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**THE MACROECONOMIC COSTS AND
BENEFITS OF THE EMU AND OTHER
MONETARY UNIONS: AN OVERVIEW
OF RECENT RESEARCH**

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ABSTRACT

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The Macroeconomic Costs and Benefits of the EMU and other Monetary Unions: An Overview of Recent Research¹

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ABSTRACT

This article provides an overview of recent research into the macroeconomic costs and benefits of monetary unification. We are primarily interested in Europe's monetary union. Given that unification entails the loss of a policy instrument its potential benefits have to be found elsewhere. Unification may serve as a vehicle for beneficial institutional changes. In particular, it may be a route towards an independent monetary policy, which alleviates the scope for political pressure to relax monetary policy. Unification also eliminates harmful monetary policy spill-overs and competitive devaluations. We explore how disagreement between the monetary and fiscal authorities about their policy objectives can lead to extreme macroeconomic outcomes. Further, we pay considerable attention to the desirability (or not) of fiscal constraints and fiscal coordination in a monetary union. Monetary commitment and fiscal free-riding play a key role in this regard. Similar free-riding issues also feature prominently in the analysis of how unification influences structural reforms. We end with a brief discussion of monetary unification outside Europe. The cost-benefit trade-off of unification may differ substantially between industrialized and less-developed countries, where differences in fiscal needs and, hence, the reliance on seigniorage revenues may dominate the scope for unification.

I. Introduction

More than ten years since its start, the costs and benefits of the Economic and Monetary Union (EMU) in Europe continue to be debated. Many experts consider the EMU to be success, though not one without some major flaws (see Wyplosz, 2006). There have been no disruptions in the financial markets as a result of the monetary unification, nor has there been economic chaos otherwise. Despite its enormous logistical complexity, the introduction of euro notes and coins went surprisingly smooth. Everywhere in the euro-area is the euro accepted as a means of payment. Overall the European Central Bank (ECB), the Euro-area's central bank, has fulfilled its obligations by keeping the area-wide inflation rate close to its self-imposed ceiling of 2%. However, this in itself is not a formal proof that the EMU is better than its potential alternatives, such as a free or

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managed float or the system of exchange rate bands that preceded the EMU. Indeed, there have been periods of substantial tensions due to the misalignment of the national business cycles and conflicts about the enforcement of the Stability and Growth Pact (SGP), which imposes fiscal constraints on the European Union (EU) countries.

Commentators such as Eichengreen (1993) and Feldstein (1997) argue that the euro was introduced for political reasons, although the European Commission (1990) goes at great lengths in providing economic arguments for the EMU. Feldstein (1997) views it as the outcome of a bargain between Germany striving for more political integration and France trying to acquire a say in monetary policy. Wyplosz (1997) gives more credit to the economic arguments behind EMU and points to the “impossible trilogy”, the simultaneous existence of free capital mobility, monetary independence and a fixed exchange rate. With full capital mobility, the European countries had no other choice than to move to a union. The alternatives would have been continued German monetary hegemony or a float with long and disruptive swings in the nominal exchange rates.

Whatever the arguments for its introduction, the euro has become a fact. Therefore, it makes sense to assess it on its economic merits. This paper explores the macroeconomic costs and benefits of the EMU, as well as potential future monetary unions elsewhere, starting from the observation that giving up monetary autonomy entails the loss of a policy instrument. Hence, except in special cases, it limits the set of feasible economic allocations. In particular, the possibility of using monetary policy to stabilize national economic shocks has disappeared. Therefore, any net economic benefit of giving up monetary autonomy must derive from institutional, political and possible other considerations that limit the scope for attaining a Pareto-optimal allocation under autonomy, but that are less binding under a monetary union. Hence, this paper explores how EMU affects institutions and incentives for macroeconomic policymaking.

It will be impossible to address in detail all the economic implications of the EMU.² As mentioned, we focus mostly on its institutional and politico-economic aspects. Therefore, we shall be brief on the effects of unification on labor markets, international trade and capital market integration. While these aspects are important, we make this choice because they have been covered in recent survey articles or because it is too early to draw firm empirical conclusions. For example, based on Rose (2000) and subsequent contributions, Baldwin (2006) has recently surveyed the empirical literature on how (European) monetary unification affects the volume of international trade, while Lane (2006) has surveyed how the EMU has affected capital markets. These surveys describe our state of knowledge about these effects, realizing that their empirical size has been hard to pinpoint so far. One reason is that the euro is not a stand-alone project of the EU, but is

² For a broad treatment of the economics of monetary union aimed at a wide audience, see De Grauwe (2007)

accompanied by other measures to promote economic integration, in particular the removal of internal trade barriers and the liberalization of the services sector. Also the limited data due to the short existence of the euro has been an obstacle to making precise empirical assessments.

The remainder of this paper is structured as follows. Section II addresses the relationship between the original optimum currency area (OCA) literature and the EMU. Section III describes the basic features of Europe's monetary and fiscal framework. Section IV investigates the consequences for monetary policy credibility and the "inflation bias" of giving up monetary autonomy. In particular, it argues that EMU may be a route to a more independent monetary policy. In Section V, we argue that it avoids the potential adverse spill-overs of non-coordinated national monetary policies. Section VI explores the conflicts of interest that arise with the introduction of fiscal policy. Of particular relevance for the EMU is the conflict between the monetary and fiscal authorities about the macroeconomic objectives within the union. Section VII discusses the cross-border spill-overs of fiscal policy and how they may be strengthened within a monetary union due to fiscal free riding. Such free riding generally works into the direction of generating too expansive fiscal policies and, hence, produces a rationale for fiscal constraints in a monetary union. In Section VIII we assess how Europe's fiscal constraints have functioned in practice. Section IX explores how EMU influences the incentive for much-needed structural reforms and thus the scope for countries to fulfill the optimum currency area criteria "ex post" by conducting such reforms. Section X briefly discusses monetary unification outside Europe, emphasizing that the cost-benefit trade off can be quite different for less-developed countries. Finally, Section XI concludes the paper.

II. Optimum currency areas and the EMU

Research into the costs and benefits of monetary unification goes back to the seminal contribution by Mundell (1961). In his view, a group of countries form an *optimum currency area* (OCA) if the benefit from eliminating currency conversion costs outweighs the cost of not being able to stabilize country-specific shocks under a union. Building on Mundell's work, McKinnon (1963) emphasizes the importance of an economy's openness as measured by the size of the tradable sector relative to that of the non-tradable sector. Given that the foreign currency price of tradables is determined abroad, in a small and highly open economy the general price level in domestic currency, which is primarily determined by the tradable price level, is sensitive to exchange rate movements. In addition, the trade balance will hardly be influenced by exchange rate changes. Hence, for such an

economy unification offers the benefit of a more stable price level, while the cost in terms of losing an instrument for attaining external balance is low. Finally, Kenen (1969) argues that the more diversified an economy is, the less vulnerable it is to sector specific shocks and the smaller is the stabilization cost of joining a monetary union.

With the demise of the Bretton Woods system in the beginning of the 1970s, the main currencies started to float against each other, a regime that at the time was widely considered to be the most preferable one. Its main proponent was Friedman who had already argued much earlier (Friedman, 1953) that changes in exchange rates offered the easiest and fastest solution to solving macroeconomic imbalances between countries. With the move to flexible exchange rate regimes, research on OCAs went out of fashion for a long time until the Delors Committee (1989) produced its blueprint for the EMU, which was later incorporated in the Treaty on the European Union (the “Maastricht Treaty”). The large amount of research that followed has shifted much of the attention from the original OCA considerations to other aspects emphasized in the Report and later in the Treaty, namely the entry criteria for the EMU and the role of fiscal policy.

In terms of the original trade-off presented by Mundell (1961), the economic case for EMU seems to be rather weak. Currency conversion costs in Europe are generally thought to be small (the European Commission, 1990, estimates them at 0.3 – 0.4% of EU GDP), while the move to a single currency entails the loss of the exchange rate as a tool for the stabilization of country-specific shocks. Hence, except in special cases monetary unification limits the set of feasible economic allocations, implying that its potential economic benefits must derive from sources other than those related to macroeconomic stabilization. A growing recent literature analyzes monetary unions in the context of micro-founded New-Keynesian type of models characterized by nominal rigidities and imperfect competition. Examples are Benigno (2004), which is extended by Beetsma and Jensen (2005) to include fiscal policy. These papers characterize optimal policies in monetary unions. However, in terms of maximum achievable welfare, these unions are indeed generally dominated by a flexible exchange rate regime. Other related contributions are Pappa and Vassilatos (2007), Galí and Monacelli (2008) and Ferrero (2009).

The advantage of monetary autonomy in New-Keynesian models also depends rather critically on the degree of exchange rate pass-through in import prices, as demonstrated in the work by Corsetti and Pesenti (2002) and Devereux and Engel (2003). The standard assumption is that there is full pass-through. In that case, the euro-price of imports from the U.S. rises one-for-one with a depreciation of the euro against the dollar. However, in reality prices of imported products often show only limited variation in response to exchange rate changes. The simple two-country exposition in Corsetti (2008) shows that when pass-through is completely absent, i.e. prices are

preset in the currency of the destination market (also referred to as local currency pricing), the optimal monetary policies under autonomy effectively result into a fixed exchange rate. Hence, this outcome is merely the accidental result of the optimal policies chosen under a float and as such it differs from our traditional perception of a monetary union.

Overall, from the “narrow” perspective of macro-economic stabilization, the case for monetary unification is hard to make. Of course, a union may be superior when standard assumptions are relaxed. Neumeyer (1998) presents a model with incomplete asset markets, allowing for both asymmetric economic and political shocks. The latter cause movements in the money supplies and, therefore, in nominal exchange rates that are not justified by changes in economic fundamentals. Monetary unification eliminates the excess volatility of nominal variables due to political risks and is beneficial when this gain outweighs the loss caused by the reduction in the set of risk-sharing instruments due to the elimination of exchange rates. In a framework with anticipated changes to future productivity, Devereux and Engel (2006) show that when goods prices are sticky and news about future productivity levels affects the current exchange rate, relative price movements between countries may become inefficient as they are no longer driven solely by current but also by future productivity differentials via the effect that exchange rates have on relative prices. Optimal monetary policy should aim at eliminating the response of the current exchange rate to its future fundamentals. This is achieved under a fixed exchange rate. Indeed, there is increasing empirical evidence that, instead of acting as shock absorbers, nominal exchange rates act as sources of shocks (see, for example, Farrant and Peersman, 2006). Empirical research suggests also other advantages of unification than the elimination of inefficient exchange rate movements. In particular, there is evidence that the euro has led to a deepening of bond markets, making it easier to attract funds for investments (see Lane 2006), and an increase in corporate valuations, especially for firms from countries with originally weak currencies (Bris et al., 2009).

This paper will primarily explore how the EMU affects policymaking institutions and the incentives for setting the macroeconomic policy instruments. It is useful to realize that the origins of the costs and benefits of monetary unification are to some extent the same. In the traditional OCA framework, stabilization losses under a union arise from nominal rigidities. Nominal wage (and price) rigidity may prevent quick adjustment of real wages to changes in labor market circumstances, thereby resulting in unemployment. However, the very same rigidities may also be an important motive for unification. In particular, as we shall see in Section IV, nominal rigidities provide weak authorities with an incentive to stimulate economic activity by relaxing monetary policy. In equilibrium, the resulting higher inflation is anticipated and the attempt to stimulate

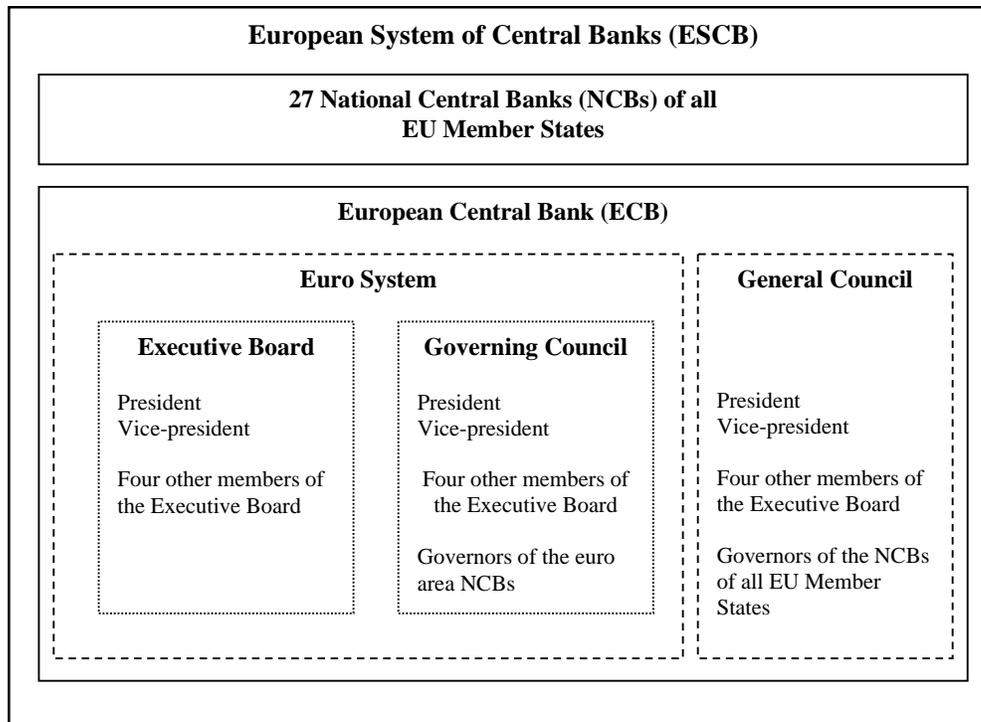
activity becomes futile. However, the move to a monetary union provides an opportunity to make monetary policy independent and get rid of the “inflation bias”.

III. Basic features of the EU’s macroeconomic framework

To aid the discussion in the remainder of this paper, this section describes the basic features of Europe’s monetary and fiscal framework. Figure 1 depicts the structure of the EU’s monetary framework. The EU consists of 27 countries, of which 16 are currently members of the euro-zone. The European System of Central Banks comprises all EU national central banks and the ECB. Monetary policy decisions are taken through majority vote by the ECB’s Governing Council composed of the ECB’s Executive Board and the Presidents of the National Central Banks in the euro-zone. The EU Treaty enshrines the independence of the National Central Banks and forbids any part of the ESCB to come to the rescue of governments in financial distress.³ The Treaty also assigns the ECB a price stability mandate, which the ECB interprets in practical terms as a rate of annual increase of the harmonized index of consumer prices (HICP) of less than, but close to, 2% in the medium term.

