An Optimum Currency Crisis

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Abstract

This paper presents an ex-post assessment of the current situation of the EMU in light of the conditions prescribed by the theory of Optimum Currency Areas (OCA). The analysis shows that some of those conditions were satisfied at the inception of the EMU, others were missing at the beginning, but improved over time as expected by the endogenous approach to the OCA theory. The common fiscal capacity was the main missing element of the initial construction of the Eurozone, and still is. The common budget is so exiguous that its effectiveness as shock absorption mechanism is negligible. The analysis then shows how some of the concerns raised on the eve of the euro did actually materialize, even if not immediately. First, in its first decade the Eurozone did not experience major turbulences, because growing financial integration was compensating the need for fiscal transfers, channelling the excess of saving from the 'core' to the 'periphery'. Second, the mechanism generated record-high private indebtedness in the 'periphery' and exposure of the banks in the 'core', making the whole system more fragile as it relied upon financial markets' stability. Third, once the long-feared shock hit, the mechanism proved weak and non-resilient. The inherent weaknesses of the EMU became evident. Fourth, as it had been foreseen, the cost of the adjustment after the shock fell mainly on labour, with much higher and longer unemployment in the Eurozone than both non-Eurozone EU and the US. Fifth, as the theory suggested, the lack of common mechanisms of adjustment dramatically increased the socio-economic divergences within the EMU. The paper finally presents a simulation for a common budget of the Eurozone, linked to the relative current account positions of the member states.

1. Introduction

The decision to establish a common currency in Europe had long been debated (Meade, 1957; Scitovsky, 1957; Mundell, 1961; McKinnon, 1963), before it was actually taken and implemented. At the summit of The Hague in December 1969 it was decided that the Community should evolve by stages into an Economic and Monetary Union (EMU). The objective of a full EMU was explicitly stated in the Maastricht Treaty in 1992. In 1999 the euro was introduced as the official currency of 11 Member States (MS) replacing national currencies[2].

This new institutional setting represented a peculiar monetary union, more integrated than past agreements of fixed exchange rates, but still far from complete economic and political unions[3]. Monetary policies of the participating Member States

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[2] A 12th country, Greece, joined one year later.

[3] "Whenever states as in the USA or Australia, provinces as in Canada, cantons, lander, etc., have joined together in a larger federal unity, both the main political, the main fiscal and the monetary powers and competencies have similarly emigrated to the federal level. The Euro area will not be like that" (Goodhart, 1998).

(MS) became the responsibility of the European Central Bank (ECB). Fiscal policies remained responsibility of national authorities, even though subject to restrictive common rules on public finances known as the Stability and Growth Pact. This created an unprecedented divorce between the main monetary and fiscal authorities (Goodhart, 1998).

The reasons for such an ambitious experiment were mainly political, but several economic advantages were also expected: a reduction in transaction costs, promoting trade (Rose, 2000), and the elimination of the exchange rate risks, favouring financial integration. At the same time, participating countries lost a great deal of flexibility, renouncing to national monetary policies and to a mechanism for adjustment to shocks (Krugman, 2012).

The theory of Optimum Currency Areas (OCA), as developed by Mundell (1961), McKinnon (1963), Kenen (1969), Fleming (1971), proposes a set of necessary conditions for monetary unions and provides an analytical framework to assess risks and opportunities a region might be confronted with. This approach has been widely discussed in the literature (Robson, 1987; Bayoumi, 1994; Bayoumi and Eichengreen, 1997; Goodhart, 1998; Alesina et al, 2002; McKinnon, 2004; Tavlas, 2009; Krugman, 2012; O'Rourke and Taylor, 2013), and it has been used to assess ex-ante the feasibility of the EMU (Mundell, 1961; McKinnon, 1963; Kenen, 1969; Eichengreen, 1991; Eichengreen, 1993a; Tavlas, 1994; Obstfeld, 1997, Alesina et al, 2002).

The standard theory of OCA was later on defined "exogenous", in contrast to an "endogenous" approach (Frankel and Rose, 1998), which admitted the possibility that OCA properties, even if not fulfilled ex-ante, could be gradually satisfied during the existence of the monetary union.

Its applicability to the specific case of the EMU has been rather controversial. The report "One Market, One Money" (EC, 1990), for instance, discarded the theory, explaining that:

> there is no ready-to-use theory for assessing the costs and benefits of EMU. Despite its early insights, the 'theory of optimum currency areas' provides a too narrow and somewhat outdated framework of analysis. Recent developments in both micro- and macroeconomics have not yet led to a unified theory of monetary unions (p.31).

Critics of the OCA theory highlighted that it lacks a formalized model allowing a measurement of the "OCA test" for potential currency unions (Robson, 1987), that it has little or no predictive capacity (Goodhart, 1998), and that analyses investigating OCA properties are by necessity backward-looking (Mongelli, 2008).

In this work, however, we apply the theory of OCA to study ex-post the developments of the EMU, following the main conditions for a suitable monetary union prescribed by the theory:

- factors mobility (capital and labour) across the area;
- price and wage flexibility;
- similarity of business cycles among participating countries;
- common fiscal capacity as a mechanism of shock absorption and risk-sharing.

The paper analyzes each one of these criteria, in order to assess to what extent they were satisfied before or during the EMU. The actual development of the EMU is then put in perspective, comparing the lessons drawn from the theory with the current status.

Sections 2 to 5 review the main conditions for OCAs and the extent to which the Eurozone complies with each of them; section 6 describes the process of building up the EMU in light of the theory; section 7 explains how the "private insurance channel" worked during the first decade; section 8 shows the developments of the EMU during the crisis; section 9 the adjustment process currently taking place; section 10 proposes a simulation of a common budget; and section 11 concludes.

2. Factors mobility

Factors mobility was proposed as a key criterion to define an OCA since the seminal work by Robert Mundell (1961), who defined an OCA "in terms of internal factor mobility and external factor immobility". We can analyze in detail the degree of mobility of capital and labour in the EMU.

2.1. Free circulation of capital

The free circulation of capital has been established in Europe in parallel with the development of the single market. The complete liberalisation of capital flows in the EU was not foreseen initially by the Treaties. The steps towards the EMU and the introduction of the single currency required a stricter coordination, which brought to the Council Directive 88/361/EEC fully liberalising capital movements between residents of the MS, by removing all remaining restrictions as of 1 July 1990. The Maastricht Treaty (1992) introduced the free movement of capital as a Treaty freedom.

Today, Article 63 TFEU prohibits all restrictions on the movement of capital and payments between MS, as well as between MS and third countries. Even though some exceptions clauses were foreseen, since 1999 the safeguard clause to remedy crises in the balance of payments is only applicable to those member states which are not part of the Eurozone[4].

The criterion of capital mobility can therefore be considered as fully satisfied by the EMU. Moreover, this growing financial integration is key to understand the development of the Eurozone (Obstfeld, 2013).

2.2. Labour mobility

Labour mobility in the Eurozone has not reached the same extent as capital mobility, due to cultural and language barriers, and regulatory constraints. The measurement of labour mobility has often been a complex topic addressed by many authors (Harris and Todaro, 1970; Diamond, 1981; Pissarides, 1990; Layard et al, 1991, Mortensen and Pissarides, 1994; Molloy et al, 2011). Many have also tried to study the specific case of intra-EMU labour mobility (Eichengreen, 1991; Vandenbrande et al, 2006; Bonin et al, 2008; Fenge and von Weizsaecker, 2009; OECD, 2012; Kahanec 2012 and 2013; EPC, 2013), which is of specific relevance for our analysis.

A first, rough, estimate can be based on the number of foreign-born residents in each country. The Eurostat Labour Force Survey provides these data for each EU MS since 2009. The number of foreign-born residents in each Eurozone country is increasing in both absolute terms (from 35,650,225 in 2009 to 38,315,569 in 2012) and

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[4] The legal basis is: Articles 63 to 66 of the Treaty on the Functioning of the European Union (TFEU), supplemented by Articles 75 and 215 TFEU for sanctions.

in relation to the total population of the Eurozone (from 10.98% in 2009 to 11.53% in 2012).

The comparison with the US can give an idea of the degree of labour mobility in Europe and of its importance as a mechanism for adjustment: Blanchard et al. (1992) explain how in response to an adverse shock in demand, relative nominal wages might decline, but in general they do not decline enough to prevent increases in unemployment. In the US, what they trigger is mostly labour out-migration, rather than job in-migration or job creation.

Similarly, Krugman (1993a) shows that in the US relative higher unemployment of some states is often reduced not so much by employment creation, but by reducing their labour force via outwards migration. The case of Massachusetts, experiencing a hard recession at the end of the 80s after a big boom, is explanatory: it lost a relevant part of its workforce, which never came back. This was the main driver of unemployment reduction.

Another way of measuring the differences in labour mobility between the US and the Eurozone is by plotting the unemployment rates at two distinct points in time, in order to see whether differences among regions or states persist or not.

Figure 1: Unemployment in 1999 and 2012. Eurozone NUTS2 Regions and US States
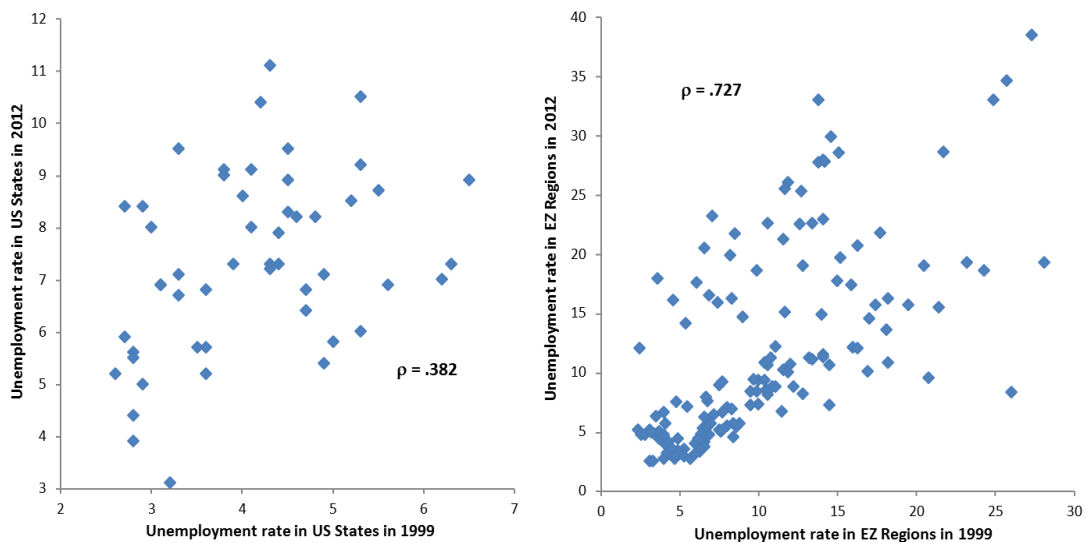
Source: Eurostat and US Bureau of Labor Statistics.

