
Arghyrou & Chortareas (2008)	*CA*, *REER*, *Y*, *Y** (foreign income)		VAR	EA countries, quarterly data: 1975–2005	Important differences across EMU countries regarding the significance of each variable in the determination of *CA* equilibrium.
Belke & Dreger (2011)	*CA*	*Y*pc, *REER*	panel	Annual data, 11 EA, 1982–2008	Competitiveness channel is more robust and shows the expected sign
Berger & Nitsch (2010)	Bilateral trade balance	*G* differentials and volatility, *REER*, *GGB*, institutional variables	Panel	EU15 + 3 countries, Annual data: 1948–2008	With the introduction of the euro, trade imbalances among euro area members widened considerably and became more persistent
Blanchard & Giavazzi (2002)	*CA*	*Y*pc in relation to an average level of *Y*pc	Panel	Annual data: 1975–2001, different groups of OECD and EU countries	It is with saving rather than investment as the main channel through which integration affects current account balances
Ahearne *et al.* (2009)	*NX* (as proxy of *CA*)	*Y*pc, *GGB P*oil, dummy for EMU	Panel	EU-15, Annual data (1981–2005),	By eliminating exchange rate risk the Euro has boosted financial flows from high-income to low-income countries in the euro area (not outside).
Jaumotte & Sodsriwiboon (2010)	*CA*, *S*, *I*	*GGB*, population growth, future old-age dependency ratio, oil balance, financial liberalization, dummies	Panel	49 advanced and emerging economies	The Euro helped southern EA countries to maintain investment despite lower saving rates by improving their access to international saving. That does not necessarily imply optimal or sustainable process.

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Eichengreen (2010)	*NX* (as proxy of net capital flows)	*Y*pc, corruption index, *GGB*, private credit, *RIR*, elderly dependency ratio	Panel	EU countries, Annual data (1999–2009), F	Convergence is conditional not just on the gap in per capita incomes but also on the quality of policies and institutions. 'Bad imbalances' driven by domestic distortions: bubble-driven asset booms, excessive budget deficits, and unrealistic expectations of future growth.
Barnes *et al.* (2010)	*CA*	Demographic variables, *G*, *Y*pc, initial NFA, *P*oil prices, *RIR*, *GGB*, structural rigidities, trade openness, institutional quality, financial depending	Panel	Sample of OECD countries, averages of 5 years period	'Fundamental' economic factors play an important role but do not fully explain the extent of imbalances over the past decade.
Decressin & Stavrev (2009)	CA	*F*, *NFA*, *GGB*, NXoil, *REER*, demographic variables	Panel and time series	Annual data, EA-11 and 13 other advanced countries	Differences between EMU countries' current accounts, are not unusual by historical standards, not different from a broad sample of advanced economies outside the EA. What is different is the current account dynamics.

Notes*: CA* is the current account, *NX* net exports, *S* saving, *I* investment, *Y* real GDP, *Y*pc real per capita GDP, *R* real GDP growth, *REER* real exchange rate, *GGB* general government balance, *NFA* net foreign assets, *EA* Euro area, *P*oil oil prices, *RIR* real interest rate.

Table 3. Results for the current account equation

dep var	d(*CA*/*Y*)		d(*CA*/*Y*)		d(*CA*/*Y*)	
sample	1999–2011		1990–2011		recessions 1990–2011	
Periods	13		22		8	
Cross-sections	12		12		12	
obs	156		264		35	
	coeff	*t*-stat	coeff	*t*-stat	coeff	*t*-stat
C	0.637	3.070	0.524	3.290	0.013	2.491
DLOG(Y_R_)	−0.136	−2.778	−0.142	−3.763	−0.051	−0.354
DLOG(ULC_)	−0.248	−4.248	−0.097	−2.896	−0.193	−2.446
Mean dep var	−0.104		−0.036		0.008	
S.D. dep var	1.721		1.587		0.018	
R-squared	0.166		0.090		0.453	
F-statistic	2.171		1.904		1.336	
DW	2.289		2.169		3.379	

5. Wage Phillips Curve

There is a rich literature on Phillips curves. Table 4 gives an indicative (but not exhaustive) summary of the literature with regard to the Euro area. Phillips (1958) originally estimated the link between money wage growth and the rate of unemployment (for the UK from 1861 to 1957).[13] Phelps (1967) and Friedman (1968) argued that his model did not properly account for inflation expectations (but implicitly had assumed adaptive expectations) and paved the way for the rational expectations revolution. Much of the recent literature is dominated by New Keynesian and New Consensus Models which rely on purely forward looking inflation expectations.

