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ABSTRACT

One Money, but Many Fiscal Policies in Europe: What Are the Consequences?*

This Paper outlines some issues regarding the interaction of independent fiscal authorities and one central bank in the European Monetary Union. It points out the possibilities for coordination failures, ranging everywhere from potentially excessive deficits and free-riding problems to coordination failures in European fiscal or banking crises. As policy conclusions, some suggestions for institutional improvements are made. In particular, the Growth and Stability Pact needs strengthening rather than weakening. Furthermore, a solution for EMU-wide banking regulation needs to be found.

JEL Classification: E50, E60, H00 and H70

Keywords: banking crisis, EMU, fiscal crisis, fiscal policy, free-riding, monetary policy and monetary-fiscal policy interaction

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Keywords: EMU, monetary policy, fiscal policy, free-riding, monetary-fiscal policy interaction, banking crisis, fiscal crisis

JEL codes: E5, E6, H0, H7

1 Introduction

In the run up to European monetary union, a number of commentators have warned about negative consequences, occasionally drawing up rather dire scenarios. A group of four German academics sued against the introduction of Euro, and wrote a popular book about the "Euro illusion", Hankel et al. (2001), in which they warn against the "explosive destruction of the European buildup-process", should EMU continue and arguing for a German exit. American economist by and large were skeptical about the whole undertaking. Feldstein (1997) wrote that "*a European central bank would be unresponsive to local unemployment, while political union would remove competitive pressures within Europe for structural reform, prompting protectionism and conflict with the United States. A Europe of 300 million people and an independent military might be a force for world peace, but war is also a distinct possibility*".

Since January 1st, 2002, EMU not only is a reality in terms of a single monetary policy, but also in terms of using the same coins and notes in all member countries. Compared to the dire advance warnings, the European Monetary Union has been off to a remarkably good start so far, see "EMU: The first two years" by the European Commission (2001). While one can debate the wisdom of a number of policy choices in the detail, the overall picture inspires confidence: a European Central Bank which quickly built a reputation of being serious about keeping inflation in check, and 12 member countries with prudent fiscal policies, aimed at avoiding the 3% deficit limit set by the Stability and Growth Pact. While the dire scenarios can still come to pass, most of the previously more skeptical observers now seem to breeze a sigh of relief.

But that does not mean that all the homework has been done. A particularly vexing issue that remains on the table is the interplay between the 12 fiscal authorities of EMU (or more, with additional members in the future), and the single monetary policy. What have we learned from the recent debate? What are the key issues? What are the policy consequences?

This paper aims at contributing to this discussion by stressing yet again a theme which the recent literature - e.g. Chari, Jones and Manuelli (1999) and others, see subsection 3.1) - has pointed out: it is the free-riding issue, which arises in the interplay between several fiscal and one monetary authority. The paper has two main sections, which are loosely related: section 3 and section 4.

Following the brief introductory section 2 on optimal fiscal and monetary policy, section 3 focusses on the free-riding issue, and shows how it arises in the bread-and-butter policy task of responding to business cycle shocks. It introduces a model of the interaction between one central bank and many fiscal authorities in subsection 3.3, allowing for country-specific demand shocks and cost-push shocks. The "ideal" split of tasks is for the fiscal authorities to respond to the demand shocks and for the central bank to respond to the cost-push shocks. However, with several fiscal authorities acting on their own, the fiscal authorities will also react to the European average of cost-push shocks, creating deficits in an effort of fighting the impact of the anti-inflationary measures by the central bank on their own economies. Since all fiscal authorities are doing this, the outcome is worse than if their policies were coordinated. The model also shows the spillovers from shocks in one country via monetary policy to the other economies and to fiscal policy choices there: countries, which do well actually make life harder for the others.

Section 4 does not build on the theoretical model in section 3. Rather, it complements it by highlighting more fundamental consequences of the free-riding theme, which raise very real and potentially extremely serious practical concerns. While the model in section 3 stresses the "day-to-day" business of responding to economic shocks and how to achieve slightly better economic performance, the free-riding aspects raised in section 4 stress issues

of long-term importance and of crisis proportions. These arise from the lack of a common banking supervision in Europe and the absence of a lender of a last resort, as well as the consequences of using member country government debt as collateral in central bank transactions, and from considering the consequences of a (yet unlikely) fiscal crisis in Europe. That section also touches upon recent research on the fiscal theory of the price level to shed light on these issues.

The policy consequences are examined and collected in section 5. One might conclude that it is best for monetary and fiscal policies to be coordinated. Indeed, one might conclude that fiscal and monetary policy makers should meet often to sort out their agendas and to mutually agree on what is necessary. But that conclusion is unwarranted for political economy reasons, as we argue in subsection 5.1. Instead, institutions should be created, which automatically assure proper coordination in the future¹. Subsection 5.2 therefore discusses some of the institutions that should be created or rules that should be strengthened. These institutions should be high on the agenda of European politicians now. Section 6 concludes.

2 The benchmark: optimal monetary and fiscal policy.

There is a benign benchmark scenario, in which everything will work fine. In that scenario, the European Central Bank keeps committed to a low target for medium-term inflation expectations, and choosing its monetary policy to accomplish this, no matter what the fiscal policies turn out to be. The fiscal authorities in turn choose fiscal policies which are optimal for their countries, adjusting to macroeconomic imbalances, should they occur. But even if one of the member countries pursues an unsustainable fiscal policy, it will not derail the common monetary policy. Should e.g. Italian debt rise to unsustainable proportions, Italy may need to default on its repayments,

¹Beetsma and Bovenberg (2000) have already pointed out the need to design well-designed institutions.

but that default will leave all other member countries as well as the common monetary policy unaffected. Given that this is so, there are no externalities from national fiscal policies to the community as a whole. The usual tradeoffs for national fiscal policy remain in place: no new issues arise due to monetary union.

This benchmark scenario is not unreasonable. Thus, before describing the potential difficulties that arise from 12 fiscal authorities interacting with one monetary authority, it is useful to describe what we know about optimal policy, when it is chosen by a single and benevolent social planner. Formally, this is known as the Ramsey problem of jointly and optimally choosing monetary and fiscal policies, subject to the restrictions of respecting the rules of a market economy.

Recent advances in the literature have yielded new insights into the solution to this problem. Schmitt-Grohe and Uribe (2001) study optimal fiscal and monetary policy under Calvo sticky product prices in a stochastic production economy without capital. Government expenditures are assumed to be exogenous, and are financed by levying distortionary income taxes, printing money, and issuing one-period nominally risk free bonds. Schmitt-Grohe and Uribe solve the Ramsey problem, and show that optimal volatility of inflation is near zero and that government debt and tax rates should be near random walks, even for small amounts of price stickiness.

