

# EUROPEAN ECONOMY



Economic Papers 306 | February 2008



## EMU's decentralized system of fiscal policy

Jürgen von Hagen and Charles Wyplosz

### **EMU@10 Research**

In May 2008, it will be ten years since the final decision to move to the third and final stage of Economic and Monetary Union (EMU), and the decision on which countries would be the first to introduce the euro. To mark this anniversary, the Commission is undertaking a strategic review of EMU. This paper constitutes part of the research that was either conducted or financed by the Commission as source material for the review.

**Economic Papers** are written by the Staff of the Directorate-General for Economic and Financial Affairs, or by experts working in association with them. The Papers are intended to increase awareness of the technical work being done by staff and to seek comments and suggestions for further analysis. The views expressed are the author's alone and do not necessarily correspond to those of the European Commission. Comments and enquiries should be addressed to:

European Commission  
Directorate-General for Economic and Financial Affairs  
Publications  
B-1049 Brussels  
Belgium  
E-mail: [Ecfinfo@ec.europa.eu](mailto:Ecfinfo@ec.europa.eu)

This paper exists in English only and can be downloaded from the website  
[http://ec.europa.eu/economy\\_finance/publications](http://ec.europa.eu/economy_finance/publications)

A great deal of additional information is available on the Internet. It can be accessed through the Europa server (<http://europa.eu>)

ISBN 978-92-79-08231-3  
doi: 10.2765/39342  
© European Communities, 2008

# EMU's Decentralized System of Fiscal Policy

Jürgen von Hagen  
Department of Economics, University of Bonn

and

Charles Wyplosz  
Graduate Institute of International Studies and CEPR

## **Abstract:**

This paper reviews the macroeconomic use of national fiscal policy in EMU and examines the rationale and scope for a collective insurance system which redistributes income among countries in response to asymmetric cyclical shocks. The analysis of the record of national fiscal policies before and after the adoption of the Maastricht Treaty finds evidence that the quality of fiscal policies has improved in two ways: they are more clearly countercyclical – or less procyclical – and they are more readily used to restore competitiveness than to attempt to boost demand when competitiveness is eroded. These observations suggest that fiscal policy remains a useful instrument. One question is whether it can be augmented – or perhaps substituted for – with a collective insurance system. Collective insurance is one alternative to external borrowing and lending and therefore one way to deal with the concerns that the SGP is meant to address. We examine in more detail two collective insurance systems: tax revenue sharing and unemployment insurance sharing. We find that the former is more promising and examine in some detail how it could be set up. It is no panacea, though. Any insurance mechanism entails moral hazard and that moral hazard can, at best, only be mitigated, not eliminated.

**JEL classification:** E61, E62, E63

**Key words:** Economic and Monetary Union, fiscal stabilization, collective insurance mechanism.

Paper presented at the Conference on *EMU at 10: achievements and challenges* held in Brussels on 26-27 November 2007. We are grateful to Lucio Pench, Martin Larch, our discussants and the conference participants for very useful comments.

## 1. Introduction

Ten years after the adoption of the single currency, the status of national fiscal policies remains an unresolved and controversial issue. On the one hand, fiscal policy is not a shared competence. On the other hand, the Excessive Deficit Procedure (EDP) rests on the principle that national budget outcomes are an area of common interest. As implemented by the Stability and Growth Pact (SGP), it envisages situations where a national government is requested to make explicit quantitative commitments, which can be specified by the Council, following recommendations from the Commission. More broadly, within the Stability programs, each Eurozone country must present each year its intended budget balance to be reached over the following three years, with the explicit aim of achieving budgets close to balance or in surplus. These programs must gain Council approval when they are presented and cannot be subsequently changed unless specific conditions are deemed acceptable. A country found in violation of its commitments is bound to face increasingly tight requests, with the possibility of being imposed a fine.

Thus, national fiscal policies belong to a grey zone of potentially constrained sovereignty. Governments remain fully sovereign in setting the level and detailed composition of their spending and revenues<sup>1</sup> and they can run smaller deficits or larger surpluses than they committed themselves to. The SGP only deals with the balance and is geared towards limiting deficits, both absolutely by setting a maximum deficit of 3% of GDP and by aiming at budgets close to balance or in surplus, and relatively by banning larger deficits or smaller surpluses than those initially approved.

This grey zone aspect raises important constitutional issues, as was amply illustrated by the November 2003 Council decision to put the SGP “in abeyance” and by the subsequent deliberation of the European Court of Justice. The new SGP, adopted in June 2005, has not addressed this particular issue, which, consequently, remains open. The revision instead introduced some implementation flexibility, with the aim of preventing economically inefficient consequences.

This paper starts with the macroeconomics of fiscal policy to evaluate various institutional arrangements. It argues that limits to budget balance sovereignty need to be carefully justified. The usual argument in favor of the EDP and the SGP is that fiscal indiscipline by one or more Eurozone members constitutes a negative externality that threatens price stability. The basis of this argument can be found in the theory of fiscal dominance, which is reviewed in Section 2. Whether this argument is strong enough to justify the EDP remains an unresolved issue. At any rate, even if it is justified, there remains the need to examine how it can be implemented without excessive economic costs.

To that effect, we evaluate the idea that, to be sustainable, restraints to the countercyclical use of national fiscal policy must be compensated for by an adequate collective insurance system. This idea has a long legacy. The desirability of a collective insurance system in a European Monetary Union was mentioned early on in MacDougall Report (European Commission 1977a, b) and the Delors Report (Delors, 1989) and presented as an extension of the Optimum Currency Area theory (see, e.g. Wyplosz, 1991). It has given rise to a significant literature, both theoretical (van Wincoop, 1995; Sorensen and Yosha, 1997; Persson and Tabellini, 1996b; Fatas, 1998; Kletzer and von Hagen, 2001) and empirical (Sala-i-Martin and Sachs, 1991; von Hagen, 1992; Pisani-Ferry, Italianer and Lescure, 1993; Bayoumi and Masson, 1995; von Hagen and Hammond, 1998; Melitz and Zumer, 1999).

---

<sup>1</sup> There exist some limits on the size of taxes like VAT.

Even if one were to conclude that some collective insurance system is indeed desirable, there remains the question of how to design such an arrangement. In Section 4, we examine a number of proposals that have surfaced.

## 2. The Fiscal Dominance Case for the SGP

There are a number of justifications for the SGP. Two of them are unconvincing. It is argued that that one country's deficit stands to raise the euro area interest rate and thus impose a cost externality on all other countries. This view seems rooted in an IS-LM view of the world. Even then, since Europe is financially integrated in world markets, its interest rate is essentially exogenous, especially as each member country is "small". A more elaborate version allows for interest rate parity and argues that a deficit raises the interest rate through expected depreciation. The theory behind this assertion is at best weak and, importantly, there is no evidence linking budget balances to the exchange and interest rates. The only evidence is that investors discriminate among borrowers, which means that there is no externality.<sup>2</sup>

Another argument in favor of the SGP is that it is a form of coordination among national fiscal authorities. Here again, the need for coordination must rest on some substantial externality that is demonstrated. Moreover, even if such an externality were to exist, it would remain to establish that the SGP-induced coordination is optimal. There is no theoretical or empirical evidence that this is the case.<sup>3</sup>

The fundamental argument in favor of the SGP is that fiscal indiscipline can become the source of inflation. It is based on solid empirical evidence. Indeed, it is well known since (at least) the hyperinflation episodes of the 1920s that fiscal indiscipline can lead to inflation. The theoretical interpretation has been elaborated by Sargent and Wallace (1981), Canzoneri et al. (2001) and Woodford (2001) among others. It can be briefly summarized with the government budget constraint:

$$(1) \quad B_{t+1} - B_t = i_t B_t - (1 + i_t)[S_t + (M_{t+1} - M_t)],$$

where  $S_t$  is the primary budget surplus in period  $t$ ,  $i_t$  the interest rate and  $B_t$  and  $M_t$  are the beginning of period stocks of public debt and base money, all expressed in nominal terms. Dividing by the nominal GDP  $P_t Y_t$  and denoting the total public sector debt as  $D_t = B_t + M_t$ , (1) can be rewritten as:

$$(2) \quad \frac{D_t}{P_t Y_t} = \left( \frac{S_t}{P_t Y_t} + \frac{i_t}{1 + i_t} \frac{M_{t+1}}{P_t Y_t} \right) + \rho_t \frac{D_{t+1}}{P_{t+1} Y_{t+1}}$$

where  $\rho_t = \left( \frac{1 + i_t}{\frac{P_{t+1} Y_{t+1}}{P_t Y_t}} \right)^{-1}$  is the growth-adjusted real interest rate factor. Public sector

solvency requires that the transversality condition  $\lim_{T \rightarrow \infty} \left( \prod_{s=t}^{T-1} \rho_s \right) \frac{D_T}{P_T Y_T}$  be satisfied. When

this is the case, iterating (2) forward, we get:

---

<sup>2</sup> For empirical evidence showing that investors indeed discriminate among public borrowers in the euro area see Bernoth et al (2004).