In contrast, Gordon's (1998) triangular model follows a more pragmatic, Keynesian tradition. It is called 'triangular' as it includes demand factors, supply shocks and past inflation. Typically, inflation is explained by unemployment (or the output gap), import prices (as proxy for supply shocks) and lagged values of inflation. Aguiar & Martins (2005) use this type of model to check the non-linearity of the Phillips curve in the case of the Euro area, providing evidence against this hypothesis. Beccarini & Gros (2008) rely on a similar specification to show that the impact of oil prices is more persistent in the Euro area than in the US. Fabiani & Morgan (2003) aggregate national Phillips curves into a single Phillips curve for the entire Euro area. Finally, Musso *et al*. (2007) use an expectations-augmented Gordon-type Phillips curve when rejecting the case of non-linearity in the case of Euro area as a whole.

[13]For useful brief presentations of the history of Phillips curve regression models see Galí *et al*. (2001), Montoya & Döhring (2011), Goodhart & Hofmann (2005).

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Table 4. Overview of empirical literature on Phillips curves

Study	Sample	Estimation	Notes
Aguiar & Martins (2005)	Quarterly data (1970:1–2002:3), EA	Gordon-type PC (GDP deflator, imports deflator)	PC turns out to be linear and its trade-off statistically significant. Non-linearity shows up in the Okun relation.
Beccarini & Gros (2008)	EA, US, Quarterly data (1996:1–2008:1). *Inflation*: Headline HCPI, core inflation, Output gap, HP filtered GDP	PC (Gordon-type) with oil prices for headline, PC (Gordon) with oil prices for core	The mean and the volatility of inflation appear to be higher in the past decade. The impact of oil prices is more persistent in the EA, and the slope coefficient is higher in the EA than in the US.
Buchmann (2009)	Monthly data (1990–2008), EA	Nonparametric and parametric estimation of hybrid-NKPC	Doubts on the validity of the New Keynesian Phillips curve. Estimates reveal an important nonlinearity in the sense that demand pressure on price inflation is not invariant to the state of the economy as it increases considerably at times of high economic activity.
Chortareas *et al.* (2011)	Quarterly data (1970:1–2007:4), EA	Hybrid-NKPC (GDP deflator, real unit labour cost)	Estimations are consistent with the pure NKPC but also with the central banks' perseverance to anchor inflation expectations when inflation is high.
Fabiani & Morgan (2003)	Quarterly data (1982:1–2000:4), national and aggregate level for DE, FR, IT, NL, ES	Gordon-type PC (ulc, consumers' expenditure deflator, import deflator, gap between unemployment and time-varying NAIRU)	Major advantages arise from the ability to develop country-specific structures for PC and not from aggregation biases that emerge when a common structure is used.
Galí *et al.* (2001)	Quarterly data (1970:1–1998:2), EA and US	Traditional PC, pure and hybrid NKPC (GDP deflator, real unit labour costs)	Hybrid-NKPC fits Euro area data very well (better than US data). Inflation dynamics in the EA appear to have a stronger forward-looking component than in the US. Labour market frictions appear to have played a key role in shaping the behaviour of marginal costs and inflation in EA.

(*Continued*)

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Table 4. Continued

Study	Sample	Estimation	Notes
Gorter (2005)	Quarterly data (1991:3–2004:4); countries: FR, DE, IT	NKPC with different specifications for marginal costs (output gap, real unit labour costs, open economy measures)	For France and Germany plausible estimations are received only when taking into account open economy factors affecting real marginal costs and subsequently the inflation process. For Germany and Italy (but not France) lagged inflation is a significant determinant of current inflation.
McAdam & Willman (2004)	Quarterly data (1970:1–1997:4), EA	NKPC, hybrid-NKPC (GDP deflator, marginal costs captured by sector based estimation using a production function)	Underlying determinants of NKPCs has general applicability to a wide set of countries as well as of use for sectoral studies.
Montoya & Döhring (2011)	Quarterly data (1990:1–2010:4), EA-11 (panel and time series)	Hybrid-NKPC (output gap, HICP core inflation, unit labour costs)	Evidence for both backward and forward looking inflation. The impact of the output gap on core inflation is significant but not large. Although the heterogeneity of Phillips curve relationships across EA economies is not large, the exceptionally large output gap caused by the crisis is one driver (among others) of the recently observed inflation differentials in the euro area.
Musso *et al.* (2007)	EA, quarterly data (AWM database: 1970:1–2005:4); *Inflation*: GDP deflator, HICP; Several alternative specifications of output gap	Linear PC (Gordon-type), PC (Gordon) with time-varying slope and intercept	No significant evidence of non-linearity. The Phillips curve became flatter around a lower mean of inflation.

