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**Fiscal Federalism and
European Monetary Integration¹**

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Abstract

The paper considers the role common fiscal arrangements might have to play in the operation of a European monetary union. In the first part of the study, we characterize an international fiscal incentive scheme which could reconcile different national macroeconomic preferences, thus supporting an international unanimity on a monetary policy. The traditional argument for fiscal federalism arises from the fact that when countries face asymmetric cyclical fluctuations, pooling of tax revenues may be warranted from the stabilization point of view. Empirical results, presented in the second part of the paper, suggest that the amplitude of asymmetric fluctuations in the GDP is largest in the "fringe" countries of Europe, while the fluctuations in the "core" are more synchronized with pan-European developments.

Tiivistelmä

Tutkimuksessa tarkastellaan kysymystä, millainen merkitys yhteisellä budjettipolitiikalla voisi olla eurooppalaisen rahaliiton toiminnassa. Ensimmäisessä osassa näytetään, millainen kansainvälinen tulonsiirtojärjestelmä sovittaisi yhteen kansalliset talouspoliittiset preferenssit, ja loisi edellytykset kansainväliselle konsensukselle rahapolitiikassa. Perinteinen argumentti yhteisen finanssipolitiikan puolesta on, että epäsymmetristen suhdannevaihtelujen oloissa yhteinen verotus on edullista stabilisaatiopolitiikan kannalta. Tutkimuksen toisessa osassa esitetyt empiiriset tulokset osoittavat, että epäsymmetristen suhdannevaihtelujen merkitys on suurin Euroopan reuna-alueilla, kun taas ydinalueella BKT:n vaihtelut ovat läheisemmin korreloituneet Euroopan keskimääräisen suhdannekehityksen kanssa.

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1 Introduction

By far the major part of the extensive writings on the proposed Economic and Monetary Union for Europe focuses on the potential costs and benefits of the EMU. Much work has also been devoted to finding an optimal sequence of steps in moving towards a single currency and to the discussion of the constitutional position and statutes for the new European central bank. Differences in the degree of economic development between the various regions involved have also received much attention, and extensive schemes have already been created in order to facilitate the inclusion of the less developed EC member states in the Economic and Monetary Union. A particularly impressive collection of work in these areas has been published by the Commission of the European Communities (1990).

There has, however, been less analysis of the policy problems that might arise in the new environment. What kind of monetary policy will be generated in the decision making bodies that are to be created for the new central bank? How will one be able to react to asymmetric shocks within a single currency area, and is the planned institutional framework flexible enough to cope with the situations that are likely to arise? An important paper by Alesina and Grilli (1991) seems to be the first attempt to analyze these questions, although they seem to be fundamental for the whole architecture and in many senses at least as important as the questions of direct costs and benefits of unification when assessing economic developments in the future Europe.

It is, of course, easy to understand why economists have been so slow to tackle these questions. In particular, it is difficult to predict how an as yet unfounded institution will behave, and analytical discussions of decision making processes in situations combining principal-agent relationships with group decision making are bound to be highly inconclusive.

However, we will try in the following pages to identify one possible standard of reference for the decision making process with the help of a small model. Our analysis is based on the recognition that, in a system where the individual members represent different constituencies with basically heterogeneous preferences and economic structures, it might be difficult to arrive at predictable outcomes without some complementary incentive scheme.

Since also the handling of asymmetric shocks will be rendered difficult without an accompanying fiscal scheme, the question of the need for some

degree of fiscal federalism — something now entirely excluded from the plans — arises. The importance of fiscal policy has been pointed out before by Eichengreen (1991) and others in the discussion of optimum currency areas. While we will present some evidence of asymmetric economic fluctuations in Europe, our analysis extends beyond business cycles to the issues of "equilibrium inflation".

2 Eurofed and inflation

The general presumption when discussing the shaping of future monetary policy in Europe seems to be that if the new European Central Bank has similar statutes to those of the Bundesbank, it will also produce similar monetary policy and be as successful as the Bundesbank. This seems to be a very bold assumption. Even if the members of the Council or the Board of the institution were to be independent vis-à-vis their own governments and other outside groups, and even if they were all to have basically a strong inclination towards low inflation, one should not expect them to completely forget the economic situation in the regions that they represent -nor would it necessarily be in the interest of the member countries to elect representatives who would do so. The EC area is still highly heterogenous, and the individual members will, on different occasions, have objectively strong reasons for disagreeing among themselves on the optimal policies for the area as a whole.