<sup>3</sup> Krogstrup and Wyplosz (2006) conclude that the pact is far from optimal.

$$(3) \quad \frac{D_t}{P_t Y_t} = \sum_{i=0}^{\infty} \left( \prod_{k=0}^{i-1} \rho_k \right) s_{t+i}$$

where  $s_t = \left( \frac{S_t}{P_t Y_t} + \frac{i_t}{1+i_t} \frac{M_{t+1}}{P_t Y_t} \right)$  is the budget surplus inclusive of seigniorage as a ratio to GDP.

The solvency condition can be satisfied in many ways. First, budget discipline may ensure that future budget surpluses  $S_{t+i}$  are such that they match the actual public sector debt. Second, fiscal discipline can be weak and recourse to seigniorage is needed to deliver the needed sequence of  $\{s_{t+i}\}$ . This is the channel through which, historically, fiscal indiscipline has repeatedly delivered inflationary episodes. This is why the Maastricht Treaty explicitly rules out any financing of budgets through seigniorage, both on a routine basis and in an emergency situation, the latter case being dealt with through the no-bailout clause. This is also why the independence of the ECB is guaranteed by the treaty.

The third case is the relevant one. If the sequence of  $\{s_{t+i}\}$  violates the solvency condition, it is the price level  $P_t$  on the left-hand side of (3) that becomes the variable of adjustment. This is the case of fiscal dominance where the budgetary authorities can impose their will and carry out unsustainable budget deficits. Monetary dominance is the opposite case, when neither seigniorage nor the price level are made to be endogenous in (3) so that the variable of adjustment is the disciplined sequence of  $\{s_{t+i}\}$ . The task of the SGP can be seen as imposing fiscal dominance so that control of the price level is not lost and without having to call upon seigniorage as mandated by the treaty.

### 3. What Do National Governments Do with their Fiscal Policies?

#### 3.1. Policy effects

Unsurprisingly, the question of the usefulness of fiscal policy as a macroeconomic tool is highly controversial. At the theoretical level, the debate pits (neo)Classical against (neo)Keynesian macroeconomists. The former asserts that, one way or another, consumers and firms view public debts as their own liability; accordingly, they reduce their expenditures whenever the debt increases or diminishes less than previously expected. The latter relies on price stickiness, borrowing constraints and/or other market imperfections to find that fiscal policy can affect output.<sup>4</sup> In view of such conflicting theoretical results, the verdict should come from empirical studies.

Empirically, too, the issue is controversial. Some authors find that fiscal policy affects output, even though the multipliers are small and have possibly declined in recent years (Blanchard and Perotti, 2002; Perotti, 2004, 2007; Favero and Giavazzi, 2007; Romer and Romer, 2007). Others find that consumption moves in an offsetting direction, although the offset effect is partial, which leaves a small output effect (Ramey, 2006).

Why do different authors reach different results? All the above papers use VAR estimates to pinpoint the relationship between output and fiscal policy. All of them also use the cyclically-adjusted balance as a measure of the fiscal policy stance.<sup>5</sup> They differ in the way they identify the VARs. Those who find a positive effect of fiscal shocks on consumption, and therefore output, typically use quarterly variables and make the assumption that there is no contemporaneous effect from cyclical conditions to policy discretionary actions.

<sup>4</sup> For a brief review of the arguments, see Ramey (2006) and Perotti (2004).

<sup>5</sup> A different literature looks at the automatic stabilizers. Buti et al. (2003) claim that a heavy tax burden may well reduce the effectiveness of the stabilizers.

Working with US data, Edelberg, Eichenbaum and Fisher (1999) and Burnside, Eichenbaum and Fisher (2004), Ramey (2006) and Romer and Romer (2007) adopt the event study approach and identify discretionary actions by studying contemporaneous press reports, focusing on war-related military spending or on tax changes not related to cyclical conditions.

The first approach suffers from two main limitations; first the use of quarterly data sits uncomfortably with the typical annual frequency of budgetary exercises; second, discrete fiscal policy actions are usually prepared over a significant period of time, which opens up the possibility that output responds to expectations of fiscal shocks, not just to the shocks themselves. The second approach suffers from some arbitrariness in identifying the relevant policy episodes, which are large by nature, possibly overlooking other, smaller episodes, which may have different effects.

These controversies are unlikely to be resolved in the near future. We note that there is no empirical evidence in favor of the assumption that fiscal policy has no effect. The debate is about the consumption impact of fiscal policies and on the size of the overall output effect, which is mostly found to be in the Keynesian direction.<sup>6</sup> Skeptics may argue that fiscal policy is not very powerful, but they do not claim that it is wholly impotent.

### **3.2. Policy motivation: the euro effect**

That fiscal policy can be used as a macroeconomic policy tool does not mean that governments do so in an appropriate way. A long tradition has identified a number of lags – recognition, decision, implementation – which could result in badly timed effects. An equally long tradition has pointed out that governments may be more motivated by political gains rather than by economic management concerns. If fiscal policy actions are not driven by a macroeconomic stabilization motive, it may not be systematically countercyclical.

The question, then, is whether euro area membership affect policymakers' incentives and, if so, how. A first place to look at is the SGP. On one hand, it can help governments to resist pressure from interest groups and therefore improve the quality of fiscal policy. On the other hand, it reduces the room for maneuver and lead to pro-cyclical policies.

Another consideration is the fact that the exchange rate is no longer available to boost external competitiveness, with two opposite potential effects on the conduct of fiscal policy. First, governments may be tempted to use fiscal policy instead of monetary policy to counteract a temporary competitiveness loss when a euro appreciation reduces domestic demand. A different case concerns a loss of external competitiveness due to domestic inflation or to a relative productivity decline. In a monetary union, external competitiveness can only be restored the hard way, through sustained cost and price moderation or enhanced productivity gains. Fiscal policy is no longer a substitute to monetary policy.<sup>7</sup> Its only possible macroeconomic contribution is to encourage cost and price moderation, possibly by restricting demand in goods and labor markets. This would make fiscal policy countercyclical during upswings and acyclical during downswings as long as the exchange rate is overvalued. A case in point is Germany over 2000-6.

All in all, the impact of the adoption of the euro on the macroeconomic use of fiscal policy is ambiguous. We expect more countercyclical action as fiscal policy substitutes for the lost monetary policy instrument, less use of this instrument in downswings as a result of the SGP,

---

<sup>6</sup> Yet another empirical literature examines the possibility of non-Keynesian effects, whereby a fiscal expansion (contraction) has contractionary (expansionary) effects. We ignore this small literature as it seems to concern exceptional events, see Giavazzi and Pagano (1990) and Giavazzi et al. (2000).

<sup>7</sup> Tax changes, as enacted in Germany in 2007, may partly mimic a depreciation, but this is not a macroeconomic use and it does not require any change in the budget balance.

especially in countries where the budget deficit is not far enough from its 3% ceiling and an asymmetric use for countries with an external competitiveness shortfall.

### 3.3. The evidence

Some of these presumptions have been tested. Looking at Eurozone countries, Gali and Perotti (2003), Fatas and Mihov (2001, 2003), and Wyplosz (2005) have found that, in most cases fiscal policy has been acyclical, sometimes even procyclical. They also report that the constraints imposed by the monetary union, the convergence criteria of the “Maastricht years” 1992-98 and the SGP since 1999, have led to somewhat less policy activism and, as a consequence, to less procyclical policies. Fatas and Mihov (2001, 2003) further document that the SGP constraints seem to have mitigated the various influences that are believed to distort the use of the fiscal policy instrument.

These estimates are based on the early experience of monetary union. We revisit them with data that extend to 2006, see the data appendix. We adopt the formulation proposed by Gali and Perotti (2003):

$$(4) \quad d_t = c + \beta^b E_{t-1}y_t + \beta^a E_{t-1}y_t + \gamma b_{t-1} + \rho d_{t-1} + u_t$$

where  $d_t$  is the annual budget deficit,  $E_{t-1}y_t$  is the expected output gap and  $b_t$  is the public debt ( $d_t$  and  $b_t$  are expressed as percent of GDP). The coefficients  $\beta^b$  and  $\beta^a$  correspond to the period before and after 1992 onward; the break is introduced to test whether the restrictions adopted in the Maastricht treaty have affected the cyclical use of fiscal policy. An alternative is to break the sample in 1999, or even to consider three subperiods, separating out the Maastricht from the monetary union years, but the data support the break as indicated. The expected output gap is estimated as in Gali and Perotti (2003) by replacing  $E_{t-1}y_t$  with  $y_t$  and instrumenting it with the US and Japanese output gaps and the lagged output gap  $y_{t-1}$ . A countercyclical use of fiscal policy implies that  $\beta^b < 0$  and  $\beta^a < 0$ . The assumption that the adoption of the common currency has fostered a substitution of fiscal for monetary policy as the macroeconomic stabilization tool implies that  $\beta^b > \beta^a$ .

