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**Working Paper**

# Fiscal and Monetary Policy Coordination in EMU

Working Paper, No. 70

**Provided in Cooperation with:**
Oesterreichische Nationalbank (OeNB), Vienna

*Suggested Citation:* von Hagen, Jürgen; Mundschenk, Susanne (2002) : Fiscal and Monetary Policy Coordination in EMU, Working Paper, No. 70, Oesterreichische Nationalbank (OeNB), Vienna

This Version is available at:
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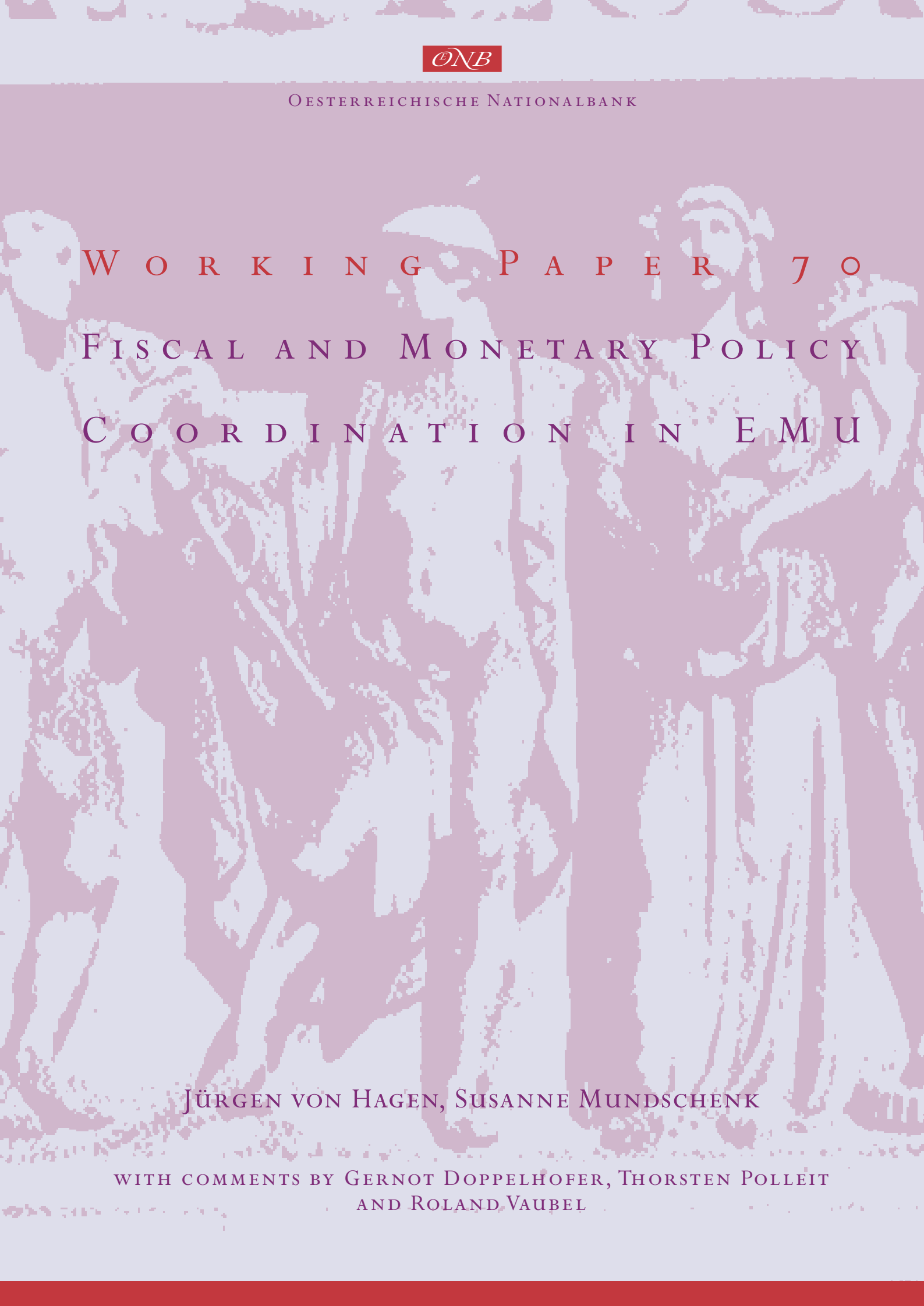

# WORKING PAPER 70

# FISCAL AND MONETARY POLICY COORDINATION IN EMU

JÜRGEN VON HAGEN, SUSANNE MUNDSCHENK

WITH COMMENTS BY GERNOT DOPPELHOFER, THORSTEN POLLEIT AND ROLAND VAUBEL

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Imprint: Responsibility according to Austrian media law: Wolfdietrich Grau, Secretariat of the Board of Executive Directors, Oesterreichische Nationalbank

Published and printed by Oesterreichische Nationalbank, Wien.

The Working Papers are also available on our website:

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# Editorial

On April 15 - 16, 2002 a conference on "Monetary Union: Theory, EMU Experience, and Prospects for Latin America" was held at the University of Vienna. It was jointly organized by Eduard Hochreiter (OeNB), Klaus Schmidt-Hebbel (Banco Central de Chile) and Georg Winckler (Universität Wien). Academic economists and central bank researchers presented and discussed current research on the optimal design of a monetary union in the light of economic theory and EMU experience and assessed the prospects of monetary union in Latin America. A number of papers presented at this conference are being made available to a broader audience in the Working Paper series of the Oesterreichische Nationalbank and in the Central Bank of Chile Working Paper series. This volume contains the seventh of these papers. The first ones were issued as OeNB Working Paper No. 64 to 69. In addition to the paper by Jürgen von Hagen and Susanne Mundschenk the Working Paper also contains the contributions of the designated discussants Gernot Doppelhofer, Thorsten Polleit and Roland Vaubel.

August 5, 2002

# Fiscal and Monetary Policy Coordination in EMU

by

Jürgen von Hagen[*] and Susanne Mundschenk[**]

Paper prepared for the conference on

Monetary Union: Theory, EMU Experience, and Prospects for Latin America

Austrian National Bank and Banco de Chile

Vienna, 14-15 April 2002

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# 1. Introduction

The beginning of the Third Stage of Economic and Monetary Union in Europe (EMU for short) has changed the quality of economic policy making of the member states. In the integrated monetary and financial market system created by the euro and the Euro-system (the European Central Bank and the national central banks of the countries participating in EMU), all participating member states share the benefits – or suffer from the lack – of a well-conceived "single" monetary policy. Price stability is the key example. Since the price level is properly defined only for the entire domain of a currency, all euro area member states together either enjoy price stability or suffer from inflation.[1] Similarly, the welfare benefits of low currency risk (reflected in the common level of long-term interest rates), external balance (reflected in the level and variability of the exchange rate of the euro against other currencies,) and the stability of the EMU banking sector and financial markets (reflected in efficient and stable financial intermediation) accrue to all member states jointly.

The euro area member states have delegated the authority over monetary policy to a common, supranational institution, the European Central Bank (ECB). Other, important parts of economic policy, however, continue to be decided at the national level, even if they have welfare effects for other member states, because they affect price stability, financial stability, or the EMU's external balance directly or indirectly through the ECB's reaction to national economic policies. EMU thus creates new and amplifies existing externalities of economic policies among the member states. Furthermore, EMU weakens the incentives for governments to consider the consequences of their national economic policies for price stability, financial stability and external balance, i.e., it invites free-riding behavior, because the benefits from policies aiming at these variables partly fall on other member governments in EMU.[2] The interdependence between the ECB's monetary policy and national economic policies and the existence of externalities and free-riding incentives in EMU imply that non-cooperative national economic policies and ECB monetary policy do not yield efficient policy outcomes in EMU.

A number of papers explore the free rider behaviour in a monetary union (Dixit and Lambertini 1999, 2001; Beetsma and Bovenberg, 2001; Uhlig, 2002). In a similar setting Buti,

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[1] Individual countries can experience price developments that differ from the average inflation rate in the euro area. However, such differential developments must be properly interpreted as regional *relative price movements*, which cannot be the subject of EMU monetary policy.

[2] Recognition of this problem with regard to the level of public sector debts and deficits has been the justification for the Excessive Deficit Procedure of the Maastricht Treaty and the Stability and Growth Pact.

Roeger and int'Velt (2001) model analyze cooperation among fiscal authorities in the presence of symmetric shocks. They find that cooperation is desirable especially if the euro economy is hit by a supply shock. Andersen (2002) shows that, in the case of a common shock, the inefficiency of non-cooperation is increasing in the number of member countries, whereas it is decreasing in the case of idiosyncratic shocks.

There are two basic channels through which national economic policies affect the aggregate EMU variables. The first, obvious one is that some national policies directly affect the relevant euro area aggregates. To the extent that the ECB takes euro area wide economic growth into consideration when setting its monetary policy, national policies affecting these variables are also relevant.[3] This regards primarily public spending and taxation, but goes beyond budget deficits, as the level and the structure of public sector revenues and expenditures have important macro effects on growth, employment, and prices.