Correia, Nicolini and Teles (2001) similarly analyze optimal fiscal and monetary policies in dynamic general equilibrium monetary models, where prices may be fixed for one period in advance. They show that the set of allocations that can be implemented as equilibria with taxes is independent of whether prices are flexible or not. Fiscal policy should be chosen as if all prices were flexible, leaving it to monetary policy to undo the distortions caused by sticky prices.

These policy recommendations only carry over to the European monetary union, if fiscal policies across Europe are coordinated, and are thus enacted, as if there was one fiscal authority complementing the one monetary authority, the European Central Bank. In fact, to implement the Ramsey solution, one needs to go further and coordinate the common fiscal policy with the

common monetary policy as well.

3 The interaction of monetary and fiscal policy in a monetary union and the response to business cycle shocks.

Instead of a single benevolent social planner deciding upon both monetary and fiscal policy, there are currently 12 fiscal authorities in the European monetary union, acting on their own and independently from the European Central Bank. Understanding the consequences of this interplay is crucial. In this section we provide a theory that allows us to investigate the results of this interaction and to provide insights into the free-riding problem in particular. The model allows us to investigate the free-riding issue as it arises in the day-to-day policy task of responding to business cycle shocks.

3.1 Free-Riding and policy coordination failures: the literature

Dixit and Lambertini (2000, 2001) and Dixit (2001) have pointed out the complexities of the interplay between one or several fiscal authority and a central bank. Dixit and Lambertini (2000a) have shown that freedom of national fiscal policies can undermine the ECB's monetary commitment, possibly justifying fiscal constraints like the Stability and Growth Pact. Dixit (2001) has shown that voting in pursuit of national interest can yield moderate and stable inflation. In sum, there is both the potential for coordination failures and reaching outcomes that are worse for each player than if one of the players had dictated the outcome, as well as the potential for stabilizing inflation volatility through the mediating effects of the median voter.

An issue that becomes particularly relevant when thinking about the interactions between 12 or more independent fiscal authorities and one central bank is the issue of free-riding. Suppose that fiscal policy has consequences for monetary policy. Then, each of the 12 fiscal authorities will generally see

itself only as a small player of the whole, and attach only minor importance on its own impact on European monetary policy, effectively free-riding in its fiscal policy choices on the consequences of monetary policy for all of Europe. But in equilibrium, every country ends up doing so, i.e. every country ends up free-riding, reaching in total a worse outcome than if the fiscal authorities had agreed beforehand on coordinating their policies.

This has been pointed out in a number of papers: this paper therefore does not make any fundamentally new point, but should rather be seen as an attempt at summarizing and highlighting the recent debate, using a simple model and some particular applications concerning practical policy issues. Beetma and Uhlig (1999) consider a two-period game between a central bank and several shortsighted fiscal authorities, who fail to internalize the consequences of their debt policies for the common inflation rate fully. Chari et al. (1999) analyze the issues of strategic interaction and free-riding more generally.

Buti and Sapir (1998) investigate a number of policy issues arising in the European monetary union. Eichengreen (1997) provides an empirical analysis of many of these issues. Fatas and Mihov (2001) provide an empirical analysis of fiscal policy in Europe during the last 10 years, whereas Gali (2001) provides an empirical analysis of the first two years of monetary policy by the European Central Bank. Kletzer and von Hagen (1999) analyze the interplay between monetary union and fiscal federalism, and analyze the issue of interregional taxes and transfers. Beetsma and Bovenberg (2000) argue against a fiscal union. Welsch (2000) provides a quantitative analysis of the fiscal policy interaction in EMU, using a computable general equilibrium model. He shows that the spillovers of domestic fiscal expansion work mainly through the interest rate effect. Beetsma, Debrun and Klaassen (2001) analyze the circumstances under which fiscal policy coordination is desirable in the European Monetary Union. The issue of public debt and fiscal policy has been studied in depth already by various authors in *European Economy* 2 (2000), a report by the European Commission. Budgetary developments in EMU are summarized in *European Economy* 3 (2001) and for candidate countries in the *Enlargement Papers* 2 (2000). The latter series generally

studies the issues of EMU enlargement.

3.2 Motivating the model structure

We wish to provide a simple model, in which one can examine the interactions between a single central bank and decentralized fiscal authorities. To that end, it appears fruitful to build on recent advances in thinking about monetary policy. A framework that has recently become popular here is what Clarida, Gali and Gertler (1999), subsequently CGG, call the New Keynesian Synthesis. The full-fledged version of this model assumes a monopolistically competitive sector of firms subject to a Calvo price setting rule, i.e. only a fraction of firms can change their prices in any given periods. This gives rise to nominal rigidities and thus to a channel for monetary policy to affect real allocations. The model assumes rational expectations and forward-looking behaviour by firms.

King and Wolman (1996), Yun (1996), Goodfriend and King (1997), Rotemberg and Woodford (1997) and Gali (2001) analyze this model and show that it can be summarized to a first-order approximation by two equations, stated in Clarida, Gali and Gertler (1999). The first is an "IS" curve relating the output gap x_t inversely to the real interest rate, i.e. the difference between the nominal interest rate i_t and expectations of future inflation π_{t+1} ,

$$x_t = -\phi(i_t - E_t[\pi_{t+1}]) + E_t x_{t+1} + g_t \quad (1)$$

see CGG, equation (2.1). This equation can be derived by loglinearizing the consumption Euler equation that arises in solving the optimization problems of households. g_t is a demand shock, which Gali (2001) and Clarida, Gali and Gertler (1999) interpret as government spending or tax cuts in particular: this is the place where we shall introduce the interaction with the fiscal authorities.

The second equation is a forward-looking Phillips curve, where current inflation is related to the output gap, expectations of future inflation as well as a cost-push shock u_t ,

$$\pi_t = \lambda x_t + \beta E_t \pi_{t+1} + u_t \quad (2)$$

All variables should be read as deviations from steady state.

CGG assume exogenous AR(1) processes for g_t and u_t . They assume that the central bank has the objective function

$$\max -\frac{1}{2}E_t \left[\sum_{i=0}^{\infty} \delta^i (\alpha x_{t+i}^2 + \pi_{t+i}^2) \right]$$

trading off deviations in the output gap and deviations in the inflation rate from their (desired) steady-state values. They show that optimal (discretionary) monetary policy "splits" the damage from the cost-push shock across both the output gap and inflation according to

$$\begin{aligned} x_t &= -\lambda q u_t \\ \pi_t &= \alpha q u_t \end{aligned} \tag{3}$$

where

$$q = \frac{1}{\lambda^2 + \alpha(1 - \beta\rho)}, \tag{4}$$

resulting in the nominal interest rate rule

$$\begin{aligned} i_t &= \gamma_\pi E_t[\pi_{t+1}] + \frac{1}{\phi} g_t \\ &= \gamma_\pi \rho \alpha q u_t + \frac{1}{\phi} g_t \end{aligned} \tag{5}$$

with

$$\gamma_\pi = 1 + \frac{(1 - \rho)\lambda}{\rho\phi\alpha} > 1$$

The model is attractive for its simplicity: despite its dynamic structure, the optimization problem for the central bank separates into a sequence of one-period decision problems, which can be solved easily.