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Paloviita (2008)	Annual data (1981–2006; 1990–2006 for pooled estimates)	NKPC, hybrid NKPC	Hybrid specification of the New Keynesian Phillips curve is needed in order to capture the euro area inflation process properly. In recent years of low and stable inflation, EA inflation dynamics have become more forward-looking and the link between inflation and domestic demand has weakened.
Pyyhtiä (1999)	Annual data (1976–1997), EA and country specific (AT, DE, FI, FR, IT, NL, ES)	NKPC with quadratic output gap (GDP deflator, output gap).	The Phillips curve has been especially asymmetric in Germany, Finland, Italy, the Netherlands and Spain. Strong negative influence of inflation uncertainty on GDP in the euro countries during the estimation period, 1976– 1997.
Rumler (2007)	Quarterly data (1980–2004), EA, AT, BE, DE, ES, FR, EL, IT, NL	Open-economy versions of hybrid-NKPC (GDP deflator, labour share, domestic and imported intermediate goods prices)	The estimates of the structural parameters of the model suggest strong heterogeneity in the degree of price rigidity across euro area counties. Price rigidity is systematically lower in the open economy specification than in the closed economy specification.
Scheufele (2010)	Quarterly data (1973:1–2004:4), DE	Hybrid-NKPC (GDP deflator, labour income share as marginal cost)	Evidence for a purely NKPC for Germany.
Tillmann (2009)	Quarterly data (1970:1–2005:4), EA	NKPC, hubrid-NKPC (GDP deflator, labour share), VAR methodology	Purely forward-looking as well as for the hybrid model cannot be interpreted as it is done in the literature due to the immensely wide confidence intervals.
Turner & Seghezza (1999)	Semi-annual data (1970–1997)	Gordon-type PC (output gap, output deflator of business sector, imports deflator)	Most countries accept a common sacrifice ratio of about $3\frac{3}{4}$.

Most recent empirical research on Phillips curves for the Euro area follows the new Keynesian approach. New Keynesian models rely on purely forward looking inflation expectations. The so-called hybrid version also takes into consideration some backward looking behaviour, thus bridging between the new Keynesian model and the backward-looking specifications (see Goodhart & Hofmann, 2005). Most authors using the hybrid version find strong evidence for an independent role of past inflation. For instance, Buchmann (2009), using parametric and non-parametric versions of a hybrid New Keynesian Phillips curve, challenges the validity of the pure New Keynesian specification and provides evidence for important non-linearity of the curve in the case of the Euro area. Galí *et al*. (2001), Paloviita (2008), and Montoya & Döhring (2011) also offer evidence for the hybrid model. Nevertheless, there are also authors who find support for the pure forward-looking model (Scheufele, 2010; Chortareas *et al*., 2011).

Our model is close to the triangular model. New Keynesian and hybrid specifications rely on the data about inflation expectations. In theory, inflation expectations are treated as rational, and model endogenous; in practice, available inflation forecast data are used. These forecasts, however, are often based on past data. We use ULC as proxy for the price levels and estimate the growth of ULC as a function of (the change in) the rate of unemployment, the growth of (lagged) import prices and lagged growth of ULC. This is a version Gordon's (1998) triangular Phillips Curve:

$$\Delta \log (ULC_{j,t}) = b_1 \cdot \Delta U_{j,t} + b_2 \cdot \Delta \log (PM_{j,t-1}) + b_3 \cdot \Delta \log (ULC_{j,t-1}) + b_4 \cdot F_j + \varepsilon_{j,t} \tag{6}$$

Table 5 summarizes our empirical from estimating this relationship. Coefficients are all statistically significant at the 1% level. Strictly speaking, our findings are biased because we use a lagged dependent variable and fixed effects. However, our results are essentially the same if we drop the fixed effects.

For our Euro period sample (1999–2011), we find that a one percentage point decline in the rate of unemployment reduces ULC growth by 0.39% in the short run. For the period 1990–2011, the reduction in ULC growth is 0.54%, but during recessions it almost triples to 1.5%. Short-run and long-run effects of unemployment differ because lagged wage inflation plays a role in determining wage growth. For 1999–2011 the long run effect is −0.68%, for 1990–2011 the value is −1.42%, whereas for recession years it reaches −5.69%.[14]

6. Okun's Law

The empirical research with regard to the Okun's Law focuses primarily on two important issues: spatial heterogeneity across countries and the time-varying

[14]One could argue that the Phillips curve should be homogeneous of degree one with respect to import prices and past wages. If this condition is imposed the long-run effects are −1.42 and −2.19 for the 1999–2011 and the 1990–2011 samples respectively (available upon request).