We also use this framework to test the other hypotheses presented above. To test whether the SGP has an asymmetric effect over the cycle, limiting the countercyclical use of fiscal policy in downswings, we replace  $\beta^a E_{t-1}y_t$  with  $\beta^a E_{t-1}y_t + \beta^{a-} E_{t-1}y_t^-$  where  $y_t^-$  is the output gap when it is negative and zero when it is positive. The hypothesis implies that  $\beta^{a-} > 0$ .

We have also noted that fiscal policy could be used as a substitute for lost monetary policy when dealing with external competitiveness. One hypothesis is that, independently of the cyclical position already captured with  $E_{t-1}y_t$ , fiscal policy is expansionary when external competitiveness is declining. Another hypothesis is that fiscal policy is instead used to reduce costs and regain competitiveness by being restrictive. We can test which hypothesis is borne out by adding:

$$\theta^b X + \theta^a X$$

where  $X$  is a measure of external competitiveness and  $\theta^b$  and  $\theta^a$  correspond to before and after 1992. When fiscal policy is used to compress costs when competitiveness is low, we expect to find  $\theta^i > 0$ . If instead fiscal policy is used to offset the demand effects of poor competitiveness, we should have  $\theta^i < 0$ . If the Maastricht Treaty and the creation of Euro area have reinforced the use of fiscal policy as a countercyclical tool, we should find  $\theta^a < \theta^b \leq 0$ . If instead fiscal policy was initially used as a demand management tool before

the Maastricht Treaty and then was put in charge of restoring competitiveness because exchange rate realignments are no longer possible, we expect to find  $\theta^b < 0$  and  $\theta^a > 0$ .

Another hypothesis, mentioned above, is that the use of fiscal policy in the face of a deterioration of competitiveness depends on the cyclical position of the economy. For instance, it could be procyclical during upswings and acyclical or countercyclical during downswings. This hypothesis can be tested by adding the following terms:

$$\lambda^{b+} E_{t-1} y_t^+ + \lambda^{b-} E_{t-1} y_t^- + \lambda^{a+} E_{t-1} y_t^+ + \lambda^{a-} E_{t-1} y_t^-$$

where  $\lambda^{b+}$  and  $\lambda^{b-}$  refer to periods before 1992 when external competitiveness is weak and when, respectively, the output gap is positive and negative, with a similar definition for  $\lambda^{a+}$  and  $\lambda^{a-}$  the coefficients corresponding to the post-1992 period. Including these terms generally deteriorates all the estimates, and yields non-significant values for these terms. This remains the case if we eliminate the pre-Maastricht years – i.e. we impose  $\lambda^{b+} = \lambda^{b-} = 0$  – with  $\lambda^{a+} > 0$ , and  $\lambda^{a-} < 0$  but still not significant.

In the end, therefore, we estimate:

$$(5) \quad d_t = c + \beta^b E_{t-1} y_t + \beta^a E_{t-1} y_t + \beta^{a-} E_{t-1} y_t^- + \theta^b X_t + \theta^a X_t + \gamma b_{t-1} + \rho d_{t-1} + u_t$$

To measure competitiveness, we use the real exchange rate, defined as relative unit labor costs, constructed such that an increase represents in external competitiveness. Since some real exchange rates are trended, we use the Hodrick-Prescott filter with a high degree of smoothing to preserve low frequency fluctuations.<sup>8</sup> We instrument  $X_t$  with its lag and the real exchange rates of Japan and US and their own lags.

Table 1 presents our results.<sup>9</sup> The deficit  $d_t$  is cyclically-adjusted and net of interest payments on the debt. We present first country by country estimates and then the results from pooling all Euro Area countries together. The country by country estimates suffer from the short sample; the longest time series are only available for 1971-2006, and much less so some countries. The pooled estimates assume that the coefficients are the same for all countries, which may not to be the case, but they rely on a larger sample (the panel is unbalanced with a total of 270 observations).

**Table 1. The budget deficit reaction function**

	Austria	Belgium	Finland	France	Germany	Ireland	Italy	Netherlands	Spain	Pooled 1	Pooled 2
$\beta^b E_{t-1} y_t$	0.15 0.56	0.08 0.67	0.47 0.27	0.25 0.24	-0.24 0.55	0.12 0.62	0.55 0.23	-0.09 0.80	-0.10 0.68	-0.11 0.43	-0.01 0.92
$\beta^a E_{t-1} y_t$	0.80 0.26	1.28 0.66	-1.37 0.42	0.19 0.76	0.71 0.57	-0.07 0.90	1.05 0.09	-0.25 0.72	-0.03 0.95	-1.14 0.07	-1.17 0.06
$\beta^{a-} E_{t-1} y_t^-$	-1.32 0.22	-0.63 0.82	0.78 0.77	0.11 0.90	-1.05 0.64	0.26 0.68	-0.79 0.48	1.36 0.23	0.45 0.57	1.50 0.12	0.57 0.28
$\theta^b X$	-0.06 0.05	0.01 0.89	-0.03 0.79	0.07 0.26	-0.19 0.11	-0.11 0.02	0.02 0.88	-0.10 0.28	-0.13 0.15	-0.14 0.04	-0.03 0.17
$\theta^a X$	-0.11 0.19	-0.51 0.41	0.21 0.49	0.01 0.91	0.11 0.35	0.05 0.33	-0.12 0.04	0.01 0.95	0.23 0.09	0.25 0.03	0.28 0.09
$b_{t-1}$	-0.05 0.01	-0.04 0.06	0.04 0.41	-0.01 0.63	-0.03 0.50	-0.02 0.16	-0.10 0.00	-0.01 0.84	-0.03 0.39	-0.01 0.46	-0.02 0.00
$d_{t-1}$	0.12 0.60	0.73 0.00	-0.08 0.83	0.71 0.05	0.59 0.00	0.51 0.02	0.30 0.33	0.44 0.06	1.04 0.00	0.79 0.00	0.73 0.00
Sample period	1977-2006	1971-2006	1976-2006	1979-2006	1971-2006	1986-2006	1981-2006	1971-2006	1981-2006	1971-2006	1971-2006

Source: see Appendix

<sup>8</sup> We set the smoothing parameter to 1000.

<sup>9</sup> Due to missing data, Greece, Luxembourg and Portugal are not included in the sample.

Notes: p-statistic reported under coefficients; White heteroskedasticity-consistent standard errors. Instruments:  $y_{t-1}$  and  $X_{t-1}$ , and  $y_t$ ,  $y_{t-1}$ ,  $X_t$  and  $X_{t-1}$  for the US and Japan, The constant and country fixed-effects not reported. In the case of Italy, the set of available information for  $\lambda^b E_{t-1} y_t^+$  and  $\lambda^a E_{t-1} y_t^+$  is too small so we do not distinguish between pre and post 1992 – i.e. we impose  $\lambda^b = \lambda^a$ . Unbalanced panel.

The country-by-country estimates are often imprecise, which partly reflects the short size of the sample. We focus our discussion on the panel estimates, as shown in the columns labeled “Pooled 1”. Table 2 summarizes the test results. These results confirm previous findings that fiscal policy has become counter-cyclical since 1992. Yet, the finding that  $\beta^{a-} > 0$  indicates that this shift occurred during upswings while fiscal policy remains approximately acyclical during downswings. In other words, the SGP is having asymmetrical effects. These results differ from those reported in the EU Commission (2006) which finds that prior to 1992 fiscal policy was procyclical in bad times and acyclical otherwise, while it has become procyclical in good times after the adoption of the euro. To check whether our results, the column “Pooled 2” shows the results when we break the sample in 1999, so that “before” refers to the period 1970-1998 and “after” to the period 1999-2006. The results remain practically unchanged.<sup>10</sup>

**Table 2. Tests**

Fiscal policy counter-cyclical until 1991	$\beta^b < 0$	No, acyclical
Fiscal policy counter-cyclical after 1992	$\beta^a < 0$	Yes
Fiscal policy more counter-cyclical in Maastricht years	$\beta^a < \beta^b$	Yes
SGP limits counter-cyclical policy in downswings	$\beta^{a-} > 0$	Yes
Fiscal policy acts on demand to compensate for external competitiveness difficulties until 1991	$\theta^b < 0$	Yes
Fiscal policy acts on demand to compensate for external competitiveness difficulties after 1992	$\theta^a < 0$	No
Fiscal policy acts on costs to deal with external competitiveness until 1991	$\theta^b > 0$	No
Fiscal policy acts on costs to deal with external competitiveness after 1992	$\theta^a > 0$	Yes

Regarding the use of fiscal policy to deal with external competitiveness, we find that the situation has been radically altered following the adoption of the Maastricht Treaty. Up until 1991, our results suggest that governments used fiscal policy to make up for demand shortfall when they faced external competitiveness losses, and conversely tightened up fiscal policy when external competitiveness was boosting demand. After 1992, instead, they tightened up fiscal policy in the face of deteriorating competitiveness as if they were using their last remaining macroeconomic instrument to weigh on costs. These results suggest that governments are now willing to suffer short-term demand shortfalls to restore cost competitiveness. Put differently, fiscal policy is not necessarily misused.