One alternative, considered by Alesina and Grilli (1991), is to vote on the common monetary policy. However, unless the very stringent conditions for the applicability of the median voter theorem hold², it is virtually impossible to say a priori where this will lead. This implies that, if decisions were frequently taken on the basis of a vote, the policy outcome could be fairly unpredictable and stochastic. If so, it would be difficult, time-consuming, and hence costly to build the desired reputation and credibility of the new monetary authority in Europe.

In order to avoid the likely instability of monetary policy decided by vote, a practice of unanimity or consent within the governing bodies would have

²In a simple "referendum" context, i.e. without the problems of representation, the preferences of the median voter win all pairwise comparisons of alternatives if the alternatives can be ordered along a single axis (such as left-right) so that everybody's preferences are unimodal on that axis.

to be developed and maintained. We now turn to the analysis of rules which might support such a practice. We have to start, however, with some general remarks on the economic analysis of inflation.

2.1 Time consistency and monetary policy: a brief review

Most economists would agree that, in principle at least, inflation could be eliminated by sufficiently tight monetary policy. Yet virtually all currencies in the world suffer from some inflation. There are two widely accepted explanations as to why policy makers allow the price level to rise. One of them is based on the fiscal consequences of inflation (seigniorage), and the other is based on time consistency problems inherent in monetary control.

According to the first explanation, governments use inflation to create a tax on money holdings. This seigniorage may be substantial, if the demand for currency is large, and the rate of inflation is high. Originally, the advocates of this theory regarded the extraction of seigniorage as evidence of government indiscipline (see e.g. Brennan and Buchanan, 1981), but some proponents of the theory also think that some seigniorage, and consequently some inflation, belongs to an efficient combination of different taxes (Phelps, 1973).

These ideas are often thought to be particularly applicable to developing countries, where the administrative difficulties in taxation are large. But this model has also been used in analyzing the effects of the EMU (Grilli, 1989; Dornbusch, 1988). However, we feel that even though seigniorage is significant in some European countries, this should not be overemphasized. Efforts to tax by way of seigniorage are, in a financially developed economy, bound to lead sooner or later to less use of the currency.

Rather, the fight against inflation is rendered difficult because of the short-term implications for employment. This view is formalized in the time consistency model, which not only seems to provide us with some insight into the problems of fighting inflation but also to provide us with a promising basis for analyzing the decision making problems within the future Eurofed.

In the time consistency model (usually attributed to Barro and Gordon, 1983), inflation results from a game between the monetary authority and private economic agents. Basically, the monetary authority allows inflation

in order to avoid recession, while private economic agents act on the basis of their conception of the preferences of the monetary authority. The model can be thought of as a sophisticated descendant of the traditional Phillips curve prescription for monetary policy, even though no stable trade-off between inflation and real output exists in the time consistency model.

A single country version of the time consistency-based inflation model can be presented as follows. Inflation is a function of excess demand for real output, plus expected inflation:

$$\pi = \pi^e + (1/s)(y - \bar{y}) \quad (1)$$

Or, equivalently, output is determined by the Lucas supply function

$$y = \bar{y} + s(\pi - \pi^e) \quad (2)$$

In (1) and (2), the parameter s indicates the responsiveness of aggregate supply to unexpected price shocks. The size of the parameter is dependent e.g. on the extent of nominal rigidities in the economy, such as long-term wage contracts. In an open economy with a floating exchange rate, depreciation of the currency can be part of a surprise inflation. It is therefore plausible to assume that the parameter s is also related to the share of exports in domestic output.

The preferences of the monetary authority are described by a utility function, assumed to be quadratic with respect to inflation:

$$U = y - (b/2)\pi^2 \quad (3)$$

We assume, by way of simplification, that the monetary authority can set the inflation rate at any level it chooses.

The monetary authority chooses the inflation rate in a situation where the nominally rigid magnitudes represented by the variable π^e (inflation expectations, wage contracts etc.) are predetermined. By substituting (2) for y in (3) and maximizing, while treating π^e as given, we see that the inflation rate which maximizes U is

$$\pi = s/b \quad (4)$$

Since all of this is known by the public, we have rational expectations and "full" (or natural) employment prevails:

$$\pi^e = \pi \quad \text{and} \quad y = \bar{y} \quad (5)$$

As is well known, inflation in this model is a result of a credibility problem. The optimal rational expectations equilibrium of monetary policy, characterized by the restriction $\pi^e = \pi$, could be achieved (given the utility function of the monetary authority), if the inflation rate could be set credibly to zero. However, there would be an incentive for the monetary authority to renege on the zero inflation policy in order to gain a temporary boost to real output. Hence, zero inflation would be time inconsistent and thus not credible.

