

Nontechnical Summary

In the context of the globalization discussion it is a popular hypothesis that financial markets discipline fiscal policy. One specific aspect of this hypothesis is the focus of this paper: the potentially disciplining effects of foreign exchange markets under different exchange rate regimes.

This study is motivated by two considerations. First, there is a correlation between the transition from fixed to flexible exchange rates in the early seventies and the rise in industrial countries' debt levels. Second, with the introduction of the Euro there is another major change of the exchange rate regime which could again be relevant for fiscal actors.

After a short survey of the relevant literature a „general to specific“ approach is applied. On a general level, the impact of the exchange rate regime on fiscal discipline is analyzed. Three main channels are identified. The exchange rate regime affects fiscal behavior because it is of relevance for the political objective function, for the interdependencies of the macroeconomic system and for the government budget constraint.

The general approach reveals that a monetary union has some negative characteristics in regard to exchange rate based fiscal discipline. The depreciation threat which possibly is an obstacle for fiscal laxity is lost since monetary union decreases economic openness. Apart from that obvious change, the reaction of interest rate differentials to different fiscal behavior of member countries of a monetary union is limited to the default risk channel. In a monetary union, any reactions caused by varying depreciation expectations or the foreign exchange rate risk premium are impossible by definition. In contrast to the monetary union regime, both the floating and the fixed exchange rate regime seem to have some features more favorable for fiscal discipline. Particularly, there is disciplining pressure from exchange rate related interest rate determinants - i.e. the exchange rate risk premium and the expected depreciation. In addition, the character of the nominal exchange rate as an explicit political objective is supportive for fiscal discipline under fixed exchange rates.

After these general considerations a specific model is presented to put more precision to the impact of the exchange rate regime on fiscal discipline. The fiscal authority is assumed to maximize an objective function. This objective function is on the one hand positively affected by an increase in the primary deficit - an assumption reflecting the public choice view on the political attraction of deficits. The objective function is on the other hand negatively affected by rising public debt and a nominal depreciation of the currency. The macroeconomic system is represented by a two country model that is based on

the monetary approach to the exchange rate under perfect price flexibility. Assumptions of this model are perfect substitutability of foreign and domestic currency assets and absolute purchasing power parity. This standard approach is extended to include a default risk premium that is influenced by the change of the public debt level. Furthermore, domestic monetary supply is assumed to be influenced by the size of the secondary deficit. Thus there is a direct link between deficits and monetary expansion which again is the crucial determinant for nominal exchange rate changes.

The model puts more precision to some aspects of the problem as it was set up in the general approach. In the model context the exchange rate regime is of relevance for the structure of political preferences: Under fixed exchange rate the political disutility from a depreciation is higher than under flexible rates. In the model the transition to monetary union is interpreted as cutting the link between domestic deficits and the money supply. In this sense monetary union is equivalent to perfect central bank credibility. Nevertheless, monetary union does not necessarily lead to more fiscal discipline. Two counteracting effects are at work. On the one hand the loss of seigniorage control makes it politically more costly for the fiscal authority to increase the primary deficit because this deficit leads to a larger debt increase than it was the case with a minimum control of seigniorage. On the other hand there is no depreciation resulting from increasing deficits which reduces the political disadvantages of deficits for the fiscal authority. The model provides the following message: Low debt countries that used to pay much attention to the stabilization of the nominal exchange rate are likely to have lower fiscal discipline after a transition to monetary union. High debt countries that used to have a benign neglect stance on nominal exchange rate changes are rather likely to be disciplined by the transition to monetary union.

The model also clarifies the interrelation between the bailout problem and fiscal discipline in a monetary union. The possibility of a weakening of fiscal discipline in a monetary union is not dependent on any bailout effect associated with the introduction of a common currency. Even with perfect credibility of a no-bailout clause such as it was written into the Maastricht treaty, the transition to monetary union could lead to higher deficits. If no-bailout provisions are not credible in a monetary union, this of course further increases the likelihood of more fiscal laxity under a common currency.

EMU and Fiscal Discipline: The End of the Depreciation Threat

Friedrich Heinemann

Centre for European Economic Research (ZEW), Mannheim

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Abstract

Are the characteristics of the exchange rate regime relevant for the degree of fiscal discipline? What are the conclusions for fiscal behavior in Europe after the transition to EMU? These are the central questions that are analyzed in this paper from a theoretical point of view. After a general discussion of these issues, the optimization process of fiscal agents is analyzed in the context of a model based on the monetary approach to the exchange rate. The model conclusion is that monetary union leads to more fiscal discipline for high debt countries that used to have a benign neglect stance on the exchange rate. Contrasting to that, low debt countries that used to pay much attention to the exchange rate in the past will behave less disciplined in the future.

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Dr. Friedrich Heinemann
ZEW
PO Box 10 34 43
D-68034 Mannheim

Phone: +49-621-1235-149
Fax: +49-621-1235-223
Email: heinemann@zew.de

1 Introduction

1973 has been identified to mark a watershed for fiscal behavior in OECD countries (Roubini and Sachs, 1989). Prior to the first oil crisis, many industrial countries had succeeded in reducing debt levels resulting from the financial burden of the second world war. After the oil crisis, debt levels started to rise again.

In their influential analysis, Roubini and Sachs ascribed this turning point to the permanent growth deceleration taking place in the early seventies. Another explanation hints at the rising influence of Keynesianism in economic policy, which made rising deficits politically acceptable (Buchanan and Wagner, 1977). However, a third explanation for the 1973 watershed has so far failed to attract much attention. The year 1973 stands for a fundamental change of the international exchange rate regime. The Bretton Woods system of fixed exchange rates was finally replaced by a system of free floating. In fact, the dummy that was used by Roubini and Sachs to measure the effect of the post-1973 growth deceleration on fiscal policy and which the authors find to be significant, can also be interpreted as a very rough exchange rate regime dummy measuring the impact of floating exchange rates. It was McKinnon (1996) who ascribed the fundamental change in fiscal behavior to the advent of unrestricted floating in 1973 which „eliminated the already weakened monetary constraint on fiscal policy in the United States, but it also finally terminated the Marshall-Dodge restraints on running fiscal deficits in Western Europe and Japan“ (McKinnon, 1996, p. 33).

Is the transition to floating in 1973 and the subsequent rise of debt levels coincidental or is there a causal relationship from floating to fiscal laxity? It is not by accident that this question is posed in the end of the 1990s, when the EU countries introduce a common currency and thus undergo a further fundamental change in the exchange rate regime. If the exchange rate regime matters for fiscal policy then the start of EMU as such will change fiscal behavior within the EU. This is an aspect often missing in the analysis of the fiscal implications of the Euro. This analysis normally focuses on the new institutions directly targeting fiscal behavior such as the convergence criteria and the Pact for Stability and Growth. Apart from these new institutions, however, the new regime of irrevocably fixed exchange rates is a major change that could have implications for the constraints and objectives of fiscal decision makers. It is the purpose of this study to shed more light on these relations.

Apart from the Euro context there is a second motivation for this analysis: This work is to contribute to the intensive research on the determinants of public deficits that has been under way since the end of the eighties. For a recent

survey see Alesina and Perotti (1995b). With the background of exploding debt levels since 1973 there have up to now been different directions to explain both this average development and the very different individual debt histories of industrial countries. A first wave of studies focused on political determinants. Roubini and Sachs (1989) and Grilli et al. (1991) identified determinants such as the type of government, political fractionalization or the durability of governments to be of relevance. A second wave of studies changed the focus to the budgetary institutions and their impact on the fiscal variables. Von Hagen (1992) and von Hagen and Harden (1994) have led the way to take into account the rules and regulations that build the framework for budgetary policies. Resulting from these different approaches the understanding for the deficit bias in modern democracies has been widened. However, it is striking that the impact of capital markets on fiscal behavior has not yet reached this level of understanding. Although in the context of the globalization discussion it is a popular hypothesis that financial markets discipline fiscal politicians, there has been only relatively few substantial academic work on this field, mainly in the context of interest rates and the impact of public debt on risk premiums (e.g. Goldstein and Woglom, 1992). Thus, analyzing the relationship between exchange rate regimes and fiscal behavior, could add to a better understanding of the determinants of deficits in a globalizing environment.