We now wish to include fiscal policy in the model above. A straightforward extension, in which g_t is endogenized and the dynamics of debt is kept track of, makes the model immediately fairly complicated. Moreover, the strategic interplay between several fiscal authorities and one monetary authority in a dynamic game raises a number of thorny modelling issues, which one would need to resolve (and which can be resolved in a number of ways).

We therefore proceed instead by simplifying the two equations (1) and (2) further, and use a one-period framework. The model we shall describe is in flavor similar to the model by Buti et al. (2000), although they use a different set of equations and focus directly on the debt limits imposed by the Stability and Growth Pact. A fully dynamic model regarding the issue of debt accumulation in a monetary union can be found in Beetsma and Bovenberg (1999).

3.3 A simple model of monetary-fiscal interaction within the EMU

We shall consider the following model, which is essentially static in nature. The model closely follows the framework outlined above, except that everything happens "simultaneously" - there are no forward-looking terms anymore - and except that we allow there to be a number of countries.

The model will study the consequences of deficit spending at a country level, when these countries are linked in a common monetary union. The most severe drawback of the model here - and it is valuable to be upfront about it - is the lack of an explicit incorporation of the debt dynamics. This is a serious omission for a number of reasons. Deficits should be of concern because they raise government debt and need to be repaid at a later point: obviously, a static model cannot adequately address this issue. The static model here also lacks microfoundations, which is one of the appealing features of the Clarida-Gali-Gertler framework or other recent theories, that appeal to sticky prices and monopolistic competition in a dynamic stochastic framework. Developing models of this type and which model the strategic interaction between several fiscal policy authorities and one monetary authority, which treat the dynamics more adequately, which quantitatively match key observations about EMU, and which then can be used to reexamine the results obtained here, and to investigate to which extent they turn out to be robust, should be high on the research agenda for policy making institutions in Europe.

The redeeming feature of the model in this section, though, is its sim-

plicity: with a few assumptions, it gets us a long way to understanding in particular the free-riding issue, but also the issue as to how monetary and fiscal policy interaction might play out. The results can be understood and sketched in a few sentences, see subsection 3.5, telling an interesting and, I believe, reasonable story which policy makers would do well to take into account.

An economy - think of Euroland - consists out of several countries, each with their own fiscal authority, one central bank and a population of private agents. The central bank controls the Europe-wide nominal interest rate \bar{i} , while the fiscal authorities each control country-specific government deficit g , which should be thought of as the difference between spending and taxes. Thus, a higher g can be interpreted as an increase in spending as much as a cut in taxes. The public forms inflation expectations π^e .

A "country" in this model refers to any entity within the common monetary area, which has its own fiscal authority. In particular, the model can be interpreted to not only allow for separate fiscal authorities of actual countries such as Germany, France and the Netherlands, but also subsidiary fiscal authorities such as the states and cities ("Länder", "Gemeinden") of Germany². Additional strategic interplay of upper-level fiscal authorities with subsidiary fiscal authorities could be modelled as an extension of this model without much difficulty.

The output gap x_j of a member country j is assumed to be given by the IS-curve

$$x_j = -\phi(\bar{i} - \pi_j^e) + g_j, \quad (6)$$

compare to equation (1), where everything is country-specific except for the nominal interest rate \bar{i} . We shall use bars to denote European averages or variables pertaining to the whole of Europe, such as the nominal interest rate.

Inflation π_j in country j is determined by the Phillips curve

$$\pi_j = \lambda x_j + u_j \quad (7)$$

²I am grateful to Axel Weber for pointing out this additionally interesting aspect of the fiscal interaction in Europe

where u_j is a cost-push-shock, assumed to have mean zero. Each country experiences a mean zero fiscal shock ϵ_j to its budget constraint: this will play a role in the objective function of the fiscal authority.

The objective function of the central bank is given by

$$\max_{\bar{i}} -\frac{1}{2}(\alpha\bar{x}^2 + \bar{\pi}^2)$$

where \bar{x} and $\bar{\pi}$ are the European averages of the country-specific output gaps and inflation rates, and where these averages depend on the nominal interest rate \bar{i} via equations (6), (7). Since member countries differ in size, we shall assume that country j has weight $1 - \psi_j$ in the European average, i.e., that all other countries together have weight ψ_j , where ψ_j is a parameter. If there are n countries, each of equal weight, then $1 - \psi_j \equiv 1/n$.

The objective function of the fiscal authority in country j is assumed to be

$$\max_{g_j} -\frac{1}{2}(x_j^2 + \theta(g_j - \epsilon_j)^2)$$

i.e., the fiscal authority likes neither deviations of the output gap from its steady state level nor deviations of g_j from its steady state level by values other than the random shock ϵ_j to its fiscal budget.

The objective function above reflects the desire of governments to both stabilize their economy as well as to run a fiscally balanced budget. The parameter $\theta > 0$ is the weight the fiscal authority puts on a balanced budget relative to a stable economy. Occasionally, additional spending needs may arise or additional revenues for more spending or deeper tax cuts are available ($\epsilon_j > 0$). Examples of the recent past include spending needs due to military involvements, windfall revenues due to income taxes on the changing value of option-related managerial payments or revenues from airwaves auctions.

Consider now the following game. First, the public sets its inflation expectations π_j^e . Then, the shocks u_j and ϵ_j for each country are drawn. Next, each fiscal authority j chooses its deficit g_j . Finally, the European central bank sets nominal interest rates \bar{i} . An equilibrium is a subgame perfect equilibrium, except for inflation expectations, which are not assumed to be set strategically, but rationally, $\pi_j^e = E[\pi_j]$, see Ljungqvist and Sargent (2000), chapter 16, for details on this.