There have been different attempts to show how a credible zero inflation policy could be possible. One approach rests on the reputational aspects of monetary policy. The credibility may be ultimately achieved, if the monetary authority pursues a strict policy stance for a suitably long time. Full employment is attained, and is maintained because any deviation from a low-inflation equilibrium would trigger a "punishment" for the monetary authority in the future. The reputational models do not, however, generally deliver zero inflation, and they suffer from other problems as well (cf. Rogoff, 1987).

Another way of avoiding the time inconsistency property of zero inflation policy is to remove discretion from monetary policy. This could be achieved e.g. by binding the monetary authority "constitutionally" to the desired monetary policy regime. The gold standard represents one instance of such a system, and the attempts to institutionalize formal monetary targets provide others, although less successful.

Financial innovations combined with large changes in the velocity of money (or the velocities of different monetary aggregates) seem to imply that any monetary "constitution" must by necessity be more or less flexible and can therefore not be strictly binding and credible. In fact, the Delors report also seems to adopt this view. We, therefore, think that the time consistency approach forms the most reliable basis available for analysing monetary policy and the causes of inflation.

2.2 A multicountry model of unanimous monetary policy

The time consistency model can easily be extended to a multicountry framework. Assume a monetary union consisting of n countries, with different economic structures and different political preferences. The countries can be described by equations like (2) and (3) above, with different parameters s_i and b_i for different countries. The ratio s_i/b_i indicates the stand-alone rate of inflation and is denoted by π_i^s . In the multicountry model, fiscal transfers between the countries are also included, which gives:

$$\begin{aligned}y_i &= \bar{y}_i + s_i(\pi - \pi^e) \\U_i &= y_i - (b_i/2)\pi^2 + a_i T_i \\ \sum_i T_i &= 0, \quad i=1, \dots, n\end{aligned} \tag{6}$$

Here T_i is the net transfer to country i from the community budget. Note that there is only one inflation rate and only one expected inflation rate, both of which are common for the whole union. The common inflation rate is assumed to be determined by the board (or governing council) of the Eurofed, on which all of the member countries are represented. The function U_i describes the preferences of the representative from country i .

Even though the members of the council of the Eurofed may have different preferences, we require a unanimous decision on the rate of inflation. How is this accomplished? Here we refer to Borch (1984), who points out that, in group decision problems, there exists a system of sharing rules - such as taxes and subsidies - which will enable the group to make a unanimous decision in any choice among alternatives. In the present case, the unanimity can be built on a prescribed system of fiscal incentives which reconciles the basically different preferences of the governors (or their constituencies). For this reason, it is necessary to allow the intercountry transfers to be a function of the monetary policy decisions of the board. Thus, we must allow $T_i = T_i(\pi)$.

By substituting the supply function (6a) into the utility function of a member of the board (6b), the latter can be expressed in the form,

$$U_i = s_i(\pi - \pi^e) + a_i T_i(\pi) - (b_i/2)\pi^2 \quad (7)$$

By maximizing (7) we see that the policy preferred by an individual board member (or country) is characterized by the inflation rate

$$\begin{aligned} \hat{\pi}_i &= \frac{s_i + a_i \frac{\partial T_i(\pi)}{\partial \pi}}{b_i} \\ &= \pi^s_i + (a_i/b_i) \frac{\partial T_i(\pi)}{\partial \pi} \end{aligned} \quad (8)$$

where π^s_i is the stand-alone rate of inflation for the country i . The presence of an inflation-dependent intercountry transfer system influences the choices of the members to an extent which depends on the relative weights they attach to international transfers and inflation. The system of international transfers which equalizes the preferred inflation rates of the different members can now be characterized. The condition for unanimity is simply

$$\frac{\partial T_i(\pi)}{\partial \pi} = \frac{b_i \pi - s_i}{a_i} \quad (9)$$

By utilizing the concept of stand-alone rate of inflation, the condition can be restated as follows:

$$\frac{\partial T_i(\pi)}{\partial \pi} = (b_i/a_i)(\pi - \pi^s_i) \quad (10)$$

Hence, unanimity on inflation requires that the marginal rate of net transfers from the community budget, with respect to monetary expansion, is positive for the countries whose stand-alone rate of inflation is below the unanimously agreed union rate. In other words, in order to agree to a relaxation of monetary policy, the board members representing low-inflation countries need to receive additional compensation from the common budget. On the other hand, countries with relatively high stand-alone rates of inflation have negative marginal transfer rates. This means that they should be "punished" by the fiscal system when a monetary expansion occurs which exceeds the preferences of the "tougher" members.