It is the intention of this paper to prepare empirical work on this field by providing a first theoretical basis. Results of an empirical study are separately presented in Heinemann (1998). In the following section 2, a short survey on some insights from the relevant literature is given. After that, the interrelations between exchange rate regimes and fiscal policy are examined in the context of different exchange rate regimes. In section 3 a general approach is presented, i.e. without restricting the analysis to the narrow assumptions of a single specific model. After that, the analysis of section 4 will focus on the conditions of a simple model based on the monetary approach to the determination of the exchange rate. Section 5 summarizes the conclusions.

2 Insights from Relevant Literature

The above cited hypothesis of McKinnon concerning a disciplining impact of fixed exchange rates has some tradition. Since Giavazzi and Pagano (1988) it is a popular interpretation of officially declared exchange rate target zones that these regimes serve the purpose to import credibility for a restrictive policy. Monetary or fiscal laxity would sooner or later endanger a given peg to a currency of a country with a more stable policy mix. According to authors like Siebert (1996, p. 9) a devaluation of a peg is politically more costly than a

depreciation under floating because „residents are made more alert on the value of their currency by institutional arrangements“. Since giving up a peg is supposed to be politically costly this imposes discipline on national agents. However, the „tying one’s hand“-story could not be clearly supported by the empirical facts. Disinflation costs for example were higher in the EMS than in other OECD countries with flexible exchange rates (Fратиanni and von Hagen, 1992) - a result not supporting the hypothesis of importing discipline and credibility through the peg.

There is also no clear proof that EMS membership has led to fiscal discipline and fiscal convergence of member states. On the contrary, Roubini and Sachs (1989) find rather an increasing fiscal divergence in the EMS. However, both authors do generally believe in a disciplining effect of an exchange rate peg on fiscal policy, but they see it rather as a long run restriction which also often has been neutralized by capital controls. In the short run a debt rising effect is predominant when new participants of the EMS lose seigniorage revenues. According to Heller (1997) the move to abolish most of the remaining capital restrictions among industrial countries in the nineties tends to put more power to the fiscal restraints of any fixed exchange rate regime.

Tornell and Velasco (1995) do not deny that the repercussions of deficits on exchange rates can serve as a constraint for fiscal politicians. However, they question the view that fixed rates impose more fiscal discipline than flexible exchange rates. They do not accept the idea that the exchange rate regime itself has an impact on the political costs of devaluation. If a devaluation is politically costly e. g. because of its inflationary consequences, then these costs should not depend on the question whether there is a peg or not. Tornell and Velasco turn the conventional view upside down and ascribe more fiscal discipline to flexible rates. In a dynamic general equilibrium model they analyze the intertemporal distribution of devaluation costs resulting from imprudent fiscal policy. The essential difference between fixed and flexible exchange rates in this model is that under the latter regime the costs of unsound policy manifest themselves immediately while under fixed rates it takes some time until the peg collapses and the costs can be felt. The fiscal politicians are assumed to be uncertain to remain in office after the end of the current term. This shortsightedness leads to higher deficits under fixed exchange rates than under flexible ones. Tornell and Velasco add empirical results from fiscal performance in sub-Saharan Africa in the 80s where there existed both flexible rates outside and fixed rates inside the CFA franc zone. According to these results countries under flexible rates are more disciplined than CFA countries.

Looking at the literature as a whole the relationship between exchange rate regimes and fiscal policy is far from being sufficiently understood. Neither is there a clear theoretical framework nor has there been sufficient empirical

studies for the industrial countries. If one widens the perspective to include the exchange rate regime of a newly established monetary union the complex becomes even more unsettled.

In regard to nominal exchange rate volatility, a monetary union is almost identical to a system of fixed exchange rates. In regard to fiscal discipline, however, monetary union appears for some authors to be rather the opposite case to fixed exchange rates. Isard (1989) argues that under monetary union the devaluation threat as a constraint for imprudent fiscal policy is missing. Bovenberg, Kremers and Masson (1991) see a similar effect through the interest rate channel. A rising debt burden is often associated also with a rising interest rate risk premium for an increasing exchange rate risk. Thus a country with a currency of its own has to pay for high deficits in form of rising interest rates. With monetary union this kind of sanction is not any longer internal to a country but has to be paid for by the whole monetary union. From the point of view of the high debt country entering a monetary union, interest rates decrease thus alleviating capital market pressure towards fiscal restraint.

The literature on the determinants of political reforms (Rodrik, 1996) stresses the function of „crisis“ to be a catalyst for in the short-run unpopular but in the long-run beneficial changes. A crisis might be necessary for a government to gain acceptance for unpopular reforms. With EMU one kind of crisis - exchange rate pressure and/or heavy depreciations of the exchange rate - ceases to be possible. Insofar exchange rate crises had a helpful function in speeding up economic reforms there is the danger of decreasing ability to reform with the advent of the Euro.

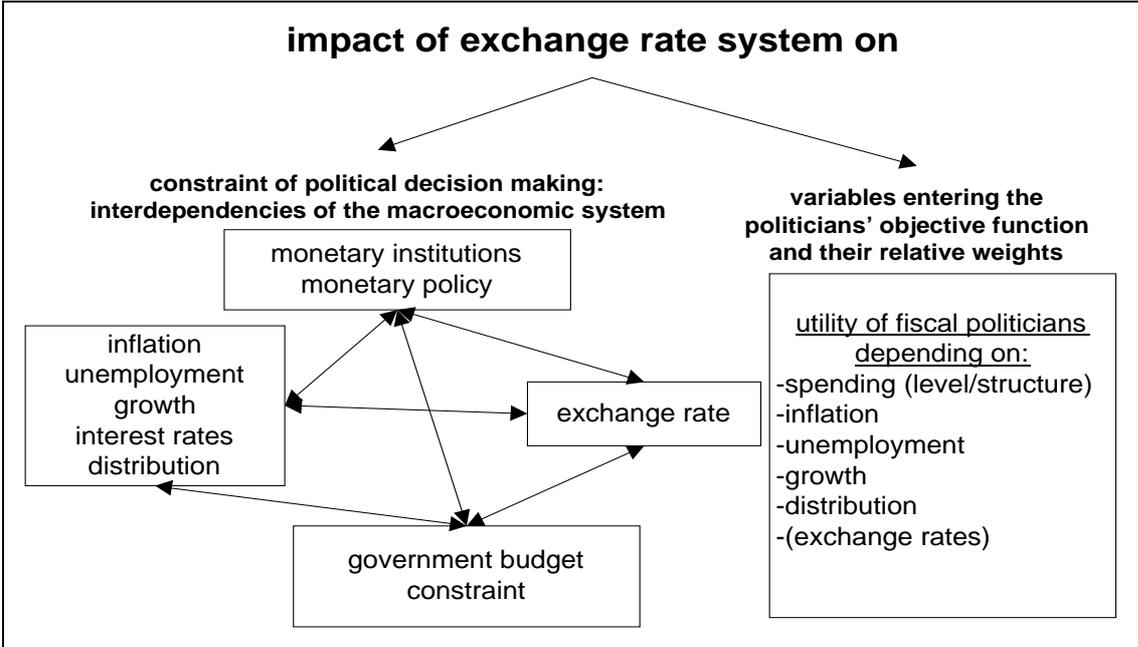
3 A General Analytical Framework

The purpose of this section is to present a general analytical framework for the interrelation between fiscal policy makers' decisions and the exchange rate regime. In order to avoid at this stage any loss of generality the presentation of a specified formal model is postponed to the next section. This "general to specific" approach has the advantage to take account of as many as possible real world dimensions of the issue.