3.4 Analysis

We solve for the equilibrium by proceeding backwards. Given inflation expectations and given fiscal deficit levels, the European central bank solves its optimization problem, subject to European-averaged versions of (6), (7),

$$\begin{aligned}\bar{x} &= -\phi(\bar{i} - \bar{\pi}^e) + \bar{g} \\ \bar{\pi} &= \lambda\bar{x} + \bar{u}\end{aligned}$$

The solution is similar to the one stated in equations (3), (4), (5) and is given by

$$\begin{aligned}\bar{x} &= -\lambda q \bar{u} \\ \bar{\pi} &= \alpha q \bar{u}\end{aligned}$$

where

$$q = \frac{1}{\lambda^2 + \alpha},$$

resulting in the nominal interest rate rule

$$\bar{i} = \frac{\lambda q}{\phi} \bar{u} + \frac{1}{\phi} \bar{g} \tag{8}$$

Due to linearity, the average of the inflation expectations is the expectation of the inflation average, and thus given by

$$\bar{\pi}^e = E[\alpha q \bar{u}] = 0$$

As we shall see, the decision rule of the fiscal authority is linear in the shocks: thus, the country-specific inflation rate differs from the EMU-inflation rate by a mean zero component. As a result, country-specific inflation expectations will be zero as well,

$$\pi_j^e = 0$$

We shall use this result in the calculation of optimal fiscal policy, rather than derive it as the last step of the calculation, in order to ease the notational burden.

The fiscal authority of country j knows the interest rate rule (8), which can be rewritten as

$$\bar{i} = \frac{\lambda q}{\phi} \bar{u} + \frac{1 - \psi_j}{\phi} g_j + \frac{\psi_j}{\phi} \tilde{g}_j \quad (9)$$

where \tilde{g}_j denotes the (weighted) average of the fiscal choices in all other countries.

The fiscal authority of country j thus solves its optimization problem subject to the constraint

$$x_j = -\lambda q \bar{u} + \psi_j (g_j - \tilde{g}_j) \quad (10)$$

The solution is given by

$$g_j = \frac{\theta}{\psi_j^2 + \theta} \epsilon_j + \frac{\psi_j}{\psi_j^2 + \theta} \lambda q \bar{u} + \frac{\psi_j^2}{\psi_j^2 + \theta} \tilde{g}_j \quad (11)$$

It is instructive to simplify the algebra by assuming n symmetric countries, i.e. by assuming $1 - \psi_j \equiv 1/n$. Then, averaging over (11) shows that

$$\bar{g} = \bar{\epsilon} + \frac{n-1}{n\theta} \lambda q \bar{u} \quad (12)$$

$$\bar{i} = \frac{1}{\phi} \bar{\epsilon} + \left(1 + \frac{n-1}{n\theta}\right) \frac{\lambda q}{\phi} \bar{u} \quad (13)$$

To figure out individual country government spending, replace \tilde{g}_j with $(n\bar{g} - g_j)/(n-1)$ in equation (11). Solve for g_j and replace \bar{g} with (12) to find

$$\begin{aligned} g_j &= \frac{n\theta}{n\theta + n - 1} \epsilon_j + \frac{n-1}{n\theta + n - 1} \bar{\epsilon} + \frac{n-1}{n\theta} \lambda q \bar{u} \\ &= \frac{n\theta}{n\theta + n - 1} \epsilon_j + \frac{n-1}{n\theta + n - 1} \phi \bar{i} \end{aligned} \quad (14)$$

i.e., is a weighted average of the country-specific fiscal shock ϵ_j and the (rationally foreseen) nominal interest rate $\phi \bar{i}$, rescaled by its effect on the output gap. Intuitively, with a positive cost-push shock, each fiscal authority sees high interest rates coming, and therefore decides to spend more at home in order to alleviate the effects on its own economy. But that in turn means that the common central bank has to choose higher interest rates in order to maintain its desired tradeoff. The individual country output gap is

$$x_j = -\lambda q \bar{u} + \frac{(n-1)\theta}{n\theta + n - 1} (\epsilon_j - \tilde{\epsilon}_j) \quad (15)$$

3.5 Results

A number of results emerge from this analysis.

Result 1 *Higher government deficits result in higher nominal interest rates, but no change in European inflation or the European output gap.*

This result emerges from examining (9). The intuitive reason is that additional government spending stimulates the economy further in this model, which in turn triggers upward pressure on inflation. Both deviations go in the same direction, and both are not in the interest of the central bank: it will therefore choose a nominal interest rate to offset these pressures.

Result 2 *If there is a single country, $\psi_j = 0$, then the optimal fiscal choice is to adjust deficits only in response to the fiscal shock ϵ_j , but not to the cost-push shocks u_j or the output gap. Nominal interest rates, inflation rates and the output gap are then independent of the preferences of the fiscal authority.*

This can be seen by noting that a number of terms drop out with $\psi_j = 0$ in equation (11): in particular, the deficit is not adjusted according to the cost-push shock. The reason is that the single fiscal authority recognizes that its fiscal reaction to the cost-push shock will be fully compensated for by the monetary authority moving subsequently: there is therefore no point of reacting to it. This result is reminiscent of the result in Correia, Nicolini and Teles (2001), that the fiscal authority should solve its problems, pretending that prices are flexible, and that the monetary authority should solve the problem of providing the appropriate adjustments to the degree that prices are sticky.

This result changes, if there are many countries.

Result 3 *If there is more than one country, $\psi_j > 0$, then optimal fiscal policy increases the deficit g_j not only in response to a positive fiscal shock ϵ_j , but also in response to a positive European cost-push shock \bar{u} . The equilibrium European inflation rate and output gap is unaffected, but the nominal interest rate is higher than would be the case in the one-country version.*

What happens in the multi-country setting is this. When a cost-push shock is observed on a European level, the ECB will raise nominal interest rates in an effort to combat inflation. That, in turn, lowers the output gap, worsening economic conditions. Each fiscal authority, knowing this, now has an incentive to increase its deficit either via deficit spending or a tax cut in an effort to avoid the worsening economic conditions in its own country. The incentive is created, because each fiscal authority only has an effect proportional to $1 - \psi_j$ on the European economy: thus, holding all other fiscal choices fixed, it looks as if it could get out of its domestic troubles by unilateral fiscal policy. However, as everyone is doing this, the net result is only an increase in the nominal interest rate, due to the ECB combatting the increased inflationary pressure from higher government spending. Note that the fiscal authority only reacts to the cost-push shock via the reaction function of the ECB, i.e. only reacts to the European average \bar{u} of cost-push shocks, not to its own, country-specific cost-push shock u_j .

The previous result demonstrates the problem of free-riding in a European monetary union. The result is a classic coordination failure, as the next result shows. For simplicity, we only state it for the fully symmetric case.

Result 4 *Suppose, all $\epsilon_j \equiv 0$ and that all countries are of equal weight, $1 - \psi_j \equiv 1/n$. Then, all fiscal authorities would be better off in a cooperative equilibrium, in which they agree to a common fiscal policy of zero deficits, rather than acting on their own.*

Without fiscal shocks, the cooperative equilibrium is the same as the equilibrium with a single country. In that equilibrium, the deficit is set to zero, while in the decentralized equilibrium, the deficit is different from zero, depending on the cost-push shock. In both equilibria, the output gap as well as the inflation rates are the same in all countries. Thus, the noncooperative Nash equilibrium differs from the cooperative equilibrium only insofar as the deficit varies systematically with the cost-push shock. This variation worsens the expected objective of the fiscal authority.