<sup>10</sup> They are also unchanged if we compare the periods 1970-1991 and 1999-2006, dropping the Maastricht years 1992-98. A possible explanation is that the Commission’s results are based on a graphical analysis. Another possibility is that they look at the relationship between changes in the cyclical-adjusted budget and in the output gap while we look at levels.

The recent literature has emphasized the importance of budgeting institutions, i.e., the rules and norms under which governments plan their budgets, pass them through the legislature and implement them, for achieving fiscal discipline. Empirical research in this area, documented and summarized in Hallerberg et al. (2007), supports the view that good budgeting institutions are a precondition for achieving the fiscal discipline desired for EMU. It is, therefore, interesting to see whether budgeting institutions which are strongly conducive to fiscal discipline prevent governments from using fiscal policy effectively for macro economic stabilization. Hallerberg and von Hagen (1999) find that governments following the “delegation approach” to budgeting institutions conduct more effective stabilization policies than others.<sup>11</sup> In this view the Stability and Growth Pact can operate as a substitute for weak budgetary institutions.

In order to test whether different qualities of institutions have indeed affected the budget outcomes, we use four indicators developed by Hallerberg et al. (2007):

- Good budgeting institutions under either approach make fiscal policy more countercyclical;
- Good budgeting institutions under the contracts approach make fiscal policy more countercyclical;
- Good budgeting institutions under the delegation approach make fiscal policy more countercyclical;
- Stringent fiscal rules make fiscal policy more countercyclical.

We successively augment the panel regression shown in Table 1 with each of four dummy variables coded 1 for the country and period when the corresponding property is found to apply, and 0 otherwise.

The resulting regressions, not shown, fail to detect any significant effect. This may be due to the small size of the sample – data availability limits the sample to only nine euro area member countries. Alternatively, it may be that these institutional differences have not affected the governments’ ability to conduct countercyclical policies. This would indicate that there is, from an institutional design perspective, no trade-off between fiscal discipline and effective macro economic stabilization.

## **4. Mutual Insurance via Transfers**

### **4.1. Principles of Fiscal Insurance**

All existing federations provide mechanisms to redistribute income among their constituent regions in response to economic developments that affect the latter in different ways ((Ingram, 1959). These mechanisms can be explicit, as in the case of Germany’s “Finanzausgleich,” or the Canadian and Australian systems of fiscal equalization, or implicit, as in the case of the US, where redistribution works through the federal government budget. They can be organized horizontally, as in Germany and Canada, where state governments pay and receive transfers to and from other state governments, or vertically, as in Australia, where the federal government pays transfers to the individual territories in accordance with their fiscal needs. They can be transfers between governments or the result of transfers to and from private households through a nation-wide social insurance system such as unemployment insurance. Such mechanisms are generally based on equity considerations: The aim of protecting the individual against economic hardship is part of the solidarity defining a society. As Delors (1989, p. 89) put it in his plea for a risk-sharing mechanism among the members of the European Monetary Union (EMU), “... *in all federations the different combinations of federal budgetary mechanisms have powerful “shock-absorber” effects dampening the*

---

<sup>11</sup> Under the delegation approach, budgeting institutions lend significant agenda setting powers to the finance minister. In contrast, the “contracts approach” builds on binding numerical targets negotiated among all actors in the budget process at the beginning of the process. See Hallerberg et al (2007).

*amplitude either of economic difficulties or of surges in prosperity of individual states. This is both the product of, and the source of the sense of national solidarity which all relevant economic and monetary unions share.”*

Although they were not designed explicitly for that purpose, transfer mechanisms of this kind can be regarded as an insurance mechanism against asymmetric cyclical fluctuations. Regions in a more favorable cyclical position than the federation on average pay transfers to regions in a less favorable position. This dampens the relative boom in the former and the relative recession in the latter. If each region had its own currency and exchange rate were flexible, exchange rate adjustments would provide a similar stabilizing function, as regions in a relative boom would experience an appreciation of their real exchange rates and a worsening of their current accounts, while regions in a relative recession would experience the opposite.<sup>12</sup> This consideration is the basis for Kenen's (1969) suggestion that fiscal transfers among the member states of a monetary union could replace the adjustment to asymmetric cyclical shocks otherwise provided by the exchange rate.

Empirical research in the 1990s has sought to estimate how important the transfer mechanisms in existing federations and large unitary states are in this regard. This discussion was spurred by Sachs and Sala-i-Martin's (1991) estimates that the US federal budget smooths around 33 – 40 percent of asymmetric shocks to regions in the US. Subsequent research has shown, however, that, for a number of data and conceptual reasons, these authors grossly overestimate the smoothing function of the federal budget. Estimates of this kind are sensitive to the use of different national accounting concepts (Mélitz and Zumer, 1999) and must distinguish between permanent redistribution among regions and the response to transitory shocks (von Hagen, 1992). The consensus estimate today is that the federal budget smooths about 10-15 percent of asymmetric shocks in the US.<sup>13</sup> Estimates for Canada yield similar results.

One might argue that such a mechanism is not required in the European Monetary Union (or elsewhere), as markets can fulfill the same function. Free trade and mobility of capital and labor generate opportunities for the citizens of the member states to protect themselves against asymmetric shocks. Indeed, empirical studies for the US suggest that financial markets smooth 30 to 50 percent of state-specific income shocks (Asdrubali et al, 1996; Athanasoulis and van Wincoop, 1998; Mélitz and Zumer, 1999). Mélitz and Zumer report similar results for Canada, suggesting that markets are more important in providing insurance than fiscal mechanisms. But, even if monetary integration promotes financial market integration and, thereby, the scope for protection against asymmetric shocks, one may argue that markets provide less insurance than citizens demand. Thus, the question remains whether EMU needs a fiscal insurance mechanism against asymmetric shocks.

To explore the principles of fiscal insurance, consider a monetary union consisting of  $i=1, \dots, n$  states or regions. Each region is endowed in each period with a stochastic per-capita income  $y_{it}$  with expected value  $y$  in all regions. Let  $y_t$  be the average income in the monetary union. There is a fiscal transfer mechanism in the monetary union paying transfers  $\tau_{it}$  to consumers in region  $i$  and period  $t$ . Households in each region are risk averse and have linear-quadratic utility functions in consumption,  $c_{it}$ ,

---

<sup>12</sup> See Stockman (1998) for a broad review of the theoretical and empirical research on the stabilizing function of the real exchange rate.

<sup>13</sup> See von Hagen (2006) for a review of the empirical literature.

$$(6) \quad U_{it} = c_{it} - \frac{\gamma}{2} \text{var}(c_{it}),$$

where  $\gamma > 0$ . The households' budget constraint is  $c_{it} = y_{it} + \tau_{it} - \theta_i$ , where  $\theta_i$  is a constant tax imposed by the regional government, which means that individuals cannot borrow to smooth consumption in the presence of shocks. For now, assume that  $\theta_i = 0$ .

The fiscal transfer mechanism can be designed to make consumers in all regions better off by paying transfers that partially offset deviations from expected income. A first, important question is whether or not the fiscal mechanism must be balanced at all times or not. If budget balance is only required in expectation, the optimal policy is to set consumption equal to expected income each period and eliminate all variance. In this case, the optimal transfers are

$$(7) \quad \tau_{it} = y - y_{it},$$

where  $y$  is potential output. Consumers are fully insured against income shocks. This is so, because it eliminates any variance in consumption over time. Note that each government could achieve the same outcome by taxing its citizens when income is above its expected value and paying transfers when income is below its expected value. In this case, each government would borrow on behalf of its citizens in the international capital market when income is low and pay back when income is high.

A natural question then is, why should there be a fiscal insurance at the level of the monetary union? The answer is two-fold. First, small countries in particular may face upward-sloping credit supply curves in the capital market, implying that they pay higher interest rates for borrowing funds when income is low than they receive on funds invested when income is high. Under such circumstances, pooling the individual consumption-smoothing policies will yield a reduction in the aggregate cost of borrowing (see Hammond and von Hagen, 1998). Second, if the monetary union imposes restrictions on public debts and deficits to safeguard the stability of the common currency, as EMU does, a common fiscal insurance mechanism assures that countries are not forced into suboptimal consumption patterns. By creating a common fiscal insurance the member countries delegate their borrowing capacity to the monetary union.