It is assumed that fiscal politicians choose fiscal instruments - e.g. the level of the government deficit - in order to maximize their objective function. This maximization problem is constrained by the interdependencies of the macroeconomic system and by the government budget constraint. In this setting (see Figure 1), the exchange rate regime has a potential impact on the behavior of fiscal politicians insofar it is of relevance for:

- the politicians' objective function (section 3.1),
- the interdependencies of the macroeconomic system (section 3.2) and
- the government budget constraint (section 3.3).

Figure 1: Relevance of Exchange Rate Regime for Political Optimization Problem



3.1 Exchange Rate Regime and the Political Objective Function

The objective function of fiscal decision makers can conceptually be derived from different sources: from the first priority of politicians in a democracy, the wish to be reelected, but also from programmatic preferences of the relevant ideologies or political parties. Traditional variables entering this kind of objective function are: the rates of inflation and unemployment, the growth rate of the economy and of voters' disposable incomes which in turn are influenced by the level of taxation. Variables corresponding to programmatic preferences are the distribution of wealth and income among the population in general or among different interest groups and the level and structure of public spending.

Figure 1 includes the exchange rate as an element entering the objective function in parentheses indicating that only under certain conditions this variable can be interpreted as a direct political objective. One argument in favor of the interpretation of the exchange rate as a direct objective is that in public opinion marked depreciations are often associated with a crisis. An appreciating currency is often attributed to economic strength of an economy.

If the exchange rate has the character of a direct political objective, does this refer to the nominal or the real exchange rate? From the point of view of rational economic thinking there is a distrust in the importance of nominal variables. On the other hand it would be unrealistic to restrict the political-economic analysis to changes of the real exchange rate. Strong nominal depreciations often lead to a public feeling of economic crisis even if these depreciations simply correct a real appreciation that has built up before. Therefore, it seems to be plausible to regard the nominal exchange rate under certain conditions as a political objective.

However, the political costs of a nominal depreciation will probably depend on factors such as the degree of openness of an economy and on the exchange rate regime.

The more open an economy the more attention will be paid to the exchange rate. In an open economy exchange rate changes are more relevant for larger shares of the population than in a relatively closed economy. If an attitude of „benign neglect“ really existed, it used to be a privilege of large economies as the USA with a low degree of openness.

The exchange rate regime can be expected to be a relevant variable as well. Although under a regime of freely floating exchange rates a depreciation may gain some attention, it is very difficult to see a reason for any direct impact of the nominal exchange rate on the popularity of a government. The case is different if the exchange rate under a peg is explicitly declared to be a political target. After such a commitment it is plausible to assume that voters will pay more attention to the exchange rate. In the relevant target zone models this fact is often taken account for in form of fixed costs that a government faces that gives up a peg (e.g. Ozkan and Sutherland, 1994). Although some authors doubt it - see in the preceding section the position of Tornell and Velasco - there is clearly a case for the existence of some extra costs for the government to lose its face if an explicitly targeted exchange rate peg has to be given up. Isard (1994) argues that without the existence of these costs it is difficult to explain the lower short run volatility of nominal exchange rates under systems of pegged exchange rates.

In popularity functions¹ the exchange rate has rarely been examined as a potential determinant. In this kind of analysis there is the methodological problem to differentiate between the impact of inflation and the impact of an exchange rate change if the former drives the latter. Inflation belongs to the variables that typically are included in popularity functions and which often is found to be significant. Under relative purchasing power parity a significant

¹ For a survey on popularity functions see for example Kiefer (1997, chapter 8).

impact of the inflation rate would imply a significant impact of the nominal exchange rate if this variable replaced the inflation rate as explanatory variable in the regression. However, if relative purchasing power parity describes nominal exchange rate movements in a satisfying way at all, then it is only on the long run. In the short run nominal exchange rate movements are different from relative inflation rates and thus lead to changes in the real exchange rate. Adding the nominal exchange rate to the inflation rate in such a regression means to control for changes in the real exchange rate. Hibbs (1982) is the only study of popularity functions known to the author where the nominal exchange rate is reported to be included and to be significant. It is the case of Great Britain, where according to Hibbs governments of all parties in the postwar period paid much attention to the role of sterling in the international monetary system and the dollar exchange rate of the pound: „in Britain’s domestic political life it has been viewed as an index of the nation’s international prestige“ (Hibbs, 1982, p. 437). In his regression, Hibbs finds in the sixties and seventies a depreciating Pound to be significantly associated with a decreasing popularity of the incumbent government.

There is at least another period where the nominal exchange rate has definitely been a direct political objective (Eichengreen and Wyplosz, 1993): For the EU countries in the years preceding the decision on EMU membership nominal exchange rate volatility was one of the convergence criteria that had to be fulfilled in order to qualify for the Euro.² Any excess volatility of the nominal exchange rate would have endangered the chances of a country to become a member of the Euro zone.

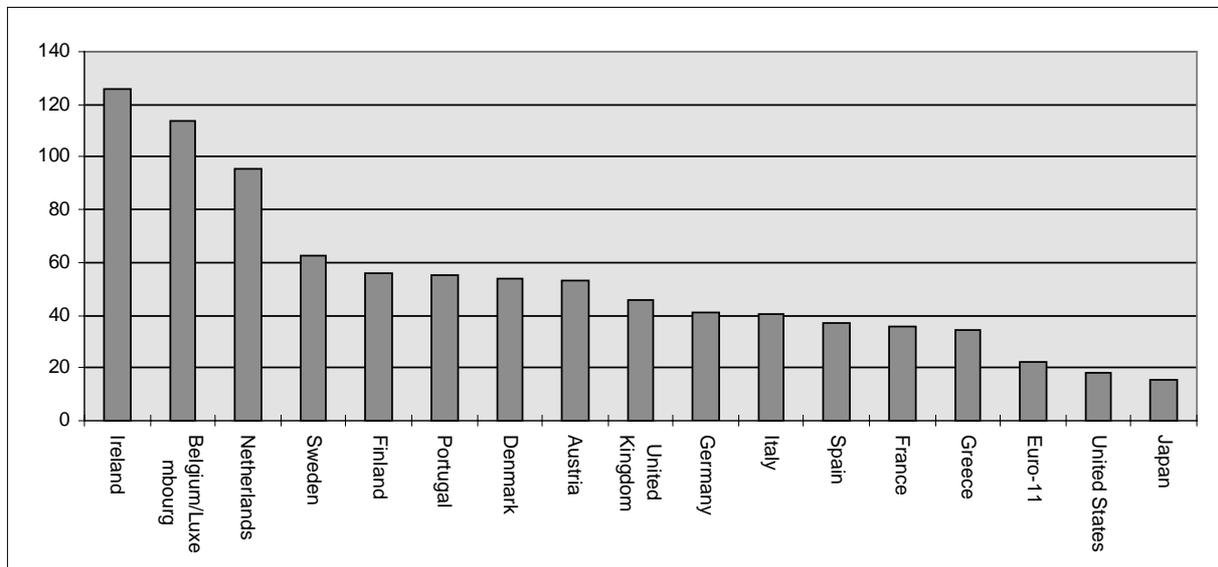
Summing up, there is the presumption that the nominal exchange rate has the function of a direct political objective under a peg but not under floating. A high degree of openness can be expected to increase the attention for the exchange rate.