We can observe that between 1999 and 2012 the differences in unemployment rates changed quite significantly among US states, the two series have in fact a low correlation (ρ=.382). If we analyze the same differences among Eurozone NUTS2 regions, between 1999 and 2012, we observe that they tend to be quite similar, definitely more than in the US (correlation ρ=.727).

While in the US labour mobility plays a role in reducing and rebalancing unemployment rates across states, in the Eurozone differences in unemployment rates are more persistent. Labour mobility, then, seems a weaker mechanism of adjustment in the Eurozone, compared with the US. The figure suggests that unemployment in the Eurozone is a localized problem, with permanent differences among regions, and labour mobility has a limited impact in mitigating the problem.

Molloy et al. (2011), however, have estimated the share of the population in 2005 who actually moved residence in the previous year in EU MS in comparison with the US: they found similar mobility rates between the US and some EU MS.

Recent analyses (EC, 2013; EPC, 2013; Dao et al, 2014) show that geographical mobility of workers as an immediate response to shocks in the EU is significantly increasing over time. The willingness of Europeans to move to another MS for work doubled in the last three years; actual moves from deficit to surplus countries doubled and tripled in some Eurozone countries, during the last two years.

Record-high unemployment levels as consequence of the crisis in the countries of origin exemplifies the growing importance of "push" factors versus "pull" factors, in explaining the increasing labour mobility within the Eurozone (EPC, 2013).

To sum up, labour mobility has traditionally been one of the "missing conditions" for the EMU as an OCA (Mundell, 1961; Eichengreen, 1993b). This situation, however, is definitely changing, with an increased flow of workers from high-unemployment countries to the others. Which part of this increase can be considered as a natural development of the monetary union, in an "endogenous OCA approach", and which instead depends on "push" factors created by the hardest crisis since the Great Depression, it is hard to say.

The effect of this higher labour mobility, however, is for the moment too limited to offset the huge rise in unemployment. A recent analysis by the ECB (2012) argues that the problem of unemployment in the Eurozone is mainly due to structural imbalances between labour demand and labour supply, rather than by a lack of geographical mobility, suggesting a relatively smaller potential role for labour mobility in alleviating the mismatch.

3. Prices and wages flexibility

Price and wage flexibility is another key condition and an important mechanism for adjustment, alternative to the exchange rate (Friedman, 1953). The relevance of price rigidity relates to the extent it transforms nominal shock into real effects, and for this reason wage flexibility can be an important adjustment mechanism.

Friedman (1953) studied price and wage rigidities in comparison with the exchange rate, as alternative methods for adjustment. He highlighted the flexibility of the exchange rate versus the inflexibility of internal prices and explained that "if internal prices were as flexible as exchange rates, it would make little economic difference whether adjustments were brought about by changes in exchange rates or equivalent changes in internal prices. But this condition is clearly not fulfilled". Prices are more flexible upward that downward, but not all in an equal manner (Stiglitz, 1999). The inflexibility of prices, or different degrees of flexibility, implies a distortion of adjustments in response to changes in external conditions. The adjustment takes the form primarily of price changes in some sectors, and of output changes in others.

Price and wage flexibility in the Eurozone has been a controversial topic, due to the intrinsic difficulties of its measurement. Dhyne et al. (2006) estimated an average monthly frequency of price change in the Eurozone of about 15% and median price duration of 10.6 months. Bils and Klenow (2004) in a comparable analysis carried out for the US found an average monthly frequency of around 25% and weighted median price duration of 4.6 months. According to these estimates, prices in the Eurozone seem stickier than in the US.

In a comparative study between Europe and the US, Verhelst and Van den Poel (2010) analyzed the levels of price rigidity in the two areas, based on frequency of change. The use of monthly data to study price stickiness showed similar levels of price rigidity in the two areas, but when higher base frequencies were examined regular prices were found to be more flexible in the US than in Europe.

Dhyne et al. (2009), however, propose a distinction between sticky and rigid prices: the first concept is based on the frequency, while the second on the extent of the change of prices. They argue that the distinction between intrinsic and extrinsic rigidity is the relevant one for policy purposes[5].

In their analysis of price rigidity in the Eurozone, they find crucial differences for food and for service prices. While retail prices of food change quite often, mainly because producer prices are very volatile, they actually exhibit substantial intrinsic rigidity. On the other hand, the low frequency of price changes for services is due to the fact that the cost of providing services is quite stable. The level of intrinsic rigidity for services is actually moderate, similar to the level for manufactured products, for which prices change much more often.

It seems plausible to argue that the level of price rigidity in the Eurozone, in spite of being still higher than in the US, is actually decreasing, approaching US levels. Alesina et al. (2008) found that that the adoption of the Euro has been associated with an acceleration of the pace of structural reforms in the product market, increasing price flexibility.

Wages are, in general, more rigid than prices, but it seems that in the Eurozone they are following the same dynamics. The decline in real wage rigidity in Europe has been showed by Goette et al. (2007).

In a comparative approach, Baddeley et al. (2002) studied regional wages in EU regions and US states, finding that wages do not seem to be more rigid in Europe than in the US. They observed a "significant variation across regions in the degree of wage rigidity" within both the EU and the US, and conclude that "it would be incorrect – or certainly misleading – to attribute the regional unemployment problem in the EU wholly to wage inflexibility".

A similar conclusion is reached by Ebbinghaus and Kittel (2005) who focus on wage coordination. Their analysis shows that the variety of bargaining patterns across European countries during the period 1971 to 1998 "contradicts a simple US-Europe juxtaposition". They find that contrary to the expectations, the labour market actors in most European countries are responsive to the performance of their bargaining system; they tend to adapt their system if wages seem to overshoot. Hence, they conclude, "the rigidity of Europe thesis does not hold in a more detailed cross-national and long-term analysis of institutional changes in wage bargaining".

Alesina et al. (2008) argued on this point that the adoption of the euro does not seem to have accelerated labour market reforms in the "primary labour market"; however, the run up to the Euro adoption seems to have been accompanied by wage moderation.

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[5] "A price is intrinsically rigid when it does not adjust, or only partially adjusts, to changes in demand and costs that have significant effects on the optimal price. A price is extrinsically rigid when the price does not adjust because demand and costs are stable and the optimal price does not vary much" (Dyhne et al, 2009).

Konya and Krause (2011) precise that, according to their analysis, wages for already employed workers are more rigid in the Eurozone than in the US, but the rigidity of wages for newly hired workers is small in both areas. This suggests that labour markets are becoming as flexible in the Eurozone as they are in the US, as far as new hires' wage rigidity is concerned.

For this criterion, as well, we could conclude that, in an "endogenous" approach to the theory of OCA, much progress has been achieved in satisfying it.

4. Business cycles

The similarity in business cycles has a particular relevance in monetary unions due to the fact that different countries become subject to a single, one-size-fits-all monetary policy (Frankel and Rose, 1998). If countries forming a monetary union have similar cycles, the single monetary policy can therefore be suitable for all of them. Different cycles between countries, on the contrary, lead to more asymmetric macroeconomic shocks, which can be amplified by the same monetary policy (De Grauwe, 2013).

Some of the MS joining the Eurozone had similar business cycles, but others were rather diverging. Greece, Ireland and Spain, in particular, had higher than average growth rates of GDP, inflation, and domestic demand. On the other side, countries like Germany or Italy had, at the inception of the EMU, very low growth rates, low inflation and stagnating domestic demand.

Critical choices of monetary policy were to be made by the ECB, and the decisive reduction in its key interest rate (-2,75% points between 2001 and 2004) was as beneficial to avoid recessions in the stagnating economies, as dangerous for fuelling asset bubbles in the fast-growing ones.

In the absence of an automatic rebalancing trough flexible exchange rate, it was argued that even the minimum structural divergences in business cycles are likely to amplify divergences in the balance of payment (Friedman, 1953; Kaldor, 1971) and these differences are likely to persist (Fleming 1971). As a proof of this, Berger and Nitsch (2010) have demonstrated that trade imbalances among Eurozone countries have widened markedly after the introduction of the common currency. This increase has a high degree of persistence, which appears to lengthen the impact of shocks on external accounts.

The following figure shows the evolution of several measures of dispersion within the Eurozone: in periods characterized by flexible (or less rigid) exchange rates, even higher differences in the rates of growth of GDP, prices, and domestic demand, correspond to lower current account imbalances, while the opposite becomes true in the EMU. The rigidity of the exchange rates, in the absence of internal compensation mechanisms, amplifies enormously the impact of differences in business cycles on the balance of payment.

Figure 2: Dispersion (σ) of Current Account balance (CA), GDP growth rates (G), Inflation (P), and Domestic Demand growth rate (D) in the Eurozone (1980-2012)
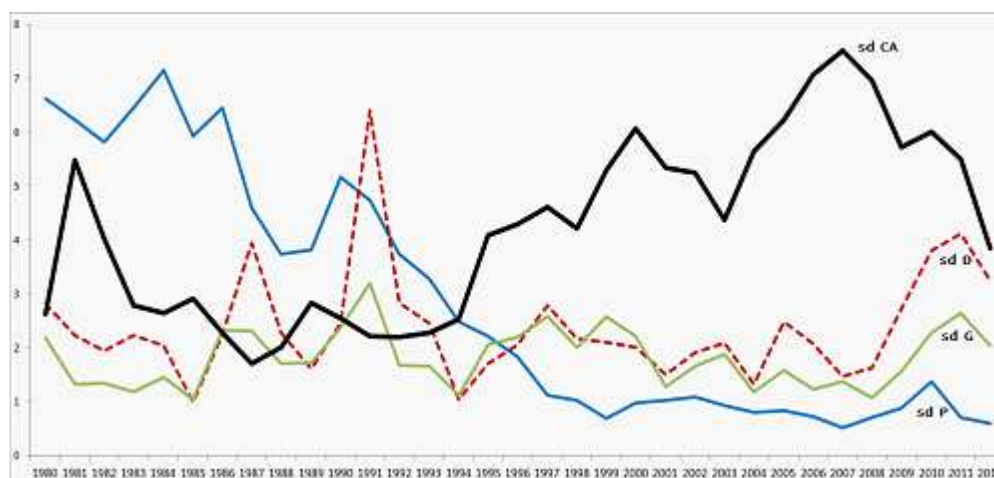
Source: Own calculations on the basis of AMECO, IMF and WB data.