The set of equations (10), with $i = 1, \dots, n$, determines which rate of inflation the Board will finally agree upon. Note that the transfers supporting the common monetary policy must sum to zero. Since this must also hold for the marginal transfers, we obtain

$$\sum_i \left(\frac{\partial T_i}{\partial \pi} \right) = \sum_i \left(\frac{b_i}{a_i} \right) (\pi - \pi^s_i) = 0 \quad (11)$$

From equation (11) we may solve the agreed inflation rate as a weighted average of the national stand-alone rates:

$$\pi = \sum_i w_i \pi^s_i \quad (12)$$

where

$$w_i = \frac{b_i/a_i}{\sum_{j=1}^n (b_j/a_j)} \quad (13)$$

Thus, the weight of an individual board member in the final decision will depend on his attitude towards inflation and the importance he attaches to obtaining net transfers for his home country. A member who displays "toughness" vis-à-vis inflation (captured by a high value for the parameter b_i) will influence the outcome relatively strongly, while the importance of a member attaching a high weight to net transfers will be relatively small.

2.3 Can the members agree on inflation?

How can fiscal incentives be built into the institutional structure of the union in order to support the achievement of policy consent? Can they be included in the revenue and dividend structure of the common monetary authority, or is there a need for genuine fiscal federalism?

In principle, the seigniorage gained by the common monetary authority provides an inflation-based transfer which could be redistributed between the members, as defined by formula (10) above. For example, relatively larger

portions of the capital and dividends of the Eurofed might be allotted to low-inflation countries. However, revenues from seigniorage are not very large as compared to countries' national incomes (or government revenues), see Table 1 at the end of text. In most countries, seigniorage is less than one per cent of GDP and only in Greece has it exceeded two per cent. In Finland, the share is as low as 0.2 per cent. Hence, significant amounts of seigniorage can only be found in Mediterranean countries, where it will be also reduced in the future: the rate of inflation should fall when a common monetary policy is implemented.

Thus it seems evident that the redistribution of seigniorage would suffice only if countries assigned an implausibly large weight to foreign transfers in their decisions (parameter a would be extremely high). It is, therefore, likely that some pooling and redistribution of the tax revenues of the member countries would be required if unanimity over monetary policy is to be maintained with the aid of fiscal incentives.

One possible way of constructing a redistribution and incentive scheme is to base it on value added taxes (and subsidies). In this case, the required tax and subsidy rates are easily defined. Assume that each country pays to the common budget a fraction t_i of its output. Given the supply functions, we get

$$\frac{\partial T_i(\pi)}{\partial \pi} = -t_i \frac{\partial y_i}{\partial \pi} = -t_i s_i \quad (14)$$

Substituting this into equation (10) and using the definition for the stand-alone inflation rates yields

$$t_i = (1/a_i) \frac{(\pi_i^s - \pi)}{\pi_i^s} \quad (15)$$

In this scheme the tax rate required to support unanimity is proportional to the relative change in the country's inflation rate when it joins the union. Are the implied tax rates low enough to be realistic? This is difficult to say. If countries have widely different stand-alone rates of inflation before joining, the implied tax and subsidy rates may become very high. This is particularly true if the parameter a , i.e. the weight given to foreign transfers, is small. In the case where $a = 1$, so that an additional ECU of output is valued as much as an additional ECU of transfer income, the transfer rates

might have to exceed 100 per cent. This, however, is an extreme assumption. The parameter a is likely to be larger than one, in which case the transfer rates might become reasonable.

3 EMU and asymmetric shocks

3.1 Evidence of structural heterogeneity

In the absence of fiscal federalism, the probability of disagreement over monetary policy is increased by divergent cyclical developments in the currency area. Available evidence indicates that different European countries (including both EC and EFTA countries) are indeed subject to idiosyncratic fluctuations of non-negligible magnitude. This is also confirmed by some tests presented below.

