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Soon after the establishment of the Eurozone it became obvious that the structural differences between member states would not abate, as expected, but rather gradually widen. Although part of the problem can be attributed to the enlargement process, it also relates to asymmetric effects of the common currency and to diverging economic policies. This paper discusses the literature which associates the economic characteristics of EMU with arguments of the optimum currency area (OCA) theory and asks for missing capstones that would meliorate EMU to eventually resemble an OCA. As potential candidates for such building blocks, some sort of fiscal union and lender of last resort may qualify, drawing on the experiences of other currency unions and federal states. The financial and debt crisis has revealed that the endogenous forces within a currency union may be too slow to absorb the shocks originating from the crisis. For a currency union to survive in such a situation it is all the more important that the OCA criteria are met and/or that complementary institutions are in place. However, as actual developments in the Eurozone reveal, the political process of approaching an OCA is piecemeal rather than comprehensive and prompt.

1. Introduction

Triggered by the global financial and economic crisis, which in 2007 originated in the United States, structural and institutional weaknesses within the European Economic and Monetary Union (EMU or Eurozone) have become obvious which in previous "normal" times had remained hidden. Already in the run-up phase to the EMU there was a considerable debate as to whether this union of heterogeneous states could reap the benefits of an "**optimum currency area**" (OCA). Sceptic voices (such as Krugman, 1993, or Eichengreen, 1998) were countered by the argument that "EMU entry per se, for whatever reasons, may provide a substantial impetus for trade expansion; this in turn may result in more highly correlated business cycles" (Frankel – Rose, 1998). Thus, it was expected that an "**endogenous currency area**", i.e. a gradual convergence of economic structures after commencement of the monetary union, would be self-validating and ensuring the viability of the monetary union.

Soon after the establishment of the Eurozone it became obvious, however, that the structural differences between member states would not abate, but over the years become even larger. This is partly due to the enlargement process, which has integrated more and more peripheral countries into the euro zone (Peters, 2006). In terms of relative unit labour costs, the gap which existed in 1999 has increased up to 2008 by another 25%. In 2009, the economic crisis reduced the spread between the country with lowest relative costs (Germany) and the one with highest relative costs (Ireland) to some 20% (De Grauwe, 2010a). A similar picture is revealed by other structural indicators.

This paper discusses the literature which relates the OCA arguments to the characteristics of EMU and asks for missing capstones that would meliorate EMU to eventually resemble an OCA. As potential candidates for such building blocks, some sort of fiscal union and lender of last resort may qualify, drawing on the experiences of other currency unions and federal states. The financial and debt crisis provides a unique possibility to reconsider the necessity and sufficiency conditions for presumptive members of a monetary union and evaluate the possibility of a long-lasting stable relationship between them.

The following Chapter 2 discusses the literature on theoretical arguments and empirical evaluations of the traditional and endogenous optimum currency area models. Chapter 3 confronts the general results with the situation in the European Monetary Union (EMU). An attempt is made to delineate the factors which preclude EMU from being an OCA, and to reason about the consequences for the sustainability of EMU. Experiences from the fate of previous and existing other currency unions, national and multinational ones, are presented in Chapter 4. The concluding Chapter 5 summarises the results.

2. Traditional and endogenous optimum currency areas

Within Europe the debate on the creation of a monetary union was not motivated by the choice between a fixed versus a floating exchange rate system which is the focal point of the OCA theory. The (political) question rather was whether the German dominance in monetary affairs should be continued and even extended, or be substituted by a jointly organised monetary system (see Archer, 2002). The link to the OCA theory was emphasised by US economists, such as Bayoumi

– Eichengreen (1996): "Like it or not, the theory of optimum currency areas remains the workhorse for analyses of European monetary unification. Indeed, many economists do not like it very much." This quote remains valid until today, and a number of advances in the theory and its empirical applications make it look a rather modern tool for analysing the macroeconomics of fixed exchange rates. However, some others, including Goodhart (1995) and Bordo – Jonung (1999), maintain that the predictive power of the OCA theory concerning the evolution of a monetary union is rather weak.

Mongelli (2002) has subdivided the development of the OCA theory into four phases:

- the "pioneering phase" from the early 1960s to the early 1970s which established the OCA theory and dealt with the borders, the criteria, the costs and benefits of monetary union;

- the "reconciliation phase" during the 1970s when various strands of the theory were linked together without producing major innovations to the theory;

- the "reassessment phase" in the 1980s and early 1990s with a renewed interest in monetary integration and the evolution of a "new" OCA theory which was instrumental for the institutional design of the EMU; and

- the "empirical phase" since the mid-1990s which now brings all facets of the theory to operationalisation and test.

The following section, though not slavishly following these phases, will consider most of their elements in turn.

2.1 *Asymmetric shocks and the static OCA theory*

The **original OCA theory**, as developed by Mundell (1961), used a static approach to find the optimal number of currencies for a given economic region. Turned around, the question was which currencies could be unified to render asymmetric exogenous shocks unlikely or to minimise the adjustment costs following such a shock. An optimum currency union would either be one where exogenous shocks would have symmetric effects on all members or where the consequences of asymmetric shocks could be spread from fortunate members to those hit most by the shock. The latter option could be pursued by real adjustments or by transfer payments.

A number of **OCA criteria** have been suggested by theoretical reasoning. Compliance with some or all of these criteria would make sure that an asymmetric shock could easily be absorbed. Mundell (1961) in his original contribution advocated flexible wages and prices and the mobility of production factors within the union. McKinnon (1963) added the openness of a country to foreign trade. Ingram (1962) noted that financial market integration could lower the need for nominal exchange rate changes, and Kenen (1969) emphasised the degree of industry or product diversification as main condition of the symmetry of disturbances. If two regions produce the same goods, symmetric shocks are more likely than in the case of two regions each of which specialising in a different set of goods. Kenen also discussed the possible contribution of fiscal integration which he saw only viable in case of advanced political integration. The variety of criteria offered suggests that a consistent set of rules and institutions would have to be in place to safeguard the sustainability of the monetary union. Bayoumi (1994) provided a formal microeconomic foundation for the original OCA theory. An overview by Broz (2005) contains a convenient listing of the various criteria, it is for convenience reproduced in Table 1.

Table 1: Traditional OCA criteria

Variables	Effect
Labour mobility	The greater the labour mobility (when wages and prices are not flexible) the easier it is to join/form a common currency area.
Wage and price flexibility	If there is wage and price flexibility in a common currency area, it will be easier to overcome asymmetric shocks and the common currency area will be more stable.
Openness	The more open the economy is, the stronger is the case for joining/forming a common currency area.
Diversification of production/exports	The more diversified the economy, the more attractive is a common currency area.
Size of economy	The larger the economy, the more attractive is the flexible exchange rate.
Inflation differential	If there is inflation differential between countries, it will be harder to maintain the fixed exchange rate.
Capital mobility	The higher capital mobility, the harder it is to maintain a fixed exchange rate (except, of course, if the country joins a common currency area).

Source: Broz (2005)

Mundell was influenced by the discussion on the **pros and cons of flexible exchange rates**, as advocated by Friedman (1953). Friedman argued that for countries with rigid wages and prices and immobile production factors between countries, an exogenous shock could be best absorbed by a flexible exchange rate. Although Friedman was not opposing currency unions per se, he considered it as a waste of resources to focus monetary policy on stabilising the exchange rate. In his opinion, exchange rate developments should be left to the market, policymakers should at best consider them as indicators for internal stabilisation policy.

For Mundell, labour is also immobile across countries, but it is mobile within a currency region. Mundell (1961) started out with a *neo-Keynesian model* (see McKinnon, 2000) which implicitly assumed a downward-sloping and stable Phillips curve and the possibility of national fiscal and monetary policies to correct the consequences of exogenous shocks ("Mundell I"). In his later work, Mundell (1973a,b) complemented his theory by introducing a *monetaristic element*: Countries adopting a common currency would gain from the abolition of exchange rate uncertainty vis-à-vis major trading partners anyway, and there was no need to search for alternative adjustment channels ("Mundell II").[1] Losing the exchange rate as a policy instrument may be a disadvantage at first sight, but it also drops out as a possible source of asymmetric shocks. In this line, also Buti – Sapir (1998) argue that the exchange rate is not a preferable channel to adjust for exogenous shocks (see also De Grauwe, 2006).

In his earlier work, Mundell was focussing on the policy choice between fixed and flexible exchange rates in a world without capital mobility. This was quite different from the setting in the early 1990s when the Maastricht Treaty was formulated. Countries now had a preference for stable exchange rates (clinging to the deutschmark even before EMU came into force) which in the face of high capital mobility could only be achieved by a radical switch to a single currency.

In the further development of the OCA literature, **two strands** may be distinguished (Horváth and Komárek, 2002). The first one, prevailing during the 1960s and early 1970s, attempted to find the crucial economic characteristics for the confines within which a fixed exchange-rate system could be applied, thus broadening and deepening the discussion on OCA criteria. The second strand started during the 1970s and continues to date. It assumes the optimality criteria being fulfilled and tries to identify the costs and benefits for a country joining a currency union. Applying such an

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[1] It was McKinnon (2001) who first pointed at the later work by Mundell and who (in McKinnon, 2004) coined the terms „Mundell I" and „Mundell II".

approach, Ishiyama (1975) distinguishes between the costs and benefits of individual OCA criteria and those of overall monetary integration. Tower – Willett (1976) miss any consensus on the quantitative importance of individual OCA criteria and see much need for further empirical research. It is anyway an empirical exercise to substantiate the political decision of joining a monetary union or not.

The classical OCA theory has been **criticised** by many authors for various reasons. Among them Robson (1987) uttered dissatisfaction that the criteria were not unambiguous to measure and were also related to each other. Tavlas (1994) sees the OCA theory cumbered by a "problem of inconclusiveness": The borders of an OCA depend on the indicator used, and different indicators could point in different directions. Tavlas also unveiled a "problem of inconsistency": Small economies are usually quite open and are therefore well suited for monetary integration, but they are also often less differentiated in production and therefore good candidates for flexible exchange rates.

2.2   *Endogenous optimum currency areas*

The breakdown of the Bretton Woods system and the introduction of Generalised Floating pushed the discussion on monetary union into the background. It was not before the 1980s that interest in European monetary integration re-emerged. When the Emerson Report (Emerson et al., 1992) was produced, the traditional OCA arguments seemed outdated. In particular, the Report changed the focus from defining an optimal geographic jurisdiction (as in the traditional OCA theory) to defining the optimum economic and monetary competences of a given geographic jurisdiction. The reassessment phase of the OCA theory produced the **"new" OCA theory** which, among others, deals with the endogeneity of currency areas and accounts for modern macroeconomic theories, including the microeconomics of monetary union, forward-looking expectations and credibility (see e.g. Dellas – Tavlas, 2009). The literature review by Broz (2005) summarises the arguments of the new OCA theory as presented in Table 2 (in addition to those already mentioned in Table 1).

Of particular importance has been the development of the **dynamic OCA theory** which is based on the "Lucas Critique": The suitability of countries to join a monetary union cannot only be judged by historical data, as the economic structure is likely to change following the accession to the union. In this vein, Hochreiter et al. (2002) assume that the actual values of the OCA criteria may adapt to the new circumstances (of a single currency). For the euro area this could be observed already in the phase before its very existence, when inflation rates and nominal interest rates converged to the standards set by the Deutsche Bundesbank. In the wake of the recent fiscal crisis, an obvious backlash has occurred, the extent and duration of which will significantly impact on the scenarios for the future of the Eurozone.

Table 2: Selected criteria of the "new" OCA theory

Variables	Effect
International risk sharing	If a country is able to share risk with its partners in a common currency area, this regime could ameliorate other rigidities in the area.
Usefulness of money	Joining the common currency area enhances the usefulness of money, but the effect is that much greater the smaller and more open the economy is.
Effectiveness of monetary policy	If a monetary policy is not effective, the loss of monetary independence is not a high cost.
Credibility of monetary authorities	If the monetary authorities do not have credibility to curb inflation, having a fixed exchange rate as a nominal anchor will be beneficial.
Endogeneity	A country is more likely to satisfy the criteria for entering a common currency area ex post than ex ante due to increased business cycle correlation.
Specialisation	A country is more likely to satisfy the criteria for entering a common currency area ex ante than ex post due to increased specialisation of the countries forming the area.
Similarity of shocks	Costs of losing independent monetary policy are lower the higher the association of shocks between the client (potential member of a common currency area) and the anchor is.
Monetary shocks	If a country is facing monetary shocks, having a fixed exchange rate will be attractive.
Real shocks	If what a country is facing are real shocks (domestic or foreign), a flexible exchange rate will be more feasible.
External nominal shocks	If what a country is facing are external nominal shocks, a flexible exchange rate will be even more attractive.
Effectiveness of exchange rate adjustments	If exchange rate adjustments are not effective, the cost of losing the exchange rate as adjustment mechanism is not significant.
Labour market institutions	If countries have different labour market institutions, it will be hard to adjust to the same kind of shock in the same way in a common currency area.
Business cycle synchronisation	If countries forming a common currency area have synchronised business cycles, they will not need flexible exchange rates as an adjustment mechanism.
Dominant trading partner	If a country has a dominant trading partner, it is beneficial to form a common currency area.

Source: Broz (2005)

A related development concerns **endogeneity** and tackles the question of causality (Frankel – Rose, 1998): Is it the ex ante existing homogeneity of potential union member that makes unification feasible? Or is it the other way round, that the unification exerts enough adjustment pressure to justify the creation of the union ex post? De Grauwe – Mongelli (2005) differentiate between four areas of endogeneity:

(i) *Endogeneity of economic integration*, concerned primarily with trade and prices; here the result is that EMU had already in the run up a significant impact by harmonising inflation rates, but this could partly also be attributed to the internal market programme. Positive trade effects of a currency union have been found in many studies, though they may evolve over a longer period – according to Rose (2004) over 15-20 years. Frankel – Rose (1997, 1998) found that trade between the member states expands, beyond the mere effect of the elimination of nominal exchange rate volatility, by a multiplication factor of three and more ("*Rose effect*").

(ii) *Endogeneity of financial integration* is less well documented. Progress has been made in the money market, integration is unfolding in the bond and equity markets, but there is little evidence for significant risk-sharing.

(iii) *Endogeneity of symmetric shocks* and the synchronisation of outputs: There is some evidence that clustering forces will dominate over dispersion forces.

(iv) *Endogeneity of product and labour markets*: Increasing flexibility in these markets, for which there is some evidence in the Eurozone, is potentially a powerful argument in favour of endogeneity.

The authors conclude that endogeneities are evolving in all four areas, though with different speed and intensity, and they are "moderately optimistic" as to the final result for the Eurozone.

Buiter (2000) advocates a "**financial integration approach**" to OCAs which rests on the presumption that all countries linked by unrestricted financial capital mobility form an OCA. This would mean that in a world of virtually free capital movements most countries would be linked together in an all-embracing OCA. It is just for political reasons that no uniform world currency has been introduced.

2.3   Possible outcomes of more integration

Two opposing views have evolved on the possible outcome of deepening and/or broadening economic integration, in particular trade integration (De Grauwe, 2009):

- Improving the trade linkages between countries will enhance the synchronisation of national business cycles, if shocks are common to all countries, or demand shocks predominate or trade is mostly of an intra-industry nature (**endogeneity hypothesis**). *Intra-industry trade* is based on economies of scale and imperfect competition, but rather not on the specialisation of countries. This is the view adopted, in the vein of Kenen's (1969) analysis, e.g. by the European Commission (1990). According to this "optimistic view of EMU" (Breuss, 2011a), the countries involved could satisfy the OCA criteria ex post.