Figure 1: Structure of the European System of Central Banks

³ The Treaty prohibits the direct financing of public entities’ deficits by National Central Banks (Art. 101), be it overdraft facilities, other types of credit facility or the purchase of debt instruments, except for the purpose of monetary policy. The Treaty also prohibits public entities’ privileged access to financial institutions (Art. 102). Moreover, the “no bail-out” clause in Article 103 stipulates explicitly that neither the Community nor any Member State shall be liable for or can assume the commitments of any other Member State.



Notes: (1) Source is ECB. (2) As of January 1, 2009, the Euro-area members are (with entry date January 1, 1999) Austria, Belgium, Finland, France, Germany, Ireland, Italy, Luxemburg, the Netherlands, Portugal, Spain; (with entry date January 1, 2001) Greece; (with entry date January 1, 2007) Slovenia; (with entry date January 1, 2008) Cyprus, Malta; and (with entry date January 1, 2009) Slovakia. (3) The EU countries that do not participate in the Euro-area are Bulgaria, the Czech Republic, Denmark, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Sweden and the U.K.

In contrast to monetary policy, fiscal policy has remained a national competency. However, in view of the danger that fiscal profligacy produces negative spill-overs and undermines the ECB's ability to pursue price stability, the Treaty imposes restrictions on government deficits and debt. Specifically, it limits the deficit/GDP ratio to 3% and the (gross) debt/GDP ratio to 60%. These limits also serve as entry requirements for EMU participation. However, once a country has been admitted into the EMU, it cannot be forced out again. Hence, some countries (notably Germany) were scared that the Treaty constraints would lose their bite. This fear resulted in the adoption of the SGP in 1997. The SGP is part of Europe's secondary law and can be changed (by unanimity) without re-opening the Treaty. It consists of a preventive arm aimed at avoiding excessive deficits in the first place and a dissuasive arm dealing with the correction of excessive deficits once they have occurred, possibly enforced by financial sanctions (see the Appendix for more details on the SGP). These initially take the form of the country having to submit a non-interest bearing deposit, which is turned into a fine if the country persists in running an excessive deficit. The preventive arm comprises the annual Stability Programmes for the EMU members and the Convergence Programmes for the non-EMU members (the "pre-ins"). In these programs countries lay out how they intend to achieve or safeguard sound fiscal positions in the medium term.

In 2005, after failure to enforce the Pact, it was revised. The revision was partly aimed at discouraging pro-cyclical fiscal behaviour, by requiring budgetary adjustment to be judged in terms of its implications for the structural balance, i.e. the cyclically-adjusted balance net of one-off items and temporary measures. Further, public debt and sustainability now receive greater emphasis, as is also the case for structural reforms, including pension reforms. Finally, the medium-term objective (MTO) for budget balance at the end of the Stability and Convergence Programme periods was made country-specific, ranging from a minimum of -1% of GDP for low-debt and high-potential-growth countries to budget balance or surplus for high-debt or low-potential-growth countries.

IV. More credible monetary policy and a lower inflation bias

Monetary unification means giving up monetary policy as an instrument for the stabilization of country-specific economic shocks. In history many countries have been prepared to relinquish monetary policy for shorter and longer periods and the question is what has motivated these countries to do so. Most cases concern unilateral monetary unions, with a small “client” country pegging its currency to that of a large country with a stable anchor currency or even using a large country’s currency as legal tender (“dollarization”).⁴ An important reason for those client countries to form a monetary union is that this offers a route to low and stable inflation.

The problem of the “inflation bias” has been studied in numerous contributions following the seminal work by Barro and Gordon (1983a, b). A simple and realistic context in which an inflation bias arises is when nominal wage contracts are signed at certain intervals (for example, two years). Given that the negotiating parties are interested in a target real wage rate, the contracted nominal wage reflects the amount of inflation expected over the duration of the contract. However, once the contract has been signed, the central bank has an incentive to relax monetary policy. This incentive is particularly strong when the central bank is under the influence of a government that wants to reduce unemployment. The result will be an increase in inflation, implying a reduction in the real wage rate and, hence a boost to employment. Of course, with rational wage setters, in equilibrium, this course of events will be anticipated. Hence, expected inflation equals realized inflation (up to a mean-zero error) and unemployment will be unaffected. The only consequence

⁴ Examples of “dollarization” are Panama, which has been using the dollar for over a century, and Ecuador, which has been using it since 2000. A weaker form of commitment is provided by a currency board. In this case, the domestic currency’s exchange rate is fixed against an anchor currency. The central bank backs the domestic money stock with anchor currency reserves and allows full convertibility of domestic currency into the anchor currency at the level of the fixed exchange rate. Examples of currency boards that use the euro are the Bulgarian lev and the Estonian kroner.

will be higher inflation.⁵ Therefore, the monetary policymaker would ideally want to commit to a shock-contingent monetary policy rule that generates low inflation on average. However, commitment to such a rule is often hampered for political reasons and the only practical alternative is to peg the currency to that of a country with a more disciplined monetary policy. The cost is that the anchor country responds to shocks that may differ from those hitting its client country. Hence, monetary unification becomes a trade-off between reduced stabilization of country-specific shocks and enhanced credibility of monetary policy resulting in a lower inflation outcome. Below we shall illustrate this trade-off in more detail in the context of a recent model with nominal rigidities.

IV.1. A unilateral peg

Alesina and Barro (2002) set up a two-country, Home and Foreign (indicated by subscripts H and F , respectively), model with firms that construct a final product out of imperfectly substitutable intermediate goods made in both countries. Intermediates are produced under imperfect competition with their prices set above marginal cost. Moreover, these prices are sticky (and determined before economic shocks occur), which creates real effects of monetary policy changes. Home and Foreign final goods are perfectly substitutable, their prices are fully flexible and they are internationally traded without any barriers. Hence, the law of one price holds for these goods.

Based on informal arguments, the following function for the Home monetary authority is posited:

$$L_H = \alpha_1 \pi_H + \frac{1}{2} \alpha_2 \pi_H^2 + \frac{1}{2} \alpha_3 \left[\psi (\pi_H - \pi_H^e) - z_H - \eta_H \right]^2, \quad \alpha_2, \alpha_3 > 0,$$

where π_H is (final-product) inflation, π_H^e is its expectation, z_H is a parameter increasing in the average mark up ratio for intermediate goods and η_H is a mean-zero independent shock capturing movements in the price mark-up. The timing of events is such that the inflation expectation is formed first, then the shock η_H occurs and, finally, the policymaker chooses inflation. The first two terms of L_H capture the losses from actual inflation. Actual inflation may involve a variety of costs, such as distortions in the tax system (“bracket creep”), suboptimal variations in relative price levels as emphasized in the New-Keynesian literature and unavoidable erosion of the real value of assets

⁵ While the welfare cost of inflation in most of these contributions is posited rather than derived, recent work by Benigno (2004), and others, provides micro-foundations for the cost of inflation. Specifically, higher inflation generates more dispersion in relative prices leading to uneven production activity among industries that are identical in their characteristics.

(such as money holdings or forced asset holdings under financial repression where anticipated inflation is not compensated for by an appropriate nominal return). Parameter α_1 may be negative, if some inflation is desirable because nominal wages are downwardly rigid or inflation yields seigniorage that helps to reduce distortionary taxes. If $\alpha_1 < 0$, the marginal cost of higher inflation is negative at low levels of inflation. The third term arises from unexpected inflation alleviating the monopolistic competition distortion and raising output by lowering intermediates prices relative to the final goods price. The larger are the deterministic and stochastic components of the mark up, z_H and η_H , the larger is the benefit of unexpected inflation in alleviating the distortionary losses.⁶ To the extent that the increase in inflation is anticipated, it becomes ineffective in raising output, as it translates into a proportionate increase in the prices set by the intermediates producers. This is the reason why it is the inflation surprise $(\pi_H - \pi_H^e)$ that appears in the final term of the loss function.

Minimizing L_H under discretion, i.e. taking as given expected inflation, yields for inflation:

$$\pi_H = -\frac{\alpha_1}{\alpha_2} + \frac{\alpha_3\psi}{\alpha_2} z_H + \frac{\alpha_3\psi}{\alpha_2 + \alpha_3\psi^2} \eta_H,$$

where the second term captures the “inflation bias” that vanishes under commitment to the optimal contingent rule. The third term is the optimal response to the supply shock η_H . Given that there is always a temptation to deviate from a rule, it may be difficult to credibly commit to such a rule. Assuming that Foreign has somehow solved its own commitment problem, an alternative might be to peg the currency to that of Foreign or to use Foreign’s currency as legal tender in Home, i.e. dollarization. The latter is the more credible solution, because it is costly to revert to the use of the own currency as it has to be brought back into circulation and the central bank may have to be refurbished to conduct its own monetary policy. Assume that the Foreign monetary authority features a similar loss function (of Foreign inflation π_F) as the Home authority and that it hands back to Home the seigniorage earned on Home holdings of its currency, dollarization will be more desirable for Home when its inflation bias is larger and the covariance between η_H and the Foreign shock η_F is higher. Further, if the correlation between η_H and η_F is sufficiently low, an anchor country that follows a constant inflation rule $\pi_F = -\alpha_1 / \alpha_2$ would be more attractive to the “client” than one that follows a contingent rule.

⁶ The third term in the loss function is quadratic. This captures the higher social loss due to lost resources when inflation rises from a level at which $\psi (\pi_H - \pi_H^e) - z_H - \eta_H > 0$ and intermediates producers operate at a marginal loss.

IV.2. Enhanced central bank independence

Because the EMU is based on a Treaty among the EU countries, we are more interested in multilateral than in unilateral monetary unions, although the reasons for joining or forming a monetary union may be very similar in both cases. A major difference is that a treaty-based multilateral union is more difficult to break up and, therefore, more credible. This is, in particular, the case when the multilateral union issues its own currency and has its own central bank, as is the case for the EMU. In fact, the EU Treaty does not even allow for the possibility of a country to withdraw or be expelled from the euro-area. As the EMU experience has shown, a multilateral union also does not need an anchor country with a stable currency, as long as it is based on a treaty defining the appropriate objectives for the central bank and guaranteeing its independence. Nevertheless, the EMU as a multilateral union has not emerged overnight, but is the result of a long process of converging national monetary policies and stabilization of exchange rates. The EMU was preceded by the Exchange Rate Mechanism (ERM) of the European Monetary System (EMS) intended to keep exchange rates around parities within narrow bands. The ERM was designed as a multilateral system, but de facto operated as a system with the German Mark as a stable anchor. The EMU, as the successor to the ERM, anchors the benefits of the ERM in terms of low and stable inflation and interest rates.

The benefits of unification are not equally-large for all participants, however. Over the past decades, Germany (and some countries such as the Netherlands and Austria that essentially maintained a fixed exchange rate against the German mark) pursued a disciplined monetary policy facilitated by the independence of the German Bundesbank and the public support for such policy. Hence, by having joined the EMU, Germany might at most enjoy the benefit of low inflation and interest rates, but possibly at the cost of suboptimal stabilization of domestic shocks. However, for other countries, joining the EMU has been an opportunity to place monetary policy at a distance from their governments and to modify its objective into price stability.

Table 1: Annual CPI and HICP inflation in selected countries and the euro-zone

	Greece	Italy	Portugal	euro-zone	EU-3	OECD-5
1990	19.89	6.25	13.30	--	6.57	5.28
1995	8.90	5.37	3.98	2.44	2.49	2.65
2000	2.89	2.58	2.80	2.10	1.60	2.53
2005	3.48	2.21	2.13	2.19	1.52	2.14
2006	3.31	2.22	3.04	2.18	1.89	2.47

2007	2.99	2.04	2.42	2.14	1.89	1.96
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Notes: “euro-zone” consists of all euro-zone members in the indicated year, except for 1995 when it consists of the initial eleven members of the euro-zone. Source: ECB and OECD (2008). The EU-3 includes Denmark, Sweden and the United Kingdom. The OECD-5 consists of Australia, Canada, Japan, New Zealand and the United States.

Table 2: Long-term nominal interest rates in selected countries

	Greece	Italy	Portugal	euro-zone	EU-3	OECD-5
1990	23.00*	13.54	20.82	10.80	11.86	10.37
1995	15.52*	12.21	11.47	8.39	7.03	8.91
2000	6.11	5.58	5.60	5.43	5.45	5.37
2005	3.59	3.56	3.44	3.41	4.19	3.73
2006	4.07	4.05	3.91	3.84	4.42	4.01
2007	4.46	4.47	4.40	4.30	4.59	4.50

Notes: * = short-run nominal interest rate. Source: OECD (2008). For each year, the “euro-zone” consists of the initial eleven members plus Greece. For 1990, it includes West-Germany instead of Germany. Further, see Notes to Table 1.

So far, the ECB has by-and-large been able to meet to its objective of keeping area-wide inflation close to 2%. Those euro-zone members with a history of weak monetary discipline have benefitted from a substantial reduction in inflation (see Table 1). Not only *realized* inflation has reached a low level, also inflation *expectations* have become low, which suggests that the anti-inflationary stance of the ECB is credible. In particular, over the available sample period (1999-2007), two- and five-year ahead inflation expectations for the euro-area from the Survey of Professional Forecasters (ECB, 2008) have always been close to 2% and have never exceeded 2%. The fall in expected inflation during the run-up to the EMU and its consistently low level afterwards is similarly reflected in nominal interest rates in the various members of the euro-zone (see Table 2) and to a lesser extent in ex-post real interest rates, as measured by the difference between the nominal interest rate and CPI inflation.

The observation that inflation (expectations) and interest rates have been low under EMU is of course not a “proof” that EMU has been a strict necessity to achieve these outcomes. Many countries have seen a steady fall in inflation and interest rates over the past decades (see Tables 1 and 2) accompanied by an increase in central bank independence.⁷ However, part of this global trend towards central bank independence has been driven by the fact that such independence is a legal requirement for participation in the EMU and likely also by the example of the EU experience for countries elsewhere. It seems doubtful that the current EMU members with a history of weak monetary discipline would have been able to achieve price stability outside the EMU, let alone that

⁷ See Crowe and Meade (2009). They update the central bank independence (CBI) index of Cukierman et al. (1992) to a comparable index for 2003 and show that developed countries have raised their level of CBI.

they would have achieved it had the EMU project never been started and served as an example of disciplined monetary policy. For sure, EMU-membership has bought those countries stronger assurance that price stability can be maintained over longer periods of time.