The condition of similarity of business cycles among countries forming a monetary union was not fully satisfied at the time the euro was introduced. However, this condition was subordinated to political decisions leading to a broader monetary union among more countries than those with similar business cycles (Eichengreen and Frieden, 1993). Since the inception of the EMU, however, the degree of internal divergences of business cycles has gradually decreased.

5. Fiscal capacity

The fourth criterion to judge the optimality of a currency area is the degree of fiscal integration among its components (Kenen, 1969). Higher fiscal integration generates a greater ability to absorb shocks with asymmetric consequences, in particular through fiscal transfers from low-unemployment regions to high-unemployment ones. A supranational (federal) mechanism of fiscal transfers would be needed as an automatic stabilizer to mitigate asymmetric shocks.

This acts as a risk-sharing mechanism and implies a *de-facto* redistribution of funds between different parts of the union. By definition, being a mechanism for absorption of unforeseen shocks, the direction, duration and extent of the redistribution cannot be pre-established or determined by law. It is clear that a high degree of political and economic integration is needed for such a mechanism to be in place (Kaldor, 1971; De Grauwe, 2006). Political union is necessary to accept a risk-sharing and economic union is needed to establish a sizeable common (federal) budget.

The problem of a common fiscal capacity at European level, as a necessary condition for a well-functioning monetary union, was well known (see, for example the "Marjolin Report" in 1975 and the "MacDougall Report" in 1977). However, since 1999 the EMU has been working with an extremely limited common budget, without a "built-in" fiscal stabiliser, and with an explicit no-bail-out clause in the Treaties: any risk arising from potential asymmetric shocks, would have remained national.

The debate about fiscal federalism is quite a rich one (Kenen, 1969; Kaldor, 1971; Oates, 1972; Mundell, 1973; Eichengreen et al, 1990; Eichengreen, 1991; Feldstein, 1992; Hallet et al, 1999; Buti and Franco, 2005; Sorens, 2008; Bordo et al. 2011), and has often used the US as a benchmark.

The stabilizing role of the federal budget in the US has long been discussed in the literature (Eichengreen, 1991). Sachs and Sala-i-Martin (1991) estimated that in the US:

> a one dollar reduction in a region's per capita income triggered a decrease in federal taxes in the neighbourhood of 34 cents and an increase in federal transfers of about 6 cents. The final reduction in disposable per capita income was, therefore, of only 60 cents.

This means that in the US between one third and one half of the shock experienced by a state is absorbed by the Federal Government. As a matter of comparison, they calculated that in the EU a one dollar shock to regional GDP will reduce tax payments to the common budget only by half a cent. This fiscal insurance scheme provided by the federal government is a key reason why the system of fixed exchange rates within the US has survived without major problems.

Bayoumi and Masson (1995) similarly found that:

> in the US, redistributive flows from all federal sources amount to around 22 cents in the dollar, while stabilization flows are somewhat larger at around 30 cents in the dollar. In Canada, the redistribution flows are around double those in the US (39 cents in the dollar) but the stabilization flows are smaller (17 cents in the dollar). Taxes and transfers both play important roles in these flows. In the EC, there is no 'fiscal federalism'; the EC budget is small and redistribution is limited.

While the US has a bigger federal budget, as a share of GDP, than the state level (24% vs 10%), the opposite happens in the Eurozone, where member states' budgets account for a much bigger share (50%) than the common (federal) budget (1%). The comparable "federal" budget operating in the EU as a transfer mechanism between countries and regions is represented by the Structural and Cohesion Funds, which account for about 0.4% of EU's GDP. Solow (2005) even argued that the less the Eurozone represents an optimum currency area, the more it would need active fiscal policies for stabilisation.

The fiscal capacity condition is clearly the least satisfied in the case of the EMU (Eichengreen et al, 1990; Feldstein, 1992), it is considered as its "major design failure" (De Grauwe, 2013), and the comparison with the US gives a first idea of the gap still to be filled.

6. The building up of the EMU in light of the theory

The histories of past, successful, experiences of monetary unifications tell us that political union may represent an important prerequisite for an effective economic and monetary union (Kaldor, 1971; Feldstein, 1992; Goodhart, 1998; O'Rourke and Taylor, 2013). The EMU followed an opposite approach, based on the conviction that the monetary union could act as "a leaven for the development of political union, which in the long run it cannot do without" (Werner report, 1970).

Others thought that it was "a dangerous error to believe that monetary and economic union can precede a political union" because "the objective of a full monetary and economic union is unattainable without a political union; and the latter pre-supposes fiscal integration and not just fiscal harmonisation" (Kaldor, 1971). This idea was later on retaken by Feldstein (1992)[6] and Friedman (1997) in their critics to the

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[6] He suggested that advocating for a monetary union but rejecting any movement towards a federalist political structure for Europe was "a formula for economic costs without any of the supposed political benefits".

EMU project. Kaldor (1971) explicitly criticized the Werner plan for not envisaging that the main responsibility for public expenditure and taxation should be transferred from the national Governments to the Community.

The subsequent "Marjolin Report" (EC, 1975) denounced that "there was no analysis, even approximative, of the conditions to be fulfilled" to create an EMU. It fully recognized the need for a central authority "with a relevant important budget" [7], and for a "centralized fiscal and social security systems ensuring a certain degree of redistribution". It stressed the necessity of closer political and financial integration and went even further proposing a "Community Unemployment Benefit Fund".

Another report committed by the European Commission (the "MacDougall Report", EC, 1977) analysed the stabilising role of public finances in Europe, finding that inequalities between countries in the Community were not higher than regional inequalities within countries, and that the redistributive function of the national budget at regional level reflected corresponding positions of the regions in their balance of payments on current account. The report found that within countries:

> between one half to two-thirds of a short-term loss of primary income in a region due to a fall in its external sales may be automatically offset through lower payments of taxes and insurance contributions to the centre, and higher receipts of unemployment and other benefits. If only because the Community budget is so relatively very small there is no such mechanism in operation on any significant scale as between member countries, and this is an important reason why in present circumstances [8] monetary union is impracticable (p.12).

After the creation of the European Monetary System (EMS) and the European Currency Unit (ECU), the "Delors Report" vigorously re-launched the process, avoiding the call for full political and fiscal integration, but stressing the need for "coordination of fiscal policies" (EC, 1989). The original architecture of the EMU assumed that a mandate to the ECB to pursue price stability and safeguards against excessive government deficits would suffice to ensure macroeconomic stability (Obstfeld, 2013).

Some authors specifically warned against the creation of a unified currency without a federal insurance scheme cushioning the impact of regional shocks, which "could very well lead the project to an eventual failure" (Sachs and Sala-i-Martin, 1991). The lack of such adjustment mechanisms was considered as potential sources of risks (Eichengreen, 1991), whose major impacts would have fallen on labour, increasing the level of unemployment over time (Feldstein 1991, and 1997).

The building criteria of the EMU did not take full account of unemployment as a key indicator and "an all-out threat to monetary stability" (Dornbusch, 1996). It was decided instead to rely on a "vastly overdone insistence on fiscal criteria" (Dornbusch, 1997), which appeared even harmful to some scholars (Buiter, Corsetti, and Roubini, 1993). A potential source of future risks was the total focus on fiscal discipline neglecting the financial one. As the former President of the EC has recently reminded, however, in the EMU:

> it was the economic axis that was missing. I therefore proposed a pact for the co-ordination of economic policies to run alongside the monetary Stability Pact. This was not accepted. Instead, it was deemed sufficient to merely add the word 'Growth' to the name of the Stability

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[7] The Report even quoted examples of what was meant by "relevant": the proportion of the "Bund" in Federal Germany, around 13% of GNP; and the proportion of federal expenditures on GNP in Canada, about 16%.

[8] At that time the Community Budget was equal to 0.7% of GDP. Today it is 1.0%.

Pact. In reality, this was purely and simply a budgetary stability pact: no economic co-ordination; no instruments to stimulate, co-operate or regulate. (…) Everything continued without any serious disruption until the international financial crisis erupted. At that point, the inherent flaws of EMU were revealed (Delors, 2013).

Exchange rates were then irrevocably fixed in 1999, eliminating the currency exchange risk. The increase in trade between countries generated a higher degree of sectoral specialisation within each country, which increased the likelihood for future external shocks to have asymmetric consequences (Kenen, 1969; Eichengreen, 1992; Krugman, 1993b). But in the absence of a quick adjustment mechanism, like flexible exchange rates, the asymmetric effects can be amplified, instead of absorbed, by a single monetary policy (Kaldor, 1971; De Grauwe, 2013).

Meade (1957) argued that monetary rigidity in Europe might come at the expenses of employment, highlighting the risks of pressures on labour and of compromising the European social model. The underlying idea was that once countries lose their monetary policy, in the absence of effective automatic stabilizers, the only possible adjustment mechanism to asymmetric macroeconomic shocks becomes internal devaluation. On the effectiveness of internal devaluations, Friedman (1997) feared that:

> if one country is affected by negative shocks that call for lower wages relative to other countries, that can be achieved by a change in one price, the exchange rate, rather than by requiring changes in thousands of thousands of separate wage rates, or the emigration of labour.

This kind of adjustment, however, happens to be much slower, more painful, and less effective (Feldstein, 1992).

7. 1999-2007: the "private insurance channel" at work

During its first decade the EMU seemed to invalid the importance of the OCA criteria. The Eurozone did not experience major turbulences in that period, even if not respecting those conditions, in particular a sizeable common budget (Mongelli, 2008; EC, 2008).

The apparent contradiction with the condition prescribed by the theory is explained by what the literature called 'the private insurance channel'. Mundell (1973) and Eichengreen (1992) had suggested that a monetary union among countries keeping their fiscal autonomy could potentially compensate the lack of a common fiscal capacity through the so-called 'private insurance channel', brought forward by financial integration.

The absence of exchange rate risks promoted financial integration among Eurozone economies, increasing capital flows from countries with balance of payments in surplus and excess of savings (the 'centre') towards deficit countries with growing levels of private indebtedness (the 'periphery'). This acted as a *de facto* substitute for the missing common fiscal capacity.