The most common method used when analyzing the relative importance of symmetric and asymmetric shocks is to compare the same variable (e.g. real GDP growth rate) between two countries³. If the variance of the difference between these variables of the two countries is smaller than the variance of the aggregated value (sum or average of the variables), one can conclude that symmetric shocks dominate, and vice versa.

This so called Aoki method is, however, not really capable of dealing with more than two countries at a time. We, therefore, chose to assess the relative importance of common and idiosyncratic fluctuations by estimating the following regression equation:⁴

$$g_{i,t} = \alpha_i + \beta_i g_{A,t} + \mu_{i,t} \quad (16)$$

³ See e.g. Weber (1990).

⁴ We recognize that the measurement of shocks from endogenous variables such as GDP can not claim a high degree of precision. Further, the distinction of "symmetric" and "asymmetric" shocks is difficult, especially if countries use the exchange rate to isolate the economy from some external disturbances.

where $g_{i,t}$ is an indicator of the cyclical situation in country i at time t , and $g_{A,t}$ is the corresponding combined indicator for all countries under consideration. Parameter β and the R^2 statistic of the equation measure, in slightly different ways, the sensitivity of the country to common fluctuations within the area, while the variance of the error term μ measures the idiosyncratic variation of the economy.⁵ As such, the model resembles the "market model" of the CAPM used in empirical finance. One can recall from that application that the residuals, called diversifiable risk, are by definition uncorrelated with the variation of the common factor (here $g_{A,t}$). This property of the model is also crucial for the present application⁶.

Denoting the overall variance of g_i by $\text{var}(g_i)$ and the variance of μ by $\text{var}(\mu)$, we have

$$\text{var}(g_i) = \text{var}(\mu_i) + \beta^2 \text{var}(g_{A,i}) \quad (17)$$

where the last term measures that part of the variation which is due to the "symmetric" shocks (common variation).

The equations are estimated using annual GDP growth rates for 16 European countries and aggregate figures for the whole of OECD Europe⁷ over the period 1973-90. Table 2 gives results from regressions of the growth rates in the individual countries on the all-European growth rate, while in Table 3 the variance of the real GDP growth rate is divided into components due to idiosyncratic and common factors.

⁵ Of course the possible stabilizing effect arising from domestic policies, including exchange rate adjustments will affect the idiosyncratic fluctuations.

⁶ Actually, our estimated OLS residual are not exactly idiosyncratic, since the measure of aggregate fluctuations will be correlated with the idiosyncratic fluctuations especially of the larger economies. This is equivalent to a simultaneity problem and might be avoided by more sophisticated methods. However, the attractive feature of the OLS residuals is that they do disappear in aggregation regardless of the number of countries considered, whereas the proper idiosyncratic components are diversified away only in the limit as the number of countries is increased.

⁷ The same equations were also estimated by relating individual country fluctuations to the real GDP of the EEC. However, since the differences as compared to the present calculations were very small, these results are not reported here. The data are from OECD Main Economic Indicators and International Financial Statistics.

As can be seen from Tables 2-3, there are large differences between the countries. In some countries, in particular the so called "core countries" of the EC, the fluctuations are highly synchronized with aggregate European developments. France in particular has a low amplitude of idiosyncratic variation. Other countries which might have relatively little temptation for autonomous countercyclical policy include Germany, Belgium and the Netherlands.

On the other hand, the fluctuations in the more peripheral countries, such as Ireland, Spain, Greece and the EFTA countries, are mostly idiosyncratic. Nordic countries are more different from the rest of Europe than the Alpine countries. Norway is an extreme case with its high and evidently asymmetric output volatility over the sample period. The periodization experiment discussed below suggests, however, that this for the most part a phenomenon of the oil crises of the 1970's and early 1980's.

On the basis of these results, one would be tempted to conclude that the core countries, especially France, Germany and the Netherlands are well suited for a monetary union in the sense that the irrevocable fixing of the exchange rate would not undermine the stability of their national economies. On the other hand, if monetary policy is of any use in managing cyclical problems, a pan-European monetary union might require the Mediterranean countries, the UK, and the EFTA countries to tolerate larger cyclical fluctuations or to rely more on fiscal stabilization.