V. Elimination of competitive devaluations

This section focuses on the benefit of monetary unification as a way to avoid competitive devaluations. Monetary autonomy may give national authorities an incentive to “steal” business from other countries by relaxing monetary policy. While each individual country perceives a (short-run) advantage to this policy action, if all countries try to exploit this possibility, the eventual result will only be higher inflation without any accompanying gain in national economic activity. The incentive to capture business from other countries may operate via both the supply and the demand side of the economy. For the supply side, the mechanism is easily demonstrated using a variation on Martin’s (1998) supply equation:

$$y_i = \psi (\pi_i - \pi_i^e) - \sum_{j=1}^m \theta_{ij} (\pi_j - \pi_j^e) , \quad \psi > 0, \theta_{ij} \geq 0, \theta_{ii} = 0, \quad (1)$$

where m is the number of countries and y_i is the log-deviation of output from some (natural) trend. This supply equation can be derived assuming a Cobb-Douglas production function with a given capital stock and nominal wages pre-set in accordance with expected inflation. It incorporates the standard Barro-Gordon inflation surprise effect on national output as well as spill-overs from other countries’ inflation surprises onto the supply of country i (captured by $\theta_{ij} > 0$). These spill-overs are assumed to be negative. In particular, for given nominal wage contracts a relaxation of monetary policy (leading to an increase in inflation) in country j reduces the real wage in country j relative to country i and causes to a shift of production activity from i to j . With autonomous monetary policies conducted by discretionary central banks concerned with a trade-off between achieving low inflation and output above its natural level, each country suffers from excessively high inflation in equilibrium.

The previous discussion focuses on the strategic exploitation of the supply-side channel to capture foreign business. However, the policy debate, at least in the European context, seems more concerned with competitive devaluations operating via the demand side. When the products of different countries are imperfect substitutes in the consumption baskets and their prices are

predetermined in the exporters' currencies, a devaluation of the domestic currency reduces the relative price of domestic products and thus stimulates demand for these products at the expense of the demand for foreign products.⁸ If all countries face the same incentive to stimulate demand for their own products, the only result will be a higher equilibrium inflation rate.

The obvious response to the, in equilibrium futile, incentive to strategically expand monetary policy would be to coordinate national monetary policies, which forces countries to internalize the negative externalities of their individual behavior. However, policy coordination is fundamentally unstable, because individual countries find it in their own (short-run) interest to deviate from such an agreement with other countries. Indeed, in reality countries are only very rarely prepared to coordinate their monetary or exchange rate policies.⁹

Monetary unification eliminates the possibility of nominal exchange rate adjustments among its members and effectively forces countries to coordinate their national monetary policies. The common monetary policy conducted by the union's central bank allows countries to achieve the same outcomes for output, but with lower inflation. In fact, in Eichengreen's (1993) view the avoidance of competitive devaluations is even the only economic rationale behind EMU: "the pressure for a single currency as a corollary of the single market derives instead from political economy considerations.... If national industries under pressure from the removal of barriers to intra-European trade find their competitive position eroded by sudden and 'capricious' exchange rate swings, resistance to the creation of the single market would intensify. In this sense and this sense alone, monetary unification is a logical corollary to factor- and product-market integration."

The potential importance of competitive devaluations was amply demonstrated in the aftermath of the September 1992 speculative attacks that forced the British pound and the Italian lira to leave the ERM. Table 3 reports the percent change relative to normal of bilateral exports in September 1993 compared to those in September 1992 (controlling for the business cycle of the importing country). Clearly, the fall in the exports from Germany and France to the U.K. and Italy was much larger than that (if any) of the exports in the opposite directions, suggesting that the ejection of the latter two countries from the ERM bought them a competitive advantage against their main trading partners in Europe. Not surprisingly, the U.K. and Italy were accused of trying to recover from their own economic downturn at the expense of their partner countries.

Table 3: Change in exports relative to normal

⁸ This demand channel is absent when all countries sell an identical product, because countries can only sell it at a common world-market price.

⁹ The most famous example in recent history are the 1985 Plaza Agreement and the 1987 Louvre Accord in which the main economic powers first agreed to stop the appreciation of the dollar and then to end its subsequent decline.

	September 1992 – September 1993
Germany to U.K.	-20.0
Germany to Italy	-41.9
France to U.K.	-7.2
France to Italy	-31.3
U.K. to Germany	-1.8
U.K. to France	-4.6
Italy to Germany	6.3
Italy to France	-3.9

Notes: (1) Data source is the Direction of Trade Statistics of the Worldbank. (2) The second column reports the change relative to normal of bilateral exports in September 1993 compared to those in September 1992. It is constructed from the residuals of a regression of the logarithm of real bilateral trade on a linear time trend, monthly dummies, and the logarithm of real industrial production of the importing country (the regression fit defines the “normal” level of trade).

Quite naturally, the pressure to devalue the national currency against the currencies of the main trading partners is strongest when the economy is in a recession and the need for preventing a rise in unemployment is highest. In the beginning of the 1990s, the other countries in the ERM were struggling to follow Germany’s monetary tightening in the aftermath of its unification. Currently, most Euro-area countries are trying to cope with a deep recession that has followed the collapse in the U.S. housing market and the crisis in the financial markets and the banking systems. International trade and domestic demand have shrunk dramatically and under those circumstances the temptation to relax monetary policy and devalue the national currency might well have become too strong for most countries. Hence, it seems likely that the EMU has prevented one or more rounds of competitive devaluations that in the longer run would have merely produced higher inflation and that could have undermined cooperation among the EU countries in other areas.

While the debate on competitive devaluations is concerned with countries exploiting their monetary autonomy to try and steal jobs from each other, the welfare consequences of such activity may be quite counterintuitive at first sight when analyzed in a properly-formulated micro-founded model. Corsetti and Pesenti (2001) show this in a two-country model in which a final good is produced using imperfectly substitutable labor inputs. The markets for those labor inputs are characterized by monopolistic distortions. Moreover, they feature nominal rigidities in the form of nominal wages being set one period ahead. A (small permanent) monetary expansion, by raising the price of the domestic product (in domestic currency), lowers real product wages and allows for an expansion of domestic output. In a closed economy, such a monetary expansion would raise welfare by bringing output closer to its social optimum; the higher level of consumption dominates the disutility from additional work effort. However, in an open economy, and assuming that the pass-through of exchange rate changes into export prices is complete, the increase in domestic output

generates a terms-of-trade deterioration, implying a decline in purchasing power that erodes the higher nominal income from increased sales. Hence, the benefit from higher consumption is shared with the rest of the world, while the additional labor effort is borne at home. On balance, a monetary expansion can be a beggar-thyself policy, despite a relative boost in domestic activity. This is more likely the case if share of foreign goods in domestic consumption is large and the monopolistic distortions are weak. Corsetti et al. (2000) reach similar conclusions in a related model with a “center” country and two “periphery” countries producing highly substitutable goods.

Formal welfare evaluations of the type described above have become commonplace only relatively recently. Today, policymakers may be more aware that devaluation can inflict a welfare loss on their own country, which should make them more reluctant to engage in such a policy. However, this view neglects the fact that the benefits of devaluations are unevenly distributed, with the export industry typically profiting from a (temporary) competitive advantage and other parts of society paying the price in terms of reduced purchasing power. With the benefits concentrated among the exporters, the latter have strong incentives to lobby for a weaker currency. Monetary unification eliminates this benefit (at least as far as intra-union trade is concerned) and avoids that national authorities are kept hostage by the interests of the exporting sector.

VI. Fiscal policy and conflicts of interest in a monetary union

So far, we have ignored fiscal policy in our discussions about the EMU. In this and the following section we shall explore whether the EMU has created special problems for the setting of fiscal policy. Such problems can arise for different reasons. One is that the fiscal authorities may pursue different macro-economic objectives than the monetary authorities. Another is that fiscal expansion may produce harmful cross-border spill-overs. Both complications with fiscal policy could present a rationale for the much-discussed constraints on fiscal policy in the EU.

The “traditional” OCA theory has largely ignored the implications of monetary unification for fiscal policymaking. Because fiscal policies are determined at the national level, governments may employ those policies in a strategic way. Unification affects the interactions among the national governments with potential consequences for the monetary and fiscal policy mix and, hence, also the macroeconomic outcomes. Formal analysis of these issues in the context of the EMU requires taking a stand on an appropriate framework to model the policy interactions among the fiscal authorities as well as the ECB. Major elements in the choice of such a framework concern the assumptions about the objectives of the various authorities, their ability to commit, the timing of their decisions and whether the ECB is forced to internalize the national budget constraints in its policies.

This section focuses on the conflict between an independent ECB and the decentralized fiscal authorities about the macroeconomic objectives. This type of conflict is relevant for the euro-zone, because the ECB attaches a large weight to stabilizing inflation at a low level, while the governments are more concerned with a high and stable level of activity. Indeed, at various recent occasions EU governments have called on the ECB to relax its monetary policy and lower interest rates. The strategic interactions among the monetary and fiscal authorities may lead to extreme outcomes that make everyone worse off and provide a rationale for imposing fiscal constraints.

This is illustrated in the work of Dixit and Lambertini (2001, 2003). We consider a setting similar to theirs, but we assume for convenience that the parameters are constant rather than stochastic as in their case. A monetary union composed of n countries. The output supply equation of country i ($i = 1, \dots, n$) is:

$$y_i = \psi(\pi - \pi^e) + \sum_{j=1}^n \phi_{ij} x_j, \quad \phi_{ii} \neq 0, \quad (1')$$

where x_j is the fiscal instrument. Inflation is the same throughout the union and, hence, has no subscript to it. In fact, this supply equation can be thought of as the net effect of an inflation surprise after all the off-setting cross-border effects as captured in equation (1) have been cancelled out. Equation (1') then generalizes (1) by allowing for potential direct spillovers of fiscal policy (if $\phi_{ij} \neq 0$, if $j \neq i$). A higher value of x_j captures a more expansive fiscal policy (for example, an increase in government consumption or a reduction in distortionary taxation), which may exert a positive or a negative effect (the sign of ϕ_{ij} is unrestricted). Importantly, though, the presence of those direct fiscal spill-overs does not have any qualitative bearing on the results.¹⁰

Inflation is determined jointly by the monetary instrument μ and the national fiscal policies:

$$\pi = \mu + \gamma \sum_{j=1}^n x_j, \quad \gamma \neq 0, \quad (2)$$

where the parameter γ may be of either sign. A supply-side fiscal expansion depresses inflation ($\gamma < 0$), while a demand-side fiscal expansion produces the opposite effect ($\gamma > 0$).

The respective loss functions of the fiscal authority (F) in country i and the common monetary authority (M) are

$$L_i^F = \frac{1}{2} \left[(\pi - \tilde{\pi}_i^F)^2 + \alpha_{4i} (y_i - \tilde{y}_i^F)^2 \right] \quad \text{and} \quad L_i^M = \frac{1}{2} \left[(\pi - \tilde{\pi}^M)^2 + \sum_i \alpha_{5i} (y_i - \tilde{y}_i^M)^2 \right], \quad \alpha_{4i}, \alpha_{5i} > 0.$$

Crucial for the eventual outcomes, and the need for fiscal restrictions, is whether or not the various authorities agree on the ideal levels for output and inflation. If they do (see Dixit and Lambertini, 2003), i.e. $\tilde{\pi}^M = \tilde{\pi}_i^F$, $\forall i$, and $\tilde{y}_i^M = \tilde{y}_i^F > 0$, $\forall i$, there are $(n+1)$ objectives (n output levels and one inflation level) and an equal number of policy instruments. All the best response functions intersect at the same point and the ideal inflation and output levels emerge as equilibrium outcomes. This result obtains irrespective of whether the ECB is able to commit to its announcements and, in case it cannot commit, the relative timing of the authorities' movements (simultaneous or one before the other) in setting their policy instrument.¹¹ Anticipating that the fiscal policies can always be set to fulfill all output targets, the ECB as a first mover sets money growth (taking into account the anticipated fiscal choices) such that inflation hits its target. Similarly, when the ECB moves last, it

¹⁰ The next section explores in detail how fiscal spill overs may lead to fiscal free-riding and excessive deficits and, hence, provide another motive for fiscal constraints in a monetary union.

¹¹ With monetary commitment inflation expectations are formed after monetary policy is chosen but before fiscal policy is decided. Without commitment, all policy instruments are chosen after inflation expectations have been formed.

can always set money growth to hit the inflation target. Given expected inflation, and anticipating the ECB's policy choice, the fiscal authorities can always choose their instruments such that all output targets are achieved. The irrelevance of the ECB's commitment capacity and the sequencing of moves in this and specific related games are also formally demonstrated in Kempf and von Thadden (2008). With this game as an example, these authors also emphasize that the existence of cross-border spill-overs does not necessarily generate fiscal coordination problems; all the targets are achieved whether or not the national fiscal authorities coordinate.

This benign outcome is destroyed when the authorities disagree about the ideal policy outcomes (Dixit and Lambertini, 2001). Specifically, and realistically, assume that the ECB is more conservative in all respects than each of the fiscal authorities. That is, the ideal national output level of each fiscal authority exceeds that of the ECB ($\tilde{y}_i^F > \tilde{y}_i^M, \forall i$) and the ideal inflation rate of the ECB is lower than that of any of the fiscal authorities ($\tilde{\pi}_i^F > \tilde{\pi}^M, \forall i$). Moreover, $\alpha_{s_i} < \alpha_{a_i} / n, \forall i$ (and γ and ϕ_i are positive). Under these circumstances, with the various authorities moving simultaneously (after inflation expectations have been formed), in a Nash game a race emerges with fiscal expansion aimed at raising output and monetary contraction aimed at offsetting the effect of the fiscal expansion on inflation, and vice versa. This race yields outcomes that are more extreme than the bliss-points of all the policymakers; output in each country is above the fiscal authority's ideal level, while inflation is below the central bank's ideal level. These outcomes are socially undesirable. For example, too high output implies too little leisure and may result in an overheating economy causing macroeconomic instability, while too low inflation raises the likelihood of a deflationary trap. Formally, the disagreement about the policy objectives expands the number of targets beyond the number of available instruments, implying that not all targets can be reached.

In principle, there are different ways to avoid such extreme policy outcomes. One would be to better align the targets assigned to the monetary and fiscal authorities. While it may be relatively easy to modify the objectives of the central bank, this is a lot harder for the governments, which are under continuous political pressure from voters and interest groups to strive for a high level of economic activity. A second, more realistic possibility is to assign either the monetary authority or the fiscal authorities a leadership position in the game. The leader anticipates the reaction of the follower and by following a more moderate policy the former induces the latter to adopt a more moderate policy also. However, as we shall discuss later, there may be good reasons to put the ECB into a leadership position and not the fiscal authorities. The question is how this can be achieved in practice. This brings us to a third, and complementary, solution, which is to impose constraints on fiscal policy, thereby forcing the fiscal authorities to adopt more moderate policy stances and taking away the need for the ECB to engage in overly contractionary policymaking. In fact, by imposing

restrictions on the fiscal authorities, the ECB may effectively be put into a leadership position. At least, this is the role that some economists envisage for the SGP (see Ballabriga and Martinez-Mongay, 2003).