What about the exchange rate as a direct political objective under the conditions of a monetary union such as EMU? Within the participating EU countries there is no longer a changeable nominal exchange rate, although it remains in relation to the outside world. Looking at the criteria openness and exchange rate regime EMU will probably lead to the exclusion of the exchange rate from any objective function of national fiscal authorities: For the foreseeable future the Euro will be a free floating currency vis-à-vis the Dollar and Yen and the degree

² Because the relevant criterion required merely to keep exchange rates within the „normal“ margins two years before the decision on EMU membership it was effectively softened in August 1993, when normal margins of the ERM were extended from +/- 2,25% to +/- 15%.

of openness of the European economies will decrease markedly with the Euro (see Figure 2).

Figure 2: Openness (Ratio of Sum of Exports and Imports to GDP, 1995)



Source: OECD, data for Euro-11 exclude intra-EU trade

3.2 Fiscal Policy and Exchange Rates under Different Regimes

Besides its relevance for the political objective function, the exchange rate regime has an impact on the macroeconomic system. The way variables such as unemployment, growth, interest rates and the exchange rate react on fiscal policy, depends on the exchange rate regime. Thus, the exchange rate regime affects the constraints of economic policy. It determines interdependencies and the tradeoffs between different policy objectives.

The left hand side of Figure 1 describes these interdependencies in a very general way. Of course, it would be far behind the scope of this section to summarize these interdependencies comprehensively - this task would imply condensing modern macroeconomics in a few sentences. Instead the focus will be on the relationship between fiscal policy on the one hand and exchange rates under different exchange rate regimes. There will be no intensive discussion of the link between fiscal policy and output or employment under different exchange rate regimes.

There are - apart from space limitations - two reasons for largely ignoring output effects (an approach also applied in the model specification of the next section): First, the deeper causes for the political popularity of deficits, as identified in the relevant literature (see introduction) do not seem to stem from

any trade-off between deficits and employment. The „naive“ approach where politicians are assumed to use deficit finance in order to stabilize the economy has been falsified on the basis of actual fiscal behavior. The popularity of deficits has rather to do with limited time horizons of voters and politicians or some kind of fiscal illusion. Because deficits are not used to stabilize output in real life, it would be misleading to focus on such a trade-off. The second reason for neglecting output effects is simply the fact that the relation between fiscal deficits and growth is very much an open question. Recent empirical investigation for OECD countries show that - against standard Keynesian analysis - fiscal restriction may be expansionary depending on the structure of consolidating measures (Alesina and Perotti, 1995a/1997, McDermott and Wescott, 1996). Thus, identifying output effects of fiscal policy depending on different exchange rate regimes would probably be a too speculative basis to be a foundation for the further analysis.

Directing the focus on the consequences of fiscal policy for exchange rates requires again the differentiation between real and nominal effects. Because in terms of the political objective function it can be assumed that it is the nominal exchange rate that attracts most public interest. Thus it is logical to stress the nominal dimension. Luckily, the statements of most theories concerning exchange rate effects of deficits concern both dimensions, the nominal and the real exchange rate. Real depreciations work in most models through a nominal depreciation.

Flexible Exchange Rates

Under flexible exchange rates different theories come to contrary conclusion concerning the impact of a deficit financed fiscal expansion on the nominal and real exchange rate (Clark and Laxton, 1995). In particular, there are contradicting conclusions from the standard Mundell-Fleming analysis and long-run models that take stock-flow-adjustments into account in the tradition of Branson (1977). In a Mundell-Fleming world with high capital mobility, a fiscal expansion without any change in the monetary stance leads to an appreciation of the exchange rate. This appreciation is caused by capital inflows in reaction to rising interest rates. Under perfect capital mobility - which today seems to be the relevant case for industrial countries - there is no output effect and no increase in domestic interest rates. The demand effect of the fiscal expansion is fully neutralized by the crowding out of net exports.

A depreciation resulting from a deficit financed fiscal expansion is possible, however, if important assumptions of the Mundell-Fleming models are given up. These assumptions include static expectations and the independence of fiscal and monetary policy. If there is monetization of fiscal deficits or at least

expectations concerning a future monetization there would be a tendency towards depreciation. Here the relevance of the monetary institutions becomes obvious. The degree of central bank independence is an important determinant for the macroeconomic interdependence, especially the relation between fiscal policy and inflation.

Furthermore, if assets of different countries are no perfect substitutes, the result of Mundell-Fleming might not hold. It is possible that an increase in the public deficit of a country increases also the perceived riskiness of this country's assets. This would in turn require an increase in the risk premium for these assets leading to a depreciation of the currency (Giorgianni, 1997).

Finally, the Mundell Fleming model ignores long-run stock effects resulting from the flows which are analyzed in models in the tradition of Branson (1977). The long-run equilibrium is reached if the deficit (surplus) of the trade balance is financed by the interest earnings on net foreign assets (is used to finance the interest payments on net foreign debt). If there is a permanent increase of public debt this in turn leads to an increase of net foreign debt which again has the consequence of a permanent increase in the current account surplus. Thus the long-run effect of a permanent increase of fiscal deficits is a currency depreciation in the extent necessary to improve the trade balance (MacDonald, 1997).

Thus, the pattern suggested by theory is the following: on the short-run a deficit will tend to lead to an appreciation, while on the long-run there is a clear theoretical case for a depreciation. The short-run appreciation is, however, not to be expected, if deficits - e.g. due to a high given level of public debt - put monetary authority under pressure or lead to a significantly increasing risk premium for the country's assets.

An empirical verification of this pattern is difficult due to the forward looking behavior of currency markets. Any change in fiscal variables that has been expected before will not move exchange rates. Thus observable reactions of exchange rates to fiscal determinants might not in every case be useful for the test of the above theories. In fact, empirical tests are ambiguous as summarized in Clark and Laxton (1995). Recently MacDonald (1997) found the Dollar and Yen to react consistent with the stock-flow-approach but the DM to move in line with the predictions of the Mundell-Fleming model. Giorgianni (1997) finds the above described risk-premium channel relevant for the Italian Lira in the period 1987-1994: In this time increasing fiscal imbalances of the Italian public sector are associated with increasing risk premiums and a weak lira.

If it is right that there tends to be a difference between the short-run and long-run reaction of the exchange rate on fiscal policy this is relevant for the impact of the exchange rate regime on fiscal behavior. Assuming - as usual in political-

economic modeling - a high political discount factor, politicians will be more interested in the short-run consequences of their actions. This would be an argument against the above cited hypothesis of Tornell and Velasco (1995) that flexible exchange rates are disciplining because the punishment for lax fiscal policy is immediate. If there is in the short-run - the politically relevant perspective - an appreciation as a consequence for increasing deficits there is no immediate punishment. The depreciation resulting on the long-run might be out of the politically relevant time horizon.

Fixed Exchange Rates

In the standard Mundell-Fleming analysis under fixed exchange rates there is the assumption of perfect credibility of a peg. What might have been a relevant model in the earlier times of the Bretton Woods era, is obviously not relevant any longer in times of globalized financial markets. The post 1973 experience from fixed exchange rates or target zone institutions such as the EMS show that the degree of credibility of a parity and the determinants of that credibility are of crucial importance. The currency crises of the EMS and several collapses of emerging market currencies - recent examples are Mexico 1994/1995, Asia 1997/98 and Russia 1998 - have motivated theoretical and empirical analysis of these phenomena. A recent survey for the determinants of speculative crises is Kaminsky et al. (1997).