The second channel works through national economic structures that shape the environment in which ECB monetary policy operates. For example, structural changes affecting the slope of the Phillips curve or the NAIRU in an individual member economy will change the constraints the ECB faces for its low-inflation policy, as the long-run equilibrium inflation rate of the euro area depends on such parameters.[4] Again, the reduced impact of national policies on price stability in EMU implies a reduced incentive for governments to undertake policies that could improve the monetary policy environment.[5]

The purpose of this paper is to analyze and discuss the coordination of fiscal and monetary policies in EMU. In section 2, we develop a framework for studying monetary and fiscal policy in a monetary union to explore the implications of the common currency for policy coordination. We show that there is little need for coordinating monetary and fiscal policies in the long run. In section 3, we study the interaction of monetary and fiscal policies in the short run. A monetary policy firmly committed to price stability at the EMU level implies that the central bank controls aggregate output at the euro-area level, while national fiscal policies determine the distribution of aggregate demand across the participating countries. Thus, national governments are engaged in a purely distributional game with inefficient outcomes unless policies are coordinated. If monetary policy also pursues a goal of output stabilization, policy coordination should include the central bank together with the fiscal authorities. We also show that the proposal to restrict fiscal policies to the operation of

[3] Although the ECB's main goal is price stability, it has a wider mandate of pursuing the general economic policies in the community provided that price stability is not endangered. Furthermore, the policy statements of the ECB clearly reflect a concern with cyclical developments in the euro area.
[4] This is the main tenet of models of monetary policy based on credibility arguments, e.g. Barro and Gordon (1983).
[5] See e.g. Sibert and Sutherland (2000), Calmfors (2001) and von Hagen (1999a).

automatic stabilizers at the national level, which is now often made in EMU, does not solve the issue of policy coordination. Instead, it worsens the situation of the central bank unless automatic stabilizers are identical in all member economies. In section 4, we review the existing mechanisms for policy coordination and show that they are deficient, since they focus on the long run rather than the short run and largely ignore the interdependence of national economic policies and the ECB's monetary policy. Section 5 concludes.

## 2. Monetary and Fiscal Policy Conflicts in EMU

### 2.1. A Model of a Monetary Union

In this section, we develop a macroeconomic model of monetary and fiscal policy in a monetary union. All variables other than the rates of interest and inflation are defined in logs. The monetary union consists of two countries of equal size sharing a common currency. These two countries produce tradable output goods, $Y_i$, I=1,2, which are imperfect substitutes in consumption. Aggregate demand at the monetary-union level depends on the real interest rate, i - $\pi^e$, and the aggregate primary government deficit measured relative to GDP, G, as well as an exogenous demand shock. We take the real primary government deficit at the national level, $G_i$, as the national policy instrument. The demand for money depends on the monetary-union price level, P, monetary union output, Y, the union-wide interest rate, and a money demand shock, u. Output supply in each country is determined by a short-run Lucas supply curve, where supply responds positively to unanticipated changes in the national output price. $z_{1t}$ and $z_{2t}$ are country-specific supply shocks. All shocks have zero mean, finite variance and are independent over time, and expectations are rational. For simplicity we assume that the two economies are symmetric in terms of the demand and supply elasticities.

$$M_t - P_t = Y_t - \frac{1}{\gamma} i_t + u_t \tag{1}$$

$$Y_t = \alpha_0 - \alpha_1 \left( i_t - P_{t+1}^e + P_t \right) + \alpha_2 G_t + v_t \tag{2}$$

$$Y_{1t} = \beta_0 + \beta_1 \left( P_{1t} - P_{1t}^e \right) + z_{1t} \tag{3a}$$

$$Y_{2t} = \beta_0 + \beta_1 \left( P_{2t} - P_{2t}^e \right) + z_{2t} \tag{3b}$$

Here, M denotes the nominal stock of money of the union at time t and is the policy instrument of the central bank. $P_t$ = ½ ($P_{1t}$ + $P_{2t}$) is the aggregate price level for the monetary

union. The rate of inflation is defined as $\pi_t = P_t - P_{t-1}$. $P^e_{t+1}$ is the expected price level in period t+1 with expectations based on information available at the end of period t, and $P^e_{it}$ the expected price of country i's output price based on information available at the end of period t-1. The latter expectations reflect those of wage setters at the national level.[6] We define nominal aggregate output as $Y_t + P_t = P_{1t} + Y_{1t} + P_{2t} + Y_{2t}$.

Equation (1) is the monetary union's money demand function. Equation (2) is the union's aggregate output demand function. The common interest rate, and the aggregate levels of prices and output of the monetary union are determined by the equilibrium in the money market and the combined output markets. By substituting (1) into (2) and aggregating the supply functions (3a,b), we derive the equilibrium levels of prices and output for the monetary union,

$$P_t = P^e_t + \frac{1}{J}\left[\alpha_1\gamma(M_t - M^e_t) + \alpha_2(G_t - G^e_t) - \alpha_1\gamma u_t + v_t - (1+\alpha_1\gamma)z_t\right], \tag{4}$$

$$Y_t = 2\beta_0 + \frac{2\beta_1+1}{J}\left[\alpha_2(G_t - G^e_t) + \alpha_1\gamma(M_t - M^e_t) - \alpha_1\gamma u_t + v_t\right] + \frac{\alpha_1(1+\gamma)}{J}z_t \tag{5}$$

where $J = (2\beta_1+1)(1+\alpha_1\gamma) + \alpha_1(1+\gamma)$ and $z_t = z_{1t} + z_{2t}$. Here, a superscript "e" indicates a rational expectation. Of particular interest is the expected equilibrium price level,

$$\begin{aligned} P^e_t &= \frac{1}{(1+\gamma)}\sum_{j=0}^{\infty}\left(\frac{1}{1+\gamma}\right)^j\left(\gamma M^e_{t+j} + \frac{\overline{\alpha}_0}{\alpha_1} + \frac{\alpha_2}{\alpha_1}G^e_{t+j}\right) \\ &= \frac{1}{(1+\gamma)}\left(M^{\infty} + G^{\infty} + \frac{\overline{\alpha}_0}{\alpha_1}\frac{1+\gamma}{\gamma}\right) \end{aligned} \tag{6}$$

Accordingly, the current equilibrium price level depends on the sequence of all current and future money supplies and fiscal impulses. Price stability thus requires that these sequences converge. This provides a rationale for the numerical limits on government deficits and debt in EMU.

Closing the model, equation (7) determines the relative output demands between the two countries. To simplify the algebra, we assume that the fiscal impulses fall entirely on domestic output and that the demand for domestic output is a function of the relative price of

[6] Alternatively, one might argue that wage setters use national consumption price levels instead of output prices as a basis for nominal wage demands. However, this would complicate the subsequent

the two goods. The relative price elasticity, $\alpha_3$ is a simple measure of the substitutability of the two goods.

$$\left(P_{1t}+Y_{1t}-P_t\right)-\left(P_{2t}+Y_{2t}-P_t\right)=\frac{1}{\left(1+\alpha_1\gamma\right)}\left[\alpha_2\left(P_{1t}+G_{1t}-P_{2t}-G_{2t}\right)+\alpha_3\left(P_{2t}-P_{1t}\right)+\left(v_{1t}-v_{2t}\right)\right] \quad (7)$$

Using (7), we can derive the equilibrium solutions for output and prices in country 1,

$$P_{1t}=P_t+\kappa\left(G_{1t}-G_{2t}\right)+\kappa\left[\left(v_{1t}-v_{2t}\right)-\left(1+\alpha_1\gamma\right)\left(z_{1t}-z_{2t}\right)\right], \quad (8)$$

$$Y_{1t}=\beta_0+\beta_1\left[P_t-P_t^e+\alpha_2\kappa\left(G_{1t}-G_{1t}^e-\left(G_{2t}-G_{2t}^e\right)\right)+\kappa\left[\left(v_{1t}-v_{2t}\right)-\left(1+\alpha_1\gamma\right)\left(z_{1t}-z_{2t}\right)\right]\right]+z_{1t} \quad (9)$$

where $\kappa=1/(1+\alpha_3-\alpha_2+\alpha_1\gamma)$. Note that $\kappa$ is small, if the two output goods are close substitutes, i.e., $\alpha_3$ is large. The solutions for country 2 are derived accordingly.

These derivations indicate that the model embeds a hierarchy which is relevant for the analysis of monetary and fiscal policy. Specifically, monetary policy acts at the union level, where the interest rate and the price level are determined. Focusing on these variables, it is confronted with the aggregate fiscal stance, the sum of the two fiscal impulses. National output and prices, in contrast, are determined at the national level, and country-specific shocks have no impact on the aggregate variables. Fiscal policy makers, therefore, face two tasks, namely to determine a policy stance appropriate at the aggregate level and to choose policies appropriate at the national level. As we shall see below, these tasks are generally only independent in the long run.

### 1.2. Monetary and Fiscal Policies in the Long Run

Consider, the long-run interaction of monetary and fiscal policy in this setting. As there are no surprises in the long run, the AS curve is vertical both at the national and the aggregate level. Figure 1A describes the situation. For expositional purposes, we take the past period's price level as given and put the rate of inflation on the vertical axis. The two member states of the monetary union have symmetric AS and AD curves. The AS and AD curves for the monetary union, multiplied by ½ thus lie above the two national AS and AD curves.

The important property of the long run in our context is that the central bank can choose the rate of inflation for the monetary union freely without affecting the level of output in neither country nor the monetary union as a whole. Given the central bank's choice of the rate of inflation, a change in government spending in one country affects relative output

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algebra with no important changes in the results.

prices and the distribution of output between the private and the public sector, but not the long-run level of output. Adverse supply-side policies in one country, such as a rise in distortionary taxes, shift that country's AS curve inwards, and the aggregate AS curve for the monetary union with it. However, given the paths of expected fiscal impulses, the central bank can still maintain the same inflation rate by adjusting the monetary policy accordingly with no long-run consequences for output in the other country.