This coordination failure is one justification for the Stability and Growth Pact: the ceiling on deficits can be interpreted as a ceiling on g_j in this model, and thus as a coordination device to achieve the cooperative outcome.

Result 5 *Suppose, all $\epsilon_j \equiv 0$ and that all countries are of equal weight, $1 - \psi_j \equiv 1/n$. Then, the more countries are member of EMU, the worse the noncooperative outcome and the more each country reacts to the cost-push shock \bar{u} .*

This follows directly with the previous result and from examining (14). This result shows that an enlargement of EMU is not without problems, as it will worsen the free-riding problem. In this model, the damage from enlargement is limited: the coefficient on the average cost shock \bar{u} is bounded by $\lambda q/\theta$, no matter how large the number n of member countries is. In general, the bound is given by the equilibrium which emerges, when all fiscal authorities simply neglect their impact on the common monetary policy in their decisions.

Result 6 *Suppose, all $\epsilon_j \equiv 0$ and that all countries are of equal weight, $1 - \psi_j \equiv 1/n$. Own deficits increase in the own fiscal shock ϵ_j and the average fiscal shock, $\bar{\epsilon}$, resp. the fiscal decision \tilde{g}_j of the others. The own output gap and the own inflation increase in the own fiscal shock ϵ_j , but decrease in the fiscal shock of the others, $\tilde{\epsilon}$.*

This follows immediately from examining equations (11), (14), (15) and (7). The result sheds light on the recent reprimand on Ireland, which was told to avoid tax cuts at a time of a booming economy. That tax cut corresponds to an increase in \tilde{g} in this model, triggering a higher output gap in Ireland and thus a higher output gap in Europe as a whole. This puts pressure on the ECB to combat the inflationary pressure by raising interest rates, in turn worsening the output gap in all other countries. Each country j , in an attempt to combat these effects on its own output gap, feels compelled to raise its deficits in reaction. Furthermore, since European inflation only depends on the average cost-push shock in the solution to this model, and since inflation is high in Ireland, it means that it ends up lower than usual in all other countries as well.

In providing this explanation, one obviously needs to recognize that the weight of Ireland in the European economy is rather small, and therefore so is this effect. But the principle remains that there can be externalities caused

by an economy growing above a rate sustainable at flexible prices, as it will put downward pressure on other countries in the European economy.

Care needs to be taken to sort necessary adjustments in relative prices from inflation. The inflation in Ireland should be viewed as doing exactly what exchange rates used to do, namely adjust relative prices. We should expect this to happen in lagging economies, due to a variety of factors such as increased productivity or the Balassa-Samuelson effect. One can raise the issue of whether the ECB should sensibly ignore these "catch-up" inflations, as we will surely see them again with the addition of new Eastern-European members in the future. A more detailed analysis of the issues in question can be found in Alesina et. al. (2001).

Care also needs to be taken to sort out unsustainable growth from sustainable growth. Clearly, if a country becomes more productive, this is beneficial to the entire monetary union: in fact, sharing these productivity gains through free trade and making everyone better off is possibly the "raison d'être" for the European monetary union to begin with. It would be silly to dampen or throttle these forces, as they promise greater welfare to us all. The model above in fact sheds no light on these issues, as it is not about sustainable long-run growth and productivity developments, but rather about temporary deviations from the sustainable paths caused by imbalances between where prices should be and where they actually are. These latter distortions cause misallocations of resources, and should be avoided.

3.6 Interpretation, consequences and discussion.

The practical consequences of the analysis above should be clear. The model is about the day-to-day policy task of responding to business cycle shocks, when there is one monetary but many fiscal authorities. Ideally, fiscal policy should respond to the country-specific "fiscal demand" shocks, leaving it to the European Central Bank to respond to the average of the country-specific "cost push" shocks. However, each fiscal authority will be tempted to try to improve the situation for its country by e.g. expanding government demand or government deficits precisely when the ECB needs to combat cost-push shocks via higher interest rates. With all countries doing so, the ECB

ends up combatting not only the cost-push shock, but the additional fiscal demands as well: while the ECB may ultimately be successful in avoiding any consequences for European inflation rates, the end result would be higher nominal interest rates and a situation that is worse for everybody.

To avoid this free-riding problem, institutions need to be sought that assure that country-specific fiscal policies stick to their task at hand and avoid this free-riding issue. The Stability and Growth Pact can be seen as doing exactly that: by limiting country-specific deficits, the temptation in each country to seek an improvement in their situation at the expense of all other members in the European Monetary Union will be limited. For this reason, the Growth and Stability Pact needs to be assured of a long life. Attempts to hollow it out or abandon it are misguided.

Obviously, the analysis above is based on but one theory alone. The theory is easily criticized. The model above is too simple in many dimensions as an adequate treatment of the issue: in particular, any static model which discusses issues of government deficits should be treated with caution, as deficits are inherently about intertemporal tradeoffs. We also know only too well that policies geared towards "fine-tuning" the economy are usually a recipe for failure: the lags between detection, decision, implementation and the effects of policies would need to be adequately treated as well. In sum, a more deeply founded, dynamic model is needed to see how and which results will stand the test of time. The techniques are available, see e.g. Ljungqvist-Sargent (2000), they now have to be brought to bear on the issue at hand.

But the model above serves a purpose nonetheless. Due to its simplicity, it is possible to develop some (hopefully) useful intuition into the key theme of this paper, the free-riding issue. That issue has been stressed in a number of papers in the literature, some of which have been cited above: the free-riding issue should therefore be an important element of any discussion of the future of European monetary and fiscal policy. With the model above, one can understand it clearly, while still keeping close to the issues faced by policy makers.

There are a variety of criticisms of the Growth and Stability Pact too, obviously. In particular, some observers have pointed to the lack of flexibility

on the side of fiscal authorities to respond to certain shocks when necessary. These criticisms should be allowed for in an extension of the analysis above as well. But already, the analysis allows to ask, whether one really wants the fiscal authorities to respond to shocks "when necessary". From each countrys individual perspective, it would be good to respond to the European cost-push shock or to deficits in other member countries. But the results above have shown, that these are precisely the shocks that the fiscal authorities should ultimately not respond to in order to achieve a better outcome for all: if this is what the Growth and Stability Pact achieves, then its inflexibility is an asset, not a liability.