VII. Fiscal spill-overs, constraints and coordination in the EMU

This section explores further the consequences of monetary unification for the setting of fiscal policy. We focus, in particular, on fiscal free riding in a union and the need for fiscal restrictions.

Europe has a track record of high deficits that in most cases started after the oil shocks in the previous century. This phenomenon is often explained to arise from political distortions that induce governments to behave myopically. However, these distortions are present under any monetary regime. Hence, the question is why Europe's supranational fiscal constraints were adopted only as part of the move to monetary unification and not earlier. The answer must be that unification is perceived to either exacerbate already existing negative international spill-overs of undisciplined fiscal policies or that it creates new such spill-overs, while financial markets are unable to prevent this tendency. In this section, we first review the types of fiscal spill-overs and how they are affected by unification. We then discuss the need for fiscal constraints in connection with these spill-overs and, finally, we address the case for fiscal coordination.

VII.1. Types of cross-border spill-overs of fiscal expansions

Monetary unification may strengthen existing spill-overs of fiscal policy. A national fiscal expansion raises the demand for savings, *ceteris paribus* pushing up the long-run interest rate and discouraging investment. In an integrated capital market this effect will be spread to other countries, imposing a negative externality on these countries. In fact, Faini (2006) finds for the euro-zone that a unilateral fiscal expansion raises both interest rate spreads and the overall level of the interest rate. However, the effect on the domestic interest rate will be smaller the better integrated is the capital market. Hence, to the extent that EMU promotes capital market integration, it may exacerbate a pre-existing tendency towards high deficits because the consequences of a *unilateral* fiscal expansion in the form of a higher interest rate have become smaller (see Chang, 1990, and Canzoneri and Diba, 1991, for a formal modelling of these effects).¹² Based on evidence of falling yield spreads and the

¹² Ideally, governments should be induced to take into account the harmful international effects of unilateral fiscal expansions via a higher interest rate. This would induce them to limit their deficits. However, Buitert and Sibert (2003) argue that international spill-overs may also produce *too low* deficits. The argument is illustrated in the context of a

increasing importance of area-wide news for individual country debt returns, Baele et al. (2004) conclude that the euro-area public debt market has indeed become highly integrated.

EMU may also give rise to new fiscal spill-overs. An increase in government purchases primarily affects the demand for domestic products. This raises local inflation, thereby also raising average inflation in the euro-area,¹³ which forces the ECB to contract monetary policy for entire area. Further, a national fiscal expansion may produce an appreciation of the Euro, which undermines the external competitive position of all union members. Most of the original debate was concentrated on the possibility that the ECB may be forced to prevent a sovereign debt default, either by relaxing its monetary stance at the cost of raising union-wide inflation or by buying the debt of governments under financial distress. In the end, then, the European taxpayer would pay for the recapitalization of the ECB. The anticipation that the ECB would eventually step in, might lead to moral hazard with governments taking too much risk in their public debt policies.¹⁴ At the moment, sovereign default is mostly seen as only a rather remote possibility. However, even abstracting from this possibility, the debt increase produced by a unilateral fiscal expansion could induce the ECB to relax its monetary policy if it is not completely independent and committed to price stability. Below we will illustrate this mechanism in more detail and show how it provides a rationale for fiscal constraints.

A final new spill-over mechanism arises in the context of the so-called “fiscal theory of the price level” (FTPL), under which the central bank loses control over the price level because the fiscal authority follows a policy that is unsustainable at stable prices. As a result, the public budget constraint becomes an equilibrium condition, because an adjustment in the price level helps to bring the real value of the nominal government liabilities in line with the expected discounted value of the future primary government surpluses. Even if the monetary authority is totally committed to a policy rule, for example one under which it sets the interest rate as a function of inflation and the deviation of output from its potential level, it may still lose control over the price level. Woodford (1996) and Bergin (2000) apply the mechanism to a two-country model of a monetary union. The common price level is determined by the aggregate union-level budget constraint, implying that a unilateral increase in the nominal debt that is not backed by higher future taxes produces inflation.

model with tax collection costs, in which a current tax cut enhances resources for current private consumption, thereby producing a reduction in the interest rate that in an integrated capital market spreads to other countries as well. When their initial public debt is positive, other countries benefit because in servicing their public debt they need to collect less tax revenues and, hence, lose fewer resources to the collection of those revenues. Individual governments fail to internalize this beneficial spill-over and keep initial taxes too high.

¹³ Notice that this effect is captured in equation (2).

¹⁴ That this danger is not completely unfounded is illustrated by a recent (April 2009) statement of the Irish Finance Minister that the state’s guarantee to support banks has zero cost, because the ECB would be ready to bail out banks if necessary. While the ECB has made clear that it will only prevent bank failure for liquidity reasons, even the misperception of a possible ECB bail-out may increase the ease with which additional expenditures or contingent liabilities of the Irish type can be made politically acceptable as well as acceptable to the general public.

Fiscal solvency at the national level is no longer necessary for price stability, as long as the other government runs surpluses and is prepared to hold the debt of the profligate government. Vice versa, even if a country acts in a fiscally responsible way, the stability of its price level could still be threatened by the other country's fiscal profligacy. Hence, countries are rightly concerned about each other's fiscal policies and this provides a rationale for having some supranational agent impose union-wide debt restrictions. Such restrictions would put the economy into a "monetary dominance" regime in which the central bank regains control over prices, a situation that many (e.g. Ballabriga and Martinez-Mongay, 2003) would probably characterize as the most realistic one for the EMU.

VII.2. Is there a need for fiscal constraints in the EMU?

VII.2.1. Can financial markets deter fiscal profligacy?

The need for Europe's fiscal constraints depends on whether financial markets are able (or can be made) to prevent the perceived effects of EMU on fiscal profligacy and its spill-overs. The quantitative link between fiscal expansions and interest rates is unclear and empirical estimates typically depend on the econometric strategy and the sample period (for an overview, see European Commission, 2004, Part III). For example, for a sample of OECD countries, Ardagna et al. (2007) find that an increase in the primary deficit raises the (long-term) interest rate, but that the size of the effect differs strongly depending on whether one uses a static specification or a vector auto-regression. In fact, even if interest rates react exactly as predicted by theory, they would not be able to sufficiently discipline governments when there are international spill-overs of fiscal expansions. As discussed earlier, in a more integrated financial market an increase in the public debt leads to a smaller increase in the interest rate than under financial autonomy. Hence, if monetary unification produces more integrated markets for public debt, cross-border spill overs will become stronger and financial markets will do a *poorer* job in deterring fiscal profligacy.

Even in the pre-EMU era, financial markets have failed to prevent governments from building up large stocks of public debt despite the large cross-country dispersion of nominal interest rates (see Table 2). Since the admission of the first wave of participants into EMU, sovereign debt interest rate differentials have quickly fallen to very low levels. Even during the current crisis interest differentials are low by historical standards. Of course, those low differentials could be a reflection of market participants expecting all EMU members to follow disciplined fiscal policies, but it could also indicate that the ECB no-bail-out clause is imperfectly credible. Therefore, Buiter

and Sibert (2005) argue that the ECB should abandon its policy of treating all euro-zone public debt as equivalent and levy a mark up on the interest paid by the commercial banks when they pledge as collateral for the ECB public debt from countries in the Excessive Deficit Procedure. This would suppress the demand for this debt on the market and thus increase the spread in its interest rate.

VII.2.2. Monetary policy commitment and the need for fiscal restrictions

We shall now discuss fiscal free-riding in an EMU composed of small open economies that are perfectly integrated in the world capital market and where default risk is unaffected by the outstanding public debt. As a result, the interest rate will be unaffected by a fiscal expansion. Even though financial markets function properly, there may be a rationale for fiscal constraints. This will depend rather crucially on whether the ECB can commit and possible pre-existing political distortions leading to myopic government behaviour already before unification. In the absence of those distortions, fiscal restrictions are needed only when the ECB cannot commit.

Chari and Kehoe (2007) illustrate this in a two-period EMU model with national fiscal policies. Because each union member is small, it is unable to influence the world interest rate. Public debt is nominal, providing the ECB with an incentive to reduce its real value by relaxing monetary policy.

The government of union member i ($i = 1, \dots, n$) maximizes the utility $u(C_{i1}) + u(C_{i2})$ of its representative consumer over the consumption levels C_{i1} and C_{i2} in periods 1 and 2 and subject to the budget constraints

$$C_{i1} = Y_1 + B_i \quad \text{and} \quad C_{i2} = Y(\pi) - (1 + R_i)B_i / (1 + \pi),$$

where Y_1 is the initial endowment, R_i the nominal interest rate and B_i is the amount of non-indexed debt issued by the government. There is no discounting and the initial price level is normalized to unity, implying that B_i is also the real amount of debt issued in period 1. Further, $Y(\pi)$ is thrice continuously differentiable, strictly concave and reaches a maximum at zero inflation, hence $Y'(\pi) < 0$ for $\pi > 0$. Importantly, Y_1 is sufficiently larger than $Y(0)$ to ensure that governments borrow in period 1. Notice that the final term in the expression for second-period consumption is the real debt-plus-interest repayment. Debt is sold to risk-neutral investors, whose number is so large that they compete away any profit and, hence, are prepared to buy the debt if

$$(1+R)/(1+\pi)=1. \quad (3)$$

where $R \equiv R_1 = \dots = R_n$ is the common interest rate.

We solve the model backwards. In the absence of commitment, the ECB moves last and maximizes for given R over π the average second-period utility in the union

$$\max_{\pi} \frac{1}{n} \sum_{i=1}^n u \left[Y(\pi) - (1+R)B_i / (1+\pi) \right].$$

Assuming a symmetric equilibrium and using (3), the first-order condition is:

$$Y'(\pi) + \bar{B} / (1+\pi) = 0, \quad \text{where } \bar{B} = \frac{1}{n} \sum_{i=1}^n B_i. \quad (4)$$

It is easy to see that (4) implies that the inflation rate is increasing in average union debt \bar{B} . Hence, one can write $\pi = \pi(\bar{B})$ with $\pi' > 0$. Importantly, the effect of an increase in any *individual* country i 's debt on union inflation is diluted by the union's size n . This is the source of the fiscal free-riding problem.

Further working back through the game, government i maximizes $u(Y_i + B_i) + u \left[Y(\pi(\bar{B})) - B_i \right]$ over B_i , which implies that:

$$u'(Y_i + B_i) = \left[1 + \frac{1}{n} \Gamma(\pi) \right] u'(Y(\pi) - B_i), \quad (5)$$

where $\Gamma(\pi) \equiv Y'(\pi) / [Y'(\pi) + (1+\pi)Y''(\pi)]$ and use is made of the expression for $\pi(\bar{B})$ implied by (4). For given inflation, B_i is increasing in the size of the union n . Further, for $Y''(\pi)$ and $Y'''(\pi)$ sufficiently close to zero, it is easy to see that a (larger) union implies higher average debt and higher inflation in equilibrium.

An individual government neglects any negative foreign spillovers and realizes that the cost of an individual fiscal expansion in terms of higher inflation and, hence, lower national output is smaller in a (larger) union. Hence, compared to monetary autonomy, fiscal policy will be more expansive and inflation higher in a union, and more so in a larger union. *Therefore, in the absence of monetary commitment, imposing appropriate restrictions on public debt is beneficial because it effectively eliminates this free-rider problem.*

Fiscal free-riding vanishes under monetary commitment. Now, the governments move last and select debt to maximize for given inflation $u(Y_1 + B_i) + u(Y(\pi) - B_i)$, where (3) has been imposed. Hence, debt becomes the function $B_i(\pi) = (\frac{1}{2})(Y(\pi) - Y_1)$ of inflation, which, together with (3), the ECB takes account of when it maximizes its own objective function over inflation:

$$\frac{1}{n} \sum_{i=1}^n \left[u(Y_1 + B_i(\pi)) + u(Y(\pi) - B_i(\pi)) \right] = 2u\left(\frac{1}{2}(Y_1 + Y(\pi))\right). \quad (6)$$

The optimum is achieved at $\pi = 0$. Under commitment the selected debt level $B_i(\pi)$ ceases to be a function of the union's size and, hence, the fiscal free-rider problem vanishes. Because debt is chosen last, as a function of inflation it is the same as under autonomy, implying that also inflation in the union will be the same as under autonomy (the first-order condition for maximizing (6) coincides with the corresponding condition under autonomy, assuming commitment). In fact, *because under commitment the only existing distortion (discretion) has been removed, social welfare as measured by the utility of the representative consumer attains its highest level and debt restrictions are unnecessary.*

VII.2.3. The role of pre-existing political distortions

In the framework just discussed, fiscal policy is sufficiently disciplined under monetary autonomy. However, the literature has emphasized the existence of political distortions that already produce excessive deficits under monetary autonomy, while the consequences of these distortions may be worsened by the move to EMU. Hence, while there may already be a rationale for fiscal constraints under autonomy, this rationale will be strengthened under EMU.

Beetsma and Uhlig (1999) present a model with this property. Again, the model features two periods and n small open economies selling debt to risk-neutral investors on the international capital market. Instead of a benevolent government concerned with national welfare, each country now has two political parties that prefer different public goods (although these goods are perfectly substitutable in the population's preferences). In the first period, one of the parties forms the government, while at the start of the second period a general election determines with an (exogenous) probability whether the incumbent will lose office. Anticipating the possibility that resources saved for the future may be used by the other party for the public good that provides no benefit to the incumbent, the latter supplies too much (from society's perspective) of its (own) public good in the first period, thereby generating a debt bias.

As in Chari and Kehoe (2007), debt is non-indexed and the central bank inflates away some the public debt's real value in the second period. Unification or expansion of an existing union gives rise to a very similar fiscal free-riding problem as discussed above. Now, however, the free-riding problem exacerbates a political debt bias that already exists under autonomy. There exists already a (utilitarian) social welfare case for debt restrictions under autonomy and this case is strengthened in a union.