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Table 5. Results for the ULC-Phillips curve

	*D*LOG(ULC_)		*D*LOG(ULC_)		*D*LOG(ULC_)	
Sample	1999–2011		1990–2011		recessions 1990–2011	
periods	13		22		8	
sections	12		12		12	
obs	156		264		35	
	Coeff	*t*-stat	coeff	*t*-stat	coeff	*t*-stat
C	0.009	3.334	0.005	2.607	0.023	2.398
D(*U*_/100)	−0.391	−2.617	−0.536	−4.492	−1.497	−4.141
*D*LOG(ULC_(−1))	0.405	4.960	0.624	12.966	0.737	5.383
*D*LOG(PM_(−1))	0.207	4.309	0.199	5.119	0.319	2.280
Mean dep var	0.019		0.025		0.030	
S.D. dep var	0.024		0.031		0.041	
R-squared	0.267		0.526		0.756	
F-statistic	3.666		19.718		4.415	
DW	2.203		2.285		2.602	
LR effect	−0.657		−1.424		−5.687	

relationship of the coefficient. A series of recent analyses accepts the inverse relationship between unemployment and growth but drops the assumption of invariability across time and uniformity across regions. In particular, in the case of Euro area countries, spatial and temporal heterogeneity in Okun's coefficient is a standard finding in several studies (see Cazes *et al.*, 2011; Perman & Tavera, 2007; Zanin & Marra, 2012).

In contrast to the above research, we estimate the traditional Okun's Law equation (which is identical to Okun's 1962 first equation[15]) with annual data, not for single Euro area countries but for a panel of them. An analysis of the heterogeneity of Okun's coefficient across countries is beyond the scope of this paper. Rather Okun's law provides us with a meaningful closure to our system, which will enable us to capture the total effects between domestic demand and current account rebalancing for a time period that is too short to be estimated in a single-country context (see also our comments in the next section). Our regression equation thus takes the following form:

$$\Delta U_{j,t} = c_0 + c_1 \cdot \Delta \log (Y_{j,t}) + c_2 \cdot F_j + \varepsilon_{j,t} \tag{7}$$

Much of the literature since uses the output gap instead of GDP growth. However, the output gap measures involved assumptions about the production function and about the existence and empirical identification of a natural rate of

[15]Okun (1962) presents several versions, all estimated with quarterly data. The first version estimates the difference in unemployment as a function of difference in (the logarithm of) GDP and is identical to our specification. The second version first calculates a potential GDP and an output gap. The unemployment rate is then related to the output gap.

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Table 6. Results for the Okun's law relation

Dep Var:	*D*(*U*_/100)		*D*(*U*_/100)		*D*(*U*_/100)	
Sample	1999–2011		1990–2011		recessions 1990–2011	
periods	13		22		8	
sections	12		12		12	
obs	156		264		35	
	coeff	*t*-stat	coeff	*t*-stat	coeff	*t*-stat
C	0.006	5.323	0.007	7.146	0.011	2.781
*D*LOG(*Y*_*R*_)	−0.259	−10.154	−0.262	−12.295	−0.277	−2.299
Mean dep var	0.001		0.001		0.018	
S.D. dep var	0.012		0.012		0.018	
R-squared	0.6163		0.5947		0.6024	
F-statistic	17.546		28.218		2.777	
DW	2.051		1.867		1.994	

unemployment (NAIRU or NAWRU). As we do not wish to invoke the assumption of a NAIRU, we use Okun's original version (see also Knotek, 2007).

Table 6 summarizes the results for the Okun's law relation. Coefficients are statistically significant at the 1% level in all specifications. The Okun's law coefficient is just below −0.26 and very similar for all three alternative sample periods. This number also very close to the figure (−0.3) Okun estimated. It is within the lower range of values that Moosa (1997) and Zanin & Marra (2012) report for different countries; and it also agrees with the similar panel estimations by Döpke (2001). We find no evidence that the Okun's law relation is different in recession years.

7. Total Effects

The total effect of a change in domestic demand on the current account is the direct effect of demand on the current account plus the indirect of demand on unemployment, of unemployment on wages and of wages on the current account (equation 4). Table 7 summarizes the effects of a change in aggregate demand on the current account based on the results reported in Tables 3, 5 and 6. Based on the Euro area period (1999–2011), a one percentage point increase in demand will lead to a 0.18% point reduction in the current account deficit. Of this, −0.14% points are due to the direct effect. The decrease in demand also leads to an increase in unemployment, which dampens wage growth. However, the total influence of this effect is rather moderate.