If budget balance is required each period, the transfers are

$$(8) \quad \tau_{it} = \alpha(y_t - y_{it}) + \pi_i, \quad \sum_i \pi_i = 0.$$

They consist of a state-dependent part linked to the deviation of a region's income from average income in the monetary union, and a state-independent part. Using (8) in (6), we obtain

$$(9) \quad U_{it} = \alpha y_t + (1 - \alpha)y_{it} + \pi_i - \frac{\gamma}{2} [\alpha^2 \text{var}(y_t) + 2\alpha(1 - \alpha) \text{cov}(y_t, y_{it}) + (1 - \alpha)^2 \text{var}(y_{it})].$$

Forcing the system to balance at the aggregate level implies that fiscal insurance now smoothes fluctuations of regional income around average income in the monetary union, which itself is a random variable that fluctuates over time. We can use equation (9) to calculate the optimal, utility-maximizing transfer rate  $\alpha^*$  from the point of view of households in each region  $i$ ,

$$(10) \quad \alpha_i^* = \frac{w_i(w_i - \rho_i)}{1 + w_i(w_i - 2\rho_i)}, \quad w_i = \sqrt{\frac{\text{var}(y_{it})}{\text{var}(y_t)}},$$

where  $\rho_i$  is the correlation between income in region  $i$  and average income in the monetary union, and  $w_i$  indicates how volatile a region's income is compared to average income in the monetary union. Equation (10) shows that, in this case, full insurance will generally not be optimal for all regions. Instead, different regions have different optimal transfer rates and each region's optimal degree of insurance depends on its risk profile compared to the monetary union. Note, first, that  $\alpha_i^* = 1$  for all regions, if all individual regional incomes are

uncorrelated and identically distributed.<sup>14</sup> Otherwise, the optimal degree of insurance depends on the correlation between regional and average income and on the relative volatility of regional and average income. If all regions have the same variance of regional income, the optimal degree of insurance approaches zero, as the correlation among the incomes approaches one. Thus, the more similar income fluctuations are over time, the scope there is for insurance. But note that even with positive correlations, regions with relatively large income variances compared to others find insurance attractive, while regions with relatively low income variance would prefer no insurance at all.

The point of this discussion is that, if the fiscal mechanism must be balanced each period, regions with different risk profiles demand different degrees of insurance. Designing a common fiscal insurance then requires finding a compromise among the regions. This can be done using the state-independent transfers  $\pi_i$  to make side payments between the regions. Specifically, relatively high-risk regions can pay a premium to relatively low-risk regions to compensate for providing more insurance than the latter would find optimal. Consider the following example for illustration. Let  $n=2$  and consider a region's expected utility given some transfer rate  $\alpha=a$ . From equation (9) we have

$$(11) \quad EU_i(a) = y + \pi_i - \frac{\gamma}{2} [a^2 \text{var}(y_t) + 2a(1-a) \text{cov}(y_t, y_{it}) + (1-a)^2 \text{var}(y_{it})],$$

where  $\pi_1 = -\pi_2$ . Assume that the two countries use Nash bargaining to establish the state-independent transfers, and that each region's fall-back position is  $\alpha = 0$ . The equilibrium transfer can be found by maximizing the product  $[EU_1(1) - EU_1(0)] [EU_2(1) - EU_2(0)]$ . This yields the equilibrium state-independent transfer:

$$(12) \quad \pi_1^* = -\pi_2^* = \frac{a\gamma \text{var}(y_t)}{4} [(2-a)(w_2^2 - w_1^2) + 2(1-a)[w_1\rho_1 - w_2\rho_2].$$

Assume, first, that the relative variances  $w_i$  are the same. Then the first term is zero and equation (12) says that the region whose income is more highly correlated with average income receives a transfer from the region whose income is less correlated with average income. Clearly, the former has less interest in fiscal insurance against fluctuations around the average than the latter. The side payment is used to induce it to agree to the insurance mechanism. Next, assume that both correlations are negligible such that the second term disappears. In that case, equation (12) says that the region with the more volatile income pays a state-independent transfer to the region with the less volatile income.

Generally, this discussion shows that a welfare-maximizing fiscal insurance mechanism will combine fixed transfers with state-dependent transfers, if it is required to achieve budget balance each period. Thus, whether or not the fiscal mechanism is allowed to borrow in times when average income in the monetary union is low to pay back when average income is large is an important aspect of the design of fiscal insurance.

Consider now the possibility that regional governments can undertake policies that reduce the variability of regional income, and that doing so requires a fixed tax  $\theta_i > 0$  from all households. Such policies might consist of running a *rainy day fund* from which the government can draw in times of low income, or in investing in projects improving the flexibility of local markets and factors of production. An important question then is, how does the fiscal mechanism at the level of the monetary union interfere with the regional governments' optimal policy at the regional level?

To answer this question, we assume that the variance of regional income and its covariance with average income are functions of  $\theta_i$ . Each regional government will choose  $\theta_i$  such that

---

<sup>14</sup> To see this, note that  $w_i = \sqrt{n}$  and  $\rho_i = 1/\sqrt{n}$  for all  $i$  in this case.

(13)

$$\frac{\partial EU}{\partial \theta_i} = -1 - \frac{\gamma}{2} \left[ (1 - \alpha^2) \frac{\partial \text{var}(y_{it})}{\partial \theta_i} + 2\alpha(1 - \alpha) \frac{\partial \text{cov}(y_{it}, y_t)}{\partial \theta_i} + \alpha^2 \frac{\partial \text{var}(y_t)}{\partial \theta_i} \right] = 0.$$

It is plausible to assume that the derivatives of the two variances with respect to  $\theta_i$  are negative, since reducing the variance of regional income is likely to result in a reduction in the variance of aggregate income. Whether or not such policies reduce the covariance, however, is uncertain. Using condition (13), we can derive the effect of an increase in the degree of fiscal insurance on the optimal policy of a regional government:

$$(14) \quad \frac{\partial \theta_i^*}{\partial \alpha} = \frac{2(1 - \alpha) \frac{\partial \text{var}(y_{it})}{\partial \theta_i} - 2(1 - 2\alpha) \frac{\partial \text{cov}(y_{it}, y_t)}{\partial \theta_i} - 2\alpha \frac{\partial \text{var}(y_t)}{\partial \theta_i}}{(1 - \alpha)^2 \frac{\partial^2 \text{var}(y_{it})}{\partial \theta_i^2} + 2\alpha(1 - \alpha) \frac{\partial^2 \text{cov}(y_{it}, y_t)}{\partial \theta_i^2} + \alpha^2 \frac{\partial^2 \text{var}(y_t)}{\partial \theta_i^2}}.$$

Assume that policies to reduce income risk have declining marginal returns, i.e., the second derivatives are all positive. Equation (14) then says that the effect of fiscal insurance on the optimal regional policy depends crucially on the effect a region's variance has on the variance of average income. If this effect is small, as it would be for small regions, regional policies have small effects only on the covariance of regional and average income and the variance of average income, and (14) is negative. Thus, an expansion of the fiscal insurance mechanism reduces efforts for less income variance at the regional level. The opposite may be true, however, for large regions, whose policies have strong effects on the monetary union's average income variability.

Furthermore, equation (14) shows that the response of regional policies to a small increase in fiscal insurance provided by the monetary union depends on the degree of insurance already in place. Assuming that the changes in the covariances are of smaller magnitude than the changes in the variances, (11) shows that an increase in fiscal insurance reduces local efforts to reduce income variance if  $\alpha$  is initially close to zero. The opposite is true, however, if the degree of insurance is already large. In that case, regions have an incentive to engage in policies reducing regional income variance as this contributes to a more stable average income.

This discussion shows that a fiscal insurance mechanism changes the incentives for regional governments to protect their citizens against income fluctuations, a point discussed also by Persson and Tabellini (1996) and Migué (1993). However, it is not clear a priori which way these incentive effects go. One can only conclude that a fiscal insurance mechanism may require additional policies at the level of the monetary union that rectify or amplify the incentive effects on local governments.

Turning from a simple endowment economy to a macroeconomic environment raises additional concerns. In an economy with production, household welfare will depend not only on consumption but also on employment. To offset the effects of asymmetric shocks, a fiscal insurance mechanism should then aim at stabilizing fluctuations in employment and consumption. In the simple, traditional Keynesian framework with fixed prices and Keynesian unemployment considered by Mundell (1961) and Kenen (1969), stabilizing household income through fiscal insurance would still be sufficient. In a more general, dynamic macro economic framework, it is not.<sup>15</sup> An important aspect of fiscal insurance then is whether the

<sup>15</sup> For recent analysis of these issues in the framework of a New-Keynesian dynamic general equilibrium model see Evers (2006).

monetary union pays transfers to the regional governments or the households in the individual regions (Kletzer and von Hagen, 2001). Transfers to regional governments directly affect the demand for goods and services in regional markets. Transfers to households do so only indirectly, as they operate through the households' budget constraint and distort their choices between current and future consumption on the one hand and between consumption and leisure on the other hand. The resulting effects on employment and savings may destabilize regional employment even if they reduce the impact of asymmetric shocks on regional consumption (Evers, 2006).