The first theoretical approaches following Krugman (1979) have stressed the importance of weak economic fundamentals as reason for the collapse of a fixed exchange rate or a target zone. If the mix of fiscal and monetary policy leads to a steady decline of reserves, this sooner or later provokes a speculative attack.

A second generation of models - for example Ozkan and Sutherland (1994, 1995) and Isard (1994) are characterized by the interpretation of a parity collapse as the result of an optimizing behavior of the authorities that control the parity. Defending a given parity leads to costs and benefits. Benefits might arise from the use of the peg as a nominal anchor. Cost are involved if the defense of the fixed rates requires higher domestic interest rates and leads to output losses and increasing unemployment. The balance of costs and benefits, however, is depending on many different determinants. Examples are the foreign interest rate, the level and political costs of unemployment.

Of particular importance in the context of this paper is the relevance of the stock of debt. The higher the stock of debt the more expensive is the defense of a peg through an increase of domestic interest rates due to the higher interest rate payments.

Besides widening the space of relevant variables these optimizing models lead to the possibility of self-fulfilling expectations. Currency crises might occur

without any preceding deterioration in economic fundamentals. These models have a circular structure: Expectations of private agents take into account the optimizing behavior of the authorities. Private expectations in turn are an important variable determining the optimizing decision of the authority. Thus there is the possibility of multiple equilibria: a change in expectations - even not paralleled by a change in fundamentals - might change the outcome of the authority's calculus from sticking to a pre-announced parity towards giving up the parity. These models must not be misunderstood. The message is not that economic fundamentals do not matter for the probability of currency crises. A deterioration in economic fundamentals is, however, not a necessary condition for the appearance of a speculative attack. In any way, the more sound the fundamentals, the lower the risk of a self-fulfilling change in expectations and vice versa.

The relevance of self-fulfilling attacks is crucial for the interpretation of a currency peg as a device for disciplining fiscal policy. If a speculative attack tends to be something like a „fair punishment“ for fiscal laxity then the threat of a speculative attack serves a useful purpose. If on the contrary, countries are hit by attacks independently from the quality of fiscal and other fundamental data, the speculative threat does not lead to more fiscal discipline.

Empirically, this issue has been answered differently. In their influential analysis, Eichengreen et al. (1995) find support for the predominance of attacks based on self-fulfilling expectations. In their survey, Kaminsky et al. (1997), question this interpretation and find that a number of certain „fundamental“ variables are helpful to serve as leading indicators for currency crises. Among these is the fiscal deficit.

Monetary Union

By definition there is no effect of fiscal policy on the nominal exchange rate within a monetary union. While there might be consequences for real exchange rates within the union, it is unrealistic to assume that these real changes gain wide public attention.

Of course, there might be effects running from fiscal policy of an EMU member country to the nominal exchange rate of the Euro vis-à-vis third currencies such as the Dollar or the Yen. Nevertheless, it is unlikely that these effects could have any disciplining implications. From the point of view of a small EMU member countries the impact of national fiscal policy on the external value of the Euro can be neglected. Even for a larger country the link between its fiscal position and the external value of the common currency will be much weaker than under a national currency. Apart from that, the transparency of this link - important for a disciplining function - will be low: Under EMU, it will be hard

to ascribe exchange rate movements of the Euro to the behavior of a single member country. As a whole, there is a free rider problem concerning the common objective of a stable currency.

3.3 Exchange Rate Regimes and the Government Budget Constraint

The fiscal authority's optimizing decision is not only restricted by the macroeconomic system. Another restriction originates from the government budget constraint. As in regard to the macroeconomic interdependencies, the type of the exchange rate system is of relevance for the quality of the constraint. On the revenue side, the exchange rate regime might affect seigniorage and taxes. On the expenditure side, there could be consequences for the interest payments on the stock of debt.

Under flexible rates, the level of seigniorage revenues can be chosen independently on a national level. Flexible exchange rates have the character of a necessary condition for seigniorage revenues to be controllable by the fiscal authority. At the same time flexible rates are no sufficient condition since with an independent central bank seigniorage revenues are - independently from the exchange rate regime - exogenous from the point of view of the fiscal politicians. Therefore, it is only under the constellation of both flexible exchange rates and the existence of a minimum influence of fiscal politicians on monetary policy that seigniorage is a degree of fiscal freedom. With fixed exchange rates, however, the fiscal authority can not choose the level of seigniorage completely freely even if the central bank is dependent. The degree of freedom in this setting depends on how fast a monetary expansion will endanger a given exchange rate target.

Flexible exchange rates with a high degree of exchange rate variability tend to be an obstacle to the international exchange of goods, services and capital. At least this is one of the central arguments in favor of EMU. Turning around this argument leads to the conclusion that flexible exchange rates tend to shield an economy from the international tax competition - although the empirical relevance of this relation is an open question. Thus, the range in which the level and structure of national taxation can be set without provoking sanctions from international tax competition should be larger under flexible exchange rates. It should be smaller under fixed exchange rates and smallest in a monetary union.

Under the conditions of unrestricted capital mobility interest payments on national debt are under any exchange rate regime influenced by the world level of interest rate. However, under flexible exchange rates there is more room for interest rate differentials than under credibly fixed exchange rates.

The difference between nominal domestic interest rates (i) and foreign interest rates (i^*) - measured as the yield in percent of government bonds of the same maturity and with identical other characteristics such as liquidity and taxational treatment - can be split up according to the following equation (see for example Clark/Laxton, 1995). cd^e is the expected depreciation of the domestic against the foreign currency in percent. $ferp$ is the foreign exchange risk premium and drp the default risk premium³, both in percentage points. Both risk premia compensate for the different riskiness of domestic and foreign currency government bonds. It is important to note the different character of both risk premiums. While $ferp$ corresponds to the riskiness of the domestic currency, i.e. its volatility, drp is not related to currency considerations, but refers to the relative default risk for domestic government bonds relative to foreign government bonds.

$$(1) \quad i - i^* = cd^e + ferp + drp$$

There is an equivalent formulation for expected real interest rates r^e with $r^e = i - \pi^e$, where π^e stands for the expected rate of inflation. According to this transformation, the expected real interest rate differential is equal to the expected change of the real exchange rate and both risk premiums :

$$(1)' \quad r^e - r^{e*} = \pi^{e*} - \pi^e + cd^e + ferp + drp$$

This relation holds unless there are capital controls which would drive a further wedge between domestic and foreign interest rates.

Equation (1) helps to clarify that the exchange rate regime is relevant for the interest rate payments on the national debt through its impact on the level of interest rates. Under monetary union and also under a fully credible fixed exchange rate system cd^e and $ferp$ are zero. Therefore it can be argued (Mongelli, 1997) that those countries benefit most from moving from flexible exchange rates towards EMU that had to pay high risk premiums for a high uncertainty of the exchange rate development. The same is true for countries that move from flexible exchange rates to fixed exchange rates of a minimum

³ More generally, drp stands for the country premium which besides the default risk also relates to the risk for the introduction of capital controls or the implementation of expropriation measures. For this analysis, it is sufficient to restrict the perspective to the default risk.

degree of credibility. By reducing exchange rate uncertainty through the choice of the exchange rate regime the interest rate payments on public debt can be reduced.

These considerations help to identify a major difference in the way interest rates will react to public deficits under monetary union on the one hand and under fixed or flexible exchange rates on the other hand. Under monetary union by definition there can be no increase of $ferp$ and cd^e with an increase of deficits. This is different under flexible rates: Here a rising deficit might increase both elements. The same is true for fixed rates that are not completely credible: Here, a rising deficit could - as described above - endanger the peg and lead to rising interest payments for the public debt.