However, while debt restrictions may be desirable from a social welfare perspective, the question is whether incumbent governments would be prepared to impose such restrictions upon themselves. As it turns out, they are not willing to do so under autonomy, but they do favor such restrictions under a union because of the fiscal free-riding problem that yields equilibrium debt levels that are even too high to the liking of the incumbents. This may help to explain why the European governments signed an SGP only as part of the agreement on the EMU and not before. The model also predicts that the selected debt restriction only eliminates the *additional* debt produced by the EMU, implying that debt will still be too high from a social perspective. In this connection, it is interesting to notice that it was relatively easy to get governments (also those with debt ratios above the 60% level) agree on the EU Treaty restrictions, but more difficult to have them sign the SGP. When the Treaty was signed, the EMU was expected to materialize only rather far into the future and it was likely that by that time a different government would be in power and have to face the fiscal restrictions. When the SGP was signed, the likelihood of not being subject to those restrictions had become a lot lower due to the shorter time left to unification.

VII.2.4. Further discussion on the role of monetary commitment

Chari and Kehoe (2007) derive the strong result that fiscal constraints can only be beneficial in the absence of monetary commitment. For the EMU this leads to two possible interpretations. The positive interpretation is that the time inconsistency problem in monetary policy has *not* been solved by the Treaty, for example because countries dispose of ways – such as the (political) appointment of their national central banker – to influence ECB decision making. Hence, there was still perceived to be a need for fiscal restrictions. The normative interpretation says that the ECB price stability mandate and its independence guaranteed by the Treaty have solved the time inconsistency problem and, hence, the EU fiscal constraints are unnecessary and possibly even harmful.

While in Chari and Kehoe (2007) monetary commitment obviates the need for fiscal restrictions, in Beetsma and Uhlig (1999) it *strengthens* the case for such restrictions. With the ECB

is committed to producing zero inflation, there are no future inflationary consequences to deter fiscal profligacy. Hence, the debt bias is at its worst. However, it no longer depends on the monetary regime, because the fiscal free-rider problem via the common monetary policy has vanished in this extreme case. Nevertheless, the political distortions leading to this extreme debt bias render fiscal restrictions socially desirable also in an EMU with an independent central bank subject to a strict price stability mandate.

VII.3. Coordination and fiscal discipline in a monetary union

The euro-zone has no formal institutions for fiscal coordination, let alone for policy coordination between the ECB and the fiscal authorities. While fiscal matters are addressed in the ECOFIN Council and decisions reached in this Council are binding, countries remain essentially free to set their fiscal policies as they wish. The Council cannot force them to coordinate their responses to economic shocks, although countries are of course free to do so on a voluntary basis. Besides the ECOFIN Council, there is the so-called “Eurogroup”, which is composed of the Finance Ministers of the euro-area only. In contrast to the ECOFIN Council, the Eurogroup has no formal powers and it cannot take binding decisions. Nevertheless, there have been pressures, especially from France, to raise the status of the Eurogroup and transform it into a counterweight to the ECB.¹⁵

Although the euro-zone fiscal policies are formally uncoordinated, it is still important to explore the implications of fiscal coordination, because it surfaces from time to time in the policy debate, while at some moment in the future national politicians may be willing to surrender fiscal powers to some supranational fiscal arrangement. In fact, the current economic and financial crisis has revived the discussion about the need for fiscal coordination. Individual countries (in particular, Germany) have been reluctant to engage in active fiscal expansion in response to the crisis, possibly because they fear that much of the benefit would leak abroad through higher imports. As a result, at the end of November 2008, the EU presented its European Economic Recovery Plan aimed at a discretionary fiscal stimulus of about 1.5% of EU GDP in order to mitigate the fall in economic activity. Of the 1.5%, 1.2% would come from the EU Member states and the remainder from the EU budget and the European Investment Bank.

We discuss how fiscal coordination affects fiscal free riding and thus how it affects the need for fiscal restrictions. Again, the Chari and Kehoe (2007) model can be conveniently used to

¹⁵ A number of countries have dismissed this idea and also the ECB is strongly against any arrangement that promotes formal fiscal coordination (see Issing, 2002). Presumably, the ECB fears that its independence will be undermined, because its strategic position against the fiscal authorities as a group would weaken.

explore the issue. Under fiscal coordination, and in the absence of monetary commitment, the governments maximize over B_1, \dots, B_n the average of the national objective functions:

$$\frac{1}{n} \sum_{i=1}^n \left\{ u(Y_i + B_i) + u \left[Y(\pi(\bar{B})) - B_i \right] \right\},$$

where we have used condition (3). As before, exploiting the central bank's first-order condition (4), the first-order condition for B_i is:

$$u'(Y_i + B_i) = [1 + \Gamma(\pi)] u'(Y(\pi) - B_i).$$

Comparing with (5), the union size n no longer affects the choice of debt, implying that fiscal coordination in the EMU produces the same outcomes as under autonomy and, hence, less expansive fiscal policies than without coordination (under the conditions indicated above).

This finding may generate the false impression that the need for fiscal restrictions is driven by a lack of fiscal coordination, while it is in fact the absence of monetary commitment that necessitates those restrictions. Under commitment, the coordinating fiscal authorities jointly maximize for given inflation rate the left expression in (6). The resulting first-order conditions are identical to those for the debt choices in the absence of coordination. Hence, with commitment the equilibrium allocation under fiscal coordination coincides with that under non-coordination and thus also coincides with the first best outcome, as discussed earlier. In other words, only in the absence of commitment fiscal constraints can be needed. In fact, lack of fiscal coordination *exacerbates* the commitment failure and *enhances* the need for debt ceilings when monetary policy is discretionary. This result also obtains in the Beetsma-Uhlig (1999) model with the political distortion, because only the lack of commitment produces a fiscal free-riding problem operating through the common monetary policy.

Fiscal coordination in a monetary union may also reduce welfare. Beetsma and Bovenberg (1998) show this using a model in which governments can only resort to distortionary (output-reducing) taxes and are Stackelberg leaders against an ECB that is unable to commit. In order to protect economic activity and employment, the ECB relaxes monetary policy in response to a higher union-average tax rate. Because the governments anticipate this response and realize that higher inflation alleviates their budget constraint (through a reduction in the value of non-indexed debt) they set the tax rate "too high" to force the ECB to relax monetary policy. In a larger monetary union, each government perceives a smaller effect of its own individual policy on the

common monetary policy and, therefore, selects a lower tax rate. However, fiscal coordination undoes this effect because it induces individual governments to internalize the beneficial effect of a tax increase for other governments. In effect, fiscal coordination strengthens the strategic position of the governments against the ECB. In equilibrium, the fiscal expansion induced by coordination is welfare reducing, because the debt-deflation pressure is anticipated through higher inflation expectations and the ex-post real debt return is unaffected. The consequence is an equilibrium with too high taxes and too much government spending.

In sum, fiscal coordination in a union can affect fiscal discipline in both directions. It induces governments to internalize the externalities of their policies among themselves.¹⁶ However, this does not imply that fiscal coordination leads to more discipline. In this regard, and in contrast to the framework in Dixit and Lambertini (2001) where the leadership of either authority is desirable, the strategic position of the fiscal authorities against the ECB is crucial. If they lead the ECB in their policy choices they may force the ECB to relax its policies and they will be more effective in doing so if they coordinate their policies and thus operate as a collective. Hence, fiscal coordination *is not an alternative* for imposing fiscal restrictions. It may reduce or enhance the need for such restrictions. Given the ambiguity about the consequences of fiscal coordination, further steps towards formal fiscal coordination in the euro-zone should only be taken with great care.

VIII. Europe's fiscal constraints in practice

In the previous sections we have discussed different rationales for fiscal restrictions in the EMU. However, the actual design of these restrictions is more complicated than their simple representation in the literature reviewed so far. Moreover, their practical implementation encounters problems that tend to be ignored in these contributions. A key question is whether fiscal restrictions can be designed in such a way that they are effective, but do not produce harmful side effects.

VIII.1. Strengths, weaknesses and performance of the SGP

While the SGP's 3% deficit limit is a highly transparent and well-defined criterion, it has been widely criticised as arbitrary and inadequate, because it does not take account of the systematic differences across the EMU members. The SGP has been criticized for other reasons as well.

¹⁶ Uhlig (2003) develops a model in which fiscal coordination eliminates the overly active, but in equilibrium offsetting, national fiscal responses to cost-push shocks. Because variations in the fiscal instrument are assumed to be costly, fiscal coordination raises welfare.

Because monetary policy can only be employed to stabilize the aggregate EMU economy, national fiscal policies should play a larger role in stabilizing country-specific shocks.¹⁷ The SGP is considered too rigid for fiscal policy to fulfil this stabilizing role, since the 3% deficit limit is (largely) independent of a country's cyclical situation. Countries in a downturn generally feature higher deficits and may even be forced to contract fiscal policy at a moment that an expansion would be desirable. Even if an active fiscal policy is not an option, there is widespread agreement that at least the automatic stabilizers should be allowed to operate freely, assuming that aggregate demand depends on disposable income.¹⁸

Compliance with the Pact's MTOs would normally imply enough room for the automatic stabilizers to operate freely without the 3% deficit limit being violated. However, many countries have not yet reached their MTO (see Morris et al., 2006), or have even been driven further from their MTO because of the current economic crisis, implying that in principle the room for automatic stabilization, let alone for stabilization through active fiscal policy should have been rather limited. The question is whether this has indeed been the case in reality. Galí and Perotti (2003) explore whether fiscal balances from which the automatic influence of the business cycle is purged still react in a systematic way to the business cycle. Fiscal policy is counter-cyclical (pro-cyclical) if the resulting discretionary response tends to be expansive (contractive) in response to a negative output gap and contractive (expansive) when the output gap is positive. The authors find that fiscal policy in the euro area has turned from pro-cyclical in the period before the Treaty was signed to a-cyclical over the period 1992-2002. Moreover, they conclude that this change has not come at the cost of less effective use of the automatic stabilizers. If anything, this suggests that the EU fiscal rules have improved fiscal stabilization policy. Wyplosz (2006) confirms Galí and Perotti's findings by splitting the second part of his sample into a "Maastricht period" (1992-1998) and a euro period (1999-2005). Both sub-periods are characterized by a-cyclical fiscal policy.

However, one should be careful drawing strong conclusions from these findings. First, fiscal flexibility may have remained unhampered precisely because the enforcement of the 3% deficit limit has been weak (see below). Second, EU members from outside the Euro-area and a group of other OECD countries show a similar tendency towards more counter-cyclicity. Finally, the latest years of the already brief existence of the Pact have not been included. In fact, Annett's (2006)

¹⁷ This argument is weakened by the fact that in large parts of the euro-zone monetary independence had de facto already vanished long before unification took place, implying that the need for fiscal stabilization would essentially remain unchanged. Moreover, active fiscal stabilization is generally hazardous given the difficulty in timely observing the economic situation, the implementation lag in fiscal policy changes and the substantial uncertainty about its effects on the economy.

¹⁸ The idea behind the automatic stabilizers is that the system of taxes and transfers dampens disposable income (in the absence of policy intervention, during a downturn, taxes fall while spending on transfers, in particular unemployment benefits, rises; vice versa, during an upturn). This dampens movements in consumption, which is assumed to be directly linked to disposable income. In turn, this reduces fluctuations in GDP itself.

findings suggest that the pro-cyclicality of fiscal policy may have increased again after the introduction of the SGP.

Further criticisms have been levelled at the SGP. First, governments under pressure to comply with its restrictions might be tempted to reduce spending on those items that are politically easiest to cut.¹⁹ This would most likely be public investment. However, Galí and Perotti (2003) only detect a global trend towards lower public investment with the euro-area even lagging behind the rest of the OECD. Second, because deficits tend to be high when the business cycle is unfavourable, imposing sanctions under those circumstances would actually be counterproductive. Third, as Buiter (2005) argues, the SGP only addresses the individual countries' fiscal positions, but ignores the aggregate fiscal stance in the Euro-area. It is the latter that matters most for the ability of the ECB to pursue an independent monetary policy. However, an SGP that also takes account of the overall fiscal stance would run into practical difficulties. In particular, if this overall stance is too loose, then it may hard to get countries agree on a specific division of the required fiscal contraction.

The final, and possibly most relevant, criticism on the design of the SGP is that its implementation is based on qualified majority voting by the ECOFIN Council. Indeed, in their work on the effectiveness of the state-level balanced budget rules in the U.S., Inman and Bohn (1996) conclude that for those rules to be effective they should be enforced by an independent supreme court capable of imposing serious penalties.²⁰ Naturally, finance ministers are reluctant to cast a negative vote on their colleagues if they fear "retaliation" in the future. This is not conducive to a strict enforcement of the SGP and a lack of credibility of the Pact undermines the incentives of governments to improve their structural fiscal position. Hence, a potential vicious circle is created. Indeed, over its rather brief life the Pact's 3% deficit limit has already been frequently violated, leading to a substantial number of Excessive Deficit Procedures (see Table A1 in the Appendix), but no sanctions yet.

The weak enforcement of the 3% deficit limit is not enough to conclude that the Pact has had no effect on fiscal discipline. *Ceteris paribus*, average deficits and their peaks could have been even higher without the SGP. To shed light on this matter, Table 4 reports budgetary outcomes for the euro-11 and the EU-3 for the sub-period 1980-1991 before the EU Treaty was signed, the sub-period 1992-1998 of the run-up to EMU when countries may have been unusually disciplined in order to qualify for EMU entry, and the sub-period 1999-2007 after entry when they were bound by

¹⁹ A related objection is that the 3% deficit may induce governments to artificially reduce the official deficit, such as moving certain spending items off the budget or privatizing public assets (these operations are know as "stock-flow adjustments" and they weaken the link between deficits and debt accumulation).

²⁰ More recent contributions for the U.S. are Fatás and Mihov (2006) and Canova and Pappa (2006).

the SGP. We also show the figures for the EU-3 to see whether these countries, which have explicitly chosen to remain outside the euro-area and, hence, are not subject to potential SGP sanctions, have behaved differently from the euro-11. Finally, to also compare with countries outside the EU, we report the same figures for the OECD-5.

The cyclically-adjusted primary deficit (CAPD), which controls for both the business cycle and debt interest payments, fails to produce an unambiguous conclusion about the disciplining effect of the SGP. While the CAPD of the euro-11 is lower during the third sub-period than during the first sub-period, this is also the case for the CAPD of the EU-3 and, to a lesser extent, of the OECD-5. Further insight may be obtained by considering the “exogenous CAPD”, estimated as the residuals of regressions of the CAPD on its lags. The idea is that the potential persistence in the CAPD might result in an unduly positive assessment of the disciplining effect of the SGP, because of the consolidation efforts in the run-up to the EMU. While the sum of these residuals over all observations is zero by construction, it is the difference in their average size across sub-periods that makes them interesting. We see that for the euro-11, this average is only marginally smaller over the third sub-period than over the first sub-period, while, not surprisingly it is negative (and larger in absolute value) during the second sub-period. The performance of the EU-3 seems to be better during the third than during the first and second sub-periods, and the same is the case for the OECD-5, although the differences across the periods are very small. Overall, this simple data exploration reveals little or no effect of the SGP, whether we compare across periods or across groups of countries.