Figure 1A

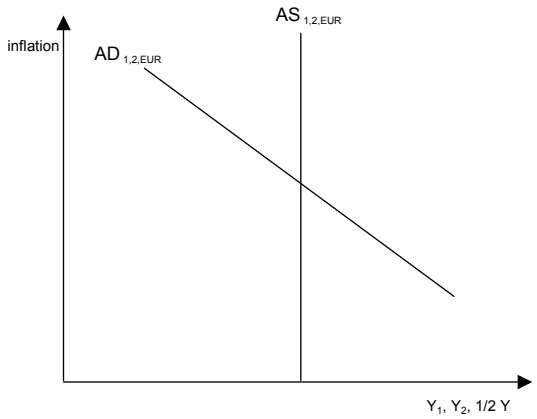
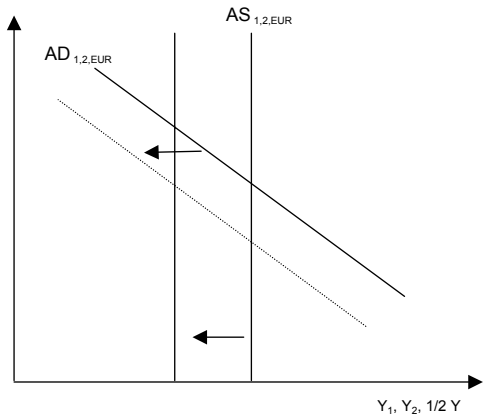



Figure 1B




The essence of this analysis is that monetary policy can achieve long-run price stability without interfering with fiscal policy, and the national governments can choose spending and taxes according to national preferences. Thus, beyond the imposition of an appropriate long-run constraint on government deficits, there is no need for coordinating monetary and fiscal policies.

## 3. Monetary and Fiscal Policies in the Short Run

### 3.1. A Graphical Exposition

Consider now the short-run version of the model. In the short run, wages are sticky and unexpected changes in prices have real output effects. The aggregate supply curve is positively sloped.

Again, the central bank can determine the equilibrium rate of inflation and, hence, the level of aggregate demand for the monetary union. Assume now that the government of the first country desires to increase output in its country and increases its deficit for that purpose. This drives up aggregate demand in this country and shifts the monetary union's AD curve outwards. Responding to the incipient inflationary pressures, the central bank raises the interest rate, pushing the union's AD curve back towards its initial position. As the interest rate rises, the national AD curves both shift inwards. In the new equilibrium, aggregate demand at the monetary union level is the same as before, but demand and output are higher in the first and lower in the second country; see figure 2A.

The point of the example is that the short-run model exhibits a conflict between monetary and fiscal policies in the monetary union. Given the positions of the supply curves, this conflict centers on the determination of aggregate demand in the monetary union and its distribution over the two countries.[7] It results from the fact that the monetary union's inflation rate is determined together with its aggregate level of output in equilibrium.

Figure 2A

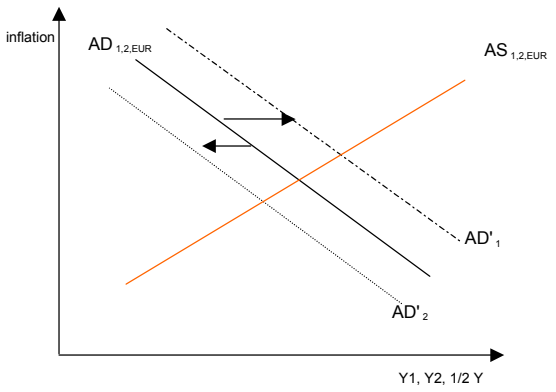
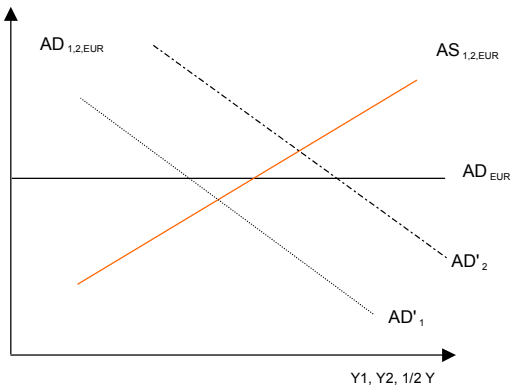



Figure 2B




There are two ways to frame this conflict. Assume, first, that the central bank is hard-nosed on inflation and unwilling to tolerate any deviation of inflation from its target rate. As the central bank counteracts all variations in aggregate demand at the monetary union level, the aggregate AD curve becomes horizontal (fig. 2B). Fiscal policies at the national level are then in a pure distributional conflict, i.e., any increase in the deficit in one country crowds out demand in the other country. Suppose that output falls short of the governments' target levels in the initial equilibrium. If the two governments fail to recognize this distributional conflict, they will increase government deficits in an effort to achieve their output goals. Since aggregate demand is controlled by the central bank, however, the fiscal expansions only lead to higher interest rates and eventually larger public debts, but neither government achieves its output goal. Coordinating fiscal policies is required to recognize the externality of fiscal policy and avoid inefficiently large deficits.

The other way to frame this conflict is to assume that the central bank is willing to tolerate deviations of inflation from its target rate in the short run, i.e., the aggregate AD curve remains negatively sloped and can be shifted by monetary and fiscal policies. Fiscal policies in the two member states then have an impact on the level and distribution of output in the monetary union as well as on the rate of inflation in the short run. There are, thus, two problems to be solved at the same time, the determination of aggregate demand and inflation at the monetary union level and the distribution of output across the two countries. In the

[7] For a strategic analysis of this conflict see Dixit and Lambertini (2000a,b).

absence of policy coordination, the governments and the central bank now compete in the determination of aggregate demand in the monetary union. If the governments pursue output targets exceeding the level of aggregate demand the central bank wishes to achieve, they will boost public deficits. Anticipating this, the central bank will tighten monetary policy more than it would otherwise. The result is an inefficient combination of tight monetary and loose fiscal conditions. Cooperative policies could achieve a better policy mix with lower interest rates and smaller deficits.

Figure 2C

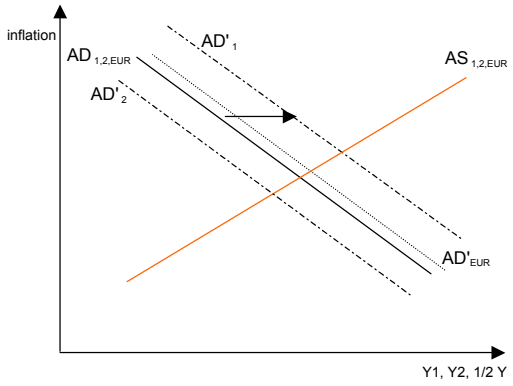
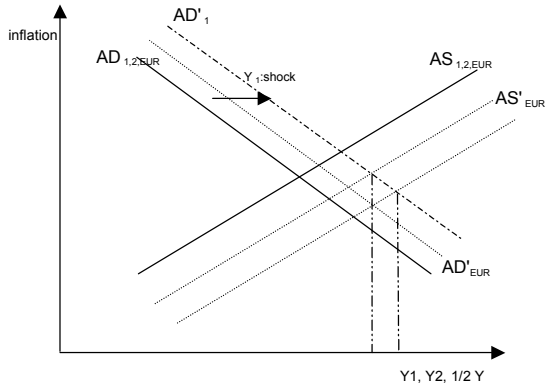



Figure 2D




It is straightforward to extend this argument to the case of an exogenous shock to aggregate demand in the monetary union, such as a change in world demand for the output goods of the monetary union. Again, the central bank uses monetary policy to counteract the inflation effects of such shocks and thus determine the level of aggregate demand for the monetary union. Fiscal policies at the national level are reduced to determining the distribution of the shock over the two countries. Unless the governments recognize the situation, their reactions to demand shocks will be inefficiently large.

Consider now the scenario where only the first country is hit by an exogenous demand shock (fig. 2C). On impact, this country's AD curve shifts outwards and the monetary union's AD curve moves with it. Faced with a rising inflation rate, the central bank responds by tightening monetary conditions, pulling the aggregate AD curve back. Assuming that the central bank is willing to tolerate some extra inflation, the aggregate AD curve will lie somewhat above the initial one; the first country's AD curve will be to its right, the second country's AD curve will be to its left. Monetary policy thus determines both the aggregate effect of the shock and its distribution over the two countries. The governments can obviously try to use fiscal policy to change the aggregate and the distributional outcomes, i.e., further shifts in the two curves may occur, before the monetary union settles down in a new equilibrium. An extreme version of this would be that fiscal policy in the first country absorbs the shock entirely. But it is far from clear that governments would agree to do this and

subject public policies in their countries to the risk of exogenous shocks. In general, therefore, a conflict between monetary and fiscal policy cannot be avoided in the short run.

### 3.2. Strategic Interaction

For a formal analysis of the short-run policy interaction, we express the model in terms deviations from expected values ( $y, p, g, m$ ). Using $g_{1t} + g_{2t} = g_t - p_t$ and setting $\beta_1$ = 0.5, we rearrange terms :

$$p_t = \rho_1(g_{1t} + g_{2t}) + \rho_2 m_t + \xi_t - \tau z_t \quad (4')$$

$$y_t = 2\rho_1(g_{1t} + g_{2t}) + 2\rho_2 m_t + 2\xi_t + \theta z_t \quad (5')$$

$$p_{1t} - p_t = \kappa(g_{1t} - g_{2t}) + \kappa(v_{1t} - v_{2t}) - (1 + \alpha_1\gamma)\kappa(z_{1t} - z_{2t}) \quad (8')$$

$$y_{1t} = \frac{1}{2}[(\rho_0 + \kappa)\alpha_2 g_{1t} + (\rho_0 - \kappa)\alpha_2 g_{2t} + \rho_2 m_t + \xi_t + \kappa(v_{1t} - v_{2t}) + (2 - (1 + \alpha_1\gamma)(\rho_0 + \kappa))z_{1t} - (1 + \alpha_1\gamma)(\rho_0 - \kappa)z_{2t}] \quad (9')$$

with $\rho_0 = \frac{1}{J - \alpha_2}$, $\rho_1 = \frac{\alpha_2}{J - \alpha_2}$, $\rho_2 = \frac{\alpha_1\gamma}{J - \alpha_2}$ ; $\tau = \frac{1 + \alpha_1\gamma}{J - \alpha_2}$, $\theta = \frac{1}{J}\left[\alpha_1(1 + \gamma) + \frac{2\alpha_2}{J - \alpha_2}\right]$ $\xi_t = \frac{1}{J - \alpha_2}(v_t - \alpha_1\gamma u_t)$