Independently from the exchange rate regime, an impact of deficits on the interest rate payments can be expected through the default risk premium channel. In the context of EMU, however, it has widely been discussed whether the introduction of a monetary union might lead to a bailout presumption. If this is the case there is a further difference in the determination of interest rates under different exchange rate regimes. If monetary union leads to a bailout presumption then the reaction of interest rates on an increase in deficits will tend to be smaller because of the tendency of drp to be insignificant in a bailout-regime.⁴

3.4 Synopsis

Looking at all effects together in a synopsis (see Table 1) one can conclude that a monetary union has some negative characteristics with respect to exchange rate based fiscal discipline. As by definition there can be no effect of fiscal policy on nominal exchange rates, the exchange rate is no element of the political objective function. Any monetary union furthermore decreases openness and thus makes a position of „benign neglect“ more likely. Interest rate differentials between member countries of a monetary union due to bad fiscal behavior are limited to the default risk element. Apart from that, a monetary union probably puts the strongest pressure on other sources of fiscal revenue such as taxation and seigniorage.

Both the floating and the fixed exchange rate regime seem to have some features more favorable for fiscal discipline. Particularly, there is disciplining pressure from exchange rate related interest rate determinants (i.e. the exchange rate risk premium and the expected depreciation). A distinct feature of any fixed

⁴ See below section 4 for a further discussion of this interrelation.

exchange rate or target zone regime is the character of the nominal exchange rate as a direct political objective. It should be stressed, however, that the disciplining effects of both flexible and fixed rates critically depend on the assumption that high deficits lead to a depreciation or at least to depreciation pressure. As discussed above this assumption has a good empirical basis. Nevertheless it is far from being undisputed.

Before proceeding to a more formal view on the issue in a specified model it has to be stressed that it is much too early to draw conclusions for the extent of the real world deficit bias under different exchange rate regimes. The result that monetary union is associated with a rather low degree of fiscal discipline is something like a tautology if one starts from analyzing the disciplining effects of changeable nominal exchange rates. However, this synopsis should have served to identify the channels that could be relevant in this context. In the following section the degree of analytical precision is to be increased at the costs of some simplifications.

Table 1: Synopsis on Disciplining Characteristics of Exchange Rate Regimes

	Floating	Fixed Exchange Rates	Monetary Union
<ul style="list-style-type: none"> effect of fiscal deficit on nominal exchange rate 	short-run: appreciation (Mundell/Fleming) or depreciation (e.g. imperfect substitutes) long-run: depreciation (stock-flow-equilibrium)	part of economic fundamentals negatively related to the credibility of a peg	no effect possible
<ul style="list-style-type: none"> exchange rate a direct political objective 	no	yes	no - openness decreases markedly
<ul style="list-style-type: none"> seigniorage as a controllable source of revenue 	if there is a minimum influence of fiscal authority on central bank: yes	if there is influence of fiscal authority on central bank: level of seigniorage possible that is compatible with the peg	no
<ul style="list-style-type: none"> intensity of tax competition restricting national autonomy in choice of tax level and structure 	lower	higher	highest
<ul style="list-style-type: none"> interest rate differentials vis-à-vis interest rate of reference country 	driven by exchange rate expectations, exchange rate risk premium and default risk premium	driven by default risk premium and - with incomplete credibility of the peg - by exchange rate expectations and exchange rate risk premium	only driven by default risk premium, even this premium might vanish if monetary union leads to a bailout-presumption

4 Fiscal Optimization in a Monetary Model of the Exchange Rate

The general approach of the preceding section is now specified in the context of a two country monetary model of the exchange rate with perfect flexibility of prices. It is the consequence of any such specification that the complexity of the real world problem is reduced. However, the chosen specification should be helpful to put more precision to the issue of exchange rate based fiscal discipline. This model is one example for a whole class of models that could be constructed within the general framework developed above. According to this given structure - as depicted in Figure 1 - the model consists of the objective function of fiscal politicians, the government budget constraint, and some relationships describing the interdependencies of the - very simple - macroeconomic system: a domestic-foreign interest rate link, an equation describing exchange rate determination and a monetary supply function. Important assumptions of this model are the constancy of real output (in line with the general approach above) and some features characteristic for the monetary approach to the exchange rate: Domestic and foreign assets are perfect substitutes, i.e. there is no foreign exchange risk premium. Purchasing power parity holds so that there are no changes of the real exchange rate.

Objective Function of Fiscal Authority

The objective function, which is maximized by the fiscal authority responsible for budgetary decisions, is given by

$$(2) \quad U(prd, \Delta debt , cd) \quad \text{with } U_{prd} > 0, U_{\Delta debt} < 0, U_{cd} < 0$$

where *prd* stands for the primary deficit and *debt* for the stock of debt, both in relation to income. *cd* is the nominal depreciation of the home currency in relation to the foreign currency in percent per period.

On the one hand, the fiscal authority increases its utility through an increase in the primary deficit. On the other hand, the costs of it - the increase in the debt burden - has a negative impact on the utility. Furthermore, a depreciation has also a negative impact on the objective function - although the extent of this impact has to be discussed in detail below.

It is important to note the different economic and political character of *prd* and $\Delta debt$. It is the primary deficit where fiscal politicians according to the political-economic approach can benefit from. A positive primary deficit

implies that spending exceeds taxing. „To spend without to tax“ is an attractive option for any government seeking reelection (Buchanan/Wagner, 1977). This is true at least in the presence of finite time horizons or fiscal illusion on the side of voters - characteristics leading to the invalidation of the Ricardian equivalence. In such a setting, interest groups can be served and the costs can be burdened on future generations whose interests are not completely taken into account by present voters. Because the net effect from a primary deficit in terms of political support is positive, the relevant derivative above is also positive. In contrast to that, the fiscal authority suffers from an increase of the debt burden $\Delta debt$ as such, for which prd is only one determinant among others. The relationship between both variables also depends on the extent of seigniorage and on interest payments on the stock of debt. The higher the debt increase the more voters worry about this burden - even if the Ricardian equivalence does not hold and voters expect only to pay for a certain share of this burden. There is no political benefit for example from an increase in debt payments because of rising interest rates leading to a faster increase of the debt burden. The relation between the political benefit indicator prd and the political cost indicator $\Delta debt$ stands for a trade-off in the optimization problem of the fiscal authority. To put the same in simple words: Fiscal politicians like deficits but they hate an increase of the debt level.

Government Budget Constraint

The relationship between the primary deficit and the increase of the debt burden is described by the government budget constraint as given by:

$$(3) \quad \Delta debt = prd - me + r debt$$

The change of the debt-income ratio depends on the ratio of primary deficit to income, the interest rate payments on the outstanding stock of debt, where r is the real interest rate relevant for domestic government bonds. Furthermore, seigniorage - here simply taken as the growth of the money stock in relation to income, me - can be used to finance the primary deficit.

Interest Rate Determination

The determination of the real interest rate for government debt is in principle already described by equation (1)' which can be further simplified in this model. Due to the assumption of perfect substitutability between home and foreign currency assets there is no foreign exchange risk premium. Apart from

that, due to the purchasing power parity assumption of the approach, there can be no expectation of a real exchange rate change. Thus, the domestic real interest rate r is simply the sum of the foreign interest rate r^* and the default risk premium drp . Due to the absence of uncertainty concerning the relevant variables, the expectations superscript of $(1)'$ can be dropped.

$$(4) \quad r = r^* + drp$$

$$\text{with } drp = \gamma \Delta \text{ debt}$$

The default risk premium is assumed to be a linear function of the change in the debt level. Of course, default risk should also depend on the level of the debt. The debt level, however, has the character of an exogenous variable in this single period optimization problem, only the change can be influenced by the fiscal authority. Thus only the default risk premium driven by the change in the debt level will be relevant for the fiscal authority's marginal calculus which motivates this simplification.