- In contrast, Eichengreen (1992) and Krugman (1993), following to some extent Myrdal (1957) and Kaldor (1966), argue that higher trade integration induces more specialisation which will increase regional concentration of industrial activities and result in more *inter-industry trade* (**specialisation hypothesis**). If an exogenous demand shock occurs to a specialised region, such as the US automobile industry, it is likely to have permanent asymmetric effects and would thus corroborate the original Mundellian analysis. In the context of EMU, Breuss (2011a) refers to this scenario as the "pessimistic view". However, the specialisation hypothesis has been attributed to capital market integration rather than to the forming of a monetary union (Artis, 2002).

Krugman (1993) viewed the **experience of Massachusetts** around 1990 as symptomatic for what could be expected for EMU. During the 1980s the New England area was thriving as the result of its specialisation on mini-computers, advanced medicine and precision military hardware. However, by the end of the 1980s, demand shifted away from these products in favour of new items (e.g. micro-computers) or collapsed as the result of policy changes (less military spending) and the end of a building boom. Because of a budget crisis, fiscal policy moved in a pro-cyclical direction, thus exacerbating the crisis.

According to Krugman, this experience foreshadows the likely development of EMU and is characterised by the following elements:

- Regional specialisation: US regions are more specialised than comparable regions in Europe, but deepening integration will increase specialisation also in Europe.

- Instability of regional exports: Shifts in taste and technology lead to erratic export developments of the specialised regions.

- Pro-cyclical capital movements: Regional export cycles are reinforced by pro-cyclical investment developments accompanied by financial flows.

- Divergent long-run growth: Growth rates differ markedly between US regions with no tendency of returning toward historical averages. This is also the result of high factor mobility.

Krugman concludes that (i) EMU will encounter asymmetric shocks similar to those for US regions, and (ii) EMU will be hit harder than US regions because it lacked American-style fiscal federalism. Therefore, "some kind of policy reform will be necessary if the increasingly unified European economy is not to pay an even higher price for that unification than the US does" (p. 243).

Figure 1: Does integration induce convergence of economies?
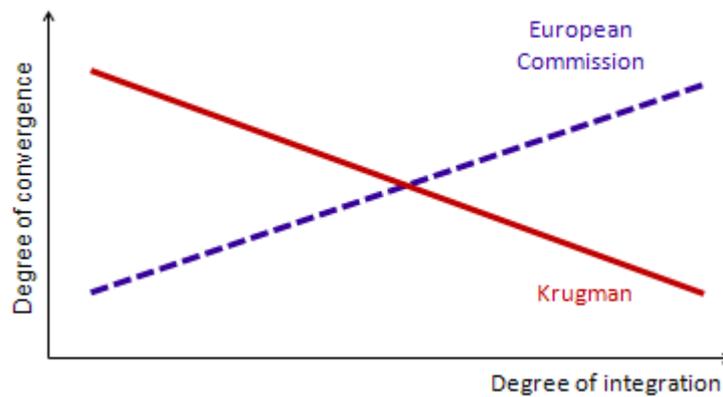
Source: adapted from De Grauwe (2009)

For the OCA model it is thus decisive whether a country is subject to the endogeneity hypothesis or the specialisation hypothesis (see Figure 1): In the first (European Commission) case, an endogenous OCA would evolve, while in the second (Krugman) case the countries involved would not cross the OCA line from below as depicted in Figure 2 (see also De Grauwe – Mongelli, 2005).

Figure 2: Endogeneity of OCA Dominating
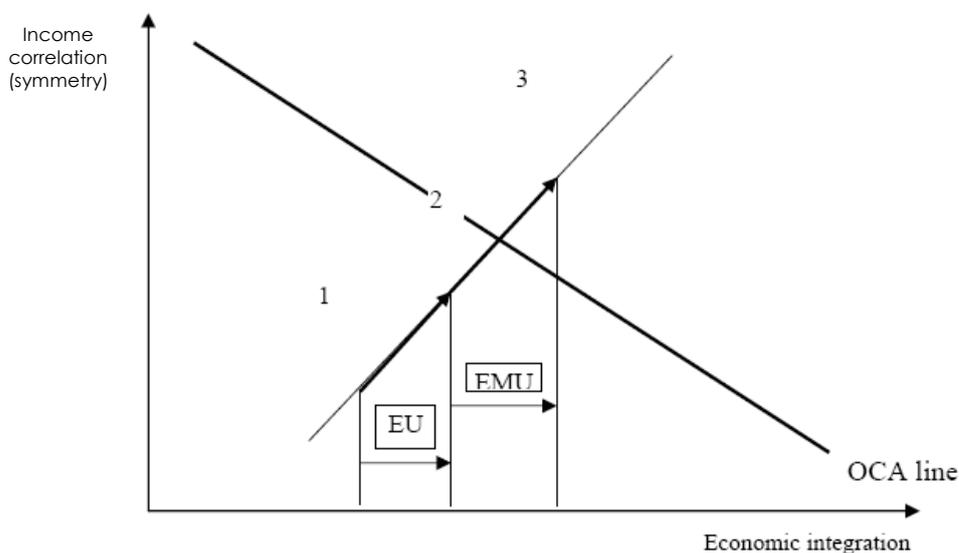
Source: De Grauwe – Mongelli (2005: 24)

An endogenous currency union would imply that monetary integration should be pursued because this would entail economic integration. If currency unions were not endogenous, an early monetary unification could jeopardize the whole integration project.

De Grauwe – Mongelli (2005) visualize (see Figure 2) the hypothetical development of a European country which first enters the EU (Stage 1) and then becomes a member of EMU. The open question then is, whether or not EMU itself has endogenously proceeded far enough to cross the OCA line from below (Stage 2). If endogeneity dominates, the country will eventually move way above the OCA line (Stage 3).

2.4   Empirical tests

For an empirical evaluation of the various aspects of OCA theory, many studies look at the business cycles of prospective member countries of a currency union and ask for the degree of synchronisation between them (e.g. Artis – Zhang, 1997; Crowley, 2006). Some other studies employ, along the lines of Blanchard – Quah (1989), structural vector autoregressions (SVARs) to identify demand and supply shocks and then calculate correlations of these shocks across countries (e.g. Bayoumi – Eichengreen, 1994, 1996, 2004; Funke, 1995).

Among the first strand is the seminal study by Frankel and Rose (1998) who test the endogeneity vs. specialisation hypotheses. They analyse the benefits of increasing bilateral trade (such as more efficient allocation of resources) as a consequence of monetary integration. By adopting an instrumental variables approach they attempt to figure out which of the opposing views are corroborated by the data for 20 industrialised countries over a period of more than 30 years. The finding is that "closer international trade links result in more closely correlated business cycles across countries". As European integration is supposed to enhance the trade links between member states, it would in turn lead to more symmetric business cycles. "That is, a country is more likely to satisfy the criteria for entry into a currency union ex post than ex ante."

Although Frankel and Rose see the reason for the positive relationship between trade intensity and business cycle synchronisation in the predominance of intra-industry trade, their empirical tests are based on overall trade statistics. This has been criticised by Fidrmuc (2004a), who provides evidence that cyclical symmetry is much better indicated by intra-industry trade than by overall trade intensities. He also maintains, in line with other authors, that trade is not the only factor producing convergence of business cycles. Mélitz (2004) explains why a currency union would foster intra-industry trade and reduce regional specialisation with the effect of increasing the symmetry of business cycles. The reason is that more integration induces incomes to rise. In turn, income-elastic trade is promoted which predominantly consists of differentiated intra-industry products.

Other empirical work on the question whether or not monetary union leads to increased economic integration includes Rose (2000), Rose – van Wincoop (2001) and Glick – Rose (2002). They find that countries joining a monetary union are likely to double the trade flows between them. This kind of "Rose effect" has been reviewed and complemented by a number of follow-up analyses (e.g. Altavilla, 2004; Berger – Nitsch, 2008). From these studies it can be concluded for EMU that over time the expansion of trade may amount to some 5% to 20% which can chiefly be attributed to the common currency and to the integration of financial markets (see also De Grauwe, 2009:27). From a non-linear model based on Beta distribution in the sample, Silvestre et al. (2007) conclude that trade has a positive effect on the correlation of business cycles which is, however, diminishing over

time. Babatskii (2004) provides estimates for the new EU member states and concludes that demand shocks become more synchronised as trade integration intensifies. Crowley (2006) finds that the endogenous OCA theory is valid not only for the current Eurozone member states, but also for most of the prospective members that have already joined the EU.

Willett et al. (2009) analyse the **endogeneity of OCA criteria** within the Eurozone by evaluating trade flows, business cycle synchronisation, and structural reforms to improve labour and product market flexibility. They find hardly any difference between Eurozone members and non-members. This may be attributed either to anticipatory activities of member countries (followed by some degree of reform fatigue afterwards) or to the lack of a major crisis to stimulate the reforms envisioned by endogenous OCA optimists. A conclusion is that the formation of EMU has not generated sufficient positive endogeneities to make a visible difference in economic performance. It can thus be inferred that, as long as a member of a currency union is far off the optimal path, convergence towards meeting the OCA criteria needs to be strong and fast. When forming a currency union, "the focus should be placed on entry conditions more than on hopes on subsequent reforms after entry" (p. 27).

A number of **country-specific factors** may retard the synchronisation of business cycles in a monetary union. If productivity differentials between member countries of a monetary union are not purely a catching-up phenomenon, they lead in the long run to substantial asymmetries in the union. An equilibrating factor could be concurrent inflation differentials originating in the non-traded sector which would explain the "Balassa-Samuelson effect" (see Balassa, 1964)[2]. But not all inflation differentials are the result of an equilibrating mechanism and may then cause concern for the sustainability of the union.

Fidrmuc (2004a,b) concentrates on employment regulation and labour market rigidities which are characteristic of European countries. Buscher – Gabrisch (2007) deal with the issue of endogenous labor markets in a single currency area. They find that in a financially integrated union the wage-setting process is dominated by national inflation rates which compensate for different nominal wage changes. As a result, real wages are more or less synchronised across the membership. Heinz – Rusinova (2011) find in EU countries some real wage reaction to unemployment and productivity changes which, however, evaporates quickly and is lower in countries with more intensely regulated labour markets.

Whether such retarding factors raise the potential for asymmetric shocks depends on the **origin of the disturbance**. Some shocks may be asymmetric just because a country is not a member of a currency union. An example could be that its national monetary policy deviates from that of a neighbouring union. By joining the union, the deviation may vanish and shocks may become symmetric with those in other member countries. In a more recent piece of work Buscher – Gabrisch (2012) find persistent asymmetries in nominal wage formation which are attributed to remaining differences in labour market institutions. As a result, "the euro zone is not endogenous with respect to wage formation. Rather, there are incentives for beggar-thy-neighbour policies" (p. 327).

Bayoumi and Eichengreen (1993) compare the correlation of demand and supply shocks in 8 US regions with 11 EU countries. The higher the correlation between regions (countries), the more symmetric the shocks are. They distinguish "core" regions (of neighbouring regions with highly

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[2] The Balassa-Samuelson effect originates from higher productivity growth in the tradeables sector than in the non-tradeables sector. If the associated higher wage growth in the tradeables sector is dispersed over the whole economy, inflation in the non-tradeables sector will exceed that in the tradeables sector. As a consequence, inflation in countries with higher productivity growth in the tradeables sector will also be higher than in other countries.

correlated supply and demand shocks) from "periphery" regions, and compare the regions within the following three groups: all regions, only core regions and only periphery regions. In all instances, the correlation between US regions is higher than between EU countries. Within each area, supply shock (and to a lesser extent also of demand shocks) are smaller and more highly correlated for core than for periphery regions. Furthermore, US regions adjust more quickly to disturbances than do EU countries, possibly reflecting the comparatively high labour mobility in the US. Demand shocks are more pronounced in the US than in the EU which may indicate the higher degree of specialisation of production in US regions. For the EU this implies that regional economic specialisation may increase once monetary unification has been achieved.

Krčilková – Zápal (2012) investigate the correlation of supply and demand shocks between "old" and "new" EU member states on a disaggregated **sectoral** basis. This combines the international correlation of sector-specific shocks with information about the country-specific weights of the three sectors agriculture, services and manufacturing. The results suggest that in general the latter sector is more conducive to monetary integration than the other ones.

Analysing the **regional** concentration in the US, the OECD (2000) found that after a long time of increasing concentration the trend was reversed towards the end of the observation period. Aiginger and Leitner (2002) compare the development of regional concentration in the US and in Europe; they conclude that regional concentration is somewhat higher in the US, but it is on a downward trend not only in the US, but also in Europe. The trend reversal could results from the rising share of services trade (for which increasing returns are less likely than in manufacturing), and could serve as an argument in favour of the endogeneity model.

For any remaining regional income differences, the **costs of exogenous shocks** may be mitigated either by insurance mechanisms (provided through capital markets or public budgets) or by idiosyncratic fiscal and wage policies (Artis, 2002). Sala-i-Martin and Sachs (1992) suggest the transfer of purchasing power from booming to depressed regions through a federal fiscal system. A monetary union would function much better if complemented by a (partially) centralised fiscal policy. The Eurozone debt crisis seems to confirm this view.

> **Many economists agree that the predictive power of the OCA theory is weak. It lacks political and historical dimensions which are important in the formation and dissolution of currency areas. However, OCA indicators hint at potential problem areas which may be encountered by existing currency unions and may have to be resolved by changing policies. In the wake of the financial crisis, it has become evident that the endogenous forces within a currency union may be too slow to absorb the (asymmetric and symmetric) shocks originating from the crisis. For a currency union to survive in such a situation it is all the more important that the OCA criteria are fulfilled and/or that complementary institutions (such as wage flexibility or a fiscal union) are in place.**

3. Why the Eurozone is not an OCA

3.1 Theoretical and empirical arguments

In a nutshell, the Eurozone with its single currency is **not considered an OCA** because labour is quite immobile, wages and prices are sticky, and financial markets are not used for risk insurance. Overall, the Eurozone is lacking a mechanism for balancing uneven consequences across member

countries of an adverse asymmetric shock. It is also not well suited to stabilise economic activity in case of a symmetric shock as in the case of the recent financial crisis.

The main **arguments against** the Eurozone being an OCA may be summarised as follows (Bordo and Jonung, 1999):

- Heterogeneous economic structures of member states
- Inflexible labour and product markets
- Absence of a central lender of last resort
- Lack of a central authority supervising the financial system
- Non-transparent ECB policy concerning purchases of government bonds
- Lack of a central fiscal authority (with the ECB substituting)
- Stability and Growth Pact (SGP) lacking credible sanctions
- SGP unduly restrictive in the face of asymmetric shocks

The Eurozone is a conglomerate of countries with different development stages. With a centralised monetary policy devoted to price stability, this has led to grossly deviating real exchange rate developments and wide current account imbalances between member states. In line with theoretical considerations, many **empirical studies** have therefore come to the conclusion that the EU is not an OCA. This was already the case for the former EU-15 which is covered e.g. by the studies of Eichengreen (1990), Neumann – von Hagen (1991), De Grauwe – Vanhaverbeke (1993), Bayoumi – Eichengreen (1993) and Beine et al. (2003). The same result also holds for the EU-25 (see Korhonen – Fidrmuc, 2001). One of the notable exceptions was formulated by the European Commission (COM, 1990).