4 Fiscal and monetary policy interaction: crisis scenarios.

The free-riding issue above was examined in its consequences for the bread-and-butter policy task of responding to business cycle shocks. While potentially of some importance, one might feel that the issue is not serious enough to warrant a lot of attention. Surely, it would be good to respond better yet to the shocks hitting the European economy. But current nominal interest rates are low, and therefore testimony to rather moderate free-riding spillovers, should they be present, and other policy issues such as the reduction of the high unemployment rates in certain parts of Europe may seem more important.

The free-riding issue is part of this nexus of policies, though, and not separate from it. Additionally, there might be much more fundamental and serious consequences of free-riding, than have been discussed already: these concern crisis scenarios of overriding importance, should they come to pass. I believe that European monetary union will enjoy good sailing in pleasant weather for a long time to come. But it is the task of academics like me to point out what might happen when conditions worsen. The commanding officers on board of the European ship may do well to be prepared for a storm, may do well to be prepared for the worst, even if the worst never takes place.

A scenario that is worth thinking through, and in which the potential for dramatic coordination failures between the independent fiscal authorities is great is a scenario of a fiscal crisis or a banking crisis in Europe. This then is the topic to which I shall turn now.

This section shares with the previous section the common theme of the free-riding issue, that arises out of the interplay between the independent fiscal authorities in the presence of a common monetary policy. But it does not build on the "business cycle shock" model above: rather, it draws on a different, but highly relevant part of the literature for insights.

4.1 Fiscal and banking crises: consequences for the EMU

Citizens of Europe and the United States look upon banking and exchange rate crises - as e.g. those in Asia, Russia or Latin America in recent years - as they look upon Malaria or starvation: horrible events, to be sure, but certain that they will never take place at home. That complacency may be misguided.

Consider the Argentinian financial crisis of 2001, and the devaluation of the Argentinian peso. Argentina had introduced a currency board in order to back up its promise of a fixed one-to-one exchange rate between the peso and the dollar. The central bank held dollar-denominated reserves far in excess of just cash and coins in circulation, backing up a large fraction of M1. The currency board looked unbreakable. Nonetheless, the peso devalued. Why?

First-generation exchange rate crisis models, in particular Krugman (1979), seek out unsustainable monetary policy, dwindling reserves and a collapse of confidence in the exchange rate peg as the main cause. But the recent crises and the Argentinian crisis seems to have little to do with monetary policy. Rather, the collapse of the peso was arguably caused by the accumulation of excessive fiscal deficits. The exchange rate collapsed because Argentinian government debt collapsed.

This is somewhat remarkable, because, as with the relationship between the European central bank and the fiscal authorities of Europe, an exchange

rate collapse is not necessary, if the central bank has kept insisting on maintaining the currency board or even switched to dollarization: Argentina would have defaulted on its debt, but a peso would still be worth one dollar. This decision was not that of the central bank, however, but was taken by the government instead. Why would it choose to devalue?

Here, one needs to examine the functioning of the banking system in Argentina, or, for that matter, anywhere else. Argentians hold money on checking and savings accounts at their banks. The banks in turn earn a living by lending these deposits again, partly to other firms and private agents, but partly also by buying interest-bearing paper such as government debt. I do not know the details of the Argentinan banking system in sufficient detail to judge this, but I would not be surprised if they even were required to back up these deposits to a considerable extent by holding dollar-denominated paper as reserves at the central bank, with dollar-denominated Argentinan government debt as one particular instrument of reserve. Indeed, it would be strange if the central bank of Argentina would not have allowed dollar-denominated debt of its own government to be valid for its transactions vis-a-vis the banking system.

Consider now the increasing fiscal imbalances and the impending debt crises. The Argentinan government knew at some point that it will be unable to meet its obligations, so it needs to default. As its debt is held by different types of individuals and institutions, the choice problem facing policy makers then is to select the distribution of the default burden. Should the default only be allocated to foreign debt holders? Or should domestic debt holders - in particular, the banks - bear part of the costs?

International defaults are costly, as they disrupt international trade flows. For that reason, a default on its obligations to the banking system - implicit or explicit - might have emerged as the preferred choice. One method for doing so is to convert bank dollar deposits into peso deposits and let the peso float: while everything continues to function at face value as before, the real value of deposits has collapsed. Indeed, Argentina implemented a policy of strict upper limits on withdrawals, severely disrupting the banking system but perhaps also saving it from a Diamond-Dybvig-style bankrun. The long-

term consequences of this policy choice still have to remain to be seen at the time of writing.

Now, consider the European Monetary Union. The main tool of the ECB for conducting monetary policy are open market operations via reverse purchase agreements. Banks and other participating institutions obtain cash from the ECB by selling debt paper to the ECB with the agreement to repurchase the paper after, say, two weeks: the discount interest rate, at which the ECB buys these papers is usually considered to be the main monetary policy instrument.

Allowable for these transactions is government debt of all EMU member countries. In fact, it is likely, that much of the short-term government debt is held by commercial banks mainly for the purpose of participating in these operations. Imagine now, that the debt level of a major EMU participant has continued to rise and is about to reach unsustainable proportions. What would happen?

At first blush, one could say: not much. After all, the repurchase agreements largely isolate the central bank from any default risk on the paper precisely because the banks agree to repurchase that debt at a pre-agreed price. Thus, should the price of the debt collapse during that two-week window, the costs will be born by the participating bank, not the European central bank.

But the issue is not quite as easy. Should the ECB pass on the costs back to the partner in the reverse transactions, then it is likely that these costs will mainly occur on a national level, as government paper for the purpose of these repurchase agreements will probably mainly be held by the banks in that same country. As in the Argentinian case, the government in that country may then require banks to limit, how much they can pay to their customer, severely disrupting the banking system in an important part of the European monetary union. And as in Argentina, the country may even consider a devaluation. It could do so in an indirect fashion, e.g. by creating a secondary currency, the "Euro secundo", which trades at a discount compared to the Euro, can be withdrawn from banks (at the cost of a one-to-one exchange rate), and which is used as the currency of

repayment of government paper to the commercial banks. I.e., the country does not need to officially withdraw from EMU: it just needs to create another currency on its territory. This could be done (and has been done e.g. in Argentina!) by circulating government notes and obligations as payment for government services and government salaries and as a substitute for cash. Nonetheless, the European Monetary Union would gradually but clearly glide into a existential crisis.

One could recommend a diversification requirement to alleviate this problem, i.e. to require banks to hold and use a mix of national debt instruments as collateral in the reverse transactions. But that would dilute otherwise effective market forces: while risky debt would otherwise be heavily discounted or not bought at all, disciplining a fiscally imprudent government, that debt now would be held by all participating banks per law. So, if anything, such a diversification requirement would make debt-financing of fiscal spending needs more and not less attractive.