The objective functions for the central bank (CB) and the fiscal authorities (FA) for country 1 and 2 are assumed to be of the following form:

$$L_{CB} = \frac{1}{2}p_t^2 + \frac{q}{2}y_t^2 \quad (10)$$

$$L_{FA_i} = \frac{n}{2}(p_{it} - p_t)^2 + \frac{1}{2}y_{it}^2 + \frac{f}{2}g_{1t}^2 \qquad i = 1,2 \quad (11)$$

According to equation (10), the central bank seeks to stabilize the price level and the level of output around its long-run equilibrium value. For q=0, we say that the central bank is hardnosed about inflation. According to equation (11), the governments seek to stabilize domestic output around its long-run equilibrium value. They also wish to avoid deviations of domestic price developments from movements in the monetary union price level. This reflects a common argument in EMU, adopted officially at the Lisbon Summit, namely that fiscal policy should aim at minimizing such deviations. Finally, governments wish keep

variations in the fiscal impulse small. Minimizing the loss functions of the central bank and the two fiscal authorities (i) and (ii) with respect to their instrument variables, $m, g_1, g_2$ respectively, yields the following optimal strategies for monetary policy and fiscal policy:

$$\rho_2 m_t = -\rho_1 (g_{1t} + g_{2t}) - \xi_t - \frac{(2q\theta - \tau)}{1+4q} z_t \tag{12}$$

$$\begin{aligned}\left[ n\kappa^2 + \frac{(\rho_0+\kappa)^2 \alpha_2^{\,2}}{4} + f \right] g_{1t} = &\left[ n\kappa^2 - \frac{(\rho_0+\kappa)(\rho_0-\kappa)\alpha_2^2}{4} \right] g_{2t} - \frac{(\rho_0+\kappa)\alpha_2}{4} \left[ \rho_2 m_t + \xi_t \right] \\ &- \left[ \frac{(\rho_0+\kappa)\alpha_2}{4} + n\kappa \right] \kappa (v_1 - v_2) \\ &+ \left[ (1+\alpha_1\gamma) \left( n\kappa^2 + \frac{(\rho_0+\kappa)^2 \alpha_2}{4} \right) - \frac{(\rho_0+\kappa)\alpha_2}{2} \right] z_{1t} \\ &+ (1+\alpha_1\gamma) \left[ \frac{(\rho_0+\kappa)(\rho_0-\kappa)\alpha_2}{4} - n\kappa^2 \right] z_{2t}\end{aligned} \tag{13}$$

$$\left[ \frac{2f}{(\rho_0+\kappa)\alpha_2} + \rho_1 \right] (g_{1t} + g_{2t}) = -\rho_2 m_t - \xi_t + \left[ (1+\alpha_1\gamma)\rho_0 - 1 \right] z_t \tag{14}$$

A solution similar to (13) holds for the fiscal impulse in country 2. From equation (12), we see that monetary policy reacts negatively to any fiscal expansion at the aggregate level as well as to the demand shocks. Unless q is large, monetary policy's reaction to supply shocks is positive to offset their effect on the price level. From (13), we see that each fiscal authority will react negatively to the monetary policy impulse. Thus, the effects of monetary and fiscal policies on aggregate demand partially offset each other. The interaction between the two fiscal policies is less straightforward. If the two output goods are close substitutes, ($\kappa$ small), the second term in the brackets is likely to dominate and the fiscal impulse in country 1 will react negatively to a fiscal impulse from the other country. Otherwise, the term in brackets becomes positive and a fiscal impulse in the second country triggers a positive impulse in the first country. In that case, the two fiscal policies reinforce each other at the aggregate level.

If fiscal policy follows the policy recommendation implied by the Broad Economic Policy Guidelines and focus on national price differentials alone, (n very large), it does not react to any aggregate shocks. However, the two fiscal authorities would be left fighting against each other's impact on the national price levels. Letting n $\Rightarrow \infty$, we obtain the strategy pair

$$g_1 = g_2 - \kappa^{-1}\varepsilon_1;\ g_2 = g_1 - \kappa^{-1}\varepsilon_2,$$

which implies that an equilibrium exists only in the unlikely case that $\varepsilon_1 + \varepsilon_2 = 0$.

Solving for the monetary and fiscal variables yields the equilibrium policies at the monetary union level:

$$\frac{2f}{2f + \rho_0\alpha_2^2(\rho_0 + \kappa)}\rho_2 m_t = -\frac{2f}{2f + \rho_0\alpha_2^2(\rho_0 + \kappa)}\xi_t + \left(\frac{(1-(1+\alpha_1\gamma)\rho_0)\rho_0\alpha_2^2(\rho_0 + \kappa)}{2f + \rho_0\alpha_2^2(\rho_0 + \kappa)} - \frac{2q\theta - \tau}{(1+4q)}\right)z_t \quad (15)$$

$$\frac{2f}{(\rho_0 + \kappa)\alpha_2}(g_{1t} + g_{2t}) = (\frac{2q(\theta + 2\tau)}{1+4q} - 1)z_t \quad (16)$$

These solutions provide a number of interesting insights. First, with f = 0, a strategic equilibrium does not exist in the monetary union.[8] The reason is simple. If fiscal expansions are costless, each government fights for a larger share of aggregate demand to stabilize its national aggregates at the desired levels. Monetary policy, in turn, offsets the impact of the combined fiscal impulses. Note that the conflict between the two fiscal authorities arises although they share the same output target in the absence of any shocks.

This yields a second, suggestive interpretation for the fiscal strictures of the Maastricht Treaty, namely as an effort to make large fiscal impulses "costly" for the fiscal authorities. In this interpretation, the monitoring process and the public admonitions built into the Excessive Deficit Procedure create a political cost of fiscal impulses that increases with their size. To be effective, however, such a process requires timely and public warnings and reprimands against profligate fiscal policies. The recent experience with the warning letters the European Commission intended to issue against the governments of Germany and Portugal suggests that the governments are unwilling to tolerate such an open procedure. Furthermore, existence of an equilibrium demands that large negative fiscal impulses are costly, too. This is not foreseen in the Maastricht rules.

With f > 0, a strategic equilibrium exists. The equations then show that monetary policy alone counteracts the demand shock at the monetary union level. The aggregate fiscal stance only counteracts the supply shock. If demand shocks are more volatile than supply shocks, this implies that the more flexible policy instrument is used to address the shock with the larger variance.

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[8] This condition is mirrored in the setting of Buti et al. (2001), who introduced costs for smoothing interest rate to the loss function of the central bank. If the interest rate smoothing parameter is equal to zero, all demand side parameters dissapear from the solution.

When the central bank is hard nosed about inflation, q = 0, aggregate fiscal policy reacts negatively to the aggregate supply shock, as it tries to offset the effect on equilibrium output by boosting demand. At the same time, monetary policy reacts positively in an attempt to offset the inflationary consequences of the shock. Thus, fiscal policy and monetary policy work in opposite directions. In contrast, the fiscal policy reaction to supply shocks becomes more muted, if q >0, since monetary policy now assumes part of the effort to stabilize output at the monetary union level. In fact, assuming that $\theta+2\tau>2$, fiscal policy does not react to aggregate supply shocks at all, if $q=1/2(\theta+2\tau-2)$. In this case, national fiscal policy focuses solely on national economic conditions with no reaction to aggregate shocks. Thus, the assignment of tasks envisioned in the Broad Economic Guidelines, whereby monetary policy is responsible for stabilization at the aggregate level and national fiscal policies focus entirely on idiosynchratic shocks at the national level, can be reached, if the central bank assumes some responsibility for aggregate output stabilization.

### 3.3. Automatic Stabilizers

It is now often argued in the EMU, that the issue of policy coordination can be solved by limiting fiscal policy to a core function, the operation of automatic stabilizers. According to this view, fiscal authorities should refrain from discretionary action and adopt a "steady hand" as Germany's chancellor Schröder put it. A full use of automatic stabilizers would circumvent the strategic interaction between fiscal policies and these and monetary policy in EMU. In this section, we show that such a view has few if any merits.

A simple and straightforward way to model automatic stabilizers is to assume that the fiscal impulse is a function of real output. This embeds both the idea of automaticity of fiscal policy and the idea that policy makers cannot identify demand and supply shocks at the time when they occur and, therefore, are unable to implement optimal fiscal policies. Each government uses an automatic stabilizer of the form $g_{1t}=-\lambda_1 y_{1t}$, $g_{2t}=-\lambda_2 y_{2t}$ .

The policy problem at the monetary union level is now reduced to the optimal choice of a monetary policy given these automatic stabilizers. Optimal monetary policy then yields

$$\rho_2 m_t=\rho_1(\lambda_2-\lambda_1)y_{2t}+\frac{\tau-2q\theta+\rho_1\lambda_1(2\tau+\theta)(1+2q)}{1+4q}z_t-\xi_t \qquad (17)$$

A first, important implication of automatic stabilizers is that optimal monetary policy is a function of output, hence of shocks at the national level unless the two countries select identical automatic stabilizers. Again to simplify, we let q = 0, i.e., the central bank is hard nosed about inflation. Given q = 0 and, hence, price stability, monetary policy still affects aggregate output, and aggregate output is affected by country-specific shocks, too. This

never occurs with optimal discretionary policies. A first implication of this is, therefore, that the restriction of fiscal policy to the use of automatic stabilizers can destabilize output at the union level. Note that this is true although there is no disagreement among the governments about the appropriate level of output that should be targeted.