In the case of EMU member countries, monetary integration started out with partners that were most advanced in meeting the optimality criteria ex ante. This does perhaps not exactly hold for Italy and Belgium, whose public debt level was higher than annual GDP already at the start of EMU. Practical politics, however, often overrule economic reasoning (Baldwin – Wyplosz, 2009), as in the early 2000s when the SGP was violated by France and Germany. The remedy was not to press the two countries for more stability, but to soften the SGP. According to Bergsten (2012) the Eurozone by 2005 consisted "of a very dissimilar set of countries without a central fiscal authority, without any credible enforcement of budget discipline, and without any real deepening of economic convergence" (p. 3).

A number of enlargements tended to add new members that were peripheral to the original core, thereby increasing the heterogeneity of the union. A recent example was the speedy accession of Eastern countries to the EU which was driven by political considerations on regional security in Europe. In this setting it became also more difficult to meet the optimality criteria ex post.

Already before the recent financial crisis, Gros (2006) was sceptic about the sustainability of EMU in crisis times. In his view, the population in less competitive member countries of the Eurozone could at a certain stage oppose a unified monetary policy which was anyway oriented at the needs of the thriving core members. However, Gros rules out the exit of individual member states from the Eurozone or a breakdown of the union, although the survival would depend on the fulfilment of the OCA criteria ex post. He complains about the lack of flexibility in economic structures and insufficient preparedness to form a political union.

Comparing the coherence of exogenous shocks and the speed of adjustment to these shocks across 11 EU countries with the results from US regional data, Bayoumi – Eichengreen (1993) use a structural vector autoregression (SVAR) decomposition of output and price data to extract information on underlying aggregate supply and demand shocks. They conclude that underlying

shocks are significantly more idiosyncratic across EU countries than across US regions, which may indicate that "the EU will find it more difficult to operate a monetary union" than the US.

However, following De Grauwe (2009) there is a subset of EU countries that form an OCA. This group consists at least of the founding EU members Germany, France and the Benelux countries plus Austria. A number of studies have argued that the one or the other EU country should be added to this list. By further extending the membership, the currency area would eventually end up in a core-periphery system with the periphery countries being somewhat less likely to experience net gains from the union than the core countries. De Grauwe – Mongelli (2005) and De Grauwe (2009) compare the results for various country groups as shown in Figure 3, where the trade-off between the symmetry of exogenous shocks and flexibility (wage flexibility, mobility of labour) is depicted by the downward sloping OCA line: The more flexible a country is, the more asymmetric shocks it can absorb. Countries sharing high income correlation, or high product and labour market flexibility or both, could easily form a currency union. This is the situation of the Eurozone which is placed here – jointly with the US states – to the right of the OCA line. There is less flexibility in the EU and in the Eurozone as compared with the US states, and the exogenous shocks are more symmetric in the US states than in the Eurozone.

Figure 3: Symmetry and openness in monetary unions
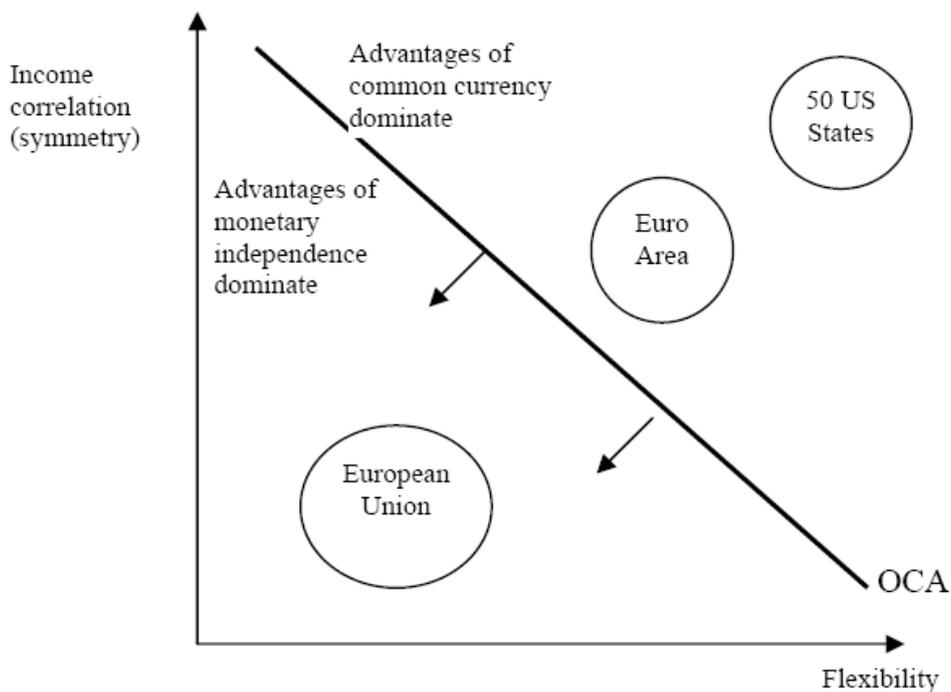
Source: De Grauwe – Mongelli (2005: 10)

One of the indicators for the formation of a joint monetary union as suggested by the OCA theory is **business cycle synchronisation**. Business cycles may diverge even between neighbouring countries when their economic development stages, structures or behaviours diverge. Employing a dynamic factor model (specifying a euro factor, country factors and idiosyncratic factors specific to each time series), Lehwald (2012) compares a pre-euro period (1991-1998) to a euro period (2000-2010) by decomposing macroeconomic fluctuations in output, consumption and investment changes. Her results suggest that, with the introduction of the euro, business cycle synchronisation was enhanced for core members while it weakened for periphery countries. Also Sinn et al. (2011)

observe a rising imbalance between core and peripheral Eurozone countries and attribute this development to some extent to the adoption of the common currency.

Crespo-Cuaresma – Fernández-Amador (2010) analyse the development of standard deviations of demand shocks and GDP components across Eurozone countries, new EU member states and other OECD countries by applying a sigma-convergence methodology. They conclude that extending the Eurozone to 22 countries would not further impair the optimality of the euro area. In another paper, Crespo-Cuaresma et al. (2011) evaluate the link between cyclical convergence and trade integration and the ensuing endogeneity problem. Having arrived at a high degree of trade integration, fiscal policy can well contribute to achieving convergence.

Figure 4: Monetary policy and economic conditions
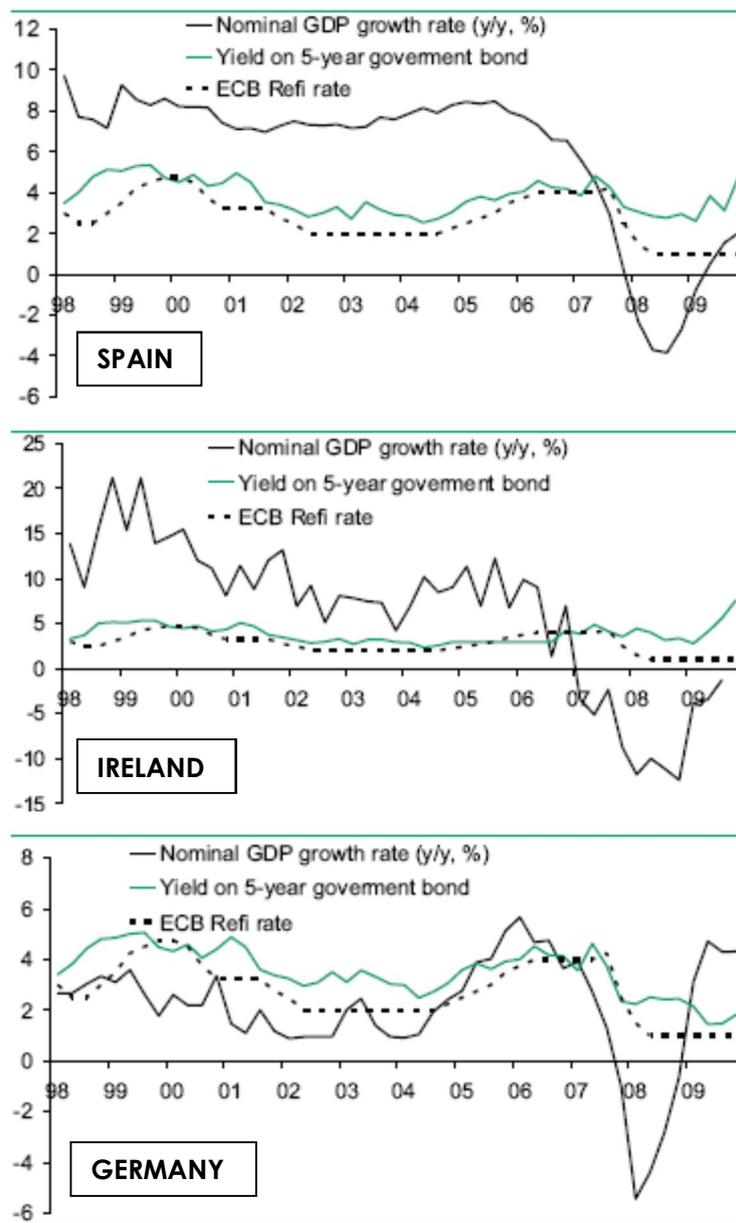
Source: De Lucia (2011)

De Lucia (2011) explores the co-movement of economies by the standard deviation of real growth rates and by the inflation dispersion among countries. The growth rates of EMU members were

quite scattered at the time the monetary union was launched, but converged (as a result of an endogenous process) in the years to follow. A low point with best growth convergence was reached in early 2008. As a consequence of the financial and debt crisis, growth rates have been increasingly diverging since. A similar pattern can be discerned for the development of inflation rates.

In the face of rising divergences between EMU member states, it is not easy for a unitary monetary policy to adequately serve all members. Applying the notion that in the long-run countries with foreign indebtedness should achieve a nominal growth rate no less than the nominal interest rate on long-term bonds, then some members would – as a consequence of the financial crisis – be clearly off track. In Spain and Ireland, for example, nominal growth has during much of the existence of EMU been higher than the nominal interest rate. Since the beginning of the crisis, that relation has been reversed. In Germany the situation is different as the nominal rate for 5-year bonds has most of the time been higher than the nominal growth rate of GDP. After the financial crisis, German GDP growth has been rather buoyant and has outreached the bond rate (Figure 4).

De Lucia (2011) has also performed an empirical analysis of the shocks the EMU members are confronted with. After disentangling demand from supply disturbances, the focus is on long-term supply shocks which are seen as relevant from the perspective of the underlying structure of the economy. The "Mundell criterion" to be analysed is the degree of correlation between the national supply shocks. High correlation implies that an exogenous shock can be curtailed by uniform monetary action as it would be in a monetary union, while low correlation suggests that these countries are better off with an independent monetary policy. According to De Lucia, out of 11 EMU countries considered (AT, BE, DE, EL, ES, FI, FR, IE, IT, NL, PT) only the original members of the EEC plus Austria exhibit a positive and statistically significant correlation. He does not mention Portugal, but states that none of the "peripheral countries" would meet the Mundell criterion (Table 3).

Table 3: Correlation of supply shocks

Corr.coeff. t-statistic	AT	BE	DE	FR	IT	NL	PT	EL	ES	FI	IE
AT	1.00										
BE	.63 4.81	1.00									
DE	.64 5.04	.55 3.92	1.00								
FR	.42 2.78	.47 3.20	.56 4.01	1.00							
IT	.68 5.55	.54 3.80	.80 7.91	.64 4.95	1.00						
NL	.37 2.42	.49 3.41	.53 3.74	.46 3.08	.41 2.70	1.00					
PT	.49 3.41	.55 3.93	.43 2.85	.38 2.48	.54 3.87	.51 3.57	1.00				
EL	.12 .70	.24 1.49	.23 1.45	.33 2.07	.29 1.79	-.48 -3.26	.11 .66	1.00			
ES	-.45 -3.03	-.41 -2.72	-.44 -2.91	-.59 -4.39	-.65 -5.15	.47 3.19	-.29 -1.84	-.45 2.98	1.00		
FI	-.57 -4.16	-.63 -4.86	-.76 -7.01	-.62 -4.68	-.69 -5.78	-.55 -3.93	-.45 -3.00	-.30 -1.88	.55 3.98	1.00	
IE	-.24 -1.45	-.34 -2.16	-.33 -2.11	-.30 -1.86	-.28 -1.75	-.27 -1.69	-.16 -.95	-.20 -1.25	.16 .96	.40 2.64	1.00

Source: De Lucia (2011)

De Lucia further considers the size and speed of adjustment to shocks, arguing that even countries with negative correlations could qualify for membership in a currency union if disturbances were small and adjustment speed high. The size is measured as the long-term impact of supply disturbances on economic activity, while the speed of adjustment is measured by the response of activity two years after the shock as a share of the total long-run effect. As a result, Greece, and to a lesser extent Ireland, do eventually not qualify for membership in a currency union with the other countries in the sample.

Yüceol (2006), who provides convenient summaries of the literature on OCA criteria and comparisons of theory with evidence, finds that in EMU there is no sustainable process of real convergence. Periphery members are not able to keep pace with the core, and conflicting national interests jeopardise possible improvements in policy coordination. The heterogeneous membership of EMU is clinched together by a uniform monetary policy which does not worry about individual country requirements. What is needed to secure the long-run viability of EMU is some mechanism for achieving real convergence between member states.

3.2   A graphical presentation

Breuss (2011b) has provided a neat graphical summary of the interconnections relevant in the discussion on EMU as a possible endogenous OCA, combining the theoretical aspects with the effects of actual measures adopted in the follow-up of the euro crisis (Figure 5). The latter are represented by the temporary European Financial Stability Facility (EFSF) and its permanent surrogate European Stability Mechanism (ESM).

The four quadrants in this figure cover the relationships (I) between heterogeneity (real divergence) and trade integration (T), (II) between the potential default of Eurozone countries and financial integration (FI), (III) between competitiveness and potential default, and finally (IV) between heterogeneity and competitiveness. The upward-sloping solid OCA lines in the four quadrants are lines of zero net gains from EMU; positions closer to the origin (e.g. the point EUR-DM) represent positive net gains, positions on the other side of the OCA line (such as EUR-17) represent net costs. In each quadrant the red arrow pointing from EUR-DM to EUR-17 indicates that the former DM bloc may be considered an OCA, while for EUR-17 this is not the case. Outward shifts of the solid OCA lines towards the broken OCA' lines (the blue arrows EFSF/ESM) depict the consequences of the rescue activities of EMU member states by which the EUR-17 group also becomes part of the OCA area.

In Quadrant I, the downward-sloping line TT portrays the "optimistic view" according to the European Commission (COM, 1990): more integration reduces real divergence. In contrast, the upward-sloping line $T_K T_K$ stands for Krugman's (1993) "pessimistic view" which covers the possibility that more integration leads to more specialisation (see also Figure 1). Equivalent interpretations can be given for the other quadrants, for details see Breuss (2011b). The rectangle formed by numbers "1" defines equilibrium of the original OCA, the number "2" rectangle denotes the current state of affairs which Breuss considers sustainable only if the Eurozone can be transformed into a fiscal transfer union. The future of the Eurozone may thus boil down to the policy options between a transfer union and the return to a downsized OCA resembling the former DM bloc.