Since the inception of the EMU, countries in the so-called 'centre' systematically generated an excess of savings, with a level of investment around 20% of GDP and a level of savings around 25% of GDP. The opposite happened in the so-called 'periphery', where these figures were inverted. It is quite intuitive to grasp the underlying macroeconomic dynamic at work in this case: an increasing flow of capital was channelling the excess of savings from the 'centre' towards the 'periphery'.

A simple chart, like the one produced by Lane (2013), illustrates this phenomenon: capital flows accounted for around 12% of Eurozone GDP in 2001, and they skyrocketed until 42% in just six years. This unprecedented boom of capital flows acted as a system of transfers from economies with growing current account surpluses to others with growing current account deficits. The long-advocated common fiscal capacity was actually substituted by an enormous system of intra-EMU transfers in the private financial sector, instead than by public finances.

Figure 3: Capital Flows in the Euro Area in % of GDP (1993-2011)
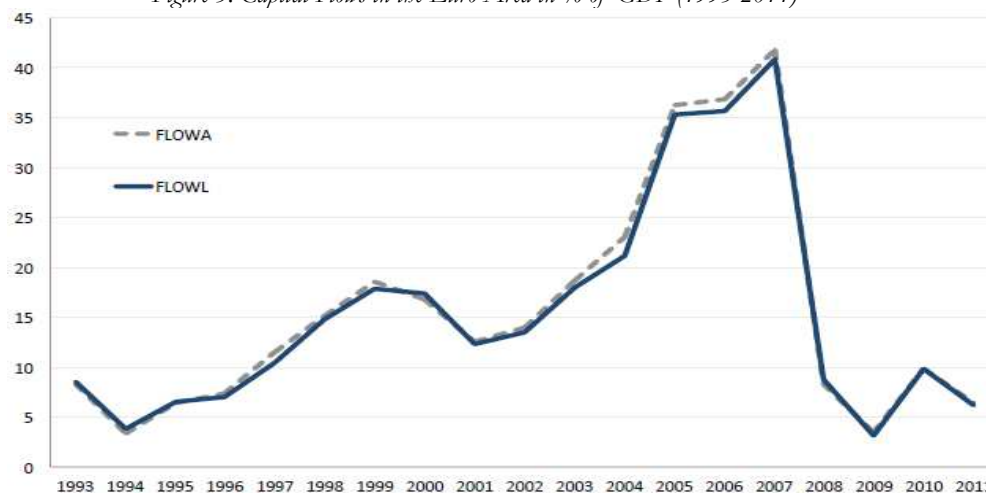
Source: Lane, P. R. (2013). Euro Area: Capital Flows in percent of GDP. IMF BOP database.

The representation of such a transfer mechanism in the private sector, operated by financial markets, is illustrated by the two specular dynamics of private indebtedness in deficit countries and banks' exposure in surplus ones. Between 1999 and 2007 private indebtedness literally exploded in the 'periphery' of the Eurozone, while public debt was generally under control. Even in Greece, where public debt increased, this change was absolutely minimal compared with the contemporary increase in private debt: +13% versus +217.5%. Only in Portugal were the two increases comparable, but private indebtedness rose more than the public one, over the period.

Table 1: Public and Private Debt in % of GDP (1999-2007)

	Public Sector Debt/GDP			Private Sector Debt (Variation in %)
	1999	**2007**	**Δ 99-07**	**Δ 99-07**
Eurozone	71.7	66.4	-7.4 %	+26.8 %
Greece	94.9	107.2	+13.0 %	+217.5 %
Ireland	47.0	25.0	-46.8 %	+101.0 %
Spain	62.4	36.3	-41.8 %	+75.2 %
Italy	113.0	103.0	-8.6 %	+71.2 %
Portugal	51.4	68.4	+33.0 %	+48.9 %

Source: ECB (2013).

In surplus countries, meanwhile, the exposure of the banking sector to banks in the 'periphery' rose fivefold over the same period (Figure 4, left). This phenomenon is eloquently exemplified by the case of Germany: the country with the highest current account surplus, and a growing divergence between levels of investment and savings, channelled this excess of savings towards the credit markets in the 'periphery', thus increasing the exposure of its banking sector to the banks in Greece, Ireland, Spain and Portugal by 573% (Figure 4, right).

Figure 4: Foreign claims of banks from the 'centre' towards banks in the 'periphery' of the Eurozone[9] (left) and of German banks to banks in GIPS[10] (Greece, Ireland, Portugal and Spain), Italy, and France (right) (1999-2013, in Millions of US dollars).
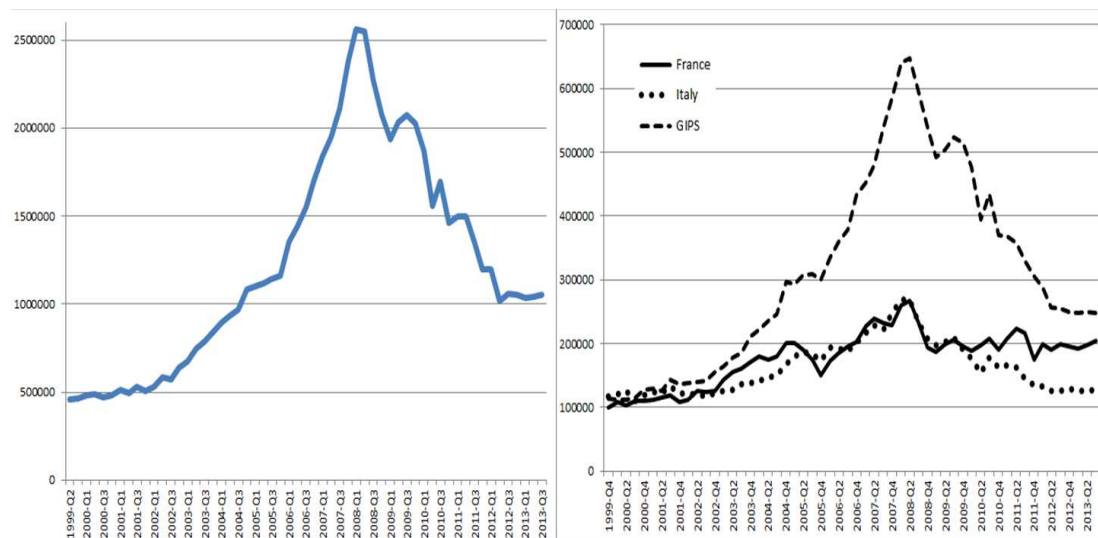
Source: own elaboration on data from the Bank of International Settlements.

Credit booms and asset-price bubbles in the 'periphery', in the absence of the exchange rate risk, represented a too profitable opportunity for banks in the 'core' not to fuel their exposure to them. Hale and Obstfeld (2014) have even provided evidence that after the euro's introduction core EMU countries increased their borrowing from outside of EMU in order to increase their lending to the periphery. This behaviour dramatically fuelled imbalances and increased the fragility of the whole Eurozone banking sector.

Moreover, the huge capital flows from the 'core' to the 'periphery', fuelling an asset-price boom and significantly higher inflation in the 'periphery' than in the 'core', represented themselves a kind of large asymmetric shock, but a relatively gradual one, for the Eurozone (Krugman, 2012).

The main characteristic of this system was that it relied completely on the efficiency and stability of financial markets. The conundrum in which the EMU project was locked at the time of its creation – no economic and political union to underpin the monetary union through a common fiscal capacity – had been solved by delegating that task to the financial markets.

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[9] The group of "non-stressed" countries includes Austria, Belgium, Germany, France, and Netherlands. The group of "stressed" countries includes: Greece, Ireland, Italy, Portugal, and Spain.

[10] The group of GIPS includes Greece, Ireland, Portugal, and Spain

Unfortunately the financial crisis provoked the long-feared external shock, which challenged the solidity of this architecture: capital flows from the 'core' to the 'periphery' came to a sudden stop; the 'private insurance channel' instead of acting as a stabiliser suddenly contracted. Its resilience and the sustainability of a monetary union based on it proved weak. The explosion of the government debt ratios after 2008 was the result of a balance sheet recession triggered by the desire of the private sector to reduce its excessive debt (De Grauwe and Ji, 2013a).

8. The EMU in the crisis

The external shock arrived in the form of a worldwide financial crisis, which destabilised the mechanism sustaining the EMU architecture. This revitalized old worries that macroeconomic shocks in Europe might have "larger and longer lasting effects on relative unemployment (and) the adjustment to relative shocks in the European common currency area may turn out to be a painful and protracted process", Blanchard et al. (1992).

After a first year of fiscal expansion, as a prompt response to the contraction in the private sector, strongly restrictive fiscal policies were imposed on the countries in the 'periphery'. As expected, the Eurozone experienced an unprecedented rise in unemployment, whose intensity and duration differ from non-Eurozone EU countries and the US.

Figure 5: Unemployment rates in Eurozone, non-Eurozone EU, and the US
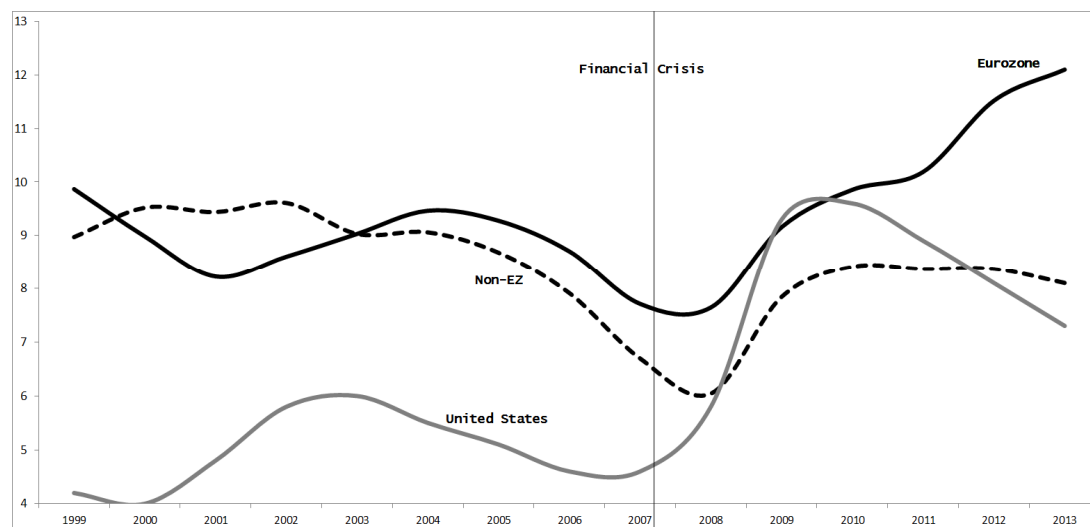
Source: Eurostat and US Bureau of Labor Statistics.