Table 4: Budgetary outcomes in various sub-periods

	Cyclically-adjusted deficit		
	1980-1991	1992-1998	1999-2007
euro-zone	4.91	3.77	1.40
EU-3	2.30	3.33	-0.42
OECD-5	3.64	2.25	0.65
	CAPD		
	1980-1991	1992-1998	1999-2007
euro-zone	0.98	-1.26	-1.36
EU-3	-0.42	1.06	-1.65
OECD-5	0.69	-0.54	-0.67
	“Exogenous” CAPD		

	1980-1991	1992-1998	1999-2007
euro-zone	0.14	-0.36	0.07
EU-3	0.01	0.23	-0.20
OECD-5	0.07	0.04	-0.05

Notes: (1) Figures represent un-weighted averages over countries and are expressed in percent of potential GDP. (2) The euro-11 is Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal and Spain. (3) The EU-3 is Denmark, Sweden and the U.K. (4) The “exogenous CAPD” is obtained by taking the residuals of a regression of the CAPD on its first two lags on a country-by-country basis. Each cell gives the average over the relevant countries and years of these residuals. These numbers are in percent of potential GDP. Data source: OECD (2008).

VIII.2. Alternative proposals to strengthen fiscal discipline in the EMU

Perceived flaws in the design of the SGP and a disappointing experience with its enforcement have produced numerous proposals to improve its functioning. According to Eichengreen (2005), a natural route would be to give the European Commission a larger role in its enforcement. In fact, the Commission’s role has already increased with the revision of the Pact in 2005, which has enhanced the focus on the structural deficit as well as the level of the public debt and the long-run sustainability of fiscal policy. However, giving the Commission more enforcement power is a sensitive matter, because of the limited degree of political integration in Europe and the lack of democratic accountability of the Commission. Moreover, in recent years, there has been a backlash of Euro-scepticism in which “Brussels” is seen as having too many powers relative to the national governments.

Other contributions want to complement the SGP with additional national arrangements aimed at fostering discipline or to replace it with completely new arrangements. An interesting example is Casella’s (1999) proposal to introduce a market-based system of tradable deficit permits, in which the total supply of deficit permits is determined each year by the overall deficit ceiling in the euro-zone. Governments temporarily in need of more resources could buy additional permits from other countries and, hence, the one-size-fits-all-constraint of the SGP is avoided. Also, the overall deficit ceiling can be adjusted to Europe’s cyclical circumstances. Disadvantages of the proposal are the difficulties in getting countries to agree on this overall ceiling, the enforcement of the system and the incentive to systematically underreport national deficits.

Dissatisfaction with the SGP and fiscal rules more generally has also stimulated interest in the idea of independent fiscal agencies, which come in two basic forms as discussed in Debrun et al. (2009). *Fiscal councils* strengthen the commitment to fiscal rules and as such are complementary to them. Typically, they would assess the adherence to existing fiscal rules (by providing objective analysis of current fiscal developments and their macroeconomic context) and possibly provide recommendations for improving fiscal policymaking. *Independent fiscal authorities* would be

endowed with a mandate to decide on specific aspects of fiscal policy (such as the target for the fiscal balance which the government would have to respect) within the confines of some framework established by the political principals. Such an authority would be able to exert discretion in areas where politician's incentives are known to be distorted. As such it would obviate the need for a fiscal rule that has to be inflexible to be effective in enforcing fiscal discipline. To date, however, there exist no independent fiscal authorities of the type described here, presumably because of the difficulties in defining an appropriate mandate and the unwillingness of politicians to delegate some of their decision power to an unelected, technocratic body.

While the enforcement of fiscal discipline at the EU-level remains problematic, any further measures aimed at containing fiscal profligacy need to be organized at the national level. Some countries have introduced national fiscal rules complementary to the SGP and/or have established a "medium-term budgetary framework" under which they set multi-annual fiscal plans and follow a fiscal process in accordance with those plans. Moreover, national fiscal councils (such as in Belgium and more recently also in Sweden) are now entering the fiscal landscape.

IX. Monetary unification and structural reforms

Analysis of the costs and benefits of monetary unification is usually conducted under the assumption that structural distortions, such as rigidities in labor and product markets, are given. However, the process of entry into a monetary union and membership of a union may themselves affect market flexibility by influencing the incentives for structural reforms. This way, the net benefit of unification becomes endogenous.²¹

There is a widespread agreement on the need for structural reforms in the euro-area, given the high and persistent unemployment rate in some countries, large wedges between total unit labour costs and net consumption wages and the evident lack of competition in some sectors of the economy. In fact, one of the original arguments in favor of the EMU was that the competitive pressures introduced by the euro (for example, through more transparency about prices and the elimination of the possibility to devalue the exchange rate) would force governments to introduce structural reforms and make markets more flexible. However, recent theoretical literature on how EMU affects the incentives for structural reform, in particular labor market reform, does not

²¹ There is an analogous reason why the desirability of monetary unification may be endogenous. Frankel and Rose (1998) present empirical evidence that countries with more bilateral trade feature higher business cycle correlations. If monetary unification induces countries to trade more with each other (for which there is substantial evidence – see the survey in Baldwin, 2006), business cycle correlations rise and it becomes easier to meet the OCA criteria.

unambiguously confirm this conjecture and shows that free-riding problems analogous to those in fiscal policy may undermine the reform efforts in a monetary union.

It is useful to distinguish between reform induced by the desire to become EMU member and the incentive for reform once membership has been secured. In particular, the desire to qualify for membership could provide an extra impulse for structural reform. Entry into the EMU imposes fiscal restrictions, limits on nominal interest rates and inflation, and the criterion that exchange rate has been stable before entry. The non-fiscal criteria are often regarded as irrelevant, because once a country has adopted the euro nominal interest rates and the inflation rate converge to those of the euro area, while the exchange rate ceases to exist. At most these criteria would serve as a screening device for whether the country is ready to accept a tight monetary policy. However, this view neglects the potential beneficial effect that these criteria may have on structural reforms. For example, with more flexible labor markets the inflation and interest rate criteria can be more easily fulfilled, because less distorted labor markets featuring lower unemployment weaken the incentive for surprise monetary expansions, implying a smaller inflation bias as well as lower nominal interest rates. Ozkan et al. (2004) demonstrate this argument with a formal analysis.

That membership of a monetary union may generate free-rider problems analogous to those in fiscal policy is conveniently illustrated in a simple set-up borrowed from Calmfors (2001). Consider some country i . Its unemployment rate is given by:

$$u_i = u_i^* - \psi(\pi_i - \pi_i^e) + \varepsilon_i, \quad \psi > 0,$$

where u_i^* is the natural unemployment rate and $\varepsilon_i = \zeta + \nu_i$. Here ζ is a common shock and ν_i a country-specific shock. For simplicity, we assume that shocks always have mean zero, while all potential shock correlations are zero. Structural labor market reform $s_i \geq 0$ reduces equilibrium unemployment such that:

$$u_i^* = \bar{u} - \delta s_i, \quad \delta > 0,$$

where \bar{u} is equilibrium unemployment in the absence of reform ($s_i = 0$). Here, one might think of structural reform as a reduction in employment protection or changes in the legal framework for wage setting that reduce the power of trade unions. Implementing reform is politically costly, because those who are negatively affected may take to the streets or vote for the opposition at the next parliamentary or presidential election. Therefore, the government faces a “traditional” loss function, augmented with a final term that captures this reform cost:

$$L_i^F = \frac{1}{2}\pi_i^2 + \frac{\alpha_6}{2}u_i^2 + \alpha_7s_i, \quad \alpha_6, \alpha_7 > 0.$$

Monetary policy is selected by a common central bank for the $n \geq 1$ countries. The central bank is concerned with union averages (denoted by an upperbar) and features a standard loss function:

$$L^M = \frac{1}{2}\pi^2 + \frac{\alpha_6}{2}\bar{u}^2,$$

where inflation is assumed the same throughout the union, $\pi_i = \pi$ for all i .

Labor market institutions s_i are determined first, followed by inflation expectations. After that, the shocks materialize and, finally, the central bank directly sets the inflation rate. Working backward and minimizing L^M we obtain:

$$\pi = \alpha_6\psi\bar{u}^* + \frac{\alpha_6\psi}{1 + \alpha_6\psi^2}\bar{\varepsilon}.$$

The government balances the benefits and costs of more reform. Taking reform in other countries as given and taking account of its effect on inflation via \bar{u}^* , minimization of $E[L_i^F]$ yields the first-order condition for reform in country i as

$$-\alpha_6\delta u_i^* - \frac{\delta}{n}(\alpha_6\psi)^2\bar{u}^* + \alpha_7 = 0.$$

The first term on the left-hand side is the direct gain from reform in terms of lower natural unemployment, while the final term captures the marginal cost of reform. The second term is the marginal (indirect) gain from the inflation reduction produced by the fall in natural unemployment and, hence, the diminished incentive of the central bank to generate surprise inflation. Clearly, monetary unification (a shift from $n = 1$ to $n > 1$) or the enlargement of a monetary union reduces this indirect gain via lower inflation, because the inflation reduction from an individual increase in reform is diluted in a (larger) monetary union with a central bank that attaches only a “1 over n” weight to each individual country.

Hence, a free-riding problem akin to those discussed in the context of fiscal policy emerges also here in the choice of reform. In a monetary union, the benefit of an individual reform increase

spreads to all other countries through the common monetary policy, while the cost is born at the national level. This results in too little reform in a union. In the context of related frameworks, Sibert and Sutherland (2001) and Chari and Kehoe (2008), who generalize their (2007) model to free-riding problems in labor market policies and bank regulation in a monetary union, also conclude that monetary unification weakens the incentive for reform.

The above free-riding problem may become less severe if reform not only reduces the natural level of unemployment, but also the sensitivity of unemployment to shocks. Specifically, suppose that unemployment is now given by:

$$u_i = u_i^* - \psi(1 - s_i)(\pi - \pi^e) + (1 - s_i)\varepsilon_i, \quad (7)$$

where, as before, $u_i^* = \tilde{u} - \delta s_i$, and s_i can now be thought of as the share of flexible sectors in the economy. In flexible sectors wages respond to shocks so as to instantaneously clear the sector-specific labour market. Now reform no longer only reduces natural unemployment. By limiting nominal wage rigidity, it also diminishes the effectiveness of monetary policy in reducing unemployment (see the second term on the right-hand side of (7)). This weakens the incentive to engineer surprise inflation. Moreover, it also weakens the transmission of shocks into unemployment (see the final term in (7)). Because a union-wide monetary policy fails to stabilize the national component of ε_i , everything else equal government i will now choose to reform more than under autonomy to partially offset the reduced stabilization of the idiosyncratic part of the shock. (More reform implies less impact of $(1 - s_i)\varepsilon_i$ on unemployment u_i .)

The preceding discussion shows that the theoretical effect of monetary unification on structural reforms is ambiguous. This ambiguity arises from other arguments as well. On the one hand, as Bean (1998) argues, reform may not only lower equilibrium unemployment, it may also reduce the sacrifice ratio, for example, by diminishing the persistence in wage setting arising from Taylor-type overlapping wage contracts. A lower sacrifice ratio is relatively more desirable in a union than under monetary autonomy, because exchange rate depreciation is no longer available to cushion a disinflation. On the other hand, in a union supply-side reform at the national level can no longer count on the monetary authority supporting the reform with a stimulus of aggregate demand. This effect is likely to be stronger for large and more closed economies where the slack created by the reform is not so easily absorbed by additional exports. This shifts the burden of generating more demand to the fiscal authorities, who however may be constrained by the SGP.

While theoretical considerations do not provide a clear answer about the effects of the EMU on structural reforms, the same is true for the empirical work that is available to date. The empirical

analysis by Duval and Elmeskov (2006) for OECD countries indicates that for large countries the loss of monetary autonomy may negatively affect the likelihood of undertaking structural reforms. Duval (2008) provides evidence that sound public finances and fiscal expansions (to compensate potential losers) stimulates reform and that the effect of fiscal expansion on reform may be larger under a fixed exchange-rate regime. Alesina et al. (2008) explore structural reforms in different sectors (energy, communication and transport) for three groups of countries (euro-area, non-euro EU and other OECD countries) over the period 1975-2003. They distinguish between product market reforms and labor market reforms. By reducing rents, the former are supposed to ameliorate the resistance to labor market reforms since there remains less to be gained from not reforming. The authors find evidence that, even when controlling for the introduction of the Single Market, the adoption of the euro has accelerated the pace of product market deregulation. However, the euro does not seem to have speeded up labor market reforms, although the countries that eventually joined the EMU achieved more wage moderation during the run-up to the euro.

X. Other and prospective monetary unions outside Europe

Outside Europe monetary unification is also on the agenda. In the Middle-East, the countries participating in the Gulf Co-operation Council (the United Arab Emirates, Saudi Arabia, Kuwait, Qatar, Oman and Bahrain) intend to introduce a common currency, the Khaleeji, by 2010. Further, in Africa plans exist for a West African Monetary Zone (WAMZ) by the end of 2009. Both unification processes have been stimulated by the example of the euro, while the macroeconomic convergence criteria for those unions are partly copied from those for the EMU. However, the cost-benefit trade-off of unification can be quite different for developing countries, some of which are moreover highly dependent on natural resources.

X.1. Monetary unification in Africa

Africa is already home to several monetary unions, including the West African Economic and Monetary Union (WAEMU) and the Central African Economic and Monetary Community (CAEMC).²² Each of these unions has its own central bank and its own currency, of which the

²² There exists also Southern Africa's Common Monetary Area, which comprises the Republic of South Africa, Lesotho, Swaziland and Namibia. Monetary policy for the area is determined by the South African Reserve Bank. Each member country has its own currency, while the South African rand is also legal tender in all countries, except for Swaziland. South Africa shares its seigniorage revenues with Lesotho and Namibia. See Masson and Patillo (2004) for a more detailed description. Further, there exists an agreement among the 14 countries of the Southern African

exchange rate is fixed to the euro. Gambia, Ghana, Guinea, Nigeria and Sierra Leone plan to form a new monetary union, the West African Monetary Zone (WAMZ), by 2009, with the “Eco” as the common currency. The West African Monetary Institute in Ghana, the forerunner of the new common central bank, is preparing the launch of the new currency. The eventual objective is to merge the WAMZ with the WAEMU into a new, larger union called the “ECOWAS”.