Figure 5: Eurozone – from an OCA to a fiscal transfer union
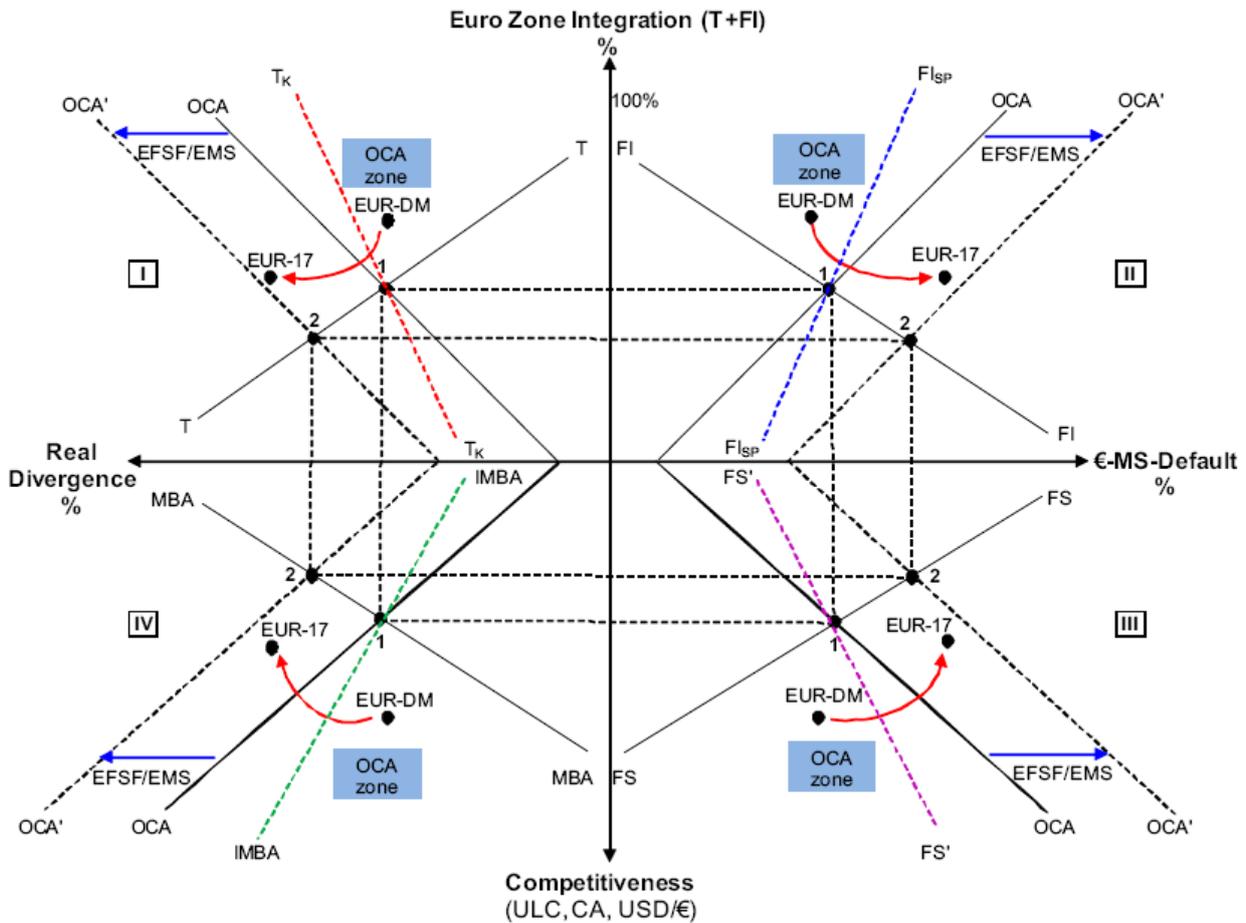
Source: Breuss (2011b)

3.3 Policy considerations

For economic policy, there are two main questions to be solved in a monetary union:

- What can be done to reduce the likelihood of an *asymmetric shock*?
- If a negative shock occurs, what are the *alternative mechanisms* to absorb the consequences and thereby justify the fixed exchange rate system?

Previous sections of this paper have tackled the question of asymmetric shocks. As to the **alternative mechanisms** after a shock, several options are at hand, some of which may have to be applied in succession:

- To prevent an *immediate break-down* of financial markets, a national or international lender of last resort should be prepared to inject liquidity into the financial system. This would also mitigate the consequences for goods markets through avoiding a possible credit crunch (see e.g. Jeanne – Wyplosz, 2001).

- *Medium-term adjustment* measures may consist of increasing the flexibility of wages and prices to remain internationally competitive; and/or adjusting interest rates to reflect a change in the risk premium.

- *Long-term adjustment* to secure international competitiveness should rest on structural reforms helping to lift productivity to a higher growth path.

(1) As an **immediate activity**, any **lender of last resort** (LOLR) needs to be equipped with the power to tax (Buiter, 2000). In case of a financial crisis, it is usually up to the central bank with its "short-term deep pockets" to provide liquidity to the financial system. To remain solvent, it may in principle be forced to do this in unlimited amounts which would eventually be inflationary. Therefore the central bank needs the backing of the state which possesses the power to tax ("long-term deep pockets"). In the Eurozone, no European fiscal authority exists and the power to tax remains with the nation states. Thus, there is no effective LOLR at the union level.[3]

The current European debt crisis distressingly reveals this deficiency. Certain aspects of a LOLR are currently performed (i) by the European Central Bank (ECB) and its massive purchases of sovereign bonds on the secondary market, and (ii) by the "bilateral" rescue activities of some EU member states to bailout Greece and other debt-ridden member countries. The LOLR responsibilities will in future also be shared by the European Stability Mechanism (ESM). Buiter (2010) qualifies the ESM as "a first necessary but not sufficient step toward the creation of the minimal fiscal Europe required for the Euro Area to survive and prosper" (p. 23).

The ECB has abandoned its pledge to abstain from purchasing the sovereign debt of member states. For Bordo (2010) the result is that "(i)n the absence of an effective fiscal union the central bank is conducting fiscal policy", with the effect that its independence is at stake. In this situation, the financial markets have taken over the lead and have established fiscal discipline on some peripheral member countries – in a fully-fledged OCA this task would have been performed by the central fiscal authority.

Monetary integration would infer that a common monetary policy, decided and implemented at the supranational level, would result in a unified structure of **interest rates**. In contrast to long-term interest rates, short-term rates are more under the direct control of the ECB and therefore move rather close together. For long-term rates, such a development could be observed during the run-up to the union, but it has been eroded since (see Figure 6). Favero – Missala (2010) distinguish three phases of yield spreads for long-term government bonds vis-à-vis German bunds:

- *Pre-EMU decade* (up to 1998) with significant spreads which were gradually shrinking in the course of the 1990. The spreads were linked to the development of inflation differentials which also left their mark on exchange rate adjustments.

- *Post-EMU decade* between the introduction of the euro (1998) and 2008, just before the burst of the financial bubble. In this period the spreads almost vanished. For high-yield countries, like Italy, Portugal and Spain, the spreads were reduced from some 300 basis points at their peak to just 30 basis points. At the same time, inflation differentials also became negligible.

- The consequences of the *financial crisis* became visible in the Eurozone in rising public debt figures, followed by a loss of confidence in the sustainability of public finance and the solvability of the financial sector. Spreads became highly dispersed again according to the markets' perceptions of the risks associated with the financial situation in individual member countries. In the meantime, the measures adopted at union level have helped to regain some financial stability.

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[3] See also the overview by Bordo (2000) and the analyses for emerging countries, based on the experiences from the Asian financial crisis, by Jeanne – Wyplosz (2001).

Figure 6: Interest rate developments before and after the introduction of the euro (September 1992 – January 2013)
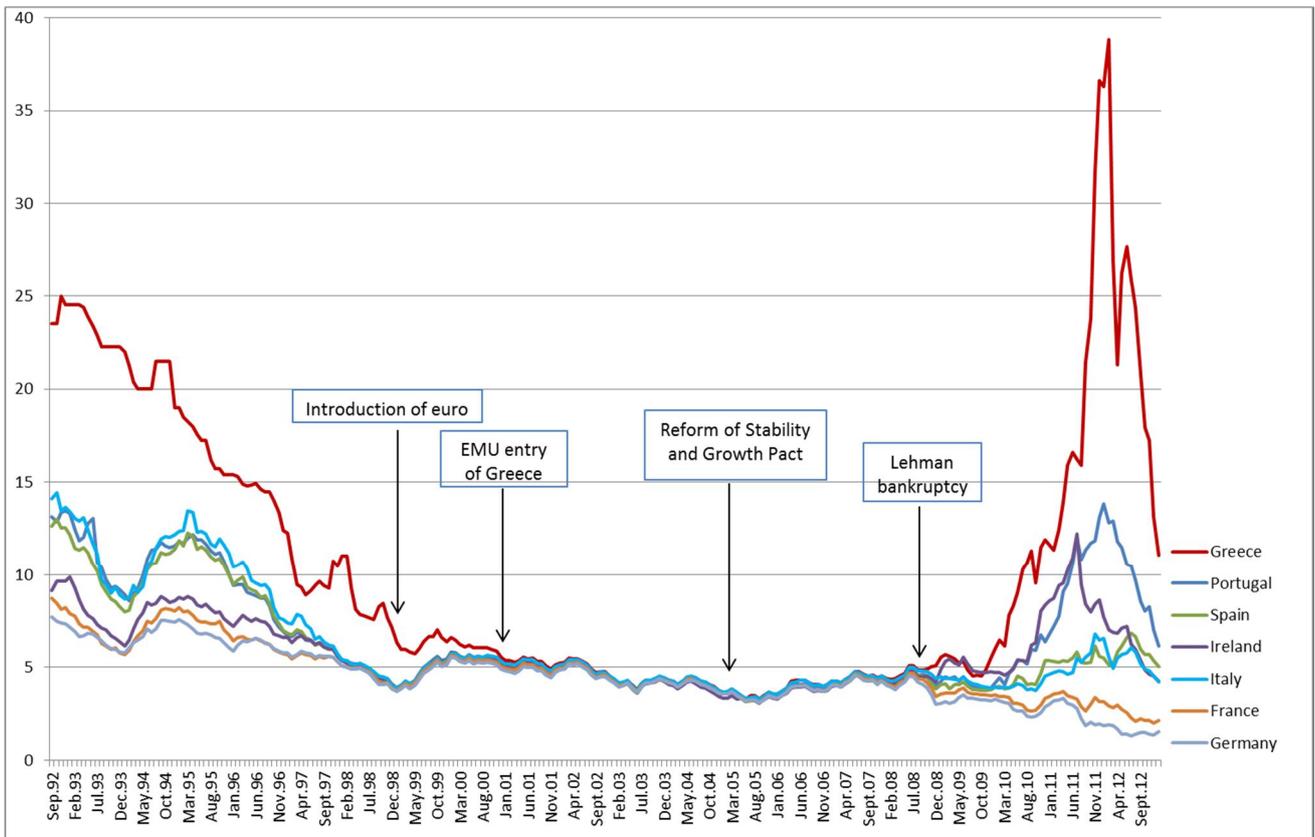
Data source: Oesterreichische Nationalbank

Of particular importance is the increasing dispersion of **long-term interest rates** since the outbreak of the financial crisis in 2008. To avoid a disaster, banks were bailed out by governments who themselves were already in a precarious fiscal situation, having spent extraordinary amounts to mitigate the incipient economic downturn. Although the dispersion of nominal yields is somewhat compensated by an increasing dispersion in inflation rates, real interest rates are also much higher now in periphery countries than in the core. This is mirrored in the differences in economic growth, with Germany and the other core countries faring much better than the periphery.

(2) Medium-term adjustment measures would in the first place attempt to restore competitiveness by enhancing productivity and reductions in real wage costs. Drastic wage reduction are however prone to create heavy social tensions accompanied by strikes, demands for early parliamentary elections and perhaps changes of governments. Troubled countries therefore tend to just dampen the growth rates of nominal wages and salaries which may jeopardise a quick regaining of confidence in the sustainability of economic developments.

To avoid the heavy consequences of wage cuts as well as those of an explicit exit from the currency union, Cavallo and Cottani (2012) propose (in the case of Greece) a "**fiscal devaluation**" by redesigning the tax system: This form of an "internal devaluation" would substitute the current social security contributions for an increase in the value-added tax, thereby essentially switching the tax burden from companies to households. Such a revenue-neutral change would improve the competitiveness of domestic production and exports, and would increase the market price of imports, just what a devaluation would accomplish. This is an old idea which was already brought forward by Keynes (1931) who suggested (for the UK to maintain the gold standard) to impose

uniform import tariffs and grant export subsidies. In more recent years, this issue has been taken up, among others, by Haberler (1967), Calmfors (1998), Farhi et al. (2011), the IMF (2011). De Mooij and Keen (2012) undertake an empirical evaluation for the Eurozone with the result that a revenue switch in the order of 1% of GDP would generate an immediate increase of exports of between 0,9% and 4% of GDP. After 10 years the estimated effect becomes insignificant. As a recent example of fiscal devaluation, the French "social VAT" could be mentioned: As of mid-2012 social contributions by employers have been cut, financed by an increase in the standard VAT rate and the taxation of capital gains.

Kochanova (2008) discusses the opposing opinions of De Grauwe (2009 and earlier editions of his textbook) and Krugman (1989) with regard to **differences in economic growth** between members of a monetary union. According to De Grauwe's model, a relatively fast growing country would be faced with fast growing imports and a rising current account deficit. As a member of a currency union, it could not devalue and would thus have to conduct deflationary policies in order to lower its export prices and maintain external equilibrium. To Krugman, on the other hand, a fast growing country should appreciate its currency or otherwise, if member of a currency union, increase its export prices. This is because in the Krugman model the faster growing country does so as a consequence of innovation and the development of new products. Thus, persistent growth differences per se may not be a good indicator for a widening productivity gap.

(3) Taking the **long view**, a number of policies could in theory be conceived to correct for an ever increasing gap in competitiveness compared with the core of a monetary union:

- National adjustment measures would primarily consist of *structural reform* with the aim of raising the long-term growth potential of the economy and of dampening the growth path of wage costs and public expenditures. They would thus be concentrated on improving the efficiency of the education and innovation systems as well as the social security and health systems.

- *Exit from the Eurozone*: Instead of the politically more sensitive direct cuts of wages and salaries, a change in the exchange rate would indirectly achieve the same result. For EMU members it would mean a permanent exit or a temporary holiday from the Eurozone. Such a move has been proposed (in the case of Greece) by Feldstein (2010). There has been great reluctance within the Eurozone (by both core and periphery countries) to consider such a step, given the potential disruptions of banking systems and financial markets. Currently there is no provision in the EU Treaty for a member country to leave the currency union and at the same time retain EU membership.

- Advancements of the Eurosystem towards establishing a *fiscal union* and eventually a *political union*: As already mentioned above, many observers consider such a development as inevitable anyway. Given the disapproving position of a number of member countries (including Germany and the UK), any decisive step in this directions seems politically unrealistic.

When **structural reform** measures are necessary for maintaining or recovering international competitiveness, the political decision process and the implementation phase are time-consuming. Above all, effective reforms are susceptible to hurting specific groups of the population which may trigger resistance and narrow the political room for manoeuvre to virtually zero. Even without such frictions, the intended effects may take a long time to materialise.

Glick and Rose (2002) estimate the effect on bilateral trade of the **dissolution of a currency union** and conclude that trade would be halved on average. This is perhaps overstated given the choice of the sample starting in 1947. More than two thirds of the 60 cases included may also be

explained by the end of a colonial relationship (Pomfret, 2009). For the consequences of exits or a Eurozone breakdown, see also Eichengreen (2007), Dobbs (2012), Bootle (2012), Tepper (2012), Nordvik (2012) and Record (2012).