From 2007 to 2009 unemployment rose dramatically in the three areas, but while in the US it started decreasing since 2010, and in non-Eurozone EU countries it stabilized since then, in the Eurozone it rose abruptly in the last three years. This trend can be interpreted as a symptom of a new crisis, very much specific to the EMU. The old problem of a missing common mechanism for shock absorption returned topical.

It is interesting to compare the federal/common budgets versus the state/national ones in the EU and the US. While the difference in the size of the common (federal) budgets is well-known, it is more interesting to observe the dynamics of the aggregates. Since the shock caused by the financial crisis in 2008, the reaction in the two areas has

been different: in the US the big increase in government spending has taken place at the federal level, while in the Eurozone it has occurred at MS level, with important differences among countries. While in some MS fiscal policies were substantially expansive to counteract the contraction, others were forced to adopt strongly restrictive fiscal policies. This dynamic has reinforced the divergences within the EMU, instead of reducing them.

Figure 6: Federal vs State level budgets in the Eurozone and the US
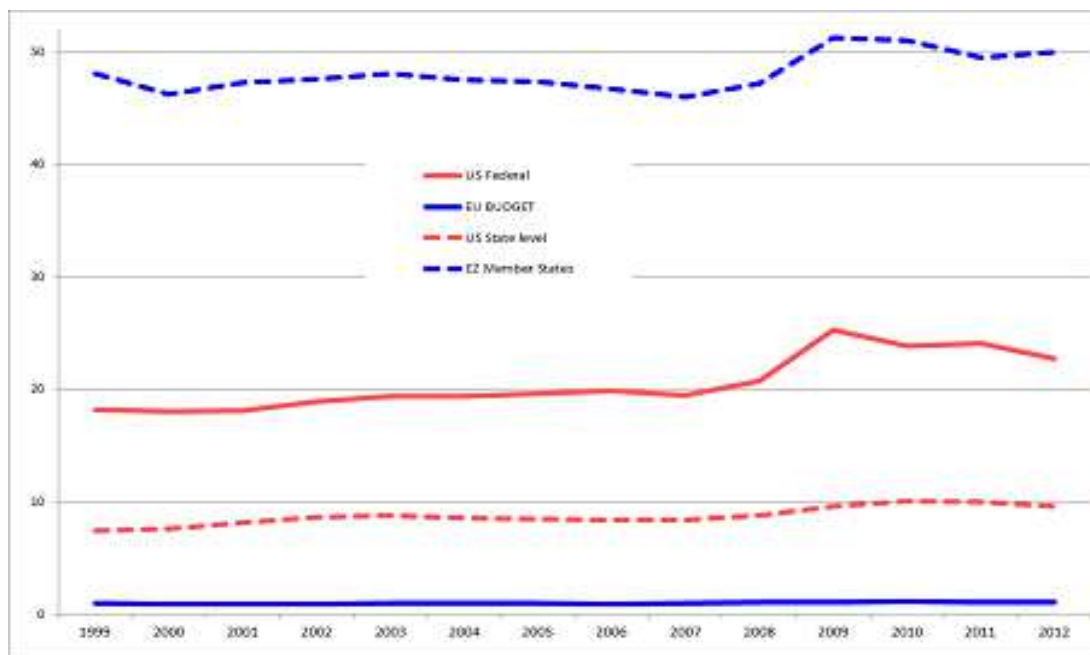
Source: Eurostat and US Office of Management and Budget.

In the US, as a consequence of the recent crisis, the state of Florida experienced a strong burst of a housing bubble pretty much similar to the one Spain had. But while Spain had to undergo very painful and not-so-effective internal devaluation, with huge fall in output and record-high unemployment, Florida could benefit from net fiscal transfers from the federal budget of about 5% of the state GDP (Krugman, 2012). Unemployment in Florida went down, even below the national average, driven by massive out-migration, but this did not undermine its tax base as it will do in Spain, thanks to the federal insurance scheme.

The state of Nevada experienced a boom and bust cycle similar to the one Ireland had. Both banking sectors found themselves heavily in trouble and close to bankrupt, but in the US it was the federal government intervening. It has been estimated that the federal intervention amounted to a transfer of more than 10% of Nevada GDP (Gros, 2012). Ireland, instead, had to borne the full weight of the intervention. This triggered a sovereign debt crisis, with consequent austerity policies and record-high unemployment.

It is interesting to look also at the case of Latvia. The Baltic republic was not yet a member of the Eurozone[11], but had a peg with the euro, which maintained even when it was hardly hit by the crisis. The price for maintaining the peg was a massive internal devaluation, which contracted national GDP by almost 25%. Unemployment rose

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[11] It joined the Eurozone on the 1st of January 2014.

dramatically, and a massive out-migration took place. This seems to mirror similar experiences of US states, but what was missing in the case of Latvia was the net fiscal transfer from a federal budget to compensate. Besides, in spite of the adjustment via labour mobility and structural reforms, the Latvian economy is still far from recovering its pre-crisis levels of GDP and employment.

Labour mobility is playing a role in the current adjustment within the Eurozone too. Recent analyses show that labour out-migration in the Eurozone increasingly affects high skilled workers, who migrate to occupy medium or low skilled jobs (EC, 2013). This phenomenon of over-qualification has risen in particular for movers from the periphery to the centre of the Eurozone, reducing the tax bases of the outgoing countries, and initiating a vicious circle, which in the end makes it more difficult to pay back debts (O'Rourke and Taylor, 2013).

In the absence of compensating mechanisms, the impoverishment of some parts of the Eurozone will increase in parallel to the increase in well-educated and qualified out-migration. Loss of human capital, deterioration of skills, and erosion of the tax-base are all factors that might compromise future growth potential. Moreover, while in the process of adjusting b-o-p imbalances deflationary policies have been implemented in deficit countries, expansionary policies have been missing in surplus countries (Lin and Treichel, 2012; De Grauwe, 2013).

The forced pro-cyclicality of fiscal policies in the 'periphery', induced by misconceived regulations and panic-driven financial markets (DeGrauwe and Ji, 2013b), the asymmetry of the adjustment, and the absence of a built-in fiscal stabilizer, made divergences in unemployment rates within the Eurozone literally explode. The following figure shows a measure of dispersion of unemployment rates among Eurozone NUTS2 regions, compared with non-Eurozone[12] ones and US states.

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[12] All NUTS2 regions from Belgium, Germany, Ireland, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland are included in EZ since the beginning, 1999. Estonia as well is included in EZ since 1999, because it had maintained a fixed exchange rate since then (15.6466). Greek regions are included in EZ since 2000, non-EZ in 1999. Lithuania is in non-EZ for 1999-2001, and EZ since 2002, because it has maintained a fixed exchange rate since then (3.4528). Bulgaria is non-EZ for 1999-2005, and EZ since 2006, because it has maintained a fixed exchange rate since then (1.9558). Malta and Slovenia are non-EZ for 1999-2005, and EZ since 2006. Cyprus is non-EZ for 1999-2006, and EZ since 2007. Slovakia is non-EZ for 1999-2007, and EZ since 2008. Denmark and Latvia are part of the ERM II like Lithuania (since 1999 and 2005 respectively). Czech Republic, Hungary, Poland, Romania, Sweden and UK are non-EZ.

Figure 7: Dispersion (σ) of Unemployment rates in EZ and non-EZ NUTS2 Regions and US States
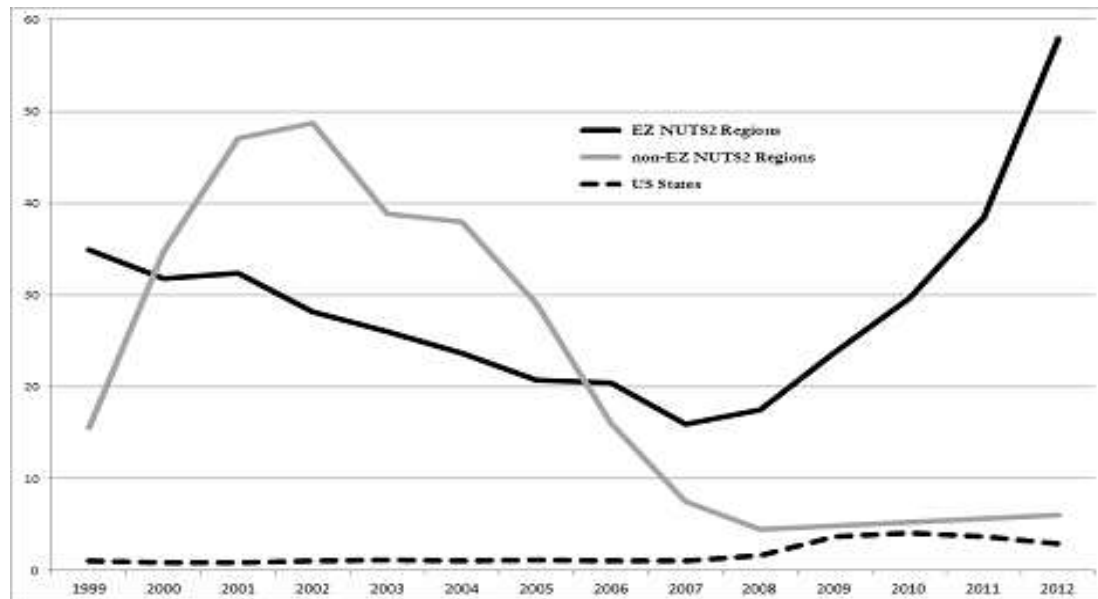
Source: Own calculations on the basis of Eurostat and US Bureau of Labor Statistics data.

Apart from the absolute value of these dispersions, predictably lower in a complete federal system like the US, it is interesting to observe the tendencies over the last years. US states have experienced a limited increase in the divergences in unemployment rates, as a consequence of the shock caused by the financial crisis. These differences are comparably much lower than in Europe and are decreasing, signalling a process of common adjustment within the federation, led by labour mobility and fiscal transfers. The fiscal federalist system absorbs a substantial fraction of interregional shocks.

EU countries with flexible exchange rates (non-Eurozone) have more similar levels of unemployment among their regions than before. This is probably given to the fact that the weight of the adjustment to the shock was absorbed by the exchange rates, before falling on the employment. The Eurozone lacks both mechanisms: neither flexible exchange rates, nor a complete federal state with full factor mobility and fiscal capacity.