The ECB could bear part of the fiscal risk itself e.g. by offering the banks in question to sell the debt instruments back at market price, not at the pre-agreed price. In that way, the costs of the excessive deficits are distributed across Europe. But with admitting these debt instruments for repurchase operations, the ECB effectively starts financing the spending needs of the fiscally imprudent country through seignorage. It is well understood that financing the government through the money printing press is a very bad idea. Indeed, such a policy would make a debt crisis more and not less likely, as governments would know that they might ultimately be partially bailed out. Nonetheless, the ECB may find itself eventually in a position, where assuring the soundness of the banking system by providing additional "cheap liquidity" via continuing repurchase operations with downgraded or devalued debt is the best of the available bad options.

The ECB could remove the debt instruments of the country in question from its list of admissible assets. Then, in turn, most of the demand for the short-term debt of that country would collapse immediately. With the country no longer able to roll over its short-term debt, a fiscal crisis would be triggered. This option may be less painful than a bigger crisis further down

the road, but it also converts possibility into certainty.

Conversely, before the collapse, banks may actually perceive an incentive to use high-yield short-term debt of imprudent member countries as collateral in reverse transactions: it serves the same liquidity needs but provides higher rates of return. In equilibrium, the yield differences will be lessened, resulting implicitly in an ECB subsidy of fiscally imprudent governments.

In sum, once a fiscal crisis is imminent, the European monetary union is in danger of being severely disrupted or even effectively abandoned. The European central bank cannot ignore that possibility, however remote it may appear at the time of this writing, and does right in monitoring and commenting on the deficits of member countries. Clearly, the Growth and Stability Pact, with its debt ceilings, can be helpful in keeping these risks in check. This requires that member countries continue to adhere to its rules. Unfortunately, most observers do not believe this to be a viable long proposition: Eichengreen and Wyplosz (1998) for example provide for a rather skeptical assessment in that regard.

4.2 The fiscal theory of the price level and EMU

One theoretical foundation for these very real, though perhaps not imminent, dangers can be found in the fiscal theory of the price level, see e.g. Leeper (1991), Sims (1994) and Woodford (1995). In standard monetary theories, the price level is indetermined, if monetary policy follows an interest rate peg. The fiscal theory of the price level closes this system of equations by demonstrating that the real net present value of future government repayments can be used for calculating the real value of the outstanding nominal government liabilities and thereby for calculating the (initial) price level.

Bartosz Mackowiak (2001) has recently shown, how this line of thinking applies to financial crises like those in Argentina or Brazil. He has shown that the fiscal theory of the price level more easily explains a number of facts - like the lack of further, ongoing devaluation after an initial currency depreciation - than other models of currency crises, and provides an explicit link between expectations of future fiscal policy and the probability and degree of devaluation. Sims (1999) explicitly applies the fiscal theory of the

price level to the European monetary union, and already highlights many of the issues of the preceding section. Bergin (2000) provides a fiscal theory of the price level applicable to the situation of a monetary union between two countries: for the purpose of that analysis, it suffices to consider two rather than an arbitrary number of countries. He provides conditions under which fiscal solvency is not necessary for each member government in a monetary union.

More generally, and aside from the fiscal theory of the price level, the importance of fiscal considerations for exchange rate crises and financial crises is well recognized and described in e.g. Cole and Kehoe (1996, 2000), Corsetti, Pesenti and Roubini (1999) and Burnside, Eichenbaum and Rebelo (2001). What should be high on the agenda is to examine the implications of these models for the European Monetary Union and its interplay of 12 (or more) independent fiscal authorities. The implications for the fiscal theory of the price level for EMU are analyzed in Wren-Lewis (2002), where also further references on this topic can be found.

4.3 Contagion and systemic risk

A more subtle way in which fiscal authorities in the European monetary union interact is through the lack of a common banking supervisory framework: a theme already emphasized by Begg et al (1999). At this point, most banks in Europe either operate within the borders of its country, where they are incorporated or outside Euroland. But developments are likely to take place, and consolidations in the banking sector seem likely, such that eventually, the lion share of a banks Euroland operations will happen outside its homebase. Nonetheless, banking supervision is done on a national level. Likewise, there is no lender of last resort in Europe: that function too is organized in a decentralized manner. It turns out, that these issues are ultimately again an issue of the interplay between independent fiscal authorities, who have to foot the bill for national regulatory agencies in case of errors.

The problem for any national lender of last resort is whether or not to apply Bagehotes principles in case a bank is in trouble, i.e. to evaluate, whether the bank is simply illiquid, and should be lendend funds at penalty

rates, or whether it is insolvent and thus should go bankrupt. Even in the latter case, it is more likely than not that banks in Europe will be partially rescued by politicians fearful of the loss of jobs and the political ramifications of a failed bank. In any case, any losses resulting from a misjudged liquidity provision to an insolvent bank ultimately must be born by the national fiscal authority: the weighing of the tradeoffs between a "type I" error of bailing out an insolvent bank and a "type II" error of not bailing out an illiquid bank is a political and not just an economic decision.

Consider now the case, where a bank is incorporated in country A, but conducts its main operations in country B within Euroland, and where that bank gets into trouble. Should the regulator and thus the fiscal authority of country A bail out this bank? It may figure that, while it bears the costs, the main benefits appear to accrue to depositors in country B, and conclude that some kind of agreement with the fiscal authority in country B is called for. While perhaps a reasonable request, a bank in crisis does not allow for lengthy negotiations, and a bank in trouble may be more likely to default. I.e., in the tradeoff of risks, a shift towards type II errors and away from type I errors may occur, making bank deposits a riskier proposition as a result. One cannot know how large this shift is, but with the first large illiquid but not insolvent European bank, which nonetheless fails because of attempted fiscal renegotiations, the public and the finance industry may suddenly reassess the soundness of the remaining banking system, possibly causing disruptions and bankruns. More illiquid banks may fail. In other words, the decentralized nature of the banking supervision makes contagion more likely and may be a cause of systemic risk. Systemic risk then raises the question of fiscal responsibilities even more severely. If a number of banks are affected simultaneously, no fiscal authority will see itself called upon to be the major player in funding the resolution of these problems: a fiscal stand-off and a bailout freeze are the more likely consequences.

This argument, obviously, is true for any two countries which share banks operating on both territories, be these countries linked in a monetary union or not. But in a monetary union, the issues are more severe, because the incentive for fiscal renegotiation is stronger: after all, the fiscal authority of

country B (and also the fiscal authorities of all other countries) can be held hostage by the fiscal authority of country A additionally via the threat of disrupting the common monetary system. The free-riding argument returns here in disguise.

The policy conclusion: one should establish a European banking supervisory body, with clear rules about the fiscal consequences of type I errors of bailing out banks which turn out to be insolvent. National regulatory bodies presumably have built up a large amount of expertise and knowledge regarding the banks under their supervision: it would therefore not be prudent to abolish them. However, they should be made part of a larger European-wide agreement and network in order to avoid fiscal standoffs and bailout freezes in a time of crisis.