The main obstacles to forming the WAMZ are the differences in external shocks and national differences in the need for seigniorage revenues. In particular, international trade by these countries is heavily concentrated towards commodity exports. Therefore, terms of trade shocks tend to be relatively large, and are typically not very highly correlated across the countries. For example, the largest country in the region, Nigeria, is the only oil exporter. Moreover, internal trade among the prospective union members is relatively small. Finally, the countries that intend to form the WAMZ suffer from weak currencies and chronic budget deficits. Hence, seigniorage revenues play a relatively large role and this is likely to remain the case, because the new common central bank will unlikely to be sheltered from political pressure.

Debrun et al. (2005) analyze the plans for the WAMZ in the context of a model in the spirit of Alesina and Barro (2002), but with some major differences. In Debrun et al. the monetary union is multilateral and there is no anchor country with an exogenous pre-commitment technology. In particular, central banks are dependent both before and after monetary unification. Further, their model explicitly includes fiscal policy and related inefficiencies generated by politically motivated decision makers. In particular, governments try to channel resources to socially useless activities (for example, corruption or unnecessary infrastructure projects) and are unable to raise enough tax revenues, so that they have to rely at least in part on seigniorage revenues. Therefore, the analysis emphasizes differences in spending targets and inefficiencies.

To discuss the results, it is useful to briefly outline the main elements of the model. The supply equation for country i generalizes (1):

$$y_i = \psi (\pi_i - \pi_i^e - \tau_i) - \sum_{j=1}^m \theta_{ij} (\pi_j - \pi_j^e) + \xi_i, \quad \theta_{ij} \geq 0, \theta_{ii} = 0,$$

where τ_i is the tax rate and ξ_i is a mean-zero supply shock that can be interpreted as a terms of trade shock. For convenience, we assume that shock is independent across countries. This supply

Development Community (SADC) to form an economic and monetary union by 2016 and introduce a common currency and a regional SADC central bank by 2018 – see Tavlas for an assessment of these plans.

equation is derived in the same way as before assuming a proportional tax on revenues. The model also features a government budget equation, which is in shares of GDP:²³

$$g_i = \kappa\pi_i + \tau_i - \lambda_i,$$

where g_i is (socially-useful) government spending as a share of GDP, κ is the inflation tax base and λ_i is the part of tax revenues that does not go to useful government spending, for example as a result of corruption or pure waste. One can define the government's *financing need* as:

$$F_i = \tilde{g}_i + \lambda_i,$$

where \tilde{g}_i is the government's ideal spending level as a share of GDP.

The above expressions apply to both monetary autonomy and monetary union. The budget equation assumes that in the latter case seigniorage is allocated solely on the basis of relative GDP. Each government wants to stabilize inflation, taxes and government spending around their target levels and likes to see an activity level that is as high as possible. The timing of events is standard with inflation expectations being formed first, followed by the realization of the shocks and, finally, the selection of all policies. Crucially, both the monetary and fiscal authorities choose their policy instruments (inflation, respectively taxes) subject to the government budget constraint or constraints (in the case of a union central bank), taking inflation expectations as given. Hence, the (union) central bank takes account of how inflation affects the government budget constraint implying that it is *de facto* under the control of the government(s). Indeed, under monetary autonomy, the outcomes are identical to when the government directly selects both fiscal and monetary policy.

Under autonomy, a higher individual financing need drives up the tax burden, widens the wedge between ideal and actual spending and raises inflation in order to produce more seigniorage revenues. A favorable supply shock has the opposite effect on these outcomes. A crucial difference with monetary autonomy is that under a monetary union the central bank internalizes the, in equilibrium futile, incentive of the national monetary authorities to attract activity away from other countries by relaxing monetary policy. Suppose country j has relative weight ω_j (such that $\sum_{j=1}^n \omega_j = 1$) and define $\bar{\theta} = \sum_{j=1}^n \omega_j \sum_{k=1}^n \theta_{jk}$ as a measure of the average spillover across countries in the union. It turns out that while union inflation is increasing in the average financing need, it is

²³ Actually, this is an approximation derived by making a quantity-theory assumption for real money holdings and assuming that actual output does not deviate too much (as a result of tax distortions and inflation surprises) from exogenous potential output.

decreasing in the amount of spill-over $\bar{\theta}$ that is internalized (and in the average supply shock). Effectively, unification substitutes for a move towards a more conservative central bank (i.e. a central bank that attaches a higher weight to stabilizing inflation at a low level).

Assume that welfare is measured as the weighted average of the individual governments' welfare losses. Lower average and less volatile inflation in a union contribute directly to higher welfare and indirectly by generating more stable seigniorage revenues and, hence, a more stable wedge between ideal and actual public spending. However, lower average inflation also produces less seigniorage on average and, hence, creates a larger average wedge between ideal and actual spending. In addition, it leads to higher average distortionary taxes implying lower average output. On these accounts monetary autonomy will be preferred.

When countries are both ex-ante and ex-post identical (that is, they all have the same finance needs and are hit by identical shocks), monetary unification is preferred to autonomy. From the perspective of each individual country, the policy responses to the shock are optimal and the government budget constraint is properly internalized in the policy decisions, while the only distortion (the incentive to generate an inflation surprise) is alleviated with the union central bank internalizing the cross-border externalities of inflation surprises. With countries that are identical in terms of finance needs, but not necessarily in terms of shocks, the choice between unification and autonomy generally involves a trade off among the effects discussed above.

With differences in financing needs, but identical national shock distributions, preferred inflation differs across countries. The country with the highest financing need prefers the highest inflation rate. While a country would always prefer a marginal reduction of inflation relative to that under autonomy,²⁴ inflation in a union may be too low on average for its taste if the country's financing need is relatively high. The reason is that the switch to unification lowers inflation not only because the wasteful attempts to export the underperformance in production are mitigated, but also because unification means a merger with countries with lower average financing needs. For fiscally conservative countries with low financing needs, union inflation could be too high due to the merger with fiscally less disciplined countries. This occurs if the latter effect dominates the inflation reduction brought about by the internalization of the monetary spill-overs in a union.

Numerical analysis by Debrun et al. (2005) shows that the WAMZ would make all of its envisaged members, except for Nigeria, worse off. Nigeria has higher financing needs than the other countries, while moreover its terms of trade shocks differ, because it is the only oil exporter in the region. Hence, for unification to be in the interest of its potential members at least a minimal degree of convergence in financing needs would be needed.

²⁴ The financing need is internalised in the inflation choice, but there is still the distortion of the failure to commit.

X.2. The Gulf Cooperation Council (GCC)

The GCC monetary union will be based on criteria that closely resemble the EMU entry criteria. However, the GCC criteria are not meant as entry criteria. Hence, compliance with their criteria can only be achieved through peer pressure. Specifically, the prospective union members are supposed to adhere to the same numerical restrictions on debts and deficits as in the EU, except that the deficit is allowed to rise to 5% of GDP when oil prices are weak (see Buiter, 2008). After all, the GCC economies are all highly dependent on international energy prices and this translates into volatile public budgets. Buiter (2008) criticizes the GCC fiscal criteria as meaningless measures of fiscal sustainability in view of the future oil and gas revenues and the need to consolidate all assets and liabilities of all publicly-owned or publicly-controlled institutions. However, experience suggests that GCC government spending follows revenues and is, therefore, pro-cyclical (see Sturm and Siegfried, 2005). This provides a potentially useful role for fiscal restrictions that become tighter when energy prices and, hence, revenues are high.

XI. Concluding remarks

In this paper we have surveyed and interpreted recent research on the costs and benefits of the EMU. We have explored how unification affects the trade-off between credibility and flexibility of monetary policy and we have argued that unification offers an opportunity to provide a central bank with more independence from its government, thereby adding to the credibility of monetary policy and thus the reduction of inflation expectations. Repeated political pressures on the ECB to pay more attention to the external value of the euro and to lower interest rates underline the importance of its independence and its mandate for price stability as enshrined in the Treaty. We have also argued that the EMU eliminates adverse monetary policy spill-overs, such as those arising from competitive devaluations.

We have investigated how conflicts between the fiscal authorities and the ECB about the macroeconomic objectives may produce a race among the policymakers that leads to extreme policy outcomes that no one actually wants. We have also devoted ample attention to how monetary unification may promote fiscal free riding, thereby causing fiscal profligacy or worsening already existing tendencies to fiscal excesses. These free-rider problems imply a rationale for fiscal constraints, even when financial markets work well in the sense of properly reflecting future risks in

public debt interest rates. The rationale is that the response of financial markets to a unilateral fiscal expansion is diluted in a monetary union and, hence, they fail to induce governments to properly internalize the cross-border externalities of their policies. We conjecture that the effects of unification on fiscal free-riding may even be strengthened if unification stimulates financial integration, because interest rate responses to individual fiscal policies become even weaker. If each government that is under political pressure to expand the economy anticipates that the interest rate effect of its own actions will be only minor then in equilibrium the union may well end up with higher real interest rates. However, more financial integration also means that firms can draw from a larger pool of savings and this stimulates investment. The need to protect the benefits of growing financial integration in the presence of fiscal free-riding further strengthens the case for fiscal restrictions.

We have reviewed the case for fiscal coordination in the EMU. Coordination may strengthen fiscal discipline and reduce the need for fiscal constraints. However, this is not always the case. In particular when the fiscal authorities are leaders in their game with the ECB, coordination reinforces their strategic position and this may undermine fiscal discipline and put the central bank under pressure to relax its policy. Hence, fiscal coordination may increase the need for fiscal restrictions. However, at the same time it might undermine their enforcement. Enforcement of the SGP is the competence of the ECOFIN and tighter fiscal coordination may well enhance the reluctance of the Finance Ministers to cast negative votes on their colleagues.

While fiscal constraints tend to be beneficial in the context of the theoretical models that the literature has offered so far, their practical design and implementation in Europe has provoked substantial criticism. The SGP is alleged to undermine macro-economic stabilization in the presence of country-specific shocks, although existing empirical evidence does not seem to support this view. In our view, and that of many others, the SGP's most fundamental weakness is that its enforcement relies on the Finance Ministers being prepared to cast a negative verdict on each other. Experience so far has clearly revealed their unwillingness in this regard and this undermines the credibility of the 3% of GDP deficit limit, thereby weakening the incentives for improving structural budgets. Hence, if the SGP hampers fiscal stabilization, then this may well be the direct result of weak (expected) enforcement and not of the specific design of the SGP.

We have also explored the consequences of EMU for structural reform, in particular labor market reform, both before entry and after entry into the union. Structural reform may lend (additional) rationale to the heavily-criticized EMU entry criteria, because it would be easier to fulfil these criteria when markets are more flexible. Once a country is part of a monetary union, the incentive to conduct structural reform may be weakened by free-rider problems similar to those that

plague fiscal policy in a union. Overall, the theoretical consequences of unification for reform are ambiguous. Empirically, there seems to be evidence that the euro has promoted product market deregulation, while there is little or no evidence that it has affected labor market reforms.

While the euro is a fact, the question of its costs and benefits remains relevant. Over the coming years new countries may join the euro-zone. Most of the potential new candidates are Central and Eastern European countries. However, we may also expect that at some point the United Kingdom, Denmark and Sweden will be confronted again with the question of joining. The current financial and economic crisis has reignited debates about joining the euro-zone. Insight in the costs and benefits of EMU will also be relevant for the newly planned multilateral monetary unions in Africa and the Middle East. Importantly, though, the net benefit of unification depends on the stage of development of the economies and financial markets of the candidate entrants. For example, unification may have an important effect on seigniorage revenues in developing countries, while this is not the case for the European countries. It may also be more difficult to endow a union in the developing world with the right institutional structure. In particular, if all candidate members have a history of weak monetary discipline, and, hence, none of them would fear to be giving up a strong currency, the support for setting up an independent union central bank will be weak. Likewise it will be hard to agree on proper fiscal constraints and a credible enforcement mechanism if there is a tradition of chronic deficits. To form a union with a weak institutional structure is dangerous, in particular when such a structure is enshrined in a treaty that is hard to modify. A set of formal entry criteria like those for the euro-zone may serve as a useful test of prospective members' ability to follow disciplined policies. Unfortunately, the planned unions in the Middle East and in Africa intend to rely only on peer pressure to induce countries to meet the relevant fiscal objectives before they set off.

References:

Alesina, A., Ardagna, S. and V. Galasso (2008). The Euro and Structural Reforms, *NBER Working Paper Series*, No.14479.

Alesina, A. and R. Barro (2002). Currency Unions, *Quarterly Journal of Economics*, 117, pp. 409-436.

Annett, A. (2006). Enforcement and the Stability and Growth Pact: How Fiscal Policy Did and Did Not Change Under Europe's Fiscal Framework, *Working Paper 06/116*, IMF.

Ardagna, S., Caselli, F. and T. Lane (2007). Fiscal Discipline and the Cost of Public Debt Service: Some Estimates for OECD Countries, *The B.E. Journals of Macroeconomics*, 7 (1) (Topics), Article 28. Available at: <http://www.bepress.com/bejm/vol7/iss1/art28>.

Baele, L., Ferrando, A., Hördahl, P., Krylova, E. and C. Monnet (2004), Measuring European Financial Integration, *Oxford Review of Economic Policy*, 20 (4), pp. 509-30.