As it turns out, in a more general macro framework, the optimal design of a fiscal insurance mechanism depends crucially on the type of shock hitting the economies. It is now well understood that, in the context of dynamic general equilibrium models and in the presence of aggregate productivity shocks, output stabilization is not an efficient policy.<sup>16</sup> The reason is that such shocks move the economy's efficient (flexible-price) equilibrium level of output. They should be accommodated, since households want to adjust their levels of consumption and investment accordingly (Rotemberg and Woodford, 1997). Carrying over this insight to asymmetric productivity shocks implies that full insurance against such shocks is undesirable in a monetary union. Pure relative demand shocks of the kind considered by Mundell (1961) can be offset completely by transfers paid between regional governments, provided that the governments use these transfers to finance the purchase of goods and services in the local markets. In the case of productivity shocks, however, neither transfers between regional governments nor transfers between private households alone are sufficient to achieve optimal insurance. A combination of both is required to stabilize consumption and employment (Evers, 2006).

As argued above, the scope for fiscal insurance among the participants of the European Monetary Union depends on the correlation of income and employment fluctuations among the states and regions of the union. Recent empirical work that has investigated the correlation of business cycles in the EMU sheds some light on this issue. Traistaru and von Hagen (2004) find that the correlation between country-specific and the euro-area business cycles is positive for all EMU member countries. Correlation coefficients vary between 0.30 and 0.50. Montoya and de Haan (2007) consider NUTS-1 regions in the EMU. They find that the average correlation between regional business cycles and the euro-area business cycle is above 0.60 and has been growing over the past decade. This is consistent with earlier results by Artis and Zhang (1997) and Fatas (1997) who find that business cycles became more correlated among the member states of the ERM during the 1980s and 1990s. Overall, this literature suggests that monetary integration has led to more strongly correlated business cycles without eliminating the scope for fiscal insurance altogether. Traistaru and von Hagen (2004) show that the business cycle correlations between the new EU member states and the euro area have increased but remain much weaker than the correlations among the EU-15 states. Future enlargements of the euro area by Central and East European countries will, therefore, increase the scope and desirability of a fiscal insurance mechanism.

## **4.2. Political Economy Considerations**

For a fiscal insurance mechanism in the euro area, additional considerations arise (Hammond and von Hagen, 1998). Since the euro area is not fully politically integrated, the political acceptability of a fiscal insurance mechanism is an important constraint on its design. A first point is that the mechanism must be fully automatic and tied to a formula determining the transfers. If the latter were left to the discretion of the governments, they would soon become politicized, e.g., by paying transfers to governments facing reelections. Since a fiscal transfer mechanism would create opportunities for politicians to spend monies raised from tax payers in other countries, it would set up a classical fiscal commons problem, allowing politicians to

---

<sup>16</sup> See Canzoneri (2006) for a summary of the relevant discussion.

spend money without regard to the full cost of taxation. The result would be a tendency to increase the volume of transfers over time. This tendency could be mitigated by requiring unanimity for all decision over the payment of transfers, but this would make the system too rigid to respond quickly to economic shocks as they arise.

A second point is that such a mechanism must avoid the impression of bureaucratic discretion and that it serves other distributional goals than insurance. This requires transparency and, therefore, a relatively simple transfer formula. Furthermore, the mechanism must clearly address cyclical fluctuations. Hammond and von Hagen show that these two requirements create a trade-off. Identifying cyclical shocks properly calls for the use sophisticated econometric models which result in fairly complicated formulas to calculate the transfers. If, however, transfers are based simply on differences in real growth rates across member states, they generate permanent flows from fast to slow-growing countries and may even destabilize cyclical movements.

A third point is that, if it aims at offsetting the loss of the exchange rate channel of macro economic adjustment, a fiscal insurance mechanism would have to target the national economies of the member states. The different sizes of the national economies then create an obvious problem if the mechanism is required to be balanced every period, i.e., stabilizing a negative, asymmetric shock of one percent of GDP in Luxembourg would require a transfer of small absolute size from the remaining countries, while stabilizing a shock of the same relative size in Germany would require a payment of very large absolute size from the remaining countries. This problem could be overcome by allowing the mechanism to run surpluses and deficits at the aggregate level. In that case, however, one would have to pay close attention to the risk that the national governments abuse it as a new source of permanent borrowing circumventing the strictures of the Stability and Growth Pact.

### **4.3. Assessment of Individual Proposals**

An important message from the discussion above is that the design of a fiscal transfer mechanism for the euro area depends critically on the question whether or not this mechanism would be required to be balanced financially every period. If not, the main issue that remains is to identify the shocks properly; once this is done, full insurance against asymmetric demand shocks and some partial insurance against asymmetric productivity shocks is desirable. A second, important message is that such an insurance mechanism should not be exposed to moral hazard. Proposals for fiscal insurance in the euro area should be evaluated on the basis of these two tenets. We consider two insurance mechanisms frequently found in existing federal systems. The first is the sharing of tax revenues among the government of euro-area member states. The second is a euro-area wide unemployment insurance. The former would pay transfers among the governments, while the latter would pay transfers directly to the households.

#### **3.1.1. 4.3.1. Tax Revenue Sharing**

Insurance through tax revenue sharing can be achieved by having all member governments pay a fixed proportion of their tax revenues annually into a common euro-area tax fund, which simultaneously pays out transfers to these governments on a fixed (per capita) basis. Payments into the fund would then vary with the evolution of the tax base over time, while payments out of the fund would not follow any cyclical movements. Thus, countries with temporarily high tax bases would pay more, countries with temporarily low tax bases would pay less than they receive. As governments adjust their spending accordingly, stabilization is provided.

The appropriate tax base for such a mechanism would be VAT rather than income or payroll taxes. The reason is that, first, VAT is closer to demand shocks than income or payroll taxes, and, second, it reacts faster to cyclical movements in the economy than income taxes or

payroll taxes which are often declared and paid with delays. To set up such a mechanism, member countries of the euro area could agree to share a portion of their VAT revenues through the common fund. In fact, different countries could participate in such a fund with different shares of their VAT revenues according to national preferences and economic circumstances. For example, governments with more volatile economies could decide to bring a larger share of their revenues into the fund. Implementation of such a mechanism would, therefore, not require raising VAT rates in any member state, an important condition for the acceptability of the proposal.

An advantage of such a mechanism is that it would allow member governments to engage in counter-cyclical policies addressing asymmetric shocks in a way fully consistent with the rules of the SGP. States receiving net transfers could increase government spending without violating their commitment to keeping their budgets close to balance or in surplus. Note that the additional spending should have a greater effect on aggregate spending in the country concerned, as households would recognize that it is not connected with an increase in future tax liabilities and, hence, would not cut back private demand as in the case of deficit-financed government spending; a point confirmed empirically by Bayoumi and Masson (1995).

Assume, first, that the mechanism does not have to achieve balance at the aggregate level. Effectively, it would then compensate the restrictions on borrowing at the national level by allowing borrowing at the level of the euro area. A strict control of the mechanism assuring that it does not build up a stock of permanent debt would be required; we return to this issue in the next section. The main moral hazard problem here is that governments would not adjust spending in accordance with the net transfers they pay or receive under the mechanism, and, thus, not provide the desired stabilization. But this problem need not worry the euro area as a whole. It could be left up to the national electorates to make sure that their governments use the resources they have available properly.

Things are more complicated if the mechanism had to be balanced financially, because it would then have to be combined with permanent transfers among the governments compensating for differences in their risk profiles. Negotiating these transfers and adjusting them over time would require a way to reveal the true degree of risk aversion of the national populations and the true volatility of the asymmetric shocks. Both would be difficult to achieve and subject the mechanism to political games. Since governments with less volatile economies would receive permanent transfers under such a scheme, the mechanism would create incentives to implement policies at the national level that reduce the national economies' exposure to asymmetric shocks. Thus, the incentive effects would work in the direction of reducing asymmetric shocks in this case.

#### 4.3.2. Euro-Area Unemployment Insurance

The alternative proposal would be to implement a euro-area wide unemployment insurance. Under such a scheme, households in economies enjoying positive asymmetric shocks would pay rising insurance contributions which would be paid to households suffering from negative asymmetric shocks. This would help stabilize aggregate demand across euro-area countries. Since unemployment insurance would constitute an entitlement for individuals, such a scheme cannot be forced to balance at the aggregate level unless the governments pay additional contributions making good for any shortfalls of revenues over expenditures.<sup>17</sup>

An insurance mechanism of this sort would have to address a variety of problems. First, given that levies on labor income are large in most European countries already, it would have to be

---

<sup>17</sup> This system would differ from European regional policies since these policies involve transfers based on income levels, not cyclical fluctuations.

implemented in a way that does not increase the cost of labor further. An obvious way to do that would be to replace a part of the existing unemployment insurance schemes at the national level to the euro-area level. Note, however, that Italy today does not have an unemployment insurance system at the national level. Thus, this approach would require the institution of a new branch of social insurance in this country.