Next, we insert the optimal monetary policy rule into the equilibrium solutions for output at the national level. This yields the equilibrium solutions for the two national outputs,

$$\left[2+\left(\rho_0+\kappa\right)\alpha_2\lambda_1\right]y_{1t}=\left(\kappa\lambda_2-\rho_0\lambda_1\right)\alpha_2 y_{2t}+\kappa\left(v_1-v_2\right)+\phi z_t+\left[\left(1+\alpha_1\gamma\right)\kappa-1\right]2z_{1t} \qquad (18a)$$

$$\left[2+\alpha_2\left(\lambda_2\kappa+\rho_0\lambda_1\right)\right]y_{2t}=-\alpha_2\left(\rho_0-\kappa\right)\lambda_1 y_{1t}-\kappa\left(v_1-v_2\right)-\phi z_t+\left[\left(1+\alpha_1\gamma\right)\kappa-1\right]2z_{2t} \qquad (18b)$$

with $\phi=\dfrac{\tau-2q\theta+\rho_1\lambda_1\left(2\tau+\theta\right)\left(1+2q\right)}{1+4q}-\left(\rho_0-\kappa\right)\left(1+\alpha_1\gamma\right)$.

It is clear that the choices of optimal automatic stabilizers in the two countries remain fully interdependent. Even if the fiscal authorities are interested only in stabilizing domestic output, they will not choose fully offsetting stabilizers ($\lambda_i = \infty$), as the stabilizers also affect the transmission of shocks across countries and the impact of monetary impulses on the domestic economy. Note that, from equation (17), country 2 has an incentive to choose a value of $\lambda_2 > \lambda_1$, as doing so induces monetary policy to contribute to the stabilization of domestic output. As the country 1 has a similar incentive, the two countries to some extent compete for aggressiveness of automatic stabilizers due to the implied reaction of monetary policy. In sum, the analysis shows that a focus on automatic stabilizers shifts the problem of policy coordination to a different level without eliminating it.

### 3.4. Fiscal Policy Coordination

The purpose of policy coordination is to develop a common fiscal stance among the member governments. Formally, this is achieved by minimizing a joint loss function for the two fiscal authorities.

$$L^{FA}=\sum_i L_i^{FA} \qquad (10')$$

Minimizing (10') and the loss function of the central bank with respect to the instrument variables, $g_1$, $g_2$, and $m$ respectively, yields the following strategy for the coordinated aggregate fiscal policy:

$$\left[\alpha_2^2\rho_0^2+f\right]\left(g_{1t}+g_{2t}\right)=-\alpha_2\rho_0\left(\rho_2 m_t+\xi_t\right)+\left[\left(1+\alpha_1\gamma\right)\left(\rho_0^2+\kappa^2\right)-\rho_0\right]\alpha_2 z_t \qquad (19)$$

Solving for the monetary and fiscal variables yields the equilibrium policies at the monetary union level:

$$\frac{f}{\rho_0^2\alpha_2^2+f}\rho_2 m_t = -\frac{f}{\rho_0^2\alpha_2^2+f}\xi_t - \left(\frac{2q\theta-\tau}{(1+4q)} + \frac{\alpha_2\rho_0\left[(1+\alpha_1\gamma)\alpha_2\left(\rho_0^2+\kappa^2\right)-\alpha_2\rho_0\right]}{\rho_0^2\alpha_2^2+f}\right)z_t \tag{20}$$

$$f\left(g_{1t}+g_{2t}\right) = \left[\alpha_2\rho_0\frac{2q\theta-\tau}{1+4q} + \left[(1+\alpha_1\gamma)\alpha_2\left(\rho_0^2+\kappa^2\right)-\alpha_2\rho_0\right]\right]z_t \tag{21}$$

Comparing the coefficients of fiscal and monetary policy at the monetary union level, we find that fiscal policy coordination reduces the optimal monetary policy reaction to aggregate supply shocks, if we assume that f is small and the following two relationships hold: $2\alpha_2 < 2+\alpha_1(1+3\gamma)$ and $2\alpha_3 < \alpha_2+\alpha_1(1+\gamma)$. For a larger values of f, the effect becomes ambigous. Comparing the coefficients in (21) and (16), coordinated fiscal policies lead to a larger reaction to aggregate supply shocks than uncoordinated fiscal policies, if

$$(\frac{2q(\theta+2\tau)}{1+4q}-1)(\frac{\kappa-\rho_0}{2}) < (1+\alpha_1\gamma\kappa^2). \tag{22}$$

Note that $\kappa - \rho > 0$, unless the substitutability of the two output goods is too large. In this case, coordinated fiscal policies are more activist than uncoordinated fiscal policies, if the central bank is hard nosed about inflation (q=0). Since $\rho_0 < 1$ under plausible assumptions about the parameters, coordinated fiscal policies are always more activist when the two output goods are very close substitutes, ($\kappa \approx 0$).

# 4. Policy Coordination in EMU

### 4.1. Methods and principles of policy coordination

Before EMU, policy coordination in the EU relied on two main methods, harmonization of policies based on common rules of behavior, and delegation to community institutions (Jacquet and Pisani-Ferry, 2000). EMU has expanded the scope of coordination under both methods. The conduct of the common monetary policy by the Eurosystem is an example for delegation. The fiscal strictures of the Excessive Deficit Procedure and the Stability and Growth Pact are examples for rules-based coordination in EMU. But in addition to these traditional methods, the Maastricht Process and the development of the union during

the 1990s also introduced new forms of coordination, which are based on dialogue, the exchange of information, peer pressure, and persuasion. The reliance on "soft" enforcement, i.e., peer pressure and persuasion, indicates that the EU member states were unwilling to give up further sovereignty over their economic policies. The scope of policies covered by the existing coordination processes ranges from budgetary policies over labor market policies to regulatory policies at the national level.

Policy coordination can have a narrow or a broad agenda. With a narrow agenda, coordination is limited to monitoring the national economic policies of the member states and challenging practices that are expected to worsen the quality of the EMU's macro economic performance, e.g. with regard to price stability. The Excessive Deficit Procedure is an example for coordination under such a narrow agenda. Coordination with a narrow agenda leaves the member states the freedom to choose their policy goals, instruments, and methods of implementation. With a broad agenda, policy coordination goes beyond that and develops an explicit framework for cooperative policies. This requires agreement on a set of common policy goals and methods to achieve these goals. Apart from the single monetary policy and the administration of the Single Market, policy coordination in EMU today proceeds under a narrow agenda.

Apart from the single monetary policy and the administration of the Single Market, policy coordination today also is of an "unconditional" nature in the sense that the participating member governments (and the ECB, where applicable) inform each other about what they intend to do given their expectations about future economic circumstances. What will happen, if these expectations fail to materialize, however, is not part of the various procedures. This limitation is particularly important in the context of coordination between monetary and fiscal policy in the EMU, where the key strategic issues involve the short run and development of transparent rules for reactions to shocks could greatly help guide private sector expectations.

### 4.2. Actors

According to Article 99 of the Treaty on European Union (TEU), member states coordinate their economic policies at the EU level within the Council of Ministers with the participation of all 15 member states and the presence of the European Commission and of the European Central Bank where deemed necessary. The Council of Economics and Finance Ministers (ECOFIN) is the relevant one for the discussion and decisions about government deficits, spending and taxation, while the Employment/Social Affairs Council deals with employment and social policies. In the coordination procedures established by the Treaty, the Council adopts economic policy guidelines and recommendations by majority

voting on a proposal from the Commission. There is also a host of ministerial committees working below the Council to prepare its work.

In recognition of the specific coordination requirements among participants of the euro area, the 1997 European Council in Luxembourg established the Euro Group (also known as the Euro12-Group) of the finance ministers of the EMU member states. Since the Euro Group has no formal decision making authority and its role is limited to assessing the economic situation and discussing the major policy issues for the euro area. The group is chaired by a minister of a participating EMU member state holding the EU presidency, and, in periods when a non-EMU member holds the EU presidency, by a minister of the next EMU member state to hold the EU presidency. This subgroup of ECOFIN gathers in connection with ECOFIN meetings.

The European Commission is present both at Council and Euro Group meetings. The Commission has the right to set the policy agenda for Council meetings and to provide analysis for multilateral surveillance. The Economic and Financial Committee (EFC) has advisory and preparatory functions for the Council meetings. It consists of representatives of the national administrations and the national central banks, as well as two representatives of the European Commission and the ECB. Within the limits set by the consensus agreements of the national governments, both institutions, the EFC and the European Commission have played leading roles in the development of the coordination process, e.g. by proposing and developing the various procedures reviewed below. While the European Commission and the EFC cover macroeconomic and financial issues, the Economic Policy Committee (EPC), which consists of officials from economics ministries, is primarily concerned with structural policies.

Experience in the EMU and other contexts suggests that the responsiveness of governments to peer pressure is not the same in all countries. Large countries in particular are less likely to react to peer pressure in the desired way, as the wish to be a “good European” typically plays a much weaker role in their domestic politics than in smaller countries.[9] This is indicated by the observation that the share of EU initiatives in total legislative initiatives is usually smaller in the parliaments of large countries such as Germany, where 15-20% of all initiatives are due to implementation of EU initiatives (see von Beyme 1997) than in smaller countries like Belgium, where it is around 50%. The slippage in fiscal discipline observed in 1999 – 2001 and the fact that France and Germany undertook significant tax measures without referring to them in their stability programs (European

[9] It is interesting in this context to note that, during the convergence process to EMU in the 1990s, the small EU countries were much more responsive to the pressures for adjustment of budgetary policies than the large countries. See von Hagen, Hughes-Hallett and Strauch 2000.

Commission, 2000) also support the impression that the effectiveness of peer pressure to secure commitment of the large member states is limited.

The effectiveness of recommendations made at the EU level to guide national budgetary policies is limited by several procedural impediments. Although the deadline for the submission of stability or convergence programs has been moved forward from 1 March to the end of preceding year, national budget processes and the writing of these programs run on different and loosely connected calendars. In many EMU member states, the budget and the stability program are prepared by different administrative units. Thus, the link between these processes is weak in many countries (Hallerberg, Strauch, von Hagen 2001). A further difficulty in this context is that the procedures for policy coordination do not always involve the relevant actors at the national level. This implies that negotiations at the EU level often lead to no more than statements of good intentions to persuade the other actors relevant at the national level.