Since the Eurozone is not a full-fledged OCA (yet), it must pay particular attention to improving on the compliance with the OCA criteria or establish alternative mechanisms, such as a **fiscal union**, to sufficiently cope with asymmetric (and symmetric) shocks: "In the absence of the monetary union, adjustment would occur via floating exchange rates. In the presence of an effective fiscal federal state, adjustment would occur via labor (and capital) mobility and fiscal transfers" (Bordo, 2010: p. 3). Bordo argues that the euro crisis would have been less severe had EMU availed of an effective fiscal union which, through fiscal transfers, would have avoided extreme debt ratios. With a credible no-bailout clause, the Eurozone would have followed a type of balanced-budget rules (such as those adopted by the US states) and would thus have avoided a debt crisis. Bordo concludes that "the lessons of history suggest that unless the Eurozone moves much more in the direction of the fiscal transfers of successful fiscal federal nations, that the next crisis may lead to its break up" (p. 4).

As the history of currency unions reveals, long-lasting monetary unions have usually been footed on **political union**, which would deliver the democratic justification for a union-wide stabilisation policy including fiscal policy. The more important one renders the existence of political union, the less important will the ex-ante fulfilment of economic criteria be. With this in mind, Padoa-Schioppa (2004) views political union as eventually indispensable for a permanent monetary union, but he concedes that this criterion may be endogenous as well and come about only after forming the economic union. In the case of EMU, he sees the implementation of a single currency as an intentional expression of the political will to crown economic integration later on with a political union. De Grauwe (2009) also forcefully advocates the completion of EMU through a political union, although he warns of the problem that there is no unique definition what a "political union" means and when it has been achieved. He advocates a continuous process of political unification to embed the Eurozone in a wide system of political ties to take care of the divergent economic forces within the union.

Experiences with the Great Recession and with the following debt crisis in Europe suggest that EMU is still an **unfinished experiment**, and one is reminded of the questions posed by Bordo (2004: 1): "Will it all work out to fulfill the dreams of the postwar visionaries for a United States of Europe? Will it collapse? Or will it just muddle along with no definite political structure?"

Recent crisis developments have made it clear that the Eurozone is by far not a full-fledged OCA. Even the expectation that the OCA criteria may be endogenous and therefore lead to optimality ex post, has not materialised. Although empirical evaluations of the endogeneity model with respect to the synchronisation of business cycles seem to indicate a development towards more symmetric shocks in the Eurozone, persistent productivity gaps and institutional dissimilarities hint at a considerable potential for asymmetric shocks. Remedies may include measures to attain the OCA criteria ex post, a supplementary fiscal union or eventually a political union.

4. Learning from other monetary unions

More insights on how monetary zones and federal states solve problems resulting from internal heterogeneity can be derived from the **analysis of practical examples**. The idea is to learn from the successes and flaws of other countries or groups of countries with fixed exchange rates. Looking into the history of currency areas reveals that their formation and destruction or survival depended on quite different factors, including political and economic forces (Theurl, 1992; Horváth – Komárek, 2002). Bordo (2004) concentrates on the comparison of EMU with the evolving US monetary union, because both regions are of similar economic size and EMU is likely to encounter similar hurdles as the US did in the past.

Some authors, however, see no benefit from digging up the history of monetary unions, because they view EMU as a unique exercise (Artis, 2003). Eichengreen (2008) stresses that EMU is a union sui generis which should at best be viewed from the dissimilarities vis-à-vis other examples. Such comparisons may thus not be helpful, but rather draw off the attention from the real problems. These warnings in mind, we still make an attempt to draw inference from other currency unions.

4.1   *National versus multinational monetary unions*

Some authors (e.g. Bordo and Jonung, 1999, 2000) distinguish between national and multinational monetary unions. National unions may be further subdivided into federal states (such as USA, Germany, Austria) and unitary states (e.g. Italy, France).

The national unions can provide valuable information on the institutions which govern the financial relations between the various layers of government. In contrast to transnational currency zones, practically all federal states avail of vertical equalisation schemes. Objectives are generally (i) the redistribution of income from "rich" to "poor" regions, (ii) the income stabilization in the case of temporary exogenous shocks and (iii) the provision of public goods for which there is no market. A number of federal countries – like the United States (see Henning – Kessler, 2012; HM Treasury, 2003; Terlau, 2004), Canada, Australia, Germany and Switzerland (Blöchliger, 2001) – have been effective in supplementing monetary with fiscal union. However, there are also counter-examples of monetary plus fiscal unions which have not been overly successful, such as for a long time Argentina and Brazil.

Bordo (2010) characterises the **Eurozone** as a "multinational monetary union with a single central bank and without a fiscal union". He draws lessons from the history of successful national monetary unions, a number of which have achieved monetary integration in the process of becoming nation states. Bordo and Jonung (2000) believe that "the survival prospects of a monetary union depend crucially on whether it is organized as a national or multinational union", the termination of a monetary union usually being the consequence of a political process and not of economic forces per se. The fate of EMU was envisaged to depend largely on whether it would eventually resemble more a national than a multinational currency union.

Already at the *start* of EMU a number of *shortcomings* were spotted: (i) the absence of a central lender of last resort function; (ii) the lack of a central authority supervising the financial systems; (iii) unclear and inconsistent policy guidelines for the ECB; (iv) the absence of central co-ordination of fiscal policies; and (v) unduly strict "Maastricht" criteria for domestic debt and deficits in the face of asymmetric shocks. Given the historical record of monetary unions, Bordo – Jonung (1999)

expected that the economic frictions between member states could be overcome as long as political unity prevailed or was credibly aspired.

Most of the examples necessitate a rather *long-term perspective*. According to Rockoff (2000) the U.S. had about 150 years to form a full-fledged monetary union. At the time of writing he expected that in Europe monetary integration could be achieved much faster. Any international comparison must take into account that, from state to state, the various levels of government are entrusted with different fiscal responsibilities. In the United States, for example, the lower levels of government have less fiscal autonomy than in Canada. Even more pronounced is the national autonomy in the Eurozone.

4.2   United States as prime example of a successful national monetary union

The United States has often served as the reference country for expected developments in Europe. In its Lisbon Agenda of 2000, the EU formulated a catching-up scenario with the eventual goal of outperforming the US. Europeans were reassured of this strategy when the financial crisis started in the US and left the country with a much higher overall deficit and debt position than those of the Eurozone. A similarity exists between the two areas in form of unsustainable fiscal positions of some US states and some EU periphery countries. However, while in the US there is also an unbalanced fiscal position at the federal level, there is no such possibility for the EU budget. Against this background it has been disappointing for Europe that the financial markets have valued the Eurozone and some of its core members as less credible debtors compared with the US and most of its states. Darvas (2010) lists the following possible explanations:

- The Greek solvency crisis furthers expectation of contagion in Europe which has not appropriately been countered by credible policies.
- Fiscal federalism is not well developed in Europe. Fiscal policies are rather exercised at the level of member states, not permitting uniform fiscal targets and the solution of banking crises with spill-overs between nations.
- The slow implementation of fiscal reforms in the Eurozone does not improve credibility.
- The repudiation by Germany and some other countries of introducing Eurobonds further frustrates a speedy resolution of the current crisis.

Similarly, De Grauwe (2010b) finds an answer in the different mechanisms dealing with internal structural differences. The Eurozone does not avail of a mechanism to "internalise" the Greek debt problem in a way which automatically provides transfers to the country in problem. In the US existing regional differences are partly alleviated via the Federal budget which automatically redistributes to the deficit regions some 0.2 to 0.4 dollars for every dollar decline in income at the state level. There exists thus some kind of implicit fiscal equalisation via the federal budget which is virtually absent in the EU.

Financial market seem to account for another important difference between the Eurozone on the one hand and the US, the UK and Japan on the other: In the latter countries government debt can in principle be serviced any time, if necessary by extending credit from the central bank. In the Eurozone this is prohibited by the no-bailout provision of the Treaty.

When comparing the currency unions of the United States and the Eurozone, one should exercise much patience and keep in mind that US institutions and policies have only evolved over many decades without a given prior design – which at least to some extent was shaping EMU.[4] When

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[4] For a thorough discussion of the US as a monetary union, see e.g. HM Treasury (2003).

Bordo (2004) compares the two unions, he takes a rather broad view and organises his comments according to three aspects which we will also follow in the next few paragraphs: real, monetary and fiscal integration.

Real and labour market integration

When the US entered the process of monetary integration, it was in many respects much more advanced than the Eurozone is today. Due to declining transportation costs, goods markets were virtually integrated well before the Civil War. With respect to labour markets, the Constitution of 1789 did already provide for an integrated market which was de facto established by the 1870s, except in the Civil-War-ridden South. The obvious difference to the Eurozone led Krugman (1993) to his argument that regional shocks in the US are largely absorbed by migration to other regions, while in the Eurozone they would surface as rising unemployment.

Evolution of monetary union

Monetary union in the US was initiated by the Constitution which can also be considered as a starting point of political unification. The power to coin money was originally given to the Congress and not to the states. However, state bank notes were also floating at various discounts. Before the Civil War from 1861 to 1865, "we had a currency union in one sense – the precious metals were the unit of account throughout the Union; but in another sense we did not – we had multiple currencies that presented citizens with choices about holding currencies bearing different risks and returns. There was no lender of last resort, no deposit insurance, and no presumption of federal bailouts of banks' depositors" (Sargent, 2012). During the Civil War gold coins and gold certificates were complemented by paper money which traded at a discount, "Greenbacks" in the North and Confederate notes in the South. As a consequence of the Civil War, the South was excluded from the national capital market for more than two decades. From 1863 (foundation of the US banking system) to 1914 (foundation of the Federal Reserve System), various forms of base money (gold, silver, paper money) circulated in parallel at par. Up to 1935, the 12 regional Reserve Banks had some monetary independence, in particular the right to set their own discount rates. During the 1920s and early 1930s, regional conflicts of interest contributed to the lack of monetary stability which eventually resulted in the Great Depression. As a consequence, the Banking Act of 1935 concentrated all monetary powers at the Federal Reserve Board (Bordo, 2004).

Bordo, Redish and Rockoff (2011) point at the "twin weaknesses" of the American financial system, (i) the division of the commercial banking system along state lines and (ii) the "shadow banking system" of virtually unregulated investment banks and other financial intermediaries. These institutional characteristics seemed to be instrumental for the bank failures and for the bailouts necessary to prevent the recent financial crisis from becoming systemic.

Evolution of fiscal federalism

Besides real and monetary integration, fiscal issues are frequently taken from the US experience as an example for possible developments in the Eurozone, although the basic policies are quite different: While the US states have transferred significant fiscal competences to the federal level to strengthen political union, the EU nations have enviously kept most fiscal competences in their hands.

Henning – Kessler (2012) pay specific attention to (i) fiscal federalism and the transfers between the federal government and the states, (ii) no bailing-out of the states by the federal government, and (iii) limits to the state deficits and the resulting low debt level of the states. They subdivide the development of fiscal federalism in the United States into five distinct periods which will guide us through the following paragraphs:

(1) Establishment of the new federal government according to the Constitution of 1789 and the reforms initiated by President Alexander Hamilton.

(2) The state defaults during the 1840s.

(3) The post-Civil War crisis with a number of defaults at state and local level.

(4) The Great Depression of the 1930s.

(5) Some scattered defaults since about 1970.

(1) The Constitution of 1789 provided President Alexander Hamilton, who in his earlier capacity was the first Treasury Secretary of the newly-formed union, with the possibility to organise the purchase and restructuring by the federation of the debt instruments of individual states. In 1790 the federal guarantee was extended to the states, their bonds were transformed into non-redeemable consols with fixed interest, and in 1792 a sinking fund was established. The government assumed $18.3 million of the outstanding state debt of $79.1 million. No complete fiscal union was formed at this stage, and it took several decades before fiscal federalism was established (see, e.g., Bordo – Végh, 2002).

(2) In the early 1800s the states financed most of their expenditures via the proceeds from land sales without having to rely on taxes. During the 1820s and 1830s, infrastructure investments by the states, induced by the westward expansion, were largely debt financed, and debt redemption was expected to be covered by project revenues such as road and bridge tolls. Following the financial panic of 1837 and the subsequent recession of 1839-43, a number of states defaulted. Congress rejected another assumption of state debt, thereby effectively establishing a credible no-bailout rule which did not become a written provision in the Constitution. This induced the states to gain fiscal sovereignty, and many of them introduced, without outside pressure, a system of balanced budgets.

(3) Following the Civil War, the "Reconstruction" was largely debt financed via state or state-guaranteed bonds (e.g. of railroad companies and municipalities). Lacking a strong tax base, many of these bonds could eventually not be serviced and a number of state and municipal defaults occurred. The no-bailout principle had originally only been established between the federal and state levels, now the states began to rewrite their constitutions to include a no-bailout provision vis-à-vis the municipalities. In the decades after the Civil War, the USA eliminated the huge imbalances between the North and the South by relying on labour mobility, fiscal transfers and a central fiscal authority.

(4) During the 1920s and early 1930s, local governments invested heavily in infrastructure projects. They were financed by bonds which were backed by property tax and mostly held by domestic residents. In the course of the *Great Depression* the tax base collapsed, and by the end of 1935 more than 3,200 municipalities had defaulted. As the no-bailout principle was strictly maintained, the federal government took over, as part of President Roosevelt's New Deal, a number of responsibilities from local governments. In addition, heavy agricultural price subsidies were introduced (see, e.g., Bordo, Markiewicz and Jonung, 2011). According to Wallis (1984), the distribution of public expenditures between federal, state and local levels changed significantly from 1932 (30%, 20% and 50%, respectively) and 1940 (46%, 24% and 30%). Thus the Great Depression brought about a mounting role of federal expenditures relative to the state level. This was largely due to the introduction of countercyclical fiscal policies and automatic stabilisers at the federal level. At the same time, some fiscal transfers from the federal government to the states were permitted. They attenuated, jointly with high labour mobility across regions, the differences between the states with respect to the geographic setting and asymmetric shocks.

(5) In the decades from 1970 to 2009, a series of more or less isolated municipal defaults occurred, among them the more spectacular cases of New York (1975) and the District of Columbia (1990s). In the course of the current financial crisis, the states of California and Illinois have slipped into financing troubles. Because of the size of these states, speculation has emerged on the financial markets as to a possible bailout by the federal government. However, there is no precedent in the recent history which would justify such an expectation.

Current state of fiscal affairs

Today the fiscal system of the US is characterised by a large federal budget which dominates fiscal activities and limited state budgets, virtually all of them are subject to some sort of balanced budget rules (except Vermont). The requirement is not simply balancing the budget at any time, but to keep a bank account where surpluses may be deposited for use in hard times, and which precludes debt from being accumulated (see Box).

Box: The meaning of a "balanced state budget"

As reported in NCSL (2010), the balanced budget rules of US states usually cover the "general fund" of the state which comprises most public expenditures and tax receipts. Federal grants and reimbursements are mostly earmarked for specific activities, they do not touch the budget balance. Additional "capital budgets" are reserved for long-term public investments and are also not included in the budget. The balanced budget rules therefore resemble a "golden rule" which requires that current expenditures be matched by tax receipts. Deviations from this general setting may occur, e.g. when unfunded liabilities are not counted as debt or when contributions to pension funds are diverted to the general account. In addition, "rainy day funds" may be accumulated in good times to be spent in bad times. In some states there are further provisions which specifically restrict only taxation (e.g. the qualified legislative majority for increasing taxes in California) or public spending. Some quasi-autonomous agencies are allowed to borrow. Examples are purchase and lease-back contracts with state governments, or toll highways which are financed by issuing bonds (Krugman, 1993).