Second, many European countries have experienced an increase in non-traditional forms of employment in recent years, which are not included in the existing social insurance schemes. However, these new forms of employment are precisely those that are the most flexible ones in the labor market and, therefore, the most responsive ones to asymmetric shocks. The implementation of a euro-area wide unemployment insurance would most likely be most efficient, if non-traditional jobs could be integrated into the scheme. But doing so should not destroy their very purpose of providing flexibility to the labor market.

Third, European countries suffer from very different rates of permanent unemployment. The main moral hazard problem of a euro-area wide insurance is that it creates incentives for national governments to raise (or to not do enough to lower) permanent unemployment in order to receive permanent net transfers through the mechanism. One obvious way of dealing with this problem is to insist on co-insurance. Euro-area wide unemployment insurance would only be provided for countries that have substantial unemployment insurance at the national level. Given the concern over the high cost of labor in the euro area, this would limit the amount of insurance that can be provided at the aggregate level. An alternative solution would be to limit the duration of the unemployment insurance provided by a euro-area wide mechanism strictly to periods of six to twelve months.

## 5. Institutional Requirements for a Transfer System

The analysis carried out in the previous section suggests that the most promising mutual insurance system rests on tax revenue sharing with a mutual fund that need not be balanced year after year. There are two main moral hazard problems challenging the viability of such a system. The first is that it might create opportunities for cheating by individual countries trying to induce permanent redistribution in favor of individual countries. The second is that it will be abused as a way to circumvent the borrowing restrictions under EMU, leading to permanent indebtedness of the system at the aggregate level. We now take issue with these challenges.

### 5.1. Moral Hazard Problems at the Country Level

The purpose of the fiscal insurance system would be to insure the tax revenues of the participating governments against transitory asymmetric shocks. Such shocks may be correlated over time, but, in order to guarantee that the insurance system does not run permanent surpluses or deficits, only shocks that do not affect the level of taxes permanently can be insured. Since tax revenues in practice are affected by a mixture of permanent and transitory shocks, the viability of a fiscal insurance system requires a method to identify transitory shocks and separate them from permanent shocks. As demonstrated in Hammond and von Hagen (1998), this is possible, if the system can be based on sophisticated econometric models. This, however, is unlikely for a system that results from an agreement among governments of different countries.

Ruling out complicated econometrics, a simple mechanism for calculating the transfers paid within the system must be found. Assuming that tax revenues of government  $i$  in period  $t$ ,  $T_{it}$ , are proportional to GDP,  $Y_{it}$ ,

$$(15) \quad T_{it} = \alpha Y_{it}$$

this can be achieved by tying payments into the system to the asymmetric deviation between actual and potential GDP,  $P_{it}$ ,

$$(16) \quad t_{it} = \lambda\alpha[(Y_{it} - P_{it}) - \beta(Y_t - P_t)],$$

where  $\lambda$  determines the degree of insurance chosen by government  $i$ ,  $Y_t$  and  $P_t$ , are the actual and the potential level of euro-area GDP, and  $\beta$  is the weight of country  $i$  in euro-area potential GDP. Countries enjoying a boom relative to the euro area would pay into the insurance scheme, while countries suffering from a relative recession would receive transfers. By definition, these deviations are transitory, assuring that the system is balanced on average over the business cycle. Note that, as business cycles among the participating countries become more correlated, transfer payments into and out of the system will become smaller.

A moral hazard problem arises from the fact that, in each period, a government has an incentive to overstate its potential GDP in order to reduce its payment into the system. To see this, note that  $(dt_{it}/dP_{it}) = -\lambda\alpha(1-\beta^2) < 0$ . In other words, faced with formula (16) as a basis for its payments, governments have an incentive to declare that their economy is in a recession. This implies that the computation of potential GDP cannot be left to the governments alone. One approach would be to delegate these computations to a politically independent agency, e.g., the European Commission or an independent research institute.

An alternative solution would be to modify (16) in a way that assures balance over time independently of the way how potential (and actual) output are calculated. Assuming that potential output is constant over time for simplicity, this can be done by using the following formula:

$$(17) \quad t_{it} = \lambda\alpha[(Y_{it} - P_{it}) - \beta(Y_t - P_t)] - \sum_{j=0}^{t-N} (1+r_t)^{N+j} t_{it-N-j}.$$

The penalty term reduces any transfers received in period  $t$  by a part of the accumulated transfers paid in the past. Letting  $N$  be the length of the business cycle assures that this would not interfere with stabilizing cyclical movements. Under this approach, any misrepresentation of potential output in period  $t$  leads to a reduction in transfers received or an increase in payments made into the system in the future. By applying an appropriate interest rate  $r$ , the incentive to cheat is balanced by the desire to avoid future reductions in transfers received. If potential output is calculated properly, the penalty term converges to zero over time. It is straightforward to extend this approach to the case of growing potential output.

## 5.2. Moral Hazard Problems at the Aggregate Level

At the aggregate level, the moral hazard problem lies in the possibility for the participating countries to abuse the insurance scheme as a way of circumventing the borrowing constraints under EMU. Governments running budget deficits close to three percent of GDP might ask for payments out of the insurance system in order to increase its borrowing outside its own budget. Obviously, as long as a penalty as in equation (17) is applied and strictly enforced, these governments will be forced to run budget surpluses in future periods in order to pay back what they borrowed indirectly. If this is true, such indirect borrowing does not increase government debt permanently and does not endanger the sustainability of the common currency. Therefore, there is no problem for the monetary union as a whole.

The moral hazard problem comes from the possibility that the governments agree collectively not to enforce the repayment embedded in the penalty. Note that, as long as each country strictly keeps its own account within the fiscal insurance system and is responsible for the liabilities created by any transfers paid to it, no government must fear becoming financially responsible for the misbehavior of other governments. But this may imply that governments would rather give into the demands of others to borrow indirectly through the insurance mechanism than facing an open conflict with them. The experience with the enforcement of the SGP in the years after 2001 suggests that this possibility cannot be ruled out.

Ultimately, this problem is linked to the governance of the insurance mechanism. It could be mitigated by delegating the governance of the system to a politically independent body which has a vital interest in preserving its financial sustainability, either the European Commission or the European Central Bank. These bodies would then have the right to veto the payment of transfers to individual countries and to impose a penalty formula such as the one given in

equation (17). For example, a veto might be triggered, if the sum of a government's budget deficit and the transfer payment received from the insurance system exceeds three percent of GDP. Even if it is hard to imagine that such an outside body could consistently withstand pressures from the participating governments, delegating such veto power would have the advantage that such pressures are made visible to the public in the countries participating in the monetary union. This would strengthen the democratic accountability of the governments and give the voters an opportunity to penalize financially irresponsible governments.

## **6. Conclusions**

The Euro area will likely remain for a long time a one-of-its kind arrangement with a centralized monetary policy and decentralized fiscal policies. This is, after all, the same arrangement as in most federal states, with two key differences. First, in Europe, the "federal" budget is very small and largely automatic. Second, in contrast with many federations where decentralized budgets are subject to strict imbalance limits while the center carries out fiscal policy, Europe's centralized budget must be balanced while sub-central budgets are in charge of fiscal policies.

Concern with this arrangement has led to the SGP. We have argued that the meaningful concern is the risk of fiscal dominance. We have also examined the record of national fiscal policies before and after the adoption of the Maastricht Treaty and found evidence that the quality of fiscal policies has improved in two ways: they are more clearly countercyclical – or less procyclical – and they are more readily used to restore competitiveness than to attempt to boost demand when competitiveness is eroded.

These observations suggest that fiscal policy remains a useful instrument. One question is whether it can be augmented – or perhaps substituted for – with a collective insurance system. Collective insurance is one alternative to external borrowing and lending and therefore one way to deal with the concerns that the SGP is meant to address. It is no panacea, though. We find that, to be effective and politically acceptable, a collective insurance system must be able not to balance every period. Put differently, effective system moves (part of) national deficits to the collective level.

We have examined in more detail two collective insurance systems: tax revenue sharing and unemployment insurance sharing. We find that the earlier is more promising and examine in some detail how it could be set up. A nice feature of any sharing system is that it is structurally balanced over time. In other words, it cannot lead to debt accumulation. But is it fool-proof? Examining various potential loopholes, we find that, if well structured, such a system has desirable incentives characteristics. Individual countries that attempt to take advantage of the system to achieve short-term political advantage can be discouraged.

There remains the possibility that collectively, Euro area governments may be tempted to use the insurance scheme to raise their debts. Individual governments could be tempted to misrepresent their true economic situation – by providing overblown estimates of their potential GDP – in order to obtain larger transfers. This moral hazard can be dealt with either by delegating the task of assessing potential GDP to an independent body, or by including in the net transfers a penalty, respectively a repayment, that correspond to the accumulated transfers received from, respectively paid into, the insurance scheme. Another risk is that collectively member governments agree to use the insurance mechanism to bypass the SGP. Here again, a solution would be to delegate to an independent body the right to block payments and to impose a penalty scheme. Of course, it is impossible that the independent body will always be the gravitas to overrule a strong coalition of member governments.