In principle, however, freezing exchange rates permanently may change the amplitude of idiosyncratic shocks. In order to check how the nature of fluctuations has changed during the gradual tightening of the ERM in the 1980's, we also conducted the above analysis for two subperiods: 1973-81 and 1982-1990. The first period is characterized by the two oil-shocks, rather slow and uneven growth, and relatively flexible exchange rates. The second period was generally more stable, and efforts to stabilize exchange rates within the European Monetary System were more successful than in the first period. The results are reported in Tables 4 and 5.

As can be seen from Table 5, a marked change occurred in the variance of shocks between the two periods; overall, the idiosyncratic variances of GDP's have fallen markedly. However, there are large, and in some cases striking, differences between the countries. In particular, one can note that the idiosyncratic variance has increased in some of those countries that have been most successful in fixing their currencies within the ERM (Table 6).

By contrast, countries which have stayed outside the ERM or have, despite ERM membership, allowed for exchange rate changes, have mostly experienced a fall in the idiosyncratic variances as compared with the pre-1982 period.

3.2 The policy challenges

The divergences in economic structures, and therefore in the incidence of economic disturbances, will cause a major challenge to economic policy when the countries are merged into a monetary union. At that stage, it will not be possible to use monetary policy to neutralize economic shocks in different areas. As noted above, the experience from fixed exchange rates so far seems to suggest that this problem has already been aggravated, as evidenced by the increase in idiosyncratic fluctuations in those countries that fix their exchange rates most rigidly. Even though there is at least a theoretical possibility that the fluctuations might become more symmetric in the future, after the single market has been completed, this cannot be taken for granted. As is often argued, specialization could also lead to regional concentration of different activities, which would tend to exacerbate the problem of idiosyncratic shocks.

If international diversification of production is not able to do away with the problems, the pressures will focus on the labour markets. Is it likely that international mobility of labour will increase to the extent that price and cost pressures will be restrained in the event of asymmetric regional imbalances? The dismantling of barriers to migration will, no doubt, work in that direction. It is, however, unlikely that mobility would react quickly to short-term cyclical factors. Rather, it is probable that cultural and linguistic differences will continue to restrain short-term movements of labour. Infrastructural rigidities (in housing etc.) will also tend to work against any rapid increase in migratory flows. Hence, it seems safe to conclude that factor mobility is most unlikely to remove the problems caused by asymmetric shocks from the policy agenda.

What about wage flexibility? Will the fact that the participants in the national labour markets realize that they have lost their opportunities to influence monetary policy increase real (and perhaps also nominal) wage flexibility? This is the standard argument of "borrowed credibility". Indeed, labour unions might in the future Europe recognize that there is a closer relationship than before between wages and employment. If that were the case, wages and costs would increase in the event of a positive demand

shock, for instance, but they would also readjust downwards when economic conditions weakened again. Hence, regional unemployment problems could be avoided.

A common monetary policy should have a clear impact on the behaviour of national labour markets, and the changes could well be in the direction described above. On the other hand, if unions start to cooperate over national borders, which is to be expected, relative wage flexibility could also be severely reduced. By the same token, well developed social safety nets are effectively preventing both real and nominal wages from falling, in particular if the disturbances are conceived to be only temporary. Again, it seems unduly optimistic to assume that increased flexibility in the labour markets will be enough to dampen the effects of asymmetric shocks.

Given the likelihood that markets will not be able to provide enough added flexibility, and that monetary policy is locked in, one has to ask whether fiscal policy could be used for the necessary "fine tuning" of the economy. In theory, at least, a timely adjustment of public revenues and expenditures could work to offset disturbances in private demand in the national economies.

However, apart from the fact that this is rendered difficult by all the rules that seem to have to be established in order to avoid excessive public indebtedness in the monetary union, experience shows that fiscal fine tuning is difficult in practice. Economic history is full of examples, but the Nordic countries (Norway, Finland and Sweden) provide good ones from the eighties. All three countries were subject to positive terms of trade shocks, which under the prevailing fixed exchange rate regime, should have been balanced by restrictive fiscal policies. Even though all three countries have a clear inclination to fiscal activism, severe overheating of the economies could not be avoided. In practice, it is difficult to achieve a timely cut in public expenditures when the budget is in surplus, as is often the case when the economy is overheated.