Article 113 forms the Treaty basis for a dialogue between the Council and the ECB. It foresees the participation of the ECB in Council meetings where matters relating to monetary policy are discussed. In turn, the Council president has the right to participate in meetings of the ECB Governing Council and to submit motions for deliberation by the Governing Council. But note that, since the president of the EU Council represents all members of the EU, he is not necessarily a good counterpart for the ECB to discuss the policy mix in the euro area. This is partly recognized by the practice that, if the EU presidency falls on a non-euro state, the Council president is represented by the chairman of the Euro Group, i.e. the finance minister from the next EMU member state to hold the EU presidency. The ECB president is always invited to participate in meetings of the Euro Group.

The Cologne Process, an informal macroeconomic dialogue, was introduced under the German presidency in 1999. It consists of bi-annual, informal consultations between public authorities and representatives of the social partners without setting objectives. The social partners are represented by their respective organizations at the European level. The dialogue focuses on issues of monetary, fiscal and wage policies. The exchange takes place on a political and technical level between the ECB, ECOFIN, the Labor and Social Affairs Councils, the Commission, and the social partners.

Although the dialogue explicitly recognizes the necessity of wage policies at the national level to be consistent with price stability in EMU, the forum is unlikely to play a major role in the coordination process. This is due to the fact that the EU federations of trade unions and employers unions do not have the authority to represent common views of their respective partners in all member countries and, therefore, cannot assure the enforcement of any agreements on guidelines for wage policies at the national level. This, in turn, is due to

the institutional heterogeneity of social partner organizations in the member countries (See OECD ,1996).[10]

### 4.3. Processes for macroeconomic policy coordination

Table 1 presents processes of economic policy coordination in the EU. They include the Broad Economic Policy Guidelines (BEPGs, the process of multilateral surveillance, the Excessive Deficit Procedure and the Stability and Growth Pact and the Cologne Process. Finally, the open method of coordination, introduced at the Lisbon Summit, aims at coordinating the coordination processes with respect to EU goals. The last method is not an additional process alongside with the others but a concept of how to link the existing procedures. Its task is to exploit the fact that the processes are interacting with respect to policy goals such as employment and growth.

According to Article 99 of the TEU, the BEPGs form the center of economic policy coordination process at the community level. The BEPGs consolidate the different existing processes (Luxembourg, Cologne and Cardiff) and aim at exploiting the synergies between them. BEPGs also form the reference for the multilateral surveillance procedure, under which the consistency of national economic policies with the BEPGs and the functioning of EMU in general are monitored. The multilateral surveillance procedure includes the possibility to make confidential or public assessments of the policies of individual member states and to give confidential or public recommendations to their governments. The European Council decides by unanimity vote on the BEPGs upon proposals by the European Commission and recommendations by ECOFIN. Since 2001, an enhanced framework for preparing and monitoring the implementation of the BEPGs is used that includes explicitly different decision making levels and actors at national and EU level in order to strengthen responsibility for final implementation.

The difference between the EU and EMU matters particularly in this context. The BEPGs do not distinguish sufficiently between economic goods shared among all EU members, such as the Single Market, and those shared only among the members of the euro area, such as price stability in the EMU. At the level of the EU, the Internal Market constitutes the reference point for policy coordination. As in pre-EMU times, the coordination of economic policies assures that countries do not engage in policies that undermine the smooth functioning of open markets – competitive devaluations being the traditional example. The euro area, however, has a broader need for policy coordination.

[10] Wyplosz (1999) argues that further centralization at EU level is also hindered by the diverging labor costs throughout Europe where in Germany labor costs are five times larger than in Portugal.

Fiscal policy remains a national competence for EMU member states, but under several constraints. EU Procedures for the conduct of fiscal policy are the Excessive Deficit Procedure, the Mutual Surveillance Procedure (Articles 99, 100, 111 TEU) and the Stability and Growth Pact (Regulations 1466/97, 1467/97, 97/C236/01-02). The No-Bail-Out-Rule (Articles 103 TEU, Article 21 ESCB Protocol) protects member states from becoming responsible for financial liabilities of other member states against their will. The Excessive Deficit Procedure includes the mandate (Article 3 of the Protocol) that the member states of EMU should implement appropriate institutions at the national level that enable them to fulfill their obligation for maintaining sustainable finances. In contrast to the obligation for all member states to have independent central banks, there is, however, no explanation of what this obligation means in practice. For members of the EMU, the Excessive Deficit Procedure is an unconditional obligation to avoid excessive deficits. In addition, the Stability and Growth Pact calls for medium-term budgetary positions close to balance or in surplus. The higher the debt-to-GDP ratio of a country, the greater must be its efforts to reduce it rapidly. Member states are required to take immediate corrective actions, if they are found to have an excessive deficit. The Excessive Deficit Procedure and the Stability and Growth Pact allow for the imposition of financial sanctions in such cases – a feature that distinguishes them from other coordination procedures.

In the context of the Stability and Growth Pact, the EMU members are required to produce annual stability programs that present the main fiscal decisions and budgetary choices on the path to the medium term objective for budgetary positions close to balance or in surplus (2001-2004 for the latest programs). The Council considers whether the budget-policy strategy and the economic targets continue to meet the requirements of the Stability and Growth Pact and the BEPG. In order to prevent the occurrence of excessive deficits, the Council may give an early warning in line with Article 99(4) of the Treaty.

While the combined Excessive Deficit Procedure and Stability and Growth Pact acknowledge the importance of fiscal discipline for the conduct of monetary policy, the setup is still unsatisfactory with respect to the EMU for several reasons. First, the procedures focus on individual member country performance with no regard to the aggregate fiscal policy stance of the euro area as a whole. Implicitly, the setup is based on the assumption that being close to balance is unconditionally the proper contribution of fiscal policy to macroeconomic stability in the euro area. While this may be true in the long run, our analysis in section 3 showed that stability demands different constellations of monetary and fiscal policy at different stages of the business cycle.

Second, the procedure focuses narrowly on deficits and debts. In our context of policy coordination, the emphasis of the Excessive Deficit Procedure and the Stability and Growth Pact on government borrowing is justified only if one assumes that national fiscal policies

affect the macroeconomic performance of EMU and cause horizontal spill-overs predominantly through their capital market effects.

Within the existing framework for policy coordination, the place for formulating and monitoring the achievement of such objectives would be the BEPGs. Other processes such as the Excessive Deficit Procedure and the Stability and Growth Pact as well as the Cardiff and Luxembourg processes described below are to provide detailed analysis of the respective policy areas. It is interesting, therefore, to note that the Commission's and the Council's 2001 recommendations for more fiscal discipline in Ireland were made under Article 99.4 (BEPGs), although the analysis was made in the context of the stability and Growth Pact (Fisher and Reitano, 2001). Thus, there seems to be some recognition of the incompleteness of the framework for fiscal policy coordination provided by the Excessive Deficit Procedure and the Stability and Growth Pact. But the weaknesses of the BEPGs for policy coordination in the EMU context also suggest that the potential for using them for the purposes indicated above remains limited.

**Table 1: Annual EU Procedures and actors involved**

| Procedures | Form of Coordination and Instruments | Actors | Tasks |
|---|---|---|---|
| **Broad Economic Policy Guidelines (BEPGs)**<br><br>(Article 99 Amsterdam Treaty) | Core of economic policy coordination within the EU defining common objectives<br><br>Annual guidelines and recommendations to member states<br>Implementation reports | European Council<br>ECOFIN Council (Euro Group)<br>European Commission<br>Member states<br>Economic and Financial Committee<br>Economic Policy Committee<br>European Parliament | The BEPGs defines the economic policy orientations for the EU in accordance with Article 2. The BEPGs integrate the different processes mentioned below. |
| **Multilateral surveillance**<br><br>(Article 99 (3) Amsterdam Treaty)) | Monitoring process<br>Peer review | ECOFIN Council<br>European Commission<br>Member states<br><br>Economic and Financial Committee | The Process monitors and assesses the economic developments and policies in member states as well as in the community as a whole.<br>It forms the basis for community compliance procedure (Article 99 (4)) |
| **Excessive Deficit Procedure (EDP)** (Article 104)<br><br>**Stability and Growth Pact (SGP)**<br>Regulation 1467/97 | Common rules and objectives<br>Budgetary surveillance<br>Pecuniary sanctions<br><br>Member states submit annually stability or convergence programs | ECOFIN Council<br>European Parliament<br>National governments (finance ministries)<br>European Commission<br>Economic and Financial Committee | The EDP and SGP represent an obligation on member states to achieve medium-term budgetary positions close to balance or in surplus. . |
| **Cologne Process**<br><br>ECOFIN 1999 | Informal macroeconomic dialogue at community level<br><br>Informal exchange of view<br>2 meetings per year on technical and political levels | ECB (+ representative of non EMU central banks)<br>European Commission<br>Troika of current, subsequent and preceding presidency of ECOFIN and Labor/Social ministers<br>Social Partners | The Cologne Process aims at improving the interaction between wage developments and monetary, budgetary and fiscal policy at the EU level. The process was installed to complete the Cardiff and Luxembourg Process. |
| **Open method of coordination**<br><br>ECOFIN 2000 | Coordination among existing processes<br><br>Fix guidelines and timetables for the union<br>Set national implementation targets<br>Establish performance indicators and benchmarks where appropriate<br>Monitoring, evaluation and peer review | | Enhancing consistency between the different processes |

### 4.5 Assessment

The current procedures for cooperative policies are unsatisfactory in two respects: First, they do not make sufficient room for formulating trade-offs nor for making the relevant choices at the aggregate level. This implies that no mechanism for expressing preferences over the aggregate policy stance is in place. On the one hand, the processes are rather compartmentalized in terms of policy fields, while the analysis and evaluation of trade-offs requires dealing with more than one field of policy at a time. On the other hand, such an analysis and discussion currently only happens in the context of the BEPGs. Yet, the specificity of the BEPGs and the analysis surrounding them generally seems rather low. Secondly, there exists no proper mechanism for addressing the short-run fiscal policy conflicts in the monetary union. For reasons stated above, the EU Council, the relevant decision making body in this context, does not seem to be the appropriate body for a detailed assessment of trade-offs and policy choices for the euro area.