5 Policy consequences

Let us examine the consequences for practical policy. I shall state my points most clearly, using the colors black and white: obviously, given the tentativeness of practically all economic reasoning, shades of gray are more appropriate in the end. But it does seem rather pointless to start a good discussion by watering down the arguments first.

I will argue, that we need better institutions that assure stability, not more closed-door high-level meetings in smoke-filled rooms. Let me turn to the last point first.

5.1 Is a coordination of fiscal and monetary policies a good idea?

The preceding discussions seems to suggest that coordination of fiscal and monetary policy is a good idea. Is it?

This actually turns out to be an irrelevant question. Surely, from a first-best perspective, one would ideally appoint a social planner who solves the Ramsey problem for all of Europe, implementing e.g. the Schmitt-Grohe-Urbe (2001) solution. But we know already why this will fail: without a

commitment technology, it will be hard to get around the Kydland-Prescott (1977) temptation of resorting to discretion rather than rules, thereby creating a worse outcome. It is precisely for the reason that we do not trust our own politicians in delivering optimal monetary policy that Europe has opted for an independent central bank in the first place.

To analyze what kind of coordination and what kind of interaction between fiscal and monetary policy makers is a good idea, one needs to think about the political economy of reaching particular decisions: which politicians have which incentives?

For the same reason, one needs to be skeptical about frequent meetings between fiscal and monetary policy makers. That skepticism has been described in detail in Alesina et al. (2001), a brief summary may suffice here. The argument is this. Information between fiscal and monetary authorities flows freely anyways. It is therefore hard (although admittedly not impossible) to imagine that much will be learned in terms of socially useful information in these meetings, that cannot be learned from public interactions. If politicians find it necessary to meet in secret, smoke-filled rooms to exchange information or agree on courses of actions without the knowledge of the public, can this ever be beneficial to the public? It seems to me that doubts are in order.

What is needed then is not the type of "coordination" of current policies achievable via deals reached in these dark, smoked-filled rooms. Rather, what is needed are institutions that make the necessary coordination automatic in the future. If politicians and central bankers design institutions now that, in light of an open public debate, will improve economic conditions in the future, beyond the tenure of the current decision makers, it is more likely that good things will emerge. This is nothing but the lesson taught by Kydland and Prescott (1977): what is needed are good rules, and good rules are best implemented with a commitment technology. Good commitment technologies take the form of well-designed institutions.

Good examples for these institutions are the European Central Bank as well as the Stability and Growth Pact. Suppose one would try to introduce the Stability and Growth pact now. It is unlikely that Germany would press

for this pact in its current precarious fiscal situation. But Germany did press for it under the previous government, when looking forward to the future. Solving these time-inconsistencies are precisely the issue at the heart of institutional design.

The policy conclusions that should be drawn from this piece are therefore the design of better institutions. Some are described in the next section.

5.2 What needs to be done? A homework sheet for European policy makers

High up on the agenda of European policy makers should be institutions that automatically guarantee the necessary coordination between the fiscal authorities and the European Central Bank, if needed.

Among these institutions is a strengthened Growth and Stability Pact, alleviating the concerns of Eichengreen and Wyplosz (1988), and in line with the arguments by Buti and Martinot (2000). For a practical implementation, in particular vis-a-vis the automatic stabilizers, see Buti et al. (1998) and Artis and Buti (2000). Currently, the Growth and Stability Pact relies on Ecofin, the meetings of the finance ministers of Europe, to reprimand a country or to impose penalties in case of excessive deficits. The political incentives not to impose these penalties are enormous, as they might mean the disruption of friendly political relationships to the country in question. A European monetary union with a lot of infighting and mutual reprimanding exercises does not seem to me to be a desirable long-run solution. Instead, the penalties should be imposed automatically, removing the discretionary rule of Ecofin. Any citizen of Europe should find it possible to go to court and demand the penalty payments by a member country in violation of its fiscal obligations. Obviously, there is a risk that such a rule can never do full justice to the circumstances, under which the penalty payments would not be prudent. But this risk needs to be balanced against the risk that the Growth and Stability Pact becomes a hollow shell after Ecofin showed bleeding-heart mercy with the first few violators. It is hard to imagine that the current spirit of discipline could ever be recovered, once a few too lenient rulings

have occurred. Thus, we need the automatic rules.

Without these rules, the Growth and Stability Pact can be damaged all too easily. We are currently witnessing the sad efforts by the German government to read political motives into the current and justified warnings by the European Commission regarding the excessive German deficit. The German attempts to meddle in what should be an automatic process is already causing irreparable damage to the Pact and thereby causing irreparable damage to the European Monetary Union. The reply by the other finance ministers of Europe must be to use this case in order to automatize the procedure even further, and thus to automatically preempt any (justified or unjustified) claims of attaching political motives to the deficit warnings in the future, and to relieve them from the need to renegotiate and thus to water down the contents of the warnings each time anew. When redesigning the exact rules for the Growth and Stability Pact, the idea of using tradable deficit permits should be considered, see Casella (1999).

Even these automatic rules may not suffice to avoid a fiscal crisis in a member country. One should think ahead about the consequences for repurchase agreements, if the debt levels of a member country start to reach unsustainable levels. Here, working out a predictable and pre-agreed schedule of gradually reducing the fraction to which the debt securities of a member country are allowed for these transactions would seem to me to be the best available choice. This schedule could either take the form of limiting the portfolio weight of these securities in any transaction with the European central bank or to attach penalty payments, say in the form of higher discount rates, to these securities. The most simple solution at this point may be to start discounting government debt at some average between the ECB-set interest rate and the interest rate on long-term debt, should the difference between the short and the long rate exceed the European average by more than a fixed percentage. This issue clearly needs further investigation and thought: so, for now, research targeted at these issues should be undertaken.

Another institution that is needed is a European banking supervisory body. In particular, one needs to a priori solve the fiscal consequences of erroneously bailing out banks which turn out not to be illiquid but insolvent.

The national regulatory bodies need to become part of a larger European-wide agreement and network in order to avoid fiscal standoffs and bailout freezes in a time of crisis. What needs to be sorted out is the lender of last resort function in this decentralized European monetary union.

6 Conclusions

This paper has outlined some issues regarding the interaction of independent fiscal authorities and one central bank in the European monetary union. It has pointed out that the possibilities for coordination failures are there, ranging everywhere from potentially excessive deficits to coordination failures in a European fiscal or banking crises. Some suggestions for institutional improvements were made. In particular, the Growth and Stability Pact needs strengthening rather than weakening. Furthermore, a solution for EMU-wide banking regulation needs to be found.

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