This system has gradually evolved over some 200 years, ending in quite a different setup compared with the original design in the Hamilton era. In particular, the no-bailout principle was not established from the beginning, it could only be enforced via the central assumption of state debt. The balanced-budget rules at state level were not imposed by the center, but were adopted by each state on its own, thus making up a system of similar, but not identical rules. The center is responsible for stabilisation policy and in the event for the bailout of insolvent banks (Henning – Kessler, 2012).

The *distribution of total tax revenues* between the federal government on the one hand and local and state governments on the other is about two thirds to one third (Table 4). Federal taxes collected from the states amount to some 12 to 20% of state GDP (excluding the District of Columbia), federal funds received by the states are between 9 and 31%. In the EU, member countries are responsible for almost all taxes collected. On average, they contribute some 0.8 to 0.9% of their GDP to the union's budget, and they receive about 0.5 to 3.5% of their GDP. Thus, fiscal redistribution is much larger in the US than in the EU.

The federal government provides *fiscal transfers* to the states to finance federal tasks, in particular in connection with health, education and transport programmes. Although there is no general equalisation scheme across states, these programmes are to some extent also used to alleviate regional differences and to mitigate the procyclicality of state budgets. In this way, the federal

budget automatically redistributes to the deficit regions some 0.2 to 0.4 dollars for every dollar decline in income at the state level (De Grauwe, 2010b).[5]

Table 4: Distribution of US public revenues by tax type (2011, percent ot overall total taxes)

	Federal	**State**	**Local**
Property tax	0.1	0.5	11.4
General sales tax	0.0	6.4	201.7
Selective sales/excise taxes	2.9	3.4	0.7
Individual income tax	28.9	7.1	0.6
Corporate income tax	9.0	1.2	0.2
Motor vehicle license	0.0	0.2	0.0
Social insurance/retirement	22.7	0.0	0.0
Other taxes	0.0	1.9	1.0
Total taxes	**63.6**	**20.7**	**15.6**

Source: OECD Revenue Statistics (2012)

Similar calculations by Sala-i-Martin – Sachs (1992) reveal that 33% to 40% of an idiosyncratic shock at state level is absorbed by federal funds. In Bayoumi – Masson (1995), federal transfers offset some 30% of short-term fluctuations at the state level. Subsequent research has arrived at a consensus estimate that the federal budget covers about 10-15% of asymmetric shocks in the US. For a more extended overview, including stabilisation and redistribution effects, see the following Table 5 and von Hagen (2007).

Table 5: Redistribution and stabilisation effects for states through the US federal fiscal system

	Redistribution	**Stabilisation**
von Hagen (1992)	47	10
Gros and Jones (1994)		4 to 14
Bayoumi and Masson (1995)	7 to 22	7 to 30
Asdrubali *et al.* (1996)		13
Sørenson and Yosha (1997)		15
Fatás (1998)		11
Obstfeld and Peri (1998)	19	10
Athanasoulis and van Wincoop (2001)	20	10
Melitz and Zumer (2002)	16	10 to 16
European Commission (1977)	28	
Sala-i-Martin and Sachs (1991)	33 to 40	

Note: Each result represents the percentage offset through the US federal fiscal system for a state suffering a shock to income/output.
Source: von Hagen (2007)

Over the business cycle or in a crisis situation, the balanced budget provisions of the US states tend to exert a procyclical effect: when revenues are shrinking, tax rates may have to be increased, and this may diminish the effect of stabilization policies at the federal level (Poterba, 1994). This

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[5] Much bigger transfers were provided by the American Recovery and Reinvestment Act (ARRA) of 2009 which was designed to counter the Great Recession. According to a Brookings blog of 10 September 2010, it funnels some $280 bn through state capitals, counties, cities and towns to jump start the economy.

finding has been watered down somewhat for more recent cycles by Hines (2010), but Aizenman – Pasricha (2010a) confirm the procyclicality for the recent Great Recession.

An experience which is of particular interest also for the Eurozone is the kind of spillovers that occur in the *US municipal bond market* between states with different rating status. "Munis" are issued by states, cities or local government agencies, interest on munis is usually exempt from federal income tax. The bankruptcy process for municipalities (governed by Chapter 9 of the U.S. Bankruptcy Code) allows local governments to voluntarily seek bankruptcy protection in federal courts. It is up to each state to draw on Chapter 9, and 26 states have decided to either prohibit or not expressly permit such filings (Amromin – Paulson, 2011).

According to Henning – Kessler (2012), spillovers could either be "contagious" (rising risk premiums for one state induce rising risk premiums for other states) or of the "flight-to-quality" type (when yields increase for one state investors turn to the bonds of other states). In practice, although some contagious linkages may be found (as at times between California and New York bonds), strong insulation between states dominates (Arezki et al., 2011; Ang – Longstaff, 2011). Given the high level of macroeconomic integration in the US, the rather independent development of state bond yields is somewhat surprising. Henning – Kessler attribute this (i) to the existence of the deep and liquid US Treasury security market as "safe haven", (ii) to the fact that banks as shock transmitters are relatively less important in the US than in the Eurozone,[6] and (iii) to the US fiscal rules which are independently set and enforced state by state, while in the Eurozone certain fiscal rules (e.g. the Stability and Growth Pact) are set centrally; if a Eurozone member state defaults, this results in a loss of credibility for the whole system. In addition, bank regulation in the US is now (in contrast to the earlier fragmentation) more harmonised across states than in the Eurozone.

At the end of 2010, total federal, state and local government gross debt amounted to $11.85 trillion or 81.7% of GDP. Federal debt (gross federal debt less debt held by federal government accounts) was 62.2% of GDP, while state and local debt amounted to 19.5% of GDP. Of the debt issued by lower levels of government, 39% were state debt and 61% local debt.[7] The effectiveness of balanced budget rules on state level may be judged by the low level of accumulated debt as per cent of GDP. However, such rules have not precluded some states from becoming "problem states" in terms of budget deficits. Financial markets tend to value not only the pure existence of balanced budget rules, but also the political culture that stands behind the creation and maintenance of such rules. Henning – Kessler (2012) warn that Eurozone countries keep this in mind when establishing any sort of fiscal union.

Implications for the Eurozone

When comparing the Eurozone with the US, the similarities and differences may be summarised as follows (see e.g. HM Treasury, 2003; Darvas, 2010; Sargent, 2012; and Henning – Kessler, 2012):

- *Monetary union*: In either area the real sectors were not too well integrated yet when monetary union was superimposed upon the economy. In the Eurozone this has led to deviating impacts of the centralised monetary policy on core and periphery countries. From the harmful conflicts of interest between US regions during the 1920s and 1930s, the monetary

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[6] In 2010 only 8.6% of state bonds outstanding where held in the portfolios of commercial banks (Henning – Kessler, 2012: 27).

[7] Data retrieved from http://www.usgovernmentspending.com/spending_chart_1997_2017USb_H0f (for GDP and federal debt) and http://www2.census.gov/govs/estimate/summary_report.pdf (for state and local debt).

authorities in the EMU should learn to maintain their union focus and prevent any dominance of national interests.

- *Fiscal rules*: Balanced budget rules were established in the US by the states in their own capacity, in 36 states they are considered rigorous (NCSL, 1999, 2010). In the Eurozone such rules (e.g. the attempt to introduce "debt brakes" which are not backed by local ownership) rest on a framework created at union level. Today the fiscal system in the US is characterised by a large central budget (with central government expenditures in 2012 amounting to an estimated 21% of GDP), while the EU budget volume does barely exceed 1% of GDP. However, in Europe national fiscal policy aids regional adjustment more than do fiscal activities at the US state level.

- *Fiscal federalism*: Vila Maior (2004) compares 5 federal states (Germany, Canada, Australia, Switzerland, USA) with the EU to assess whether or not the EU could benefit from the experience of other countries. His conclusion is that the EU is an economic union sui generis that should not copy the US model of "conventional fiscal federalism" with its many centralised functions, but instead rely on some form of "decentralised fiscal federalism" which would be more feasible in the European case.

- *Scope for state and local debt*: In the US the fiscal rules, mitigated by substantial contributions from the federal government, do not permit the sub-central levels of government to accumulate high debt to GDP ratios. Such ratios range from 9.3% in Wyoming to 33.0% in Rhode Island, while in the EU the range in 2010 was between 6.7% in Estonia and 129.4% in Greece (COM, 2010, and more recent Eurostat data).[8] At the federal level, the US struggles with high deficit-to-GDP ratios (8,5% in the fiscal year 2012) and rising debt-to-GDP ratios (74,2% at end of 2012).

- *Federal stabilisation policy to avoid pro-cyclicality*: During the recent crisis, the US federal government allowed automatic stabilisers to work and in addition adopted major discretionary stimulus measures. This helped attenuate the move of many states to keep their budgets balanced (Aizenman and Pasricha, 2010b). In the EU, stabilisation policy is in the hands of national governments with some coordination at the union level.

- *No orderly default mechanism*: Neither the US nor the EU dispose of an orderly default mechanism.

- *Bailout system*: In the US, a credible no-bailout system was established top-down, and bailouts by the central government have largely been avoided (e.g., for California in 2009), exceptions proving the rule (New York City in 1975 received loans from the federal government and the state). In the Eurozone such a system did exist, but it has lost its credibility to national interests (in particular of the large member countries Germany and France). Now a debate is ongoing in which way problem members should be dealt with, the options ranging from purely market-driven solutions to some form of bailout mechanism and eventually perhaps the exit from EMU.

- *No option to devalue the currency or to inflate the debt*: Neither the US nor the EU have devaluation and inflation as policy instruments at their disposal.

- *Banking system strength*: In the US, banking regulation and supervision are centralised, while in die EU this is not the case. Therefore, cross-border banking problems play a much greater role in the EU than in the US.

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[8] Eurostat data for 2011 cover the dramatic increase of Greek public debt to 170.6 % of GDP, while the Estonian figure decreased to6.1% of GDP (end of year).

- *Labour and product market flexibility*: These markets are more flexible in the US than in the EU, and in this respect the US seems much closer to an OCA than the EU. However, such flexibility may be more effective in long-run regional adjustment than for coping with temporary shocks.

- The *current account* position of the Eurozone has been more or less balanced over time, while the US current account exhibits substantial deficits (3.2% of GDP in 2011).

From these observations, Henning – Kessler (2012) draw two **central issues** which may be considered when reforming the institutions of the Eurozone:

- US *fiscal federalism* is based on strong fiscal powers at the federal level, including the power to tax, and the level of federal taxes and expenditures is high compared with those of lower levels of government. Fiscal transfers from the federal government are significant, and the countercyclical stabilisation policies of the federal government help sustain the budgetary restrictions on state level.

  In Europe it is not envisaged that the national debt brakes be complemented by a central capacity for countercyclical stabilisation policies. Europe can proceed on either of two paths, each of which carries advantages and disadvantages: (i) designing the debt brakes in a way that permits countercyclical action; and (ii) establishing an adequate countercyclical fiscal instrument at the union level. The first option would necessitate strict enforcement and explicit coordination between member states, the second option must ex ante be based on strong political cohesion among member states. The European Commission has issued a proposal to develop an EMU-level stabilisation tool which should strictly be targeted to short-term asymmetries in order to avoid permanent transfers over the cycle (COM, 2012b).

- US *capital markets* are relatively more important, and *banking regulation* is more harmonised, than in Europe. In the US, responsibility for the stability of the banking system rests with the federal government. Any need for rescuing banks has therefore not been in conflict with the balanced budget rules of the states.

  In Europe the introduction of inflexible debt brakes may at times collide with the national responsibility to secure the stability of the financial system. This can only be overcome by harmonising banking regulation and establishing at union level a common pool of fiscal resources for rescuing, restructuring and recapitalising failing banks. Towards this end, proposals have been issued by Posen – Véron (2009), and with respect to a European banking union by Véron (2012), Pisani-Ferry et al. (2012), COM (2012a,b), Beck (2012) and Véron – Wolff (2013).

From the analysis of the US case it can be concluded that a "key feature of a successful monetary union is a high degree of confidence that, should difficulties occur, both the economic and institutional structures of the monetary union have the capacity to evolve and meet emerging challenges" (HM Treasury, 2003).

4.3   *Selected other national currency unions*

A number of countries have accumulated experience with pegging their exchange rates to other currencies, mostly through currency boards or dollarization (euroisation). Their fate can to some extent be exploited for the rescue of troubled Eurozone countries.

Argentina 2001

With the Constitutions of 1853 and 1860, Argentina was established as a federal republic with rather diverse provinces which were assigned a dominating role over the federal government. By 1910 a currency board regime (the Conversion Office) was established. Argentina adopted the gold standard in 1927, but because of terms-of-trade losses had to abandon it at the end of 1929. The Great Depression was shorter and milder in Argentina than in other parts of the world. This is attributed to the flexible monetary policy which was continued when in 1936 the new central bank (Banco Central) replaced the Conversion Office. At the same time, fiscal policies remained conservative, while some taxing responsibilities of the provinces were usurped by the central government. After World War II, the provinces increasingly relied on borrowing from their provincial banks to finance the rapid growth of public expenditures, largely in public salaries and pensions. In addition, the central government provided discretionary transfers to the provinces and used the printing press as refinancing device. By the end of the 1980s, this process resulted in hyperinflation. In March 1991, another currency board arrangement was installed, and structural reforms were initiated without, however, constraining the borrowing potential of the provinces. They continued accumulating public debt, until the recession of 1998 reduced tax revenues, severed the debt servicing capacity and led to rising risk assessments on the capital markets (Bordo – Markiewicz – Jonung, 2011).

The circumstances leading to the Argentinian default of December 2001 are reminiscent of the current fate of Greece. When in August 2001 Argentina was (not for the first time) demanding IMF assistance, the commitments made by the government were unrealistic with respect to containing the rise in debt, and they failed to underpin the growth potential and the social balance. The approval by parliament of an austerity programme and the release of IMF financing did not prevent a bank run and capital flight. The default was accompanied by the collapse of the fixed exchange rate system which had been in force since 1991 in the form of fixing the peso to the US dollar via a currency-board system. The Argentinian default was attributed (e.g. by Willett, 2002, and Boinet et al., 2005) to deteriorating fundamentals, in particular the insolvency of the government, and to currency overvaluation. The latter was partly an exogenous effect as the US dollar was appreciating in world foreign exchange markets and the peso in parallel was appreciating vis-à-vis the currencies of Argentina's major trading partners, in particular against the Brazilian real. A continuous loss in competitiveness with three years of deflation ended in an economic slump with a rapidly deteriorating fiscal position. Higher interest rates further burdened the budget, and all this culminated in an abrupt shift in exchange rate expectations which the government tried to contain by temporary capital controls and a domestic-asset freeze. In January 2002, a new government devalued the peso, public debt defaulted, and all dollar-denominated private debts where "pesified". From this experience, Edwards (2002) draws a number of lessons:

- A currency board fixes the exchange rate, but does not per se solve a country's macroeconomic problems, it can particularly not provide real sector adjustment flexibility.
- A currency board does not force politicians to run a prudent fiscal policy. Argentina is a federal nation where the states have relatively more power than the federal government. The states do not feel bound by any no-bailout rule, and the lack of fiscal discipline on this level is mirrored on the federal level.
- Real exchange rate overvaluation depresses the economy and is difficult to resolve under fixed exchange rates.
- Forced exits from a currency board system generate large devaluations wrecking balance sheets and causing bankruptcies.
- There is no painless default.