In the end, therefore, we face the unavoidable fact that any insurance mechanism entails moral hazard and that moral hazard can, at best, only be mitigated, not eliminated. If the risks

are perceived as being too large, then we come back to traditional view: cyclical fluctuations are must be dealt with through individual borrowing and lending, augmented by the national use of fiscal policies. This leaves the task of imagining how to enforce fiscal discipline; the SGP, we argued, has probably improved the situation, but it suffers from a number of weaknesses. How to improve on the existing arrangement is an issue that goes beyond the scope of the present paper.

## References

- Bayoumi, Tamim, and Paul Masson (1995) "Fiscal Flows in the United States and Canada: Lessons for Monetary Union in Europe" *European Economic Review* 39, 253-74.
- Blanchard, Olivier and Roberto Perotti (2002) "An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output," *Quarterly Journal of Economics*.
- Bernoth, Kerstin, Ludger Schuknecht, and Jürgen von Hagen (2004), "Sovereign Risk Premiums in the European Bond Market." ECB Working Paper, Frankfurt
- Buti, Marco , Carlos Martinez-Mongay, Khalid Sekkat and Paul van den Noord (2003) "Automatic Stabilisers and Market Flexibility in EMU: Is There a Trade-Off?", *CES-Ifo Economic Studies* 49(6), 123-140.
- Canzoneri, Matthew B. (2006), "Coordination of Monetary and Fiscal Policies in a Monetary Union: Policy Issues and Analytical Models." Paper presented at the 2006 Annual Conference of the Money Macro Research Group.
- Canzoneri, Matthew, Robert Cumby and Behzad Diba (2001) "Is the Price Level Determined by the Needs of Fiscal Solvency?", *American Economic Review*, 91(10): 1221-38.
- Delors, Jacques (1989) "Regional Implications of Economic and Monetary Integration" in: Committee for the Study of Economic and Monetary Union (ed.), *Report on Economic and Monetary Union in the European Community*, Luxembourg: Office for Official Publications of the EC.
- Edelberg, Wendy, Martin Eichenbaum, and Jonas D.M. Fisher (1999) "Understanding the Effects of a Shock to Government Purchases", *Review of Economics Dynamics*, 166-206.
- European Commission (1977a) Report of the Study Group on the Role of Public Finance in European Integration Vol. I, *Studies: Economic and Financial Series A13*, Brussels.
- European Commission (1977b) Report of the Study Group on the Role of Public finance in European Integration Vol. II, *Studies: Economic and Financial Series B13*, Brussels
- EU Commission (2006) Public Finance Report, *European Economy* 3, Brussels.
- Evers, Michael P. (2006),
- Fatas, Antonio (1998) "Does EMU Need a Fiscal Federation?", *Economic Policy* 26.
- Fatás, Antonio and Ilian Mihov (2001) "Fiscal Policy and Business Cycles: An Empirical Investigation", *Moneda y Credito* 212.
- Fatás, Antonio and Ilian Mihov (2003) "The Case for Restricting Fiscal Policy Discretion", *Quarterly Journal of Economics*.
- Favero, Carlo and Francesco Giavazzi (2007): "Debt and the Effects of Fiscal Policy", unpublished, Bocconi University.

- Gali, Jordi and Roberto Perotti (2003) "Fiscal policy and monetary integration in Europe" *Economic Policy* 18(37), 533-572.
- Giavazzi, Francesco and Marco Pagano (1990) "Can Severe Fiscal Contractions Be Expansionary? Tales of Two Small European Countries", *NBER Macroeconomics Annual*: 75-122.
- Giavazzi, Francesco, Tullio Jappelli and Marco Pagano (2000) "Searching for Non-Linear Effects of Fiscal Policy: Evidence from Industrial and Developing Countries", *European Economic Review*, 44(12).
- von Hagen, Jürgen, and Mark Hallerberg (1999) "Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the EU" in: Jim Poterba and Jürgen von Hagen (eds.), *Fiscal Institutions and Fiscal Performance*, University of Chicago Press.
- Hammond, George, and Jürgen von Hagen (1998) "Regional Insurance Against Asymmetric Shocks - An Empirical Study for the EC", *The Manchester School* 66, 331-353
- Ingram, J. C. (1959) "State and Regional Payments Mechanisms", *Quarterly Journal of Economics*.
- Kletzer, Ken, and Jürgen von Hagen (2001) "Monetary Union and Fiscal Federalism", in: Charles Wyplosz (ed.), *The Impact of EMU on Europe and the Developing Countries*, Oxford: Oxford University Press.
- Krogstrup, Signe and Charles Wyplosz (2006) "A Common Pool Theory of Deficit Bias Correction", CEPR Discussion Paper No. 5866.
- Méltiz, Jacques (2005) Non-Discretionary and Automatic Fiscal Policy in the EU and the OECD", in: P. Wierdsma et al. (Eds.), *Fiscal Policy Surveillance in Europe*, Palgrave, Basingstoke.
- Méltiz, Jacques, and Frédéric Zumer (1999), "Interregional and International Risk-Sharing and Lessons for EMU." *Carnegie-Rochester Conference Series on Public Policy* 51, 149-188
- Migué, Jean-Luc (1993), *Federalism and Free Trade*, Hobart Paper, London: Institute of Economic Affairs.
- Perotti, Roberto (2004) "Estimating the Effects of Fiscal Policy in OECD Countries", Discussion Paper 4842, CEPR, London.
- Perotti, Roberto (2007) "In Search of the Transmission Mechanism of Fiscal Policy", unpublished, Università Bocconi.
- Persson, Torsten, and Guido Tabellini (1996a) "Federal Fiscal Constitutions: Risk Sharing and Moral Hazard", *Econometrica* 64, 623-46.
- Persson, Torsten, and Guido Tabellini (1996b) "Federal Fiscal Constitutions: Risk Sharing and Redistribution", *Journal of Political Economy* 104, 979-1009.
- Pisani-Ferry, Jean, Alexander Italianer, and Roland Lescure (1993) "Stabilization Properties of Budgetary Systems: A Simulation Analysis" in: European Commission, *The Economics of Community Public Finance*, *European Economy Reports and Studies* 5, 417-55.

- Ramey, Valerie A. (2006) "Identifying Government Spending Shocks: It's All in the Timing", unpublished, University of California, San Diego.
- Romer, Christina D. and David H. Romer (2007) "The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks", unpublished, University of California, Berkeley.
- Rotemberg, Julio J., and Michael Woodford (1997), "An Optimization Based Econometric Framework for the Evaluation of Monetary Policy," in Ben S. Bernanke and Julio J. Rotemberg (eds) NBER Macroeconomics Annual 1997, 297-346.
- Sala-i-Martin, Xavier, and Jeffrey Sachs (1991) "Fiscal Federalism and Optimum Currency Areas: Evidence for Europe from the United States", in: Matthew Canzoneri, Vittorio Grilli, and Paul Masson (eds.), *Establishing a Central Bank: Issues in Europe and Lessons from the US*, Cambridge: Cambridge University Press.
- Sargent, Thomas and Neil Wallace (1981) "Some Unpleasant Monetarist Arithmetic", *Quarterly Review*, Federal Reserve Bank of Minneapolis.
- Sorensen, Bent E. and Oved Yosha (1997) "Federal Insurance of US States: An Empirical Investigation", in: Assaf Razin and Efraim Sadka (eds.), *Globalization: Public Economics Policy Perspectives*, Cambridge University Press.
- Stockman, Alan C. (1998), "New Evidence Connecting Exchange Rates to Business Cycles." Federal Reserve Bank of Richmond *Economic Quarterly* 84:2, 73-89
- van Wincoop, Eric (1995) "Regional Risksharing", *European Economic Review* 39, 1545-68.
- von Hagen, Jürgen (1992) "Fiscal Arrangements in a Monetary Union - Some Evidence from the US", in: Don Fair and Christian de Boissieux (eds.), *Fiscal Policy, Taxes, and the Financial System in an Increasingly Integrated Europe*, Deventer: Kluwer Academic Publishers.
- Von Hagen, Jürgen (2007), "Achieving Economic Stabilization by Risk Sharing within Countries" in: Robin Boadway and Anwar A. Shah (eds.), *Intergovernmental Fiscal Transfers: Principles and Practice*. Washington DC: World Bank
- Woodford, Michael (2001) "Fiscal Requirements for Price Stability", *Journal of Money, Credit and Banking* 33: 669-728.
- Wyplosz, Charles, (1991) "Monetary Union and Fiscal Policy Discipline", *European Economy Special Edition* 1, 165-184
- Wyplosz, Charles, (1991) "Fiscal Policy: Institutions Versus Rules", *National Institute Economic Review* 191: 70-84.