In the absence of a monetary union, adjustment to shocks would happen via flexible exchange rates. In a complete monetary union, factors mobility and a relevant central budget would act as automatic stabilisers. In the EMU none of these mechanisms was available to counteract the crisis; moreover, pro-cyclical fiscal policies in the 'periphery' exacerbated the problems. As a consequence of this peculiar situation, and as foreseen by the OCA theory, the full burden of the adjustment is transferred to labour, with differences among regions which are literally exploding.

9. The Adjustment

After a decade of massive capital flows, comparatively higher growth and inflation rates, the 'periphery' of the Eurozone found itself with prices and unit labour costs totally out of line with those in the 'core'. It faced a big adjustment problem (mainly in the balances of payment), which had then to occur through prices and wages flexibility.

As expected (Friedman, 1953) a deflationary policy aimed at reducing wage levels has been applied in these countries. The focus of the adjustment imposed on deficit countries has been on "restoring competitiveness" in order to absorb macroeconomic imbalances, mainly in the balance of payments. Unit labour costs in the 'periphery' had dramatically increased, in relative terms, compared to the 'core', so they had to be corrected. Unit labour costs can be decomposed in labour income share and price deflator.

$$ULC = \frac{Tot\ Labour\ Compensation}{Nominal\ Value\ Added} * Price\ Deflator$$

In almost all countries the labour income share has decreased or remained stable over the period. It was rather the cumulated inflation differentials what determined the divergences in competitiveness among countries, as shown in the figure:

Figure 8: Average inflation differential (y-axis) and average change in relative unit labour cost (x-axis) from 1999 to 2007
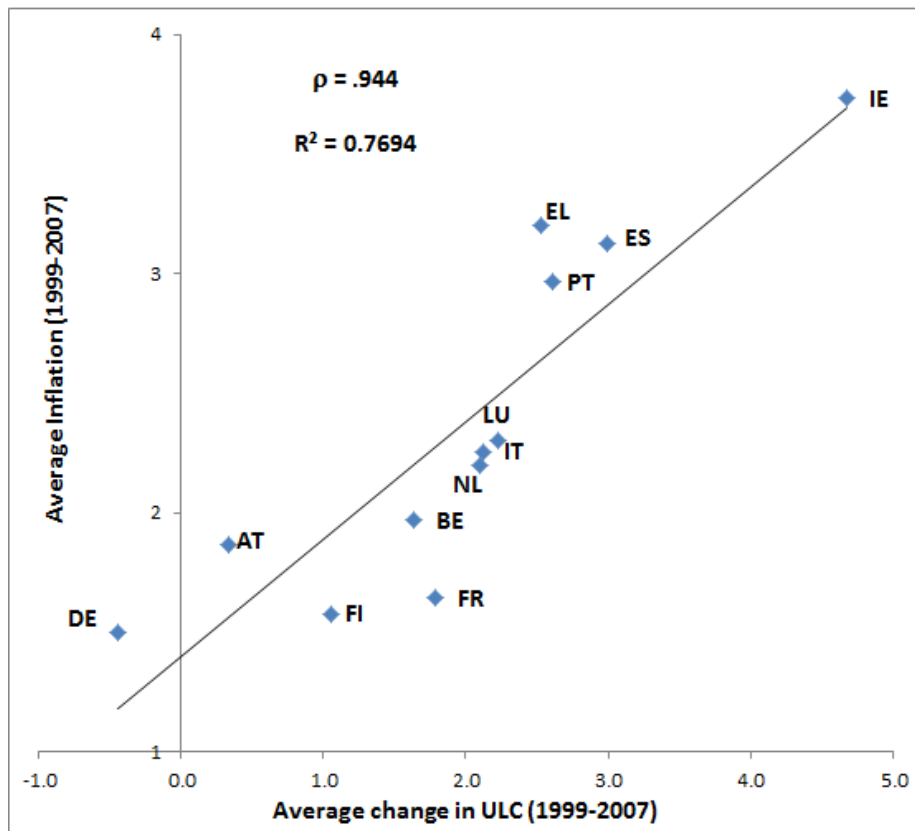
Source: Own elaborations, on OECD data.

Additional information can be derived by decomposing unit labour costs in nominal wages and productivity: $ULC = \frac{W}{q/L}$; where "W" is nominal wages, "q/L" is productivity, and "q" is output and "L" is the number of employees.

The adjustment currently taking place is mainly being driven by an increase in productivity and to a lower extent by a reduction in nominal wages. In Spain, Portugal,

Greece and Ireland, however, this positive dynamic of productivity is not due to the growth of output, which is actually falling. It is record-high unemployment, instead, what is bringing down the value of "L" much faster than the fall in "q". In other words, the main driver of the adjustment in unit labour costs in the periphery is being massive unemployment.

These increasing levels of unemployment could be explained either by so-called rigidities in the labour markets or by the effect of austerity policies, pursuing too restrictive fiscal policies, depressing aggregate demand, at a time when the private sector is not able or willing to replace it. Tamborini (2013) shows that the "rigidity hypothesis" does not hold true, because "the much worse unemployment performance of EMU5 (GIIPS) countries seems unrelated to significant differences in rigidity with respect to the other EMU partners" (p.25).

The internal devaluation applied to the 'periphery' aims at compensating past cumulated inflation differentials through wage compression and unemployment. This contributes to the contraction of domestic demand, reflected in the fall of imports in all countries, leaving net exports as the only source of growth. But 'core' countries in the EMU are not pursuing symmetric expansionary policies, leading the whole Eurozone to a protracted deflation.

Table 2 shows the dynamic of tradable and non-tradable sectors in a selection of countries. The standard case in the 'periphery' was a shift of resources to the non-tradable sectors of the economy, since the inception of the EMU. The crisis, then, has hit harder the tradable sectors, even in Germany, as expected in the case of a worldwide, global demand shock. The adjustment initiated in 2010 in the 'periphery' is generating a collapse in domestic demand, illustrated by the big losses in value added in non-tradable sectors, accompanied by a limited growth in the tradable sectors.

Table 2: Cumulative growth rates in tradable vs non-tradable sectors[13] **(2000-2007; 2008-2009; 2010-2012)**

Country	Sector	Δ 00-07	Δ 08-09	Δ 10-12
France	Tradable	11.8%	-10.8%	3.1%
	Non-Tradable	16.5%	-1.6%	4.0%
Germany	Tradable	25.0%	-24.1%	20.4%
	Non-Tradable	11.8%	0.4%	4.7%
Greece	Tradable	7.6%	-5.3%	-9.6%
	Non-Tradable	37.3%	-2.0%	-21.8%
Ireland	Tradable	40.3%	3.0%	14.8%
	Non-Tradable	42.8%	-9.8%	-11.1%
Italy	Tradable	8.0%	-20.9%	3.9%
	Non-Tradable	14.6%	-4.0%	-0.7%
Portugal	Tradable	6.7%	-10.3%	5.8%
	Non-Tradable	14.8%	-0.1%	-2.6%
Spain	Tradable	11.4%	-15.2%	5.8%
	Non-Tradable	34.4%	-10.1%	-33.1%

Source: own calculations, based on AMECO data.

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[13] Sectors are weighted according to their total share in the gross value added of each county, in each year.

These sectoral differences in growth rates after 2010 may signal that the undergoing adjustment is being driven more by the collapse in domestic demand than by an improved export capacity. Internal devaluation is cutting domestic demand, shifting resources from the non-tradable to the tradable sectors, but the gains in these sectors are not offsetting the losses in the former. Some had argued that deflationary policies may be economically ineffective and politically unsustainable in modern economies (O'Rourke and Taylor, 2013), and may end up increasing the real value of debts, putting pressure on indebted households, businesses, and financial institutions (Fisher, 1933).

Economic historians often use the parallelism with the gold standard to illustrate the current crisis of the Eurozone. That experience suggests that an asymmetric adjustment based on internal devaluation in debtor countries, with no corresponding inflation in the core, is economically and politically unsustainable (O'Rourke and Taylor, 2013). But while in that case the limited right to vote substantially allowed policy-makers to ignore the interests of the workers who suffered most (Eichengreen, 1992; O'Rourke and Taylor, 2013), in modern democracies the universal suffrage does not.

The lessons from the theory and from past experiences were at the basis of the call for a common fiscal capacity to act as an automatic stabiliser in such circumstances. A position that had been taken even by some reports of the European Commission, in the seventies.

10. A simulation of a common budget

The common fiscal capacity is the main missing element for the Eurozone to qualify as a more efficient currency union. This had been the main concern of that part of the academic world that was more sceptical about the creation of the EMU.

The MacDougall Report (European Commission, 1977) conducted an analysis of the role of public finances in the European integration, with a particular focus on the stabilisation effects of a common budget. The report studied the extent to which inter-regional income differences within countries were reduced by central or federal public finances, in eight case studies (Germany, UK, France, Italy, USA, Australia, Canada and Switzerland). It found that around 40% of the differences were reduced by internal fiscal transfers, through the common national budget.

The report also measured the public finance outflow/inflow of each region in parallel with the relative current account position of each region:

Table 3: Public finance balance and balance of payments from the MacDougall Report

	Public finance outflow (-) or inflow (+)	Balance of payments current account surplus (+) or deficit (-)
Relatively poor regions		
GERMANY (average 1968-70)		
Niedersachsen	+ 3.4	- 6.5
Schleswig-Holstein	+ 6.0	- 9.8
Saarland	+ 9.0	-13.6
FRANCE (1972)		
Bretagne	+ 11.0	-15.0
UK (1964)		
Wales	+ 7.8	-12.1
Scotland	+ 6.1	- 7.8
N. Ireland	+16.1	-21.7
ITALY (average 1971-73)		
Umbria	+ 7.8	-17.4
Abruzzi	+14.8	-14.8
Basilicata	+28.0	-42.3
Calabria	+23.5	-25.8
Relatively rich regions		
GERMANY (average 1968-70)		
Baden-Württemberg	- 5.9	+ 7.9
Nordrhein-Westfalen	- 4.5	+ 5.2
Hessen	- 2.9	+ 2.2
UK (1964)		
South East	- 4.8	+ 2.4
West Midlands	- 2.9	+ 3.2
ITALY (average 1971-73)		
Piemonte	- 7.4	+10.9
Lombardia	-11.1	+15.3
Liguria	- 4.4	+12.6

Source: MacDougall Report, 1977, page 33.