- Baldwin, R. (2006). The Euro's Trade Effects, *ECB Working Paper*, No. 594.
- Ballabriga, F. and C. Martinez-Mongay (2003), Has EMU Shifted Policy?, in Buti (ed.), *Monetary and Fiscal Policies in EMU*, Chapter 8, Cambridge University Press.
- Barro, R.J. and D.B. Gordon (1983a), Rules, Discretion and Reputation in a Model of Monetary Policy, *Journal of Monetary Economics*, 12, pp. 101-21.
- Barro, R.J. and D.B. Gordon (1983b). A Positive Theory of Monetary Policy in a Natural Rate Model, *Journal of Political Economy*, 91, pp. 589-610.
- Bean, C.R. (1998). The Interaction of Aggregate-Demand Policies and Labour Market Reform, *Swedish Economic Policy Review*, 5, pp. 353-382.
- Beetsma, R. and A.L. Bovenberg (1998). Monetary without Fiscal Coordination May Discipline Policymakers, *Journal of International Economics*, 45, pp. 239-258.
- Beetsma, R. and H. Jensen (2005). Monetary and Fiscal Policy Interactions in a Micro-founded Model of a Monetary Union, *Journal of International Economics*, 67, pp. 320-352.
- Beetsma, R. and H. Uhlig (1999). An Analysis of the Stability and Growth Pact, *Economic Journal*, 109, pp. 546-71.
- Benigno, P. (2004), Optimal Monetary Policy in a Currency Area, *Journal of International Economics*, 63 (2), 293-320.
- Bergin, P. (2000), Fiscal Solvency and Price Level Determination in a Monetary Union, *Journal of Monetary Economics*, 45, pp. 37-53.
- Bohn, H. and R. Inman (1996). Balanced Budget Rules and Public Deficits: Evidence from the U.S. States, *Carnegie-Rochester Conference Series on Public Policy* 45, pp. 13-77.
- Bris, A., Koskinen, Y. and M. Nilsson (2009). The Euro and Corporate Valuations, *Review of Financial Studies*, forthcoming.
- Buiter, W.H. (2005). The 'Sense and Nonsense of Maastricht' Revisited: What Have We Learned about Stabilization in EMU?, *CEPR Discussion Paper*, No. 5405.
- Buiter, W.H. (2008). Economic, Political, and Institutional Prerequisites for Monetary Union among the Members of the Gulf Cooperation Council, *CEPR Discussion Paper*, No. 6639.
- Buiter, W.H. and A. Sibert (2003). Cross-Border Tax Externalities: Are Budget Deficits too Small?, *NBER Working Paper Series*, No. 10110.
- Buiter, W.H. and A. Sibert (2005). How the Eurosystem's Treatment of Collateral in its Open Market Operations Weakens fiscal Discipline in the Eurozone (and what to do about it), *CEPR Discussion Paper*, No. 5387.
- Calmfors, L. (2001). Unemployment, Labor Market Reform, and Monetary Union, *Journal of Labor Economics*, 19 (2), pp. 265-289.
- Canova, F. and E. Pappa (2006). The Elusive Costs and the Immaterial Gains of Fiscal Constraints, *Journal of Public Economics*, 90, pp. 1391-1414.
- Canzoneri, M.B. and B.T. Diba, 1991, Fiscal Deficits, Financial Integration, and a Central Bank for Europe, *Journal of the Japanese and International Economies*, 5, pp. 381-403.
- Casella, A., 1999, Tradable Deficit Permits: Efficient Implementation of the Stability Pact in the European Monetary Union, *Economic Policy* 29, 323-361.
- Chang, R., 1990, International Coordination of Fiscal Deficits, *Journal of Monetary Economics*, 25, pp. 347-366.
- Chari, V. and P.J. Kehoe (2007). On the Need for Fiscal Constraints in a Monetary Union, *Journal of Monetary Economics*, 54 (8), pp. 2399-2408.
- Chari, V. and P.J. Kehoe (2008). Time Inconsistency and Free-Riding in a Monetary Union, *Journal of Money, Credit, and Banking* 40, 7, 1329-1356.
- Corsetti, G. (2008). A Modern Reconsideration of the Theory of Optimal Currency Areas, *CEPR Discussion Paper*, No. 6712.
- Corsetti, G. and P. Pesenti (2001). Welfare and Macroeconomic Interdependence, *Quarterly Journal of Economics*, 116, 2, 421-445.

- Corsetti, G. and P. Pesenti (2002). Self-Validating Optimum Currency Areas, *Mimeo*, European University Institute, Florence.
- Corsetti, G., Pesenti, P., Roubini, N. and C. Tille (2000). Competitive Devaluations: toward a Welfare-Based Approach, *Journal of International Economics*, 51, pp. 217-41.
- Crowe, C. and E. Meade (2009). Central Bank Independence and Transparency: Evolution and Effectiveness, *European Journal of Political Economy*, forthcoming.
- Cukierman, A., Webb, S.B. and B. Neyapti (1992). Measuring the Independence of Central Banks and Its Effect on Policy Outcomes, *World Bank Economic Review*, 6, 353-398.
- Debrun, X., Hauner, D. and M.S. Kumar (2009). Independent Fiscal Agencies, *Journal Economic Surveys* 23, 1, 44-81.
- Debrun, X., Masson, P. and C. Patillo (2005). Monetary Union in West Africa: Who Might Gain, Who Might Lose and Why? *Canadian Journal Economics*, 38 (2), pp. 454-481.
- De Grauwe, P. (2007). *Economics of Monetary Union*, Oxford University Press, Oxford, 7th edition.
- Delors Committee (1989). *Report on Economic and Monetary Union in the European Community*, Luxemburg: Office for Official Publications of the European Communities.
- Devereux, M.B. and C. Engel (2003). Monetary Policy in the Open Economy Revisited: Price Setting and Exchange-Rate Flexibility, *Review of Economic Studies*, 70, pp. 765-783.
- Devereux, M.B. and C. Engel (2006). Expectations and Exchange Rate Policy, *NBER Working Paper*, No.12213.
- Dixit, A.K. and L. Lambertini (2001). Monetary-Fiscal Policy Interactions and Commitment versus Discretion in a Monetary Union, *European Economic Review*, 45, pp. 977-987.
- Dixit, A.K. and L. Lambertini (2003). Symbiosis of Monetary and Fiscal Policies in a Monetary Union, *Journal of International Economics*, 60 (2), pp. 235-247.
- ECB (2008). *Survey of Professional Forecasters*, Frankfurt.
- Duval, R. and J. Elmeskov (2006). The Effects of EMU on Structural Reforms in Labour and Product Markets, *ECB Working Paper*, No. 596.
- Duval, R. (2008). Is there a Role for Macroeconomic Policy in Fostering Structural Reforms? Panel Evidence from OECD Countries over the Past Two Decades, *European Journal of Political Economy* 24, 491-502.
- Eichengreen, B. (1993). European Monetary Unification, *Journal of Economic Literature*, 31 (3), pp. 1321-1357.
- Eichengreen, B. (2005). Europe, the Euro and the ECB: Monetary Success, Fiscal Failure, *Journal of Policy Modeling*, 27, pp. 427-39.
- European Commission (1990). One Market, One Money – An Evaluation of the Potential Benefits and Costs of Forming an Economic and Monetary Union, *European Economy*, 44, pp. 427-39.
- European Commission (2004). Public Finances in EMU – 2004, http://ec.europa.eu/economy_finance/publications/publication_summary475_en.htm.
- European Commission (2008), http://ec.europa.eu/economy_finance/sg_pact_fiscal_policy/excessive_deficit9109_en.htm.
- Faini, R. (2006). Fiscal Policy and Interest Rates in Europe, *Economic Policy*, 21 (47), pp. 443-489.
- Farrant, K. and G. Peersman (2006). Is the Exchange Rate a Shock Absorber or a Source of Shocks? *Journal of Money, Credit, and Banking*, 38, 4, pp. 939-61.
- Fatás, A. and I. Mihov (2006). Restricting Fiscal Policy Discretion: The Case of U.S. States, *Journal of Public Economics*, 90 (1).
- Feldstein, M. (1997). The Political Economy of the European Economic and Monetary Union: Political Sources of an Economic Liability, *Journal of Economic Perspectives*, 11 (4), pp. 23-42.
- Ferrero, A. (2009). Fiscal and Monetary Rules for a Currency Area, *Journal of International Economics* 77, 1, 1-10.

- Frankel, J.A. and A.K. Rose (1998). The Endogeneity of the Optimum Currency Area Criteria, *Economic Journal*, 108, pp. 1009-1025.
- Friedman, M. (1953). The Case for Flexible Exchange Rates, in Friedman, M. (ed.), *Essays in Positive Economics*, University of Chicago Press, Chicago, pp.157-203.
- Galí, J. and T. Monacelli (2008). Optimal Monetary and Fiscal Policy in a Currency Union, *Journal of International Economics* 76, 1, 116-132.
- Galí, J. and R. Perotti (2003). Fiscal Policy and Monetary Integration in Europe, *Economic Policy*, 18, pp. 533-572.
- Issing, O. (2002). On Macroeconomic Policy Co-ordination in EMU, *Journal of Common Markets Studies*, 40 (2), pp. 345-358.
- Kenen, P.B. (1969). The Theory of Optimum Currency Areas: An Eclectic View, in Mundell, R. and A. Swoboda (eds.), *Monetary Problems of the International Economy*, University of Chicago Press, Chicago, pp. 41-60.
- Kempf, H. and L. von Thadden (2008). On policy Interactions among Nations: When Do Cooperation and Commitment Matter? *ECB Working Paper*, No.880.
- Lane, P.R. (2006). The Real Effects of European Monetary Union, *Journal of Economic Perspectives*, 20 (4), pp. 47-66.
- Martin, P. (1998). The Exchange Rate Policy of the Euro: A Matter of Size? *Journal of the Japanese and International Economies*, 12, pp. 455-82.
- Masson, P. R. and C. Patillo (2004). *The Monetary Geography of Africa*, Brookings Institution Press, Washington D.C.
- McKinnon, R. (1963). Optimum Currency Areas, *American Economic Review*, 53, pp. 717-25.
- Morris, R., Ongena, H. and L. Schuknecht (2006). The Reform and Implementation of the Stability and Growth Pact, *Occasional Paper*, No.47, ECB.
- Mundell, R. (1961). A Theory of Optimum Currency Areas, *American Economic Review*, 51 (4), pp. 657-665.
- Neumeyer, P.A. (1998). Currencies and the Allocation of Risk: the Welfare Effects of a Monetary Union, *American Economic Review*, 88, pp. 246-259.
- OECD (2007). *Economic Outlook*, No.82, December, Paris.
- Ozkan, F.G., Sibert, A. and A. Sutherland (2004). Monetary Union and the Maastricht Inflation Criterion: The Accession Countries, *Economics of Transition*, 12 (4), pp. 635-652.
- Pappa, E. and V. Vassilatos (2007). The Unbearable Tightness of Being in a Monetary Union: Fiscal Restrictions and Regional Stability, *European Economic Review*, 51 (1), pp. 1492-1513.
- Rose, A.K. (2000). One Money, One Market: the Effect of Common Currencies on Trade, *Economic Policy*, 30, pp. 9-45.
- Sibert, A. and A. Sutherland (2001). Monetary Union and Labor Market Reform, *Journal of International Economics*, 51 (2), pp. 421-435.
- Sturm, M. and N. Siegfried (2005). Regional Monetary Integration in the Member States of the Gulf Cooperation Council, *ECB Occasional Paper Series*, No. 31.
- Tavlas, G.S. (2005). The Benefits and Costs of Monetary Union in Southern Africa: a Critical Survey of the Literature, *Journal of Economic Surveys* 23, 1, 1-43.
- Uhlig, H. (2003), One Money, but Many Fiscal Policies in Europe: What are the Consequences?, in Buti, M. (ed.), *Monetary and Fiscal policies in EMU: Interactions and Coordination*, Cambridge University Press, Cambridge, U.K.
- Woodford, M. (1996). Control of the Public Debt: A Requirement for Price Stability? *NBER Working Paper*, No.5684.
- Wyplosz, C. (1997). EMU: Why and How Might It Happen, *Journal of Economic Perspectives*, 11 (4), pp. 3-22.
- Wyplosz, C. (2006). European Monetary Union: the Dark Sides of a Major Success, *Economic Policy*, 22, pp. 207-61.

Appendix: the Stability and Growth Pact

The Stability and Growth Pact (SGP) is a rule-based framework for the coordination of national fiscal policies in the EMU. The Pact consists of a preventive and a dissuasive arm:

The preventive arm:

Under the provisions of this arm, euro-area (non euro-area) Member States have to submit annual Stability (Convergence) Programmes, showing how they intend to achieve or safeguard sound fiscal positions in the medium term, taking into account the impending budgetary impact of population aging. The European Commission assesses these Programmes and the ECOFIN Council (the Economics and Finance Ministers of all EU countries) gives its Opinion on them based on a Recommendation from the Commission. The preventive arm includes two policy instruments:

1. The Council, on the basis of a Proposal by the Commission, can address an Early Warning to prevent the occurrence of an excessive deficit.
2. The Commission may issue policy recommendations (Policy Advice) to a Member State as regards the broad implications of its fiscal policies.

The dissuasive arm:

The dissuasive part of the Pact governs the Excessive Deficit Procedure (EDP), whose legal foundation is Article 104 of the Treaty. A country has an Excessive Deficit if it is declared so by the Council on the basis of a report from the Commission and a judgment from the Economic and Monetary Affairs Committee of the European Parliament. The Procedure is triggered by the deficit breaching the 3% of GDP threshold of the Treaty. If it is decided that the deficit is Excessive in the meaning of the Treaty, the Council issues a Recommendation to the Member State concerned to correct the Excessive Deficit and it provides a time frame for doing so. Non-compliance with the Recommendation triggers further steps in the procedure, including for the euro-area Member States the possibility of financial sanctions.

Council decisions (from activation up to and including the abrogation of the EDP) are taken by a two-third majority of the votes (weighed according to Article 205(2)), excluding the vote of the Member State concerned.

Notes: source European Commission. “ECOFIN Council” is the council of Ministers of the Economics and Finance of the EU.

Table A1: EDP procedures

Closed procedures				
Country	Date of Commission report (Article 104§3)	Council Decision (Article 104§12) abrogating the Decision on the existence of an Excessive Deficit	Council Decision on existence of Excessive Deficit (Article 104§6)	Deadline for correction
Portugal	September 24, 2002	May 11, 2004		
Germany	November 19, 2002	May 16, 2007		
France	April 2, 2003	January 30, 2007		
Netherlands	April 28, 2004	June 7, 2005		
Cyprus	May 12, 2004	June 11, 2006		
Malta	May 12, 2004	May 16, 2007		
Czech Republic	May 12, 2004	June 3, 2008		
Slovakia	May 12, 2004	June 3, 2008		
Poland	May 12, 2004	July 8, 2008		
Greece	May 19, 2004	May 16, 2007		
Italy	June 7, 2005	June 3, 2008		
Portugal	June 22, 2005	June 3, 2008		
U.K.	September 21, 2005	September 12, 2007		
Ongoing procedures under Article 104 of the Treaty (EDP)				
Hungary	May 12, 2004		July 5, 2004	2009
U.K.	June 11, 2008		July 8, 2008	financial year 2013/14
France	February 18, 2009		April 27, 2009	2012
Greece	February 18, 2009		April 27, 2009	2010
Ireland	February 18, 2009		April 27, 2009	2013
Latvia	February 18, 2009			
Spain	February 18, 2009		April 27, 2009	2012
Lituania	May 13, 2009			
Malta	May 13, 2009			
Poland	May 13, 2009			
Romania	May 13, 2009			

Notes: source European Commission.