This leads us to the conclusion that the monetary union would probably benefit from some kind of automatic fiscal compensation scheme, which would allow the automatic fiscal stabilizers to work on a regional basis. The most obvious way to accomplish this would be to introduce a Federal Budget. As argued by Eichengreen (1991), the redistributive and thereby automatic stabilizing forces generated by a federal budget are very powerful. This is easy to understand, given the fact that the variation of tax revenues due to idiosyncratic shocks could in principle be entirely eliminated by pooling regional taxes.

Now, fiscal federalism is not in the community plans at the moment, and the desirability of such an arrangement is in doubt for many good reasons, including the bureaucracy and moral hazard problems involved in large centralized systems.⁸ One should not, however, ignore, on these grounds, the fundamental complementarity of common fiscal policy with a monetary union that has been argued above.

4 Concluding remarks

It would seem important to us to analyze what kind of policies the common European central bank is likely to pursue. The constitutional framework is important in this respect, but institutional independence is not a sufficient condition for low inflation and stable and predictable monetary policy. Much more attention should be paid to the decision making processes, interests and incentives, and an assessment should also be made as to what implications this analysis might have for framing the decision making in the new body.

To us it seems evident that, even if at heart all central bankers have a strong preference for a stable value of the currency they are issuing, there are often objective reasons for disagreeing on the practical ways in which this can be achieved with least cost. The disagreements are not likely to diminish when decision makers represent a large area with different economic conditions. If the final outcome is decided by shifting majorities, the outcome might vary in a rather random fashion and be highly unpredictable. This would severely undermine the credibility of monetary policy in the future Europe, and increase the costs of maintaining low inflation. The end-result would be in sharp contrast to the aspirations underlying the present plans.

In order to avoid this, ways and means have to be found in order to make it possible to arrive at unanimous decisions at the common central bank. We suggest that this could be achieved by creating a scheme which in one way or another neutralizes the inflationary attitudes of the more "wet" members, and compensates those members of the union who have to accept a higher inflation rate than would be the case if they acted on their own. No doubt, this solution may lead in practice to a rather awkward situation where the

⁸ The Delors committee favours "common fiscal policy" in the sense of regulating the members' deficits so that fiscal policies could not diverge too much across Europe. The community budget is thought to remain small (cf. Lamfalussy, 1989).

relatively poorer countries have to compensate the richer ones for their participation in a common monetary policy.

However, it seems likely that low inflation countries would indeed need some sort of compensation in order to participate in an endeavour which could entail high risks on their part. If the conceived efficiency gains (e.g. in the form of reduced transactions costs) or some political gains are not strong enough, fiscal incentives will be needed. The simple model we used in this paper gives some ideas as to how this could be structured in principle.

It also seems clear to us that a monetary union without any balancing forces on the fiscal side could severely aggravate regional instability. The extensive regional programmes that have been created do not give much relief in this respect, since they concentrate only on structural issues. Also, the highly understandable plans for imposing restrictions on fiscal policy will make it increasingly difficult to cope with asymmetric shocks. In the standard macroeconomic analysis at least, there seem to be mutual gains available for stabilization policy in pooling some of the tax revenues from different regions when there are a lot of idiosyncratic shocks.

Thus, both the decision making process and the presence of idiosyncratic disturbances seem to call for a federal budget to complement the monetary union. It is, however, easy to raise a lot of well founded objections to this. But even without a large federal budget, some elements of common fiscal redistributive policies would seem to be necessary if the monetary union is to work satisfactorily.

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Table 1. Seigniorage in Europe, averages for 1983–87

Country	Seigniorage, of GDP	per cent
Belgium	0.86	
Denmark	0.55	
France	0.74	
Germany	0.66	
Greece	2.17	
Ireland	0.83	
Italy	1.48	
Netherlands	0.56	
Portugal	3.48	
Spain	1.41	
United Kingdom	0.39	
Austria	0.56	
Finland	0.20	
Norway	0.81	
Sweden	1.10	
Switzerland	0.55	

Source: Kokkola and Virén (1990) and own calculations. The seigniorage concept is the opportunity cost measure of Gros (1989).

Table 2. Estimation results for 1973–90. Real GDP growth rate in 16 countries regressed on the growth rate in OECD Europe.