The analysis showed that inflows to relatively poor regions were on average equal to 70% of their current account deficits, while outflows from relatively richer regions were on average equal to 95% of their current account surplus. This had an overall stabilisation effect, by reducing per capita income differences, of 40%. Given that levels of disparities in income per capita across the Eurozone are not higher than those registered within countries, a similar order of magnitude might be estimated for a common fiscal capacity at EMU level to have a similar stabilisation effect of 40%.

We try to apply the same methodology of the MacDougall Report to the present situation. In this case, we can consider the current account position in percentage of GDP of each Eurozone member state since 1999:

Table 4: Current account balance in percentage of GDP – 1999-2013

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	5.0	4.2	4.3	6.0	5.6	4.5	3.2	3.4	3.9	1.1	0.7	2.6	0.5	-0.2	0.9
Germany	-1.3	-1.8	-0.2	2.0	1.9	4.7	5.1	6.5	7.5	6.2	6.1	6.4	6.3	7.0	7.0
Estonia	-5.2	-5.2	-5.0	-10.4	-11.4	-11.4	-10.1	-15.7	-15.7	-8.5	4.0	3.5	0.3	-2.8	-2.1
Ireland	0.2	-0.4	-0.5	-0.4	0.8	-0.1	-3.0	-3.7	-5.5	-5.6	-2.3	1.1	1.2	4.4	4.1
Greece	-5.1	-12.0	-11.4	-12.7	-12.3	-10.5	-10.8	-13.7	-17.6	-18.0	-14.4	-12.8	-11.7	-5.3	-2.3
Spain	-2.7	-4.0	-4.3	-3.8	-4.0	-5.9	-7.5	-9.0	-10.0	-9.6	-4.8	-4.4	-4.0	-1.2	1.4
France	2.6	1.2	1.3	1.0	0.5	0.2	-0.6	-0.8	-1.4	-1.9	-1.8	-1.9	-2.5	-2.1	-1.8
Italy	1.0	-0.2	0.3	-0.3	-0.8	-0.4	-0.9	-1.5	-1.3	-2.9	-2.0	-3.5	-3.1	-0.5	1.0
Cyprus	-0.8	-3.9	-3.2	-3.7	-2.3	-5.7	-6.1	-7.2	-11.6	-12.2	-10.7	-9.2	-4.3	-6.6	-2.0
Luxembourg	8.4	13.2	8.8	10.5	8.1	11.9	11.5	10.4	10.1	5.4	7.3	8.4	7.3	5.9	6.7
Malta	-3.3	-12.1	-3.7	2.4	-3.0	-5.7	-8.5	-9.7	-4.0	-4.8	-8.9	-5.4	-1.0	1.1	1.8
Netherlands	4.2	6.4	5.2	6.1	6.1	8.6	7.5	9.0	8.4	4.7	3.2	5.0	7.4	7.7	9.6
Austria	-1.4	-0.7	-0.8	2.7	1.7	2.2	2.2	3.2	4.0	4.8	2.7	3.6	1.5	1.8	2.5
Portugal	-8.9	-10.7	-10.6	-8.5	-6.7	-8.3	-10.3	-10.7	-10.2	-12.6	-10.8	-10.4	-7.2	-1.9	0.9
Slovenia	-3.7	-3.2	-0.4	0.9	-0.9	-2.6	-1.7	-2.3	-4.6	-6.1	-0.4	-0.2	0.2	3.1	5.0
Slovakia	-4.1	-2.6	-7.2	-7.5	-6.4	-6.7	-8.6	-8.3	-5.6	-6.3	-2.5	-3.7	-2.6	1.6	4.3
Finland	7.0	7.6	8.4	8.5	5.1	6.3	3.5	4.6	4.2	3.1	2.0	1.7	-1.5	-1.8	-1.2

Source: Ameco.

By applying the lowest of the two ratios suggested by the MacDougall Report (70%) to the current account surplus (or deficit) of each country, we could estimate the needed contribution to (or by) a hypothetical common budget for every country, each year:

Table 5: Simulation of net contribution paid (+) or received (-) by each country (billions of euros)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium	938	822	851	1196	1130	945	682	736	881	241	153	589	105	-54	213
Germany	-1900	-2674	-258	3076	2872	7219	7935	10467	12531	10366	9774	10628	10745	12192	12179
Estonia	-26	-29	-29	-65	-77	-82	-79	-136	-146	-76	30	27	2	-25	-19
Ireland	13	-38	-46	-41	86	-12	-345	-450	-696	-697	-269	129	144	518	485
Greece	-543	-1335	-1322	-1513	-1554	-1385	-1465	-1960	-2603	-2646	-2049	-1733	-1480	-627	-263
Spain	-1384	-2180	-2435	-2167	-2399	-3614	-4744	-5974	-6848	-6629	-3179	-2903	-2643	-791	930
France	2740	1328	1485	1106	588	281	-757	-1016	-1719	-2385	-2150	-2313	-3106	-2643	-2223
Italy	937	-188	278	-314	-767	-349	-898	-1533	-1352	-2944	-1938	-3488	-3046	-523	936
Cyprus	-6	-31	-27	-32	-20	-51	-58	-70	-119	-130	-112	-97	-45	-69	-19
Luxembourg	137	235	160	200	157	239	245	231	239	126	161	191	169	138	160
Malta	-10	-39	-12	8	-10	-19	-29	-34	-15	-18	-33	-21	-4	4	7
Netherlands	1371	2142	1789	2084	2109	3023	2690	3353	3248	1857	1201	1937	2867	2935	3659
Austria	-219	-112	-122	437	281	371	372	573	733	907	484	661	287	338	485
Portugal	-888	-1109	-1120	-906	-706	-886	-1114	-1175	-1140	-1413	-1175	-1149	-785	-205	97
Slovenia	-59	-54	-7	16	-16	-50	-34	-50	-104	-144	-8	-5	5	67	106
Slovakia	-109	-70	-201	-221	-196	-216	-297	-310	-233	-274	-103	-163	-114	74	195
Finland	642	735	834	860	523	674	383	532	509	379	221	192	-171	-216	-145

Source: own calculations based on Ameco data.

It is evident that the biggest share of the contribution in this simulation would fall of the biggest economy, having also accumulated the highest current account surplus (Germany). The picture becomes even clearer if we consider only the crisis period 2008-2013:

Figure 9: Simulation of the net contribution paid (+) or received (-) by each country (billions of euros) before the crisis (1999-2007) and after (2008-2013)
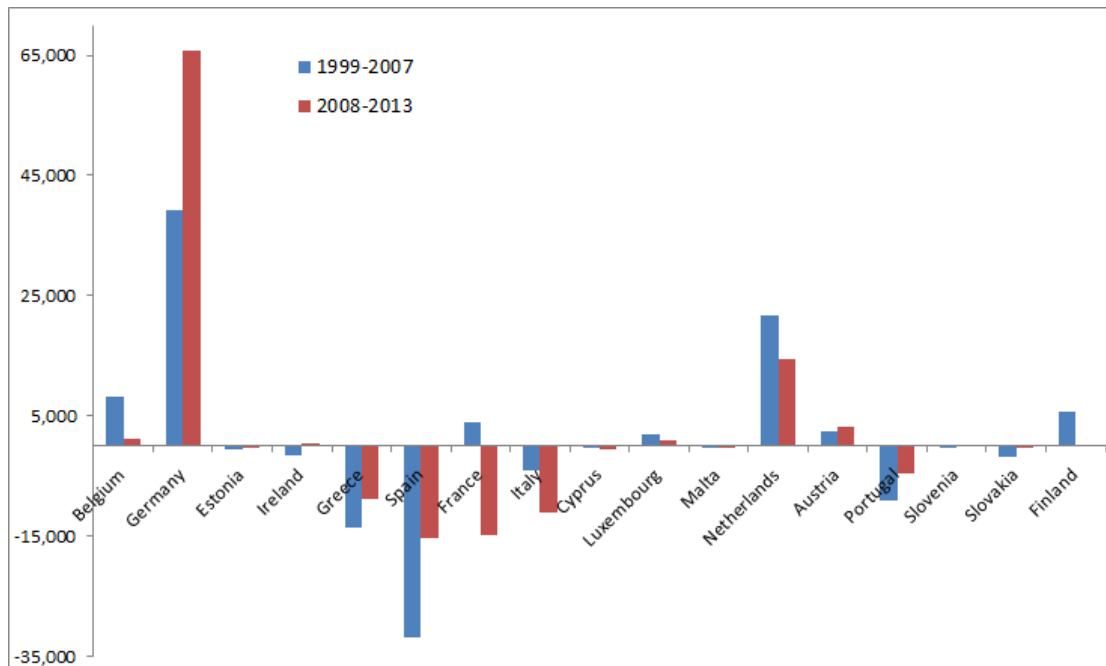
Source: own calculations based on Ameco data.

A refinement of this approach, however, would consider only the intra-Eurozone position of each country in terms of current accounts. The calculation of the respective contributions to a common budget should rather be linked to the relative current account position of each country, only within the Eurozone. This would make the composition of the budget independent from the overall growth strategy the Eurozone might want to adopt in the future.

In other words, if the Eurozone decides to move towards a higher reliance on net exports (or vice versa towards a more prominent role of domestic demand, then importing more), this should not substantially influence the size of the common fiscal capacity, built on national contributions. For this reason, it seems more appropriate to use relative positions in the current account limited to the rest of the Eurozone as trade partner. The availability of data for this indicator is lower than for absolute current account positions, with some breaks in the series, however most of the years/countries are covered, so the estimation is possible.