The recommendations of El-Erian (2012) are more targeted. They are derived from the Argentina case with the aim of sparing Greece a similar fate by (i) designing a "Plan B" which rests on flexible exchange rates; (ii) informing creditors of Plan B and its likely realisation; (iii) earmarking a significant share of the funds from international sources towards medium-term needs; and (iv) restoring the integrity and credibility of the ECB and the IMF.

In Argentina, the provinces are responsible for providing many public services, in particular with respect to education, social programmes, health and housing. The provinces also have substantial rights to collect taxes and keep their budgets balanced, but a substantial part of this responsibility has been delegated to the central government. With public expenditures decentralised and taxation centralised, sub-national budgets rely heavily on transfers from the central government. At the provincial level, about half of public revenues are provided by intergovernmental transfers.

Canada

Although there is a lot of common history between the US and Canada, many deviations have developed over time. Some of them have helped Canada to weather the crisis more smoothly than the US did. Bordo, Redish and Rockoff (2011) ascribe this in the first place to a relatively strictly regulated Canadian banking system and the move in mid-1987 to introduce a universal banking system. It permits Canadian banks to combine commercial and investment banking in one entity which is supervised by one and the same regulator (while the fragmented US banking sector is controlled by several competing authorities). Labour mobility is equally high in Canada as in the US.

Canada has been a federation since 1867 when unification occurred to ward off an impending take over by the United States. The federal state and the provinces have similar constitutional status, while the municipalities are not as independent as the provinces are. Government bonds were issued already in 1868 to redeem the provinces' foreign debt. The central government was able to borrow abroad with low risk premium during the crisis times of World War I and the Great Depression, and similar conditions prevailed on domestic markets during World War II. The Great Depression hit Canada quite as hard as the US, and economic policies switched from a non-interventionist course to mirroring some of Roosevelt's New Deal measures in the US. Canada introduced high import tariffs and adopted minimum hourly wages, a standard work week, unemployment insurance and old age care. To stabilise the financial system, the Bank of Canada was created in 1934 as the central bank of the federation. The Rowell-Sirois Commission on Dominion-Provincial Relations recommended a set of unconditional transfers ("national adjustment grants") from the federal government to the provinces. Besides these equalisation payments to provinces, an explicit fiscal equalisation scheme with horizontal redistribution was established. At the same time, the federal government was granted the exclusive jurisdiction over personal and corporate income taxes. According to Bordo – Markiewicz – Jonung (2011), the most radical fiscal innovation inspired by the Great Depression occurred in the 1938 federal budget when the federal government was assigned responsibility for smoothing economic gyrations.

Overall, the Canadian fiscal system is fairly decentralised. During the 1990s, provincial and local public expenditures amounted to about half of total public expenditures. Most direct programme expenditures are undertaken at the responsibility of sub-national entities, although the central government may intervene through conditional transfers, tax agreements and other coordination mechanisms.

As a consequence of the recessions during the 1980s and 1990s, the provinces piled up new debt to pay for expanded social programmes, and the pressure increased for a bailout by the federal government which, however, is forbidden. Most observers agree that there exists a fiscal gap favouring the federal government when compared with its spending responsibilities.

Germany

In Germany, monetary union was preceded in 1834 by the German Customs Union ("Deutscher Zollverein") which abolished internal customs barriers to facilitate trade. By 1838 two distinct currency groups had evolved, the North German Thaler standard and the South German Gulden standard. Union members had to choose between the two currencies which were linked together by a fixed conversion rate. In 1847 the Prussian central bank became the monetary authority for the whole union. In 1856 the union was informally extended by including Austria (with its Florin standard) into the union, but ten years later Austria dropped out when being at war with Prussia. An attempt to unify the coinage was made in 1857 with the Vienna Coinage Treaty ("Wiener Münzvertrag") by creating the (silver) "Vereinsthaler". Unification actually occurred when the (gold) Mark with its decimal system replaced the Thaler as a unit of account in 1871 after the Franco-Prussian war, and when the Reichsbank was created in 1875 as the union's central bank. Therefore, political unification and monetary union can be viewed as an overlapping stepwise procedure. At the beginning of World War I, the Reich had limited fiscal power (with revenues only from tariffs and some indirect taxes), but during the war a common fiscal policy was introduced (Bordo and Jonung, 1999).

In the Weimar Republic (1918-1933), Germany was burdened by high external debt and prohibitive reparation payments. One of the economic consequences was the hyperinflation of 1922/23 which was brought down by harsh monetary and fiscal restrictions. In contrast to pre-war times when Germany was truly a federal state, the Weimar Republic is frequently termed a "decentralised unitary state" which was transformed by the Nazi regime into a centralised unitary state. During the Great Depression, Germany was a highly indebted country that would abstain from activist economic policies, partly also to demonstrate the country's inability to meet its reparation obligations. In particular, Heinrich Brüning, who served as Reichskanzler from 1930 to 1932, was known for his conservative fiscal stance.

After World War II, the "Grundgesetz" provided for the resurrection of a truly federal state with strong financing positions of the Länder. Although they are rather limited in their taxing power and thus depend on transfers from the central government, they are autonomous in their borrowing activities, at least as long as the receipts are used for "investment" purposes. The term investment is a soft restriction though, and a number of Länder have incurred high public debt, thereby rendering the established no-bailout principle a regime with little credibility. In 1987 Bremen and Saarland actually received special supplementary transfers from the federal government, and the Constitutional Court in 1992 established the *principle of solidarity* by obliging the federal state to help the Länder out in cases of extreme emergency (Bordo – Markiewicz – Jonung, 2011; Rodden, 2004).

The Länder participate in a *fiscal equalisation scheme* ("Länderfinanzausgleich") with horizontal redistribution. It secures, on the one hand, a minimum level of tax revenues which is never below 95% of average German per capita budgetary resources. On the other hand it violates the link between expenditure decisions and their financing. The result is that expenditure decisions are chiefly taken on a sub-national level, while the revenue decisions occur mostly at the federal level. Taking all vertical and horizontal intergovernmental financial transactions together, the transfer dependence of the Länder amounts to some 70% of their overall budgets (Bordo – Markiewicz – Jonung, 2011). This form of fiscal federalism weakens the financial accountability at the sub-national level, which surfaced in 2002 when Germany slipped into problems of meeting the requirements of the SGP (Rodden, 2005).

In more recent times, the *unification of East and West Germany* provides a vivid example of the problems of an asymmetric shock to the heterogeneous members of a currency union. The economic, monetary and social union between the Federal Republic of Germany and the German Democratic Republic started out with a treaty signed in May 1990 by the finance ministers Theodor Weigel and Walter Romberg. It provided for a 1:1 exchange rate between the deutschmark and the East mark (for individuals, but 1:2 for corporations), and extended the authority of the Bundesbank to the new Länder. It was a purely political decision to force two countries with blatant differences in economic structures into a monetary union with a single currency. The main aim was to deter massive migration of citizens from East to West Germany. The economic consequences were foreseen and accepted without much further consideration: East German incomes were now paid out in a convertible hard currency and could be spent on a broad variety of Western consumer goods. Production of goods and services became exposed to outside competition and suffered from the appreciated currency. Between mid-1990 and mid-1992, unit labour costs bounced up by some 150%. Many companies were not able to quickly adapt their production schedules and quality to sustain the competitive pressures. During the first year of the currency union, manufacturing production was slashed by half and overall production was reduced by some 30%. Of the 10 million Eastern jobs before unification, only 6.5 million could be upheld. Although one million jobs were relocated to West Germany and some 900,000 persons retired or became engaged in training courses, unemployment soared in the East. For many years financial transfers from the West to the East of more than € 15 billion p.a. became a dominating income source of East Germans (see Horn et al., 2000).

The economic indicators for the reunited Germany were dragged down by the performance of the new Länder. Between 1990 and 1998, the unemployment rate surged from 7% to 12%, the public debt-to-GDP ratio rose from 41% to 60%. In the following consolidation period, wages increased only moderately, and productivity increases brought about a decline in unit labour costs relative to trading partner countries. The current account deficit vanished and was replaced by an ever increasing surplus. Schnabl and Zemanek (2011) draw a direct line from the German unification via current account discrepancies to the current European debt crisis. While Germany after unification was forced into an austerity process with low investment growth and capital exports, other EMU candidates benefitted from the convergence of interest rates to the low German levels and absorbed German savings to finance their buoyant demand.

From this experience, the lessons for the Eurozone would be that a currency union between two diverging economies need not be optimal ex ante. However, this would either necessitate quick and drastic structural adjustments or entail a massive flight of labour and capital to the wealthier region or require huge and lasting transfer payments to the disadvantaged region.

Italy

Political unification of Italy was completed in 1861. Already in 1862, a unified currency was introduced based on the lira of Sardinia, but no central monetary authority was established at that time. Only in 1883, after a severe liquidity crisis, the banking system was restructured and the Banca d'Italia was founded. Thus, as in the US, monetary unification followed only some time after political unity was established. The regional discrepancies between Northern and Southern Italy are partly alleviated by fiscal transfers which are commonly seen as an instrument to prevent migration from the South to the North.

Buch – Monti (2009) ask whether international trade affects the income differences within a country. The Italian example is the "Mezzogiorno effect", where the affluent Centre-Northern

regions[9] trade more with the rest of the world than the poorer "Mezzogiorno" regions in the South. It is demonstrated that there is a positive correlation between trade openness and the level of income per capita. In terms of GDP per capita, there has been a clear North-South divide, with the South barely exceeding 60% of the Centre-North (Figure 7). Over time, only minimal macro-economic convergence between the two areas has occurred.[10]

How can a monetary union work under such conditions? One explanation comes from the large number of internal migration from the South to the North, in the order of 0.2% to 0.5% of Southern population each year. What makes Italy survive as a monetary union? One factor mentioned above is the high degree of internal labour mobility which for some time was actively pursued by the government in Rome against the separatist movement of the German-speaking South Tyrol. Another factor may be the comparatively large shadow economy which makes the Italian South look poorer in official statistics than it actually is. The most important factor is certainly the well-developed social system organised along a similarly well-developed fiscal federalism.

Figure 7: Development of GDP per capita in the Centre-North and South of Italy (in euros)
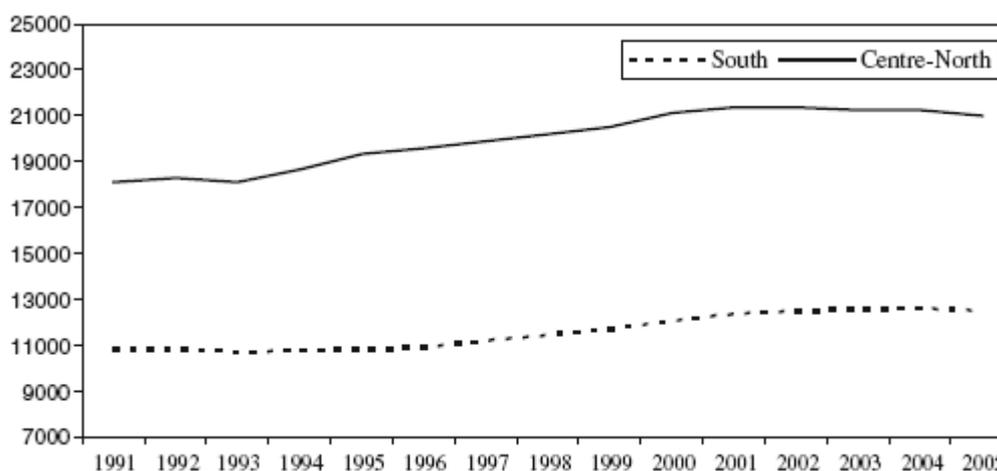
Source: Buch – Monti (2010).

4.4   *Some previous and existing multinational monetary unions*

Other interesting examples to be studied include some of the previously existing multinational monetary unions, like the Latin Monetary Union and the Scandinavian Monetary Union (see e.g. Theurl, 1992: 214-240; Cohen, 2010). The following paragraphs also look at the still existing CFA Franc Zone in Africa and the proposal to form a North American Currency Union comprising the US, Canada and Mexico. Table 6 provides a summary account of these and some other multinational monetary unions.

(1) The **Latin Monetary Union** (LMU) existed from 1865 to 1927 and originally consisted of France, Belgium, Switzerland and Italy, joined later by Greece, Bulgaria, Spain and the Holy See, and a number of other countries, including Venezuela. The member states agreed on a bimetallic

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[9] The Italian Centre-North includes the following regions: Piemonte, Valle d'Aosta, Lombardia, Trentino-Alto Adige, Veneto, Friuli Venezia Giulia, Liguria, Emilia-Romagna, Toscana, Umbria, Marche and Lazio.
[10] A somewhat different finding is uttered by Dow et al. (2009) who investigate the evidence on economic convergence across Italy which they split into four regions. The results suggest that "there are persistent interest rate differentials, but there also seems to be convergence within the four major regions. There is also evidence of homogeneity in credit conditions within each of the four regions."

currency standard, fixing the conversion rate of their national currencies to gold or silver, thereby making the currencies freely interchangeable. To maintain the value of each currency, members had to limit the expansion of their money supplies. The union came into trouble when the Holy See issued silver coins and Greece issued gold coins with less silver and gold content than agreed upon. Another stab in the back of the union was the dropping away in 1873 of the price of silver without a perspective of early recovery. When central banks of member countries tried to maintain the official conversion rate between gold and silver of 1:15, the demand for silver dropped further, and the union had eventually to abandon the convertibility of silver, ending up by 1878 in a pure gold standard.

The lesson from this union was that a monetary union with multiple currencies, having no common central bank and lacking a common monetary policy, is deemed to fail.

Table 6: Summary of some multinational currency unions

Union	Member countries	Years	Comment
African Financial Community (CFA)	West African CFA (WAEMU): Benin, Burkina Faso, Cote d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo. Central African CFA (CEMAC): Cameroon, Central African Republic, Chad, Congo Republic, Equatorial Guinea, Gabon.	1945-	Exchange rate originally fixed to the French franc (devaluation in 1994), now fixed to the euro.
Latin Monetary Union (LMU)	Italy, France, Belgium, Switzerland; later on joined by Greece, Spain and some other countries	1865-1927	Freely interchangeable currencies at fixed gold and silver prices, from 1873 de facto gold standard
Scandinavian monetary union (SMU)	Denmark, Sweden, Norway	1873-1924	Introduced gold standard and decimal system; replacing the riskdaler by the krona.
Union Économique Belgo-Luxembourgoise (UEBL)	Belgium, Luxembourg	1922-2002	Now integrated in EMU
Eastern Caribbean Currency Union (ECCU)	Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Anguilla and Montserrat	1965 (1950)-	Currency board with East Caribbean dollar as single currency (pegged to the US dollar)

Sources: Horváth – Komárek (2002), Lemus – Cashin (2012)

(2) Drawing on the experiences of the LMU, the **Scandinavian Monetary Union** (SMU) was established in 1873 by introducing a gold standard for the currencies of Sweden and Denmark as original member countries. In 1875, Norway joined the club, and a new common currency with a decimal system, the krona, was introduced, replacing the Swedish riksdaler, the Danish rigsdaler and the Norwegian speciedaler. An impetus came also from the United Kingdom and its switch to the gold standard, thereby abandoning the previous silver standard, and from the German mark since 1871. The SMU had an unofficial central bank which, from 1885, granted mutual credit between the national central banks: Starting in 1900, even national paper money was accepted in all three countries. During World War I, the SMU members ceased to follow a common monetary policy, and in 1924 the union was de facto terminated.