γ is the relevant variable in the EMU bailout discussion. The more markets expect the domestic country to be bailed out by the foreign country in case of a debt crisis the smaller is γ which stands for the reaction of the default risk premium to a change in the debt level. An implicit assumption of equations (3) and (4) should be made explicit: All public debt is financed with variable interest rates, i.e. changes of market interest rates affect instantaneously and fully the interest payments on the stock of debt. Thus the debt service immediately reacts to the foreign interest rate and changes of default risk. With interest rates fixed for a longer period there would be a lagged adjustment of the interest payments on government debt.

Exchange Rate Determination

In the monetary approach to the determination of the exchange rates, monetary demand and supply on the domestic and foreign money markets determine - together with the assumption of purchasing power parity - the exchange rate. Here a very simple approach is sufficient. Foreign and domestic demand for money are modeled in a classical way - i.e. money demand is not interest elastic. Together with the constancy of real output assumption, currency depreciation is simply driven by the relative growth of domestic and foreign money supply: $cd = me/m - me^*/m^*$, which again is equal to the inflation differential $\pi - \pi^*$. With foreign monetary supply assumed to be constant (i.e. foreign inflation equal to

zero) and the money stocks relative to income (m, m^*) normalized to be both equal one, this relation is simply:

$$(5) \quad cd = me = \pi$$

The home currency depreciation in percent is equal to the percentage rate of domestic monetary expansion - which at the same time determines the rate of inflation thus fulfilling the assumption of purchasing power parity.

Monetary Supply

So far there is no link between fiscal deficits and currency depreciation - a critical characteristic for any suggestion of exchange rate based fiscal discipline. This link is integrated into the model through the following assumption: The central bank is ready to finance a given share α of the government's secondary deficit through an increase of the monetary expansion:

$$(6) \quad me = \alpha(prd + r \text{ debt}) \quad \text{with } 0 < \alpha < 1$$

α can be interpreted as a variable for the degree of central bank independence. In the extreme case of $\alpha = 0$, perfect central bank independence would cut the link between fiscal deficits and monetary expansion. With the opposite extreme ($\alpha = 1$) the central bank would monetize the complete deficit.

Solution of Macroeconomic System and Political Optimization

In this setting, the only policy variable of the fiscal authority is prd . The fiscal authority will set the primary deficit on a level where the marginal utility from an increase in "spending without taxing" balances the marginal costs. The costs result from the consequences of higher primary deficits on the change of the debt level and the external stability of the currency.

The system (3) - (6) can easily be solved to derive the reduced form in order to explain the endogenous variables - $\Delta \text{ debt}$, $cd (=me=\pi)$, r - as functions of the exogenous variables debt , r^* and the policy instrument prd (see appendix for the derivation of the solution):

$$(7) \quad \Delta debt = \frac{1 - \alpha}{1 - \gamma(1 - \alpha) debt} prd + \frac{(1 - \alpha) debt}{1 - \gamma(1 - \alpha) debt} r^*$$

$$(8) \quad cd = \frac{\alpha}{1 - \gamma(1 - \alpha) debt} prd + \frac{\alpha debt}{1 - \gamma(1 - \alpha) debt} r^*$$

$$(9) \quad r = \frac{\gamma(1 - \alpha)}{1 - \gamma(1 - \alpha) debt} prd + \frac{1}{1 - \gamma(1 - \alpha) debt} r^*$$

$$with \ 0 < \gamma(1 - \alpha) debt < 1$$

(7) shows the debt increase following a primary deficit being the result of a multiplier process. The first round debt increase concerns only the fraction $(1 - \alpha)$ that is not monetized by the central bank. This debt increase is followed by consecutive debt increases through the rising interest rate on the stock of debt due to the increasing default risk premium. All endogenous variables are determined in a similar way. The restriction $\gamma(1 - \alpha)debt < 1$ is necessary for the stability of these multiplier processes. The solutions for the currency depreciation and the equilibrium interest rate are given by (8) and (9).

Given the stability of the process, all multipliers in (7) - (9) are positive. In the context of the maximization problem of the fiscal authority, the first multipliers on the right hand side of (7) and (8) are of particular importance. These multipliers quantify the trade-off between the politically beneficial primary deficit and the politically costly consequences in terms of the resulting debt increase and currency depreciation. Therefore, it is worth looking at how changes in structural parameters affect these multipliers.

The sensitivity of the default risk premium to the change in the debt level as measured by γ has an unequivocal impact: The higher γ , the stronger will the change in the debt level and the depreciation of the home currency react to the primary deficit. The same relationship is true for $debt$. The higher the initial debt burden, the faster debt growth and depreciation due to a given primary deficit.

The impact of a variation of α - the share of the secondary deficit that is financed through monetary expansion - is also unequivocal in relation to the debt effect of a primary deficit. The higher this share, the lower the debt increase for a given primary deficit. However, there is an ambiguous impact of central bank independence as defined by α on the equilibrium relation between the primary deficit and the exchange rate change. Only if $\gamma debt < 1$, a higher α leads to a higher rate of depreciation for a given primary deficit. For realistic

values of the variables this condition is fulfilled as can be demonstrated in the following way: With a high debt-income-ratio for example of 1, a γ smaller 1 would fulfill the condition. $\gamma = 1$ means, however, that the default risk premium increases by one full percentage point for an increase of the debt-income-ratio of 1 percentage point - a sensitivity far beyond realistic values. So it is plausible to assume $\gamma_{debt} < 1$ in the further analysis.

Given this interdependence, a rational acting fiscal agent will choose the primary deficit to maximize his objective function - equation (2) - under the constraints of the system as described by the reduced form (7) - (9). The first order condition for a utility maximum is:

$$(10) \quad U_{prd} = - (U_{\Delta debt} \frac{d \Delta debt}{d prd} + U_{cd} \frac{d cd}{d prd})$$

The primary deficit is increased to a level where marginal utility of an additional Euro of spending without taxing is equal to the marginal disutility. The marginal disutility is determined by preferences and the macroeconomic system, particularly the reaction of debt and exchange rates on an increase in the primary deficit. In the specific setting of this model, (10) can be transformed to

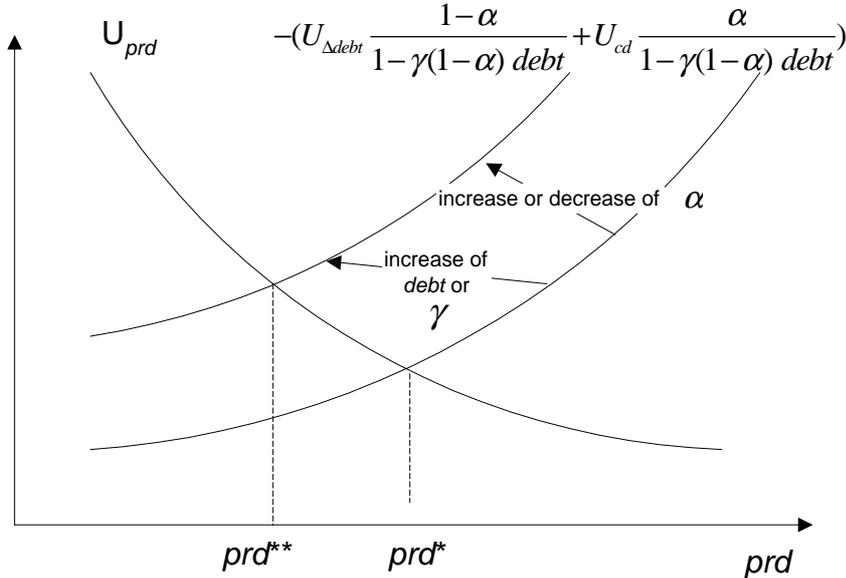
$$(10)' \quad U_{prd} = - (U_{\Delta debt} \frac{1 - \alpha}{1 - \gamma(1 - \alpha) debt} + U_{cd} \frac{\alpha}{1 - \gamma(1 - \alpha) debt}).$$