With the creation of EMU, the governments have chosen to ignore the short-run interaction between monetary and fiscal policies and the interactions between fiscal policies. A framework for cooperative policymaking among the ECB and the national governments has not yet been developed. Instead, the current setup of the EMU seems to rely on the assumption that economic policy in the euro area can be separated into the different fields covered by the various processes and that interdependencies between these fields are negligible (Padoa Schioppa,1999). In section 2, we saw that such a separability between policies holds only in the long run. In the short run, a conflict potential exists between fiscal and monetary policy together with a distributional conflict between the national policies. [11] These conflicts have not been addressed so far in existing procedures and a coherent analytical framework for policy evaluation at the aggregate level is still missing in practice.

## 5. Conclusions

We have discussed the interactions and potential conflicts between monetary policy and the national fiscal policies in EMU. The analysis shows that in the long run, monetary policy can achieve price stability without interfering with fiscal policies. The central bank may choose the rate of inflation for the monetary union without affecting output in the individual member countries nor in the union as a whole. But, in the short run, there is a potential

[11] The existence of such a conflict potential was recognized by the Luxembourg Council in 1997 which concluded that "…To the extent that national economic developments have an impact on inflation prospects in the euro area, they will influence monetary conditions in that area. It is for this basic reason that the move to a single currency will require closer community surveillance and coordination of economic policies among euro area member states."

conflict between monetary and fiscal policies, as both interact in the determination of aggregate demand in the monetary union. If the central bank firmly targets price stability, fiscal policy at the national level results in a pure distributional conflict. Governments fight for a larger share of aggregate demand to achieve their desired output levels while the central bank offsets the combined fiscal impulses. If fiscal impulses are costly, a strategic equilibrium exists where the central bank counteracts demand shocks at the union level and the aggregate fiscal stance only counteracts supply shocks.

If the central bank tolerates deviations from price stability in the short run, fiscal and monetary policies are fully interdependent at the aggregate level. Since each of the authorities affects the others' objectives, policy coordination among them improves the outcomes for all three of them. Ignoring the interdependencies between monetary and fiscal policies in the short run risks an unsatisfactory macroeconomic performance of the monetary union.

Our analysis suggests that limiting the fiscal policy to the operation of automatic stabilizers does not solve the issue of policy coordination. Instead it destabilizes aggregate output and implies that countries will compete for the aggressiveness of their optimal automatic stabilizers due to the implied monetary reaction.

Solutions to solve these short term conflicts requires agreements among member states on a joint fiscal policy stance at the aggregate level, reconciling the fiscal stance with the union's monetary policy, and procedures to express and aggregate preferences over the output-inflation trade-off at the EMU level and to make choices consistent with these preferences. The existing processes and mechanisms for policy coordination are inadequate for dealing cooperatively with the relevant conflicts at the EMU level. They are insufficiently focused on EMU macroeconomic variables, and they do not provide a framework for entering binding commitments among the governments and between them and the central bank.

Existing processes for policy coordination in EMU may perhaps provide a basis for expressing the distributional conflicts among the member states, for expressing concerns about policies in one country that could have negative effects on others through the EMU aggregates, and for peer pressure encouraging reforms. However, they provide no framework to analyze the relevant conflicts in detail nor to arrive at binding agreements among the governments assuring the consistency of their individual fiscal policies with their policy goals at the national and the aggregate level. Thus, the current institutional setup largely keeps the member states in a non-cooperative policy game. One implication is that the central bank is rightfully reluctant to engage in cooperative policymaking with the fiscal authorities, as it cannot count on the reliability of agreements it might enter into with the governments. Thus, the lack of commitment among the governments implies an inability to commit between the monetary and fiscal authorities.

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# Discussion

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## 1. Summary of the paper

The paper by von Hagen and Mundschenk investigates the interactions between fiscal policy and monetary policy in the European and Monetary Union (EMU). In particular, the paper looks at the interdependence of fiscal policy which is controlled by national governments and monetary policy controlled by the common European Central Bank (ECB).

The main conclusions of the paper are as follows: (1) In the long run, the ECB can choose inflation independently of output in either member country and national fiscal authorities can choose spending and taxes according to national preferences. There is therefore no need to coordinate monetary and fiscal policies. (2) In the short run, conflicts between monetary and fiscal policies cannot be avoided. Individual fiscal authorities will not take externalities of their policies on other member states into account and will tend to run too loose fiscal policies, which implies a tight monetary stance by the ECB to counteract inflationary pressure. Non-coordination of fiscal policies is therefore inefficient. The paper also shows that automatic fiscal stabilizers can lead to destabilization of output at the union level.

## 2. The Model

The model in this paper consists essentially of the following three equations:

$$(1) \qquad M_t - P_t = Y_t - i_t / \gamma + u_t$$

$$(2) \qquad Y_t = \alpha_0 - \alpha_1\left(i_t - P_{t+1}^{\ e} + P_t\right) + \alpha_2 G_t + v_t$$

$$(3a,b) \quad Y_{it} = \beta_0 + \beta_1\left(P_{it} - P_{it}^{\ e}\right) + z_{it}, i = 1,2$$

The aggregate money demand equation (1) determines money demand as function of aggregate income and price level, nominal interest rate and a money demand shock, $u$. The aggregate (union) demand (2) relates union output and price level to the nominal interest rate; the common demand shock is captured by $v$. Finally, individual (country-sepcific) supply functions (3a,b) show the relationship between prices and output for each of the two countries country $i=1,2$. Each country can experience supply shocks, $z_i$. The aggregate money supply is controlled by the ECB, whereas national primary deficits (G) are the policy instruments of national governments.

A fourth equation (7) closes the model and determines relative output demands in the two countries:

$$(7) \quad \underset{i=1,2}{\Delta}(P_{it} + Y_{it} - P_t) = \left[ \alpha_2 \times \underset{i=1,2}{\Delta}(P_{it} + G_{it}) + \alpha_3 \times \underset{i=1,2}{\Delta}(P_{it}) + \underset{i=1,2}{\Delta}(v_{it}) \right] \cdot \frac{1}{1 + \alpha_1 \gamma},$$

where $\Delta(x_i)$ represents the difference of a variable $x = x_1 - x_2$

**3. Long-Run Results and Issues**

Prices are assumed to be flexible in the long-run. Policy-makers therefore face a vertical supply curve in the long-run, both at the union level as well as at the national level. The ECB can therefore freely choose inflation for the monetary union without affecting output. Fiscal policy choices of the member countries will determine the relative output prices and the relative size of the government sector, but not aggregate output.

The authors assume that future money supplies and fiscal impulses converge according to equation (6) to determine the expected price level, $P^e$. This issue of price stability is related to the literature on the "Fiscal Theory of the Price Level" (see for example Cochrane 2002). The authors argue that this might provide a rationale for numerical limits on government deficits and debt in EMU. Other problems that might arise in the long-run could be debt and banking crises such as recently experienced by Argentina. For a recent discussion of these issues see Uhlig (2002).

**4. Setup of Short-Run Model**

In the short-run, there are nominal rigidities and unexpected price changes have real effects. The model equations (4' to 9') are expressed in terms of deviations from expected values for output, prices, fiscal deficits and the money supply.

The loss functions of ECB and the fiscal authorities (FA) are given by:

$$(10) \quad L_{ECB} = \frac{1}{2}\left(p_t^2 + q y_t^2\right)$$

$$(11) \quad L_{FA} = \frac{1}{2}\left[n(p_{it} - p_t)^2 + y_{it}^2 + f g_{it}^2\right], i = 1,2$$

where $q$ measures the relative weight that the ECB gives to output stabilization (the inverse of central bank conservativeness), and $n$ measures the weight of fiscal authorities to relative price differences and $f$ captures the cost that national governments face by expanding fiscal policy. Another parameter of interest is $\kappa$ which measures how complementary the two member outputs are.

## 5. Summary of Short-Run Results

The model gives a rich set of results on the interaction between monetary and fiscal policies in the short run. The policies can be summarized as follows:

*ECB policy reactions*
The ECB reacts negatively to fiscal expansion and demand shocks at aggregate level and positively to supply shocks (unless $q$ large) to offset effect on $\pi$.

*Policy reactions of Fiscal Authorities (FA)*
Governments react negatively to monetary policy impulse to offset the contractionary effect on national output. The interaction between fiscal authorities is negative if goods close substitutes ($\kappa$ small**)**. If n is large, national governments focus mostly on relative price differentials ($p_i$-$p$) and will not respond to aggregate shocks. The authors relate this point to the advice given at the Lisbon summit. The paper also shows that the restriction of fiscal policies to automatic stabilizers can lead to unstable output at the union level.

*Strategic Interactions*
The paper argues that when countries face no cost of fiscal expansion ($f = 0$) then no strategic equilibrium exists. This is not too surprising since national governments would use infinite fiscal impulses to counteract the effect of monetary policies. A more interesting question would be what happens to the equilibrium if national governments differ with respect to the cost of fiscal impulses. This could have induced the German government to impose first the Maastricht criteria on potential entrants to EMU and later the Growth and Stability Pact on EMU member states. In the short run, there will of course always be the temptation to fudge any such criteria as one could witness at recent ECOFIN meetings. Also a closer link of the results to other literature on strategic interactions would be desirable (see Dixit 2001 and Dixit and Lambertini 2001).