The results are very similar for different time periods, but do seem to differ during recession years. Extending the sample to include 1990–2011 gives a total effect of −0.18. If we restrict the sample to recession years (between 1990 and 2011), we get a total effect of −0.35. The effect is large during recession years, which is mainly driven by a much steeper slope of the Phillips curve.

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Table 7. Total effects of a change in aggregate demand on the current account

	1999–2011	1990–2011	recessions 1990–2011
dir d*CA*/d*Y*	−0.14	−0.14	−0.05
indir d*CA*/d*ULC*.d*ULC*/d*U*.d*U*/d*Y*			
d*CA*/d*ULC*	−0.25	−0.10	−0.19
d*ULC*/d*U*	−0.66	−1.42	−5.69
d*U*/d*Y*	−0.26	−0.26	−0.28
sum	−0.04	−0.04	−0.30
total d*CA*/d*Y*	−0.18	−0.18	−0.35
how much less growth for −1%pt d*CA*	−5.62	−5.60	−2.82
to reduce all imbalances of 2007 GIIPS	−47.20	−47.04	−23.72

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Given that Greece, Ireland, Portugal, Spain and Italy in 2007 had an average current account deficit of 8.4% of GDP, what is the GDP cost (on average) of eliminating this? Our estimates are 47.2% and 47.0% respectively, based on the results for the 1999–2011 and the 1990–2011 samples. These figures are similar despite the fact that their composition differs. Calculations based on the results for the recession years only give a much lower number of 23.7%. As the sample of recession-only years is small (n=35), one should be careful with its interpretation. We mainly report it as a reminder that macroeconomic relations may change during a downturn.

Such high adjustment costs are not unique to our results. Research on Phillips curves implies similarly high costs of adjustment. An OECD working paper (Turner & Seghezza, 1999) estimates Phillips curves and finds that coefficients for 16 out of 20 OECD countries can be pooled. The common sacrifice ratio, that is output loss per percentage of inflation, is 3.75. The GIIPS ULC inflation has been cumulatively, on average, 26.1% from 1999 to 2007; the Euro area's inflation was 12.9%. To reduce the price levels back to the Euro area average, the GIIPS would have to reduce the price level by 13.2%. Adding Turner & Seghazza's sacrifice ratio gives us a GDP reduction of 49.5%, similar to the value that we estimate. Finally, to illustrate how devastating the orders of magnitudes involved are, consider the case where the GIIPS had to reduce their price level to match the German one. They would have (in 2007) to reduce prices by 27.8%. With Turner & Seghazza's sacrifice ratio would require a reduction in GDP by 104%.

8. Conclusion

The paper has estimated the effects of rebalancing current account deficits for Euro area countries via internal devaluation. We find that in order to eliminate the average current account deficit of the GIIPS group, a GDP reduction of

47% is needed. These results should not be considered as forecasts, but as 'what if' exercises. Our estimations answer the following question: how big an output loss is required to eliminate the GIIPS' current account deficits *if* the basic macroeconomic behavioural equations were to hold, on average, as in the recent past? There are several reasons why things may not be as bad as our results imply. First, economic relations may differ during recessions from those of normal times. Based on a sample of recession years only, we get an estimate of a required 23% reduction in GDP to balance current accounts. This is still an enormous number. Second, there may not be a need to eliminate current account imbalances completely. Third, there are many ifs in our scenario and many factors that have not explicitly entered our analysis: 'structural reforms' may work and dramatically improve productivity (and thus competitiveness) of the GIIPS; but there are several factors that may make things worse: the effects of economic uncertainty, debt overhang and deflation may turn out to be more important factors than the export and Phillips curve effects, which have been the focus of this paper. In short, we believe that there are good reasons to think that we overestimate adjustment costs as well as good reasons to think that we underestimate them.

In brief, while we have little confidence in the precise details of our results, we do hold that they indicate a plausible order of magnitude for adjustment costs. These costs are so large that there is only one conclusion—deflationary adjustment in the deficit countries will have devastating economic and social effects. If the Euro area is to survive it has to rebalance. If this is to be done without strangulating the deficit countries, the surplus countries will have to do a much larger part of the adjustment. There are two ways of rebalancing: a deflationary method and an inflationary one. Inflationary adjustment involves higher wage growth and expansionary policies in the surplus countries. An adjustment of the surplus countries would increase growth and it would come with higher inflation, but it would allow rebalancing without a Great Depression in parts of Europe. Europe desperately needs inflationary adjustment.[16]

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[16]These inflationary policies will need a corresponding monetary policy and interventions in the workings of financial sector. The fact that we do not discuss them here does not reflect their importance but merely the scope of this paper.

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