(3) The **CFA franc zone** (Communauté Financière Afriquain) was originally designed in 1945 and is today the combination of two currency zones, the West African Economic and Monetary Union

(WAEMU)[11] with 8 member states and the Central African Economic and Monetary Community (CEMAC[12]) with 6 member states. Membership in each sub-zone is quite heterogeneous: The WAEMU region consists of 2 larger economies (Cote d'Ivoire, Senegal) and 6 small economies (Benin, Burkina Faso, Guinea-Bissau, Mali, Niger, Togo). The CEMAC region is made up of 5 oil exporting countries (Cameroon, Chad, Republic of the Congo, Equatorial Guinea, Gabon) and the rather poor agricultural Central African Republic. GDP per capita is more heterogeneous in CEMAC than in WAEMU, partly reflecting the availability of exportable natural resources such as crude oil (Table 7). In both regions, cross-border labour mobility is rather limited.

Table 7: WAEMU and CEMAC member states: Crude oil production and GDP per capita in 2011

CEMAC country	Crude oil production	GDP per capita	WAEMU country	Crude oil production	GDP per capita
Cameroon	60	2,259	Benin	n.a.	1,620
Central African Rep.	n.a.	767	Burkina Faso	n.a.	1,302
Chad	130	1,867	Cote d'Ivoire	40	1,590
Rep. of the Congo	297	4,543	Guinea-Bissau	n.a.	1,144
Equatorial Guinea	258	19,321	Mali	n.a.	1,128
Gabon	246	16,313	Niger	n.a.	771
			Senegal	n.a.	1,970
			Togo	n.a.	1,078

Sources: Index Mundi (http://www.indexmundi.com/) and IMF
Note: Crude oil production in thousand barrels per day; GDP per capita in current US dollars.

The currencies of the two sub-zones were originally fixed to the French franc and they are now linked to the euro. The two currencies are not traded on the foreign exchange markets. They are interchangeable and their convertibility is guaranteed by the French Treasury, but there is no obligation whatsoever for the Banque de France or the ECB. Each central bank of the two CFA zones maintains an operations account with the Banque de France and keeps a large share of its foreign exchange reserves[13] on that account (Dearden, 1999). Exchange rate changes are only possible by unanimous agreement of the partner countries. Except for the devaluation by some 50% in January 1994, the CFA franc has by and large experienced a stable development. Monetary policies in the two sub-zones are quite similar and subject to an annual monetary programming exercise which sets ceilings to the recourse of governments to central bank financing.

The economies of the CFA member countries are highly open and thus subject to exogenous shocks, some countries in particular to oil price shocks. Fielding – Shields (1999) analyse the similarity of shocks between CFA zone members. While the short-run effects of inflation shocks are quite symmetric, shocks to output growth are rather heterogeneous and differ also within each of the

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[11] Also known by the acronyms UEMOA (Union Économique et Monétaire Ouest Africaine) and BCEAO (Banque Centrale des États de l'Afrique de l'Ouest).
[12] CEMAC stands for Communauté Économique et Monétaire de l'Afrique Centrale
[13] Originally 65%, now 50% for WAEMU and a phasing-in share for CEMAC (see Adedeji – Williams, 2007).

two sub-zones. In the long run, the effects are even more diverse. The conclusion then is that no common policy response seems to be appropriate for all member countries.

Stasavage (1997) explored why, before the devaluation of 1994, the CFA zone was not able to achieve adequate fiscal discipline. He attributed it to the monetary rules and the institutional setup of the two central banks of the zone. They were not designed to foster economic convergence of the members, but mirrored the political interests of the CFA states and of France. In an attempt to overcome this deficiency, convergence criteria were defined in 1999 for WAEMU and in 2001 for CEMAC. Besides balance of payments and real sector indicators, they also contain fiscal criteria, such as primary government budgets in balance or surplus and government debt not exceeding 70% of GDP. These efforts have resulted, underpinned also by the oil boom, in large surpluses of the CEMAC region and sustainable deficits in the WAEMU region. Public debt was a severe problem prior to the devaluation, but has been reduced since, partly assisted by international organisations, to levels generally much below the 70% threshold (Adedeji – Williams, 2007).

Dos Reis (2004b) points at the difficulties for CFA zone members to comply with fiscal targets in the face of asymmetric and country-specific shocks. She advocates the establishment of a fiscal insurance mechanism for the two CFA currencies to improve fiscal coordination within the zone. The insurance scheme would virtually represent a fiscal transfer system administered by a supra-national authority. It could be designed to cover some 70% of the shortfalls in cyclical revenues due to terms-of-trade shocks. Member countries would agree to contribute to a buffer fund which would be co-financed by multilateral support schemes. Such a fiscal mechanism could improve the room of manoeuvre for member countries to fulfil their monetary policy commitments.

Although there has been some debate concerning the possibility of deviating exchange rates for the two sub-zones vis-à-vis the euro, the CFA franc zone is also seen as a role model for other regional monetary arrangements, in particular of ACP (African, Caribbean and Pacific) states which are covered by the Lomé Convention (Dearden, 1999). Skala (2012) goes even further and deduces from the heterogeneity of CEMAC and WAEMU member countries that also the Eurozone could survive without an all-out political union.

(4) Members of the *Eastern Caribbean Currency Union* (ECCU) are 6 independent states (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines) and 2 Territories of the United Kingdom (Anguilla and Montserrat). All countries are highly open and vulnerable to exogenous shocks. They are linked together by a currency-board arrangement with a single currency: The East Caribbean dollar maintains a fixed the exchange rate vis-à-vis the US dollar. Monetary responsibilities of the joint central bank are limited to a selection of monetary policy instruments and a truncated lender-of-last-resort function. The ECCU is a free trade area, it has not developed yet into a full-fledged customs union or a common market, although the global financial crisis has spurred activities towards more economic integration. As in EMU, fiscal policy has remained at the level of member states. Only recently, an agreement to reduce by 2020 the debt-to-GDP level to 60% has been signed (Schipke, 2012).

Similarly to her work on the CFA franc zone, Dos Reis (2004a) has also proposed a fiscal insurance mechanism for the ECCU.

(5) Stimulated by the Nobel Prize for Robert Mundell in 1999 and the advent of the Eurozone, Grubel (1999) proposed the formation of a *North American Monetary Union* (NAMU) comprising the US, Canada and Mexico, and implementing a single currency, the amero. Grubel reviews the OCA theory and the gains and costs of a monetary union. The paper concludes the amero would yield net gains for all involved economies, in particular for Canada and Mexico. Being convinced of the advantages of fixed exchange rates for the North American sub-continent, Grubel also discusses the alternatives to the amero: fixing the exchange rates, introducing a currency board and

dollarization in Canada and Mexico, but eventually dismisses all of them in favour of the amero. The successes of the first and second of these options would too much depend on continuously maintaining credibility, and the last one would result in the loss of a lender-of-last-resort and could in a growth scenario run into dollar shortage problems. Buiter (1999) and Courchene (2001) take up the thread, but debate NAMU only in terms of a currency union between the US and Canada. Buiter concludes that dollarization wold be suboptimal to Canada, while a symmetric monetary union would be economically beneficial, though politically unlikely to happen and, if created, unlikely to survive.

(6) The dissolution of the **Austro-Hungarian Empire** after World War I is sometimes addressed as an example for the consequences of ending a multinational monetary union (see e.g. Dornbusch, 1992; Garber and Spencer, 1994; Muth, 1997; Flandreau, 2006; Eichengreen, 2008). As a result of the constitutional compromise between Austria and Hungary in 1867, the two countries established a formal monetary union with the gold-based Austrian crown (introduced in September 1892) as common currency and the Austro-Hungarian Bank in Vienna as the central monetary authority. The two member states formed a free trade area with extensive real and financial integration. Fiscal policy was decided at the level of the member states, but there was some contribution to the expenditures at the union level. During World War I the nationalistic forces between and within the two countries intensified, fiscal and financial imbalances appeared and asymmetric shocks hit the two countries. When at the end of the war the old empire was dissolved, some of the newly formed nations remained for up to two years with the currency union: Austria, Hungary, Czechoslovakia and the small city state of Fiume. Czechoslovakia was the first country to leave the currency union as of February 1919 by stamping the crown notes and withholding (in form of compulsory bonds) half of the stamped amount by the new government to finance their immediate expenditures. This withholding provided an incentive to use the money in other parts of the former Empire, particularly the succession states Austria and Hungary which still had unstamped crowns in use. The capital flight was stopped by introducing exchange controls and physically closing the borders which brought merchandise trade and foreign travel to a halt. In March 1919 Austria followed by also stamping the crown notes, while Hungary retained the old currency until March 1920.

(7) An even better example would be the former **Czechoslovakia** which at the beginning of 1993 was split into the Czech Republic and the Slovak Republic as two separate nations. Although it was originally intended to maintain the currency union for some time, the differences in economic development, fiscal positions and economic policies of the two parts forced the separation of currencies (Kohútiková, 2009). On 8 February 1993 Slovakia introduced the Slovak koruna as new currency, replacing the Czechoslovak koruna at par (technically for some time also employing the stamping method). When the separation was announced, the incipient capital flight from Slovakia to Czech banks pushed the value of the Slovak koruna down. Over time it lost up to 30% vis-à-vis the Czech koruna before it was stabilised and in 2009 replaced by the euro. These developments mirror the fact that GDP per capita was lower in Slovakia than in the Czech Republic. However, market-orientation has been faster and growth rates have on average been higher in the former country, thus contributing to closing the income gap between the two nations and enabling Slovakia to join the EMU.

(8) A further example for the dissolution of a currency union is the breakup of former **Yugoslavia** and the creation of separate currencies in Slovenia (1991) and Croatia (1994). The Slovenian tolar replaced the convertible version of the Yugoslav dinar at par. It remained a short-lived experience, as Slovenia was striving for early EMU membership which happened at the beginning of 2007. The Croatian kuna was introduced in 1994 to replace the Croatian dinar which had been used as a temporary changeover currency since 1991. The kuna is closely linked to the euro, and Croatia will become an EU member country as of mid-2013.

Eichengreen (2008) questions the sense of comparing these examples with a *possible exit today* of a European country from EMU: Given today's highly developed financial system, it would be difficult to enforce exchange controls, and suspending foreign trade would be very costly. He views the historical events not as examples to be mimicked, but to illustrate the differences in historical circumstances. It also shows that reintroducing a national currency in a member state of a monetary union is a feasible though costly undertaking.

Following Muth (1997) it would be advisable for any contract forming a currency union to include provisions for an orderly exit from the union. This has been neglected in the case of EMU with the consequence that disorderly exits cannot be excluded.

From the experience of other monetary unions a number of lessons can be drawn. (i) The survival prospects of a national monetary union are much better than that of a multinational monetary union; for the fate of EMU it may therefore be decisive in which of the two directions it is evolving. (ii) A successful monetary union is usually established following political unification. (iii) A currency union without a fiscal union is likely to fail if exogenous shocks have a persistent asymmetric effect on member states. (iv) If an existing monetary union is terminated, it usually occurs not for economic, but for political reasons. (v) Any contract forming a currency union should include provisions for an orderly exit of a member country.

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5. Summary and open questions

The **results** of the preceding analysis may be summarised by the following crucial points:

- For an OCA to be efficient and effective, *asymmetric exogenous shocks* must either not occur (which means homogenous membership) or must be absorbed by the highly flexible economies of heterogeneous members. The costs of exogenous shocks may be mitigated either by insurance mechanisms (provided through capital markets or public budgets) or by idiosyncratic fiscal and wage policies.

- According to the "*new*" *(endogenous) OCA theory*, these preconditions need not be fully present at the very start of a currency union, but must be credibly approached within a limited number of years of the union's existence. The maximum available time span will depend on exogenous factors, and will in crisis times be rather short.

- The *Eurozone is not considered an OCA* because labour is quite immobile, wages and prices are sticky, and financial markets are not used for risk insurance. Overall, the Eurozone is lacking a mechanism for balancing uneven consequences across member countries of an adverse asymmetric shock. It is also not well suited to stabilise economic activity in case of a symmetric shock as in the case of the recent financial crisis.

- The European financial and debt crisis has reversed the early effects of EMU towards considerable convergence in economic developments. Since late 2008 real growth rates and inflation rates have *diverged* again.

- The heterogeneous membership of EMU is clinched together by a uniform monetary policy which does not worry about individual country requirements. At the union level, this will have to be supplemented by some *mechanism for achieving real convergence* between member states. In the very short run, certain problems could be solved by a comprehensive

lender-of last-resort function which the ECB currently does not possess. To secure the viability of EMU in the long run, decisive steps to form a political union, including some form of fiscal union with transfer capabilities, will be inevitable.

- Member countries will have to regain and maintain *competitiveness* with other EMU members. In the medium term, the capability for "internal devaluation" could be enhanced via wage, price and fiscal policies. In the long run this would have to be underpinned by timely structural reforms.

- Some authors envisage that the fate of EMU will depend largely on whether it will eventually resemble *more a national than a multinational currency union*. As the US example reveals, however, it can take a hundred years and more to become a national currency union.

- The USA demonstrates that a large currency union can be successful when the federal budget cares for stabilisation policy, fiscal transfers from the federal budget alleviate regional income differences, and the states are subject to some sort of balanced budget rule.

A number of open **questions** remain with respect to the future development of the Eurozone and its economic policies. Towards this end it must be determined what the efforts would have to be to correct the deficiencies discussed above and whether, therefore, the potential for an endogenous monetary union has not yet been fully exhausted. What would be the consequences for the existence of the Eurozone, if such corrections were not possible or feasible?

In particular, the following questions have to be sorted out:

- Is it likely for the Eurozone that its regions, as projected by Krugman, will become more and more specialised and that therefore the costs of monetary union will increase over time?

- Should the Eurozone, for achieving macroeconomic stability, just rely on market mechanisms or rather aim at fiscal union?

- If fiscal union (or "proper fiscal capacity", as formulated in COM, 2012b) is the option, should it rather be of the centralised or the decentralised type?

- What should be the mechanisms that provide insurance against asymmetric cyclical shocks? According to von Hagen – Wyplosz (2008) the following proposals should be assessed: (i) tax revenue sharing, and (ii) implementing a euro-area wide unemployment insurance.

- What are the long-term consequences of the "bazooka" policy of the ECB (providing unlimited liquidity to banks for up to 3 years)? Johnson (2012) in his Congressional Testimony argues that this is a dangerous path which may result in a loss of confidence in the euro.

- Is it prudent to exclude from future scenarios for the Eurozone the forming of a political union, including some transfer functions?

Even if political union today seems little more than a pie in the sky, it should be upheld as a remote yardstick providing guidance for politicians and their activities to resolve the euro crisis and secure the long-term viability of the Eurozone. A number of rescue proposals have recently been voiced, most of them providing some kind of common financing facility for heavily indebted member states combined with the obligation to stabilise their financial and fiscal positions. At the union level, revamping the competencies of the ECB and establishing some sort of a banking union are obvious candidates for improving the OCA quality of the Eurozone.

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