*Monetary Policy*
If the ECB is "hard-nosed" about inflation ($q$=0), no coordination issue between the central bank and national governments arises; prices completely stabilized, and output fluctuates. However, national governments can still attempt to counteract the contractionary effect of monetary policy on their output level. There is still room for coordination of fiscal policies. When the ECB also cares about output variability ($q > 0$), fiscal and monetary policies are fully interdependent.

## 6. Comments on Theory

The paper makes presents a rich framework and contributes to the literature by discussing the interaction between fiscal and monetary policies when governments face different costs of using fiscal policy ($f > 0$) or different weights on relative price differentials ($n > 0$). The paper sketches the behavior of the economy in the short and the long-run, but does not explain the medium-term adjustment or strategic analysis of repeated short-term issues.

Other interesting questions would be for example: Can fiscal authorities "learn" and anticipate the reaction of other governments or the central bank? Is the Nash equilibrium played by fiscal authorities, the only equilibrium in repeated games or can cooperation be sustained through punishment? Also a closer link of the model to other related literature (Beetsma and co-authors, Dixit 2001, Casella 1999) is needed. Finally, the paper does not address normative questions such as the optimal trade-off between independence and coordination. For an excellent recent paper on the broader issue of coordinating public in a currency area see Alesina et al (2002).

**7. Comments on Empirics**

The paper has a descriptive section 4 discussing the various policy actors in EMU. However, the paper leaves open the question how important strategic interactions and externalities are in practice? It would be interesting to use historical data, for example from the ERM since 1992 or from other monetary unions, to get an idea of the importance of these effects. Alternatively, the paper could provide dynamic simulations (impulse response functions of shocks and policy impulses) of such policy conflicts and show the transition from short to medium and to the long run.

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# Discussion

**Thorsten Polleit**[1]

It is with great pleasure that I am called to comment on the paper "Fiscal and Monetary Policy Coordination in EMU", written by Professor von Hagen and Mrs Susanne Mundschenk.

The purpose of the paper is to study the relationship and potential conflicts between a centralized monetary policy, with the primary objective of maintaining price stability, and decentralized fiscal policies in the European Monetary Union (EMU). The topic of the paper is both interesting and relevant, focusing on existing, i.e. newly created, externalities of national fiscal policies in a monetary union. The analyses, findings and conclusions contained therein provide useful insights into designing a welfare-enhancing institutional framework.

The paper has been structured as follows. In the second section of the paper, the authors model the long-term relationship between monetary and fiscal policies in EMU. In the third section, the short-run interrelations are analysed. Here, the authors provide an analytical framework dealing with the strategic interactions between monetary and fiscal policies, consider the operation of automatic stabilizers and discuss a potential policy coordination which might prevent a sub-optimal policy resulting from strategic interactions. The fourth section sets out methods and principles of policy coordination in EMU, introduces those involved in policy coordination, explains the processes for macroeconomic coordination and provides an assessment of whether the current procedures for cooperative policies in EMU are conducive to coordinating national policies.

The main conclusion of the paper is that by ignoring interdependencies between monetary and fiscal policy in the short run, there is a risk that the macroeconomic performance of a monetary union will be negatively affected. To prevent a sub-optimal outcome, an institutional framework is required to secure an agreement of a joint fiscal policy stance, reconciling it with the union's monetary policy. The authors argue that existing processes and mechanisms for EMU policy coordination are

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inadequate for dealing cooperatively with potential conflicts. In fact, current policy coordination processes and mechanisms in EMU prevent the central bank from engaging in cooperative policy-making with fiscal authorities.

In my view, the conclusions of the paper deserve further attention given their foundations in the field of institutional economics and game theory – a methodological approach which appears highly suited to the analysis of the issues under review. It is also worth mentioning at this juncture that I found the concise review and analysis of existing mechanisms for policy coordination in EMU, based on the theoretical findings, highly informative. In the following, I will confine myself to commenting on three issues. First, I will touch upon the implications that a stable demand for money would have on the analyses presented in this paper. Second, I would like to make a brief remark on the relationship between rational expectations and the effectiveness of monetary policy. And third, I would like to put forward a view that might inspire further work in this interesting and important field of research.

In the authors' model, the expected equilibrium price level is, by construction, determined by the sequence of current and future money supplies and fiscal impulses. This finding provides a rationale for imposing numerical limits on government deficits to secure price stability. The conclusion rests on the assumption that the demand for money is unstable. If, however, the demand for money were assumed to be stable, a fiscal policy induced change in output could not be held responsible for exerting influence on the expected equilibrium price level. The use of a stable demand for money trend, allowing for instabilities in the short term, might be compatible with the paper's short- and long-run policy implications. However, such a stable trend implies an inherent tendency within the private sector to restore itself to equilibrium. This might shed a different light on the rationale for shock-absorbing monetary and fiscal policy intervention. Thus, it would be interesting to see if an extension of the analysis, assuming a stable demand for money trend, yields additional insights. (I am well aware of the heated debate about the stability of money demand. In EMU, however, which has been taken as a reference point in this paper, the demand function for M3 is considered to be trend stable. That said, it might be of particular interest to contrast the results and conclusions with an environment in which the demand for money is assumed to be trend stable.)

A more general remark I would like to make refers to the relationship between rational expectations (RE) and the effectiveness of monetary policy. In general, under RE, monetary policy will exert an impact on real output only if it either delivers "surprise inflation" or prices can be assumed to be "sticky". However, if market agents expect the central bank to influence the real economy through surprise inflation because prices are assumed to be sticky, it might be reasonable to expect that hitherto long-term contracts will be changed into flexible, i.e. short-term, contracts. That said, the existence of sticky prices in the short term may not necessarily indicate a systematic effectiveness of monetary policy under RE. In fact, it is this general line of thought that encourages caution regarding base recommendations made on the assumption that monetary policy can exert a systematic impact on the real economy.

In the paper, a distinction is drawn between short- and long-term implications of monetary and fiscal policy interactions. Assuming a new classical type of macroeconomy, however, it would seem that, when analysing the impact of monetary and fiscal policy actions, a distinction between anticipated and non-anticipated, rather than short- and long-run, policy changes should do justice to the theoretical framework chosen. Moreover, it appears the proposition that public authorities should have an information advantage over the private sector needs some discussion; it is actually the crucial element allowing monetary and fiscal policies to implement shock-absorbing measures which are not anticipated by market agents, thereby having an impact on the real economy.

To conclude, a government's deficit spending is traditionally modelled as a function of the state of the business cycle. However, experience in a number of countries suggests that governments' deficit spending seems to depend heavily on eco-political factors (such as, for instance, continuously subsidising particular interests) rather than on output gap considerations. That said, it would be interesting to see how a change in the underlying reasons for running fiscal deficits might change the optimal institutional framework governing the relationship between fiscal and monetary policy in a monetary union.

# *Discussion*

**Roland Vaubel**

The authors confuse international interdependence through the price mechanism (here: the common real interest rate) with Pareto-relevant externalities (p. 11, 21). International spillovers in efficient markets do not generate Pareto-relevant external effects unless policy makers pursue more targets than they have instruments. In a Mundellian assignment solution where each policy instrument is directed at one policy target according to comparative advantage, there is no need for coordination among policy makers – neither within a country (e.g., between monetary and fiscal policy) nor between countries (e.g., their budget deficits).[1]

The assignment solution is also more efficient than CEPR-type coordination games for at least three reasons:

1. The assignment solution permits an efficient division of labour among policy makers. Each policy maker or institution is in charge of only one instrument and can specialize on its effectiveness with respect to one target variable.
2. The assignment solution permits effective democratic control. The citizens understand which policy maker is responsible for which target. Without clear responsibility, the causes of policy failures will remain obscure, and a corrective feedback will be lacking.
3. When each instrument is assigned to one domestic target according to comparative advantage, the policy makers of different countries will compete with each other ("yardstick competition"). International policy competition extends the scope for comparison so that voters are in a better position to evaluate the performance of their governments (including central banks). By contrast, international policy coordination is equivalent to an international cartel of policy makers vis-à-vis their citizens. It aggravates the principal-agent problem of representative democracy.

The two authors correctly emphasize that the European Central Bank can achieve price level stability regardless of any national budget deficits. It merely has to adjust the supply of money to the changes of money demand which are caused by the interest rate effects of government borrowing. They also rightly emphasize that, *in the long run*, the money supply changes do not affect the national outputs and that the national budget deficits merely determine the national shares of union output. It is true that, in this setting, the targets of budgetary policy makers may be simply incompatible with each other just as the

exchange rate targets of two central banks may be incompatible. It is also true that, in this case, it is impossible for all budgetary policy makers to achieve their targets independently. But the same is true when they negotiate with each other. They simply have to realize that they cannot achieve such international distributive targets. Each has to direct his instrument to the domestic target for which it has a comparative advantage, e.g., to the target of efficiently financing public investment.

In the short run, it is true, national fiscal policy shocks may raise domestic and union output, but a competitive assignment solution is still feasible and superior to a coordinated policy cartel.

I see a strong case for external limits on government budget deficits but it has nothing to do with monetary uion and the coordination of output targets. Governments incur excessive budget deficits because the debt will largely be serviced by future generations who cannot yet vote. There is a Pareto-relevant intergenerational externality which is not sufficiently internalized through the transfer motive of parents and children. A constitutional limit on budget deficits would be required but it may not be agreed by the living generations either. If, for some (false) reason, such limits can be agreed in an international treaty (Maastricht), this is very welcome. But there is no need for international coordination of monetary or fiscal policies.

Enforceable limits on budget deficits are also very useful in a strategy of reducing government expenditure with the help of prior tax cuts. The deficit limits increase the pressure to reduce expenditure. Indeed, the pressure is maximized by getting close to the limit. It is not desirable to stay far off the limit.

It is probably evident that I do not agree with the policy recommendations which the authors make in their final assessment.

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[1] See Patrick (1973), Vaubel (1983, 1985), Oudiz (1988) and my comment on Oudiz (ibid.)

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