Table 6: Current account balance, relative to the rest of the Eurozone as trade partner, in percentage of GDP – 2000-2013

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium								0.7	-1.0	_-1.6_	-2.0	-3.1	-4.8	-6.1
Germany	0.4	0.6	1.0	1.3	2.0	2.7	2.9	3.4	3.4	2.6	2.5	2.2	1.7	1.3
Estonia	-7.9	-6.9	-6.6	-6.4	-6.5	-6.5	-8.5	-10.4	-6.4	-0.3	1.7	0.6	-3.0	-4.4
Ireland						14.9	13.4	11.9	10.2	12.0	12.6	12.0	11.1	10.0
Greece	-5.9	-6.4	-5.7	-4.7	-4.5	-3.9	-4.1	-4.4	-5.5	-4.6	-3.5	-2.2	-0.7	0.4
Spain	-1.2	-1.3	-1.4	-1.4	-1.8	-2.2	-2.2	-2.6	-2.4	-0.4	0.5	1.2	1.5	2.0
France	-1.0	-1.5	-1.8	-1.8	-1.7	-2.3	-2.4	-2.9	-3.2	-3.3	-3.1	-3.4	-3.4	-3.5
Italy	-0.1	0.1	-0.2	-0.5	-0.5	-0.5	-0.7	-0.6	-0.3	-0.7	-1.1	-1.3	-0.7	-0.5
Cyprus			-12.7	-12.5	-12.9	-14.6	-12.4	-11.8	_-11.2_	_-11.2_	_-11.3_	-10.3	-10.7	-10.6
Luxembourg						-4.3	_-2.5_	0.8	-1.0	-5.4	-4.5	-5.7	-6.9	-7.0
Malta									-13.7	-11.5	-11.5	-13.2	-14.9	-13.2
Netherlands						9.9	10.5	11.8	11.0	11.7	10.8	12.3	14.4	14.9	15.2
Austria	-1.4	-1.4	-0.2	-0.3	-0.5	-0.4	0.0	0.1	0.4	0.2	0.5	-0.4	-0.4	0.1
Portugal	-6.4	-5.9	-5.9	-5.2	-5.7	-6.2	-6.3	_-6.5_	-6.9	-6.7	-5.7	-4.4	-1.8	-0.9
Slovenia			-1.3	-1.7	-5.0	-6.1	-6.4	-7.1	-8.0	-4.7	-3.4	-3.3	-2.1	0.0
Slovakia					2.5	2.3	5.3	9.9	6.6	5.7	6.9	7.0	7.0	6.2
Finland			1.5	0.8	-0.1	-1.5	-1.3	-1.1	-1.4					

Source: Eurostat, data underlined are estimations.

By applying the same ratio, based on the MacDougall Report (70%), to the current account surplus (or deficit) of each country, we estimate the contribution of each country to (or by) the common budget:

Table 7: Simulation of net contribution paid (+) or received (-) by each country (billions of euros)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Belgium								156	-227	-352	-442	-702	-1108	-1388
Germany	598	863	1597	2046	3152	4208	4673	5612	5750	4148	4078	3855	2927	2179
Estonia	-44	-40	-41	-43	-47	-51	-73	-97	-57	-2	14	5	-27	-40
Ireland						1697	1611	1505	1263	1392	1438	1408	1296	1177
Greece	-652	-740	-675	-598	-592	-530	-586	-657	-814	-650	-470	-272	-77	47
Spain	-648	-755	-806	-843	-1131	-1429	-1488	-1801	-1634	-268	307	764	1006	1302
France	-1150	-1705	-2024	-2126	-1967	-2773	-2994	-3597	-4031	-3979	-3878	-4259	-4313	-4396
Italy	-119	92	-169	-507	-530	-492	-670	-592	-334	-702	-1141	-1260	-714	-482
Cyprus			-108	-109	-117	-137	-122	-121	-119	-117	-119	-109	-111	-101
Luxembourg						-90	-56	19	-23	-120	-103	-133	-160	-167
Malta									-53	-43	-44	-52	-59	-53
Netherlands						3492	3769	4395	4231	4590	4089	4731	5581	5718	5766
Austria	-219	-215	-27	-41	-90	-73	-8	15	73	38	83	-66	-69	21
Portugal	-659	-623	-624	-552	-612	-673	-693	-729	-772	-726	-638	-481	-192	-96
Slovenia			-23	-32	-96	-124	-136	-161	-187	-101	-74	-72	-45	-1
Slovakia					81	79	197	409	288	235	297	311	320	284
Finland			151	84	-15	-167	-151	-136	-170					

Source: own calculations based on Ameco data.

In this second scenario, Germany and the Netherlands would remain the main contributors, but it is interesting to notice the differences compared with the previous scenario: the total amounts of the contributions and benefits would be significantly lower; in the period of the crisis the Netherlands would become the largest contributor; and France, instead of Spain, would be the main beneficiary, both before and after the crisis.

Figure 10: Simulation of the net contribution paid (+) or received (-) by each country (billions of euros) before the crisis (1999-2007) and after (2008-2013), considering only intra-Eurozone relative positions.
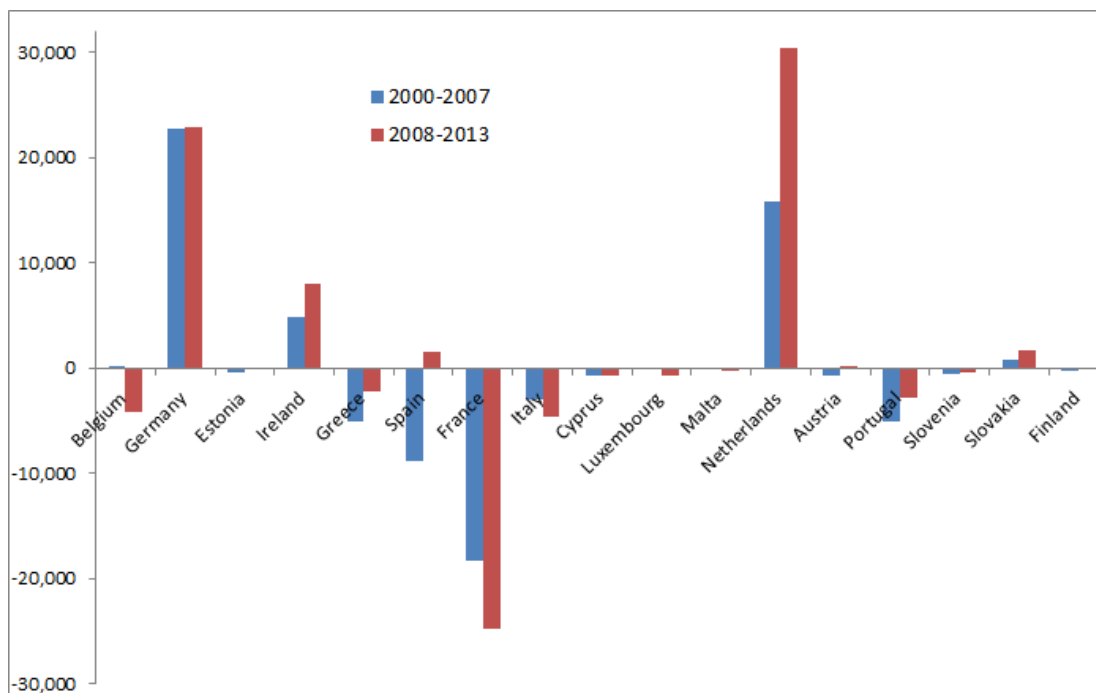
Source: own calculations based on Ameco data.

The lack of a sizeable common budget was the main design failure of the EMU. The link to the current account position of each member of the Eurozone could have probably avoided the development of the macroeconomic imbalances at the origin of its specific crisis. The deterioration of the situation has created more difficult political conditions for this solution to be implemented.

11. Conclusion

This paper joins the vast literature on the EMU as a sub-optimal currency area, proposing an ex-post assessment in light of the predictions of the theory of OCA. Five conclusions can be drawn from this analysis.

First, the EMU did not experience major turbulences during its first decade of existence, without much worry about the non-compliance with some of the OCA criteria. The architecture of the EMU was actually neutralising the two main lacking conditions: labour mobility and fiscal capacity. The first one was fulfilled only to a limited extent at the inception of the Eurozone, but kept improving during the past years, with a particular boost in the years following the crisis. The second one, instead, was missing, and still is, but found compensation in the private insurance mechanism, generated by the growing financial integration among EMU members.

Second, the 'private insurance channel' was channelling the excess of savings in the 'core', through a spectacular increase in capital flows, to the credit markets of the 'periphery', fuelling their credit boom and asset-price bubbles. This had the two effects of increasing private indebtedness in the 'periphery' and the exposure of the banks in the 'core', making the whole Eurozone banking system more fragile. The whole system was based on the reliability and stability of the financial markets.

Third, if the theory of OCA proved too pessimistic for the first decade of the EMU, once the long-feared external shock came, in the form of a worldwide financial crisis, those old fears suddenly materialized. The reason is twofold. On the one side, the theory focused on the lack of adjustment mechanisms to big macroeconomic shocks, which did not happen until 2007, but occurred then with the deepest crisis since the Great Depression. The EMU found itself deprived of any mechanism for shock absorption, and the response could only be generated at national level, with different fiscal constraints. This, in turn, exacerbated divergences within the Eurozone. On the other side, the private insurance mechanism contracted abruptly and proved weak and non-resilient as a response mechanism. The main design failure of the EMU became then dramatically evident.

Fourth, as a consequence of this inherent flaw in the EMU's architecture, and as it had been foreseen, the cost of the adjustment after the shock fell mainly on labour, with much higher and longer term unemployment in the Eurozone, than in both non-Eurozone EU and the US. This might be gradually mitigated in the future by an increasing labour mobility within the Eurozone, from deficit to surplus countries. The lack of a common fiscal capacity, however, implies that no mechanism will be in place to compensate those countries for the loss of their most skilled workforce and for the erosion of their tax bases. The impoverishment of these countries will increase in parallel to the increase in labour mobility. The analysis shows that as a consequence of a series of asymmetric adjustments, with internal devaluation in deficit countries not accompanied by expansionary policies in surplus countries, social and economic divergences in the Eurozone are literally exploding.

Fifth, a simulation for a common budget is proposed. Taking inspiration by the old analysis presented in the MacDougall Report (1977), the contribution to the common budget is linked to the current account position of each member state. A refinement of this approach considers only relative positions in the balance of payment within the Eurozone, allowing the composition of the budget to remain independent from the overall Eurozone growth strategy. The simulation shows that the cost would be concentrated on Germany and the Netherlands, while France would become the main beneficiary. The deterioration of the situation within the Eurozone has created difficult political conditions for this solution to be implemented. This may represent a challenge for the political sustainability of the European project.

The EMU seems locked into a vicious circle, which had been foreseen long ago: "monetary unity imposed under unfavourable conditions will prove a barrier to the achievement of political unity", Milton Friedman foresaw. But now political unity is precisely the necessary condition to save monetary unity.

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List of Acronyms

EC	European Commission
ECB	European Central Bank
ECU	European Currency Unit
EMU	Economic and Monetary Union
EU	European Union
GDP	Gross Domestic Product
IMF	International Monetary Fund
NUTS	Nomenclature of Territorial Units for Statistics
NUTS 2	basic regions for the application of regional policies
OCA	Optimum Currency area
OECD	Organisation for Economic Co-operation and Development
MS	Member States (of the EU)
TFEU	Treaty on the Functioning of the European Union
UK	United Kingdom
US	United States
WB	World Bank