Country	beta	R ²	SEE
Belgium	1.12	0.65	1.33
Denmark	1.11	0.74	1.04
France	0.81	0.75	0.72
Germany	1.11	0.74	1.04
Greece	0.74	0.15	2.72
Ireland	0.44	0.09	2.32
Italy	1.31	0.70	1.34
Netherlands	0.98	0.68	1.05
Portugal	1.85	0.65	2.14
Spain	0.98	0.47	1.61
U.K.	1.26	0.59	1.63
Austria	0.84	0.48	1.37
Finland	0.47	0.12	2.05
Norway	0.33	0.01	5.00
Sweden	0.26	0.07	1.50
Switzerland	0.93	0.30	2.22

Note: Data for Belgium and Ireland ends in 1989.

Table 3. The variance of real GDP growth in 16 countries, decomposed into idiosyncratic and common factors. Common factor measure: GDP growth in OECD Europe. Estimation period 1973–90.

Country	Variance due to common factor	Idiosyncratic variance
Belgium	3.29	1.77
Denmark	1.38	3.41
France	1.59	0.52
Germany	3.03	1.09
Greece	1.35	7.39
Ireland	0.52	5.36
Italy	4.16	1.79
Netherlands	2.37	1.11
Portugal	8.42	4.59
Spain	2.33	2.59
United Kingdom	3.85	2.65
Austria	1.79	1.95
Finland	0.55	4.20
Norway	0.25	25.05
Sweden	0.17	2.26
Switzerland	2.10	4.94

Note: see table 2.

Table 4. Estimation results for periods 1973–81 (1) and 1982–90 (2).
 Real GDP growth in 16 countries regressed on the GDP growth in OECD Europe.

Country	beta		R ²		SEE	
	(1)	(2)	(1)	(2)	(1)	(2)
Belgium	1.09	1.34	0.66	0.66	1.70	0.96
Denmark	1.04	-.85	0.66	0.23	1.62	1.45
France	0.83	0.74	0.96	0.33	0.36	0.98
Germany	1.03	1.54	0.83	0.62	1.01	1.13
Greece	0.73	0.94	0.17	0.28	3.55	1.40
Ireland	0.34	1.09	0.09	0.20	2.38	2.16
Italy	1.34	1.23	0.78	0.86	1.54	0.46
Netherlands	0.89	1.49	0.80	0.60	0.96	1.14
Portugal	1.93	1.54	0.80	0.29	2.10	2.24
Spain	0.87	1.56	0.44	0.70	2.11	0.96
U.K.	1.38	0.51	0.79	0.10	1.55	1.47
Austria	0.82	0.96	0.51	0.40	1.73	1.10
Finland	0.48	0.44	0.13	0.07	2.69	1.53
Norway	0.45	-.42	0.02	0.02	6.86	2.83
Sweden	0.25	0.29	0.07	0.06	2.00	1.07
Switzerland	0.83	1.39	0.25	0.76	3.10	0.74

Note: see table 2.

Table 5. Idiosyncratic and common components of the variance of GDP growth in 16 countries. Common factor measure: GDP growth in OECD Europe. Estimation periods 1973–81 (1) and 1982–90 (2)

Country	Variance due to common factor		Idiosyncratic variance	
	(1)	(2)	(1)	(2)
Belgium	5.55	1.80	2.29	0.92
Denmark	5.07	0.63	2.64	2.10
France	3.21	0.46	0.13	0.95
Germany	5.02	2.06	1.03	1.27
Greece	2.49	0.76	12.61	1.97
Ireland	0.53	1.18	5.68	4.68
Italy	8.42	1.33	2.38	0.21
Netherlands	3.76	1.94	0.93	1.29
Portugal	17.46	2.07	4.42	5.00
Spain	3.52	2.11	4.46	0.91
United Kingdom	8.96	0.23	2.41	2.15
Austria	3.15	0.81	2.98	1.21
Finland	1.07	0.17	7.21	2.34
Norway	0.96	0.16	47.11	7.99
Sweden	0.30	0.08	3.98	1.13
Switzerland	3.22	1.69	9.61	0.54

Note: see table 2.

Table 6. The change of the idiosyncratic variance of the GDP growth rate in 16 European countries.

Variance in 1982–90 as per cent of the variance in 1973–81.

Country	var(2)/var(1)
France	749 %
Netherlands	140 %
Germany	124 %
Portugal	112 %
United Kingdom	89 %
Ireland	82 %
Denmark	80 %
Austria	41 %
Belgium	40 %
Finland	32 %
Sweden	29 %
Spain	21 %
Norway	17 %
Greece	16 %
Italy	9 %
Switzerland	6 %

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