Figure 3 depicts the choice of an optimum primary deficit (prd^*) by the fiscal authority. The above discussed impact of structural parameters in the system has the following consequences for the optimum level of the primary deficit: The higher the initial debt level $debt$ and the higher γ , the higher are the marginal costs of an increase in the primary deficit and the lower is prd^* , consequently. Thus, in Figure 1, prd^{**} is c.p. associated with a higher $debt$ or a higher γ respectively than in the case of prd^* . Concerning γ , this reflects also the importance of no-bailout provisions for fiscal discipline. If there is a bailout presumption, the reaction of the default risk premium to a change of the debt level as measured by γ is small and the resulting optimum deficit is large.

The impact of an α variation on marginal costs of a primary deficit is equivocal. A high share of monetization tends to reduce the debt effect but increases the depreciation effect of a primary deficit. In Figure 3, it is therefore not clear

whether c.p. prd^* or prd^{**} is associated with a higher α . Thus the preference structure of the fiscal authority is important. If a depreciation is politically cheap relative to a debt increase (i.e. $-U_{cd}$ is low and $-U_{\Delta debt}$ is large) a rising monetization of the deficit would lead to a larger prd^* . This characteristic of the model is worth to be underlined: Limiting access to seigniorage finance can lead to lower or higher primary deficits. The outcome depends on the political sensitivity towards debt increases relative to the sensitivity toward depreciations - a result of relevance for the transition to monetary union as analyzed below.

Figure 3: Utility maximization of fiscal authority



Impact of the exchange rate regime on the optimum primary deficit

Now the impact of the exchange rate regime on the politically optimum primary deficit in this specific setting can be analyzed. Here, the exchange rate regime is of relevance for political preferences, for α and possibly also for γ .

Concerning political preferences, these will be different under different exchange rate regimes. Political sensitivity towards exchange rate changes will be higher under any fixed exchange rate system than under floating. The commitment to a fixed rate or an exchange rate target zone increases the costs of a depreciation (see also section 3). In the terminology of the model: $-U_{cd}$ under a free float is smaller than $-U_{cd}$ under any kind of exchange rate target. With a monetary union, there is no nominal exchange rate change by definition so that $-U_{cd}$ is not relevant any longer for the optimization problem.

The impact of the exchange rate regime on α , the share of monetization, is less straightforward. In regard to de jure central bank independence a move from floating to a fixed exchange rate regime as such is not relevant. This move could, however, be relevant de facto if the central bank is obliged to defend a given parity even in case of conflict with its monetary objectives. In the following it is assumed that the degree of central bank independence is not affected by going from floating to fixed exchange rates.

There is a clear interrelation between the degree of central bank independence and the introduction of monetary union. The establishment of a common currency is more than a change in the exchange rate regime because it necessarily implies a change in the monetary regime. If the domestic and the foreign country form a monetary union, there can no longer be a difference in the speed of monetary expansion between both countries (at least under the conditions of the monetary model as specified here). By the supra-nationalization of the monetary supply the single country therefore must lose its influence on seigniorage finance. In the above terminology this means that the rate of monetary expansion me is defined to be exogenous and equal for both countries and α becomes equal to zero. In this model the introduction of monetary union is identical to the establishment of perfect central bank independence.

There is a less clear relation between the parameter γ and the exchange rate regime. As motivated above, the degree of any bailout presumption is crucial for the size of γ . It is hard to see any difference in explicit or implicit bailout systems between floating or fixed exchange rates. There is also no direct impact of a monetary union on bailout systems. However, in the EMU context indirect effects feeding bailout expectations have been discussed (see for example Lane, 1993; Heinemann, 1995, Eichengreen and Wyplosz, 1998). Among the arguments is the idea that within a monetary union the negative implications of a national debt crisis in regard to the stability of the financial system spread more easily across borders than it is the case with different currencies. With this kind of negative externalities increasing, the bailout presumption is strengthened.

The impact of the exchange rate regimes on the variables of the model is summarized in Table 2. On this basis the following results concerning fiscal discipline under different exchange rate regimes can be derived.

Table 2: Impact of Exchange Rate Regimes on Preferences and Structural Parameters

	floating	fixed exchange rates	monetary union
U_{cd}	$-U_{cd}^{floating} < -U_{cd}^{fixed}$		irrelevant, because no nominal exchange rate changes
α	$\alpha^{floating} = \alpha^{fixed}$ (if fixed exchange rate system do not reduce de facto independence of central bank)		$\alpha = 0$ because of supra-nationalization of monetary policy
γ	no impact		impact if transition to monetary union feeds bailout expectation

Relative to floating, fixed exchange rates lead to a lower level of primary deficit that is optimal from the point of view of the fiscal authority - assuming that the fixing of exchanges rates does not affect central bank independence.

More interesting is the comparison between monetary union on the one hand and both other regimes (which are only different concerning U_{cd}) on the other hand. Since there is no link between the marginal political benefits of a primary deficit (left hand side of (10)') and the exchange rate regime, this comparison depends on the differences of marginal political costs (right hand side of (10)'). Monetary union provides more fiscal discipline than fixed exchange rates (which discipline more than flexible) if these marginal costs are higher, i.e. if the following relation holds:

$$(11) -U_{\Delta debt} \frac{1}{1 - \gamma debt} > - (U_{\Delta debt} \frac{1 - \alpha}{1 - \gamma(1 - \alpha) debt} + U_{cd} \frac{\alpha}{1 - \gamma(1 - \alpha) debt})$$

The marginal political costs of an increase in prd under monetary union are given on the left hand side whereas the right hand side stands for the marginal political costs under fixed exchange rates, where U_{cd} is of the specific size

corresponding to the fixed exchange rates case. $U_{\Delta debt}$ is not affected by the exchange rate regime. (11) can be transformed into the condition

$$(11)' \quad \frac{U_{\Delta debt}}{U_{cd}} > 1 - \gamma debt.$$

This condition (where $\gamma debt$ is assumed to be smaller 1, see above) for a disciplining effect of the transition to a monetary union reflects the above discussed ambiguous effect of an α variation on deficits. With monetary union, a depreciation as a punishment for primary deficits disappears. At the same time there is a higher debt increase resulting from a primary deficit because the access to seigniorage is lost for the fiscal authority. Both effects on the optimum primary deficit counteract. As a consequence, monetary union provides more discipline if political costs of a debt increase are large relative to the costs of a depreciation. The higher the debt level and γ , the more likely is a disciplining effect of monetary union.

Therefore, the differentiated conclusion from this model is: For low debt countries where a lot of attention is paid to the exchange rate, the introduction of monetary union will rather tend to weaken fiscal discipline. In contrast to that for high debt countries with a „benign neglect“ stance on the exchange rate, monetary union implies more fiscal discipline.

It must be added that these results have been derived on the basis that the central bank is not perfectly independent already before the supra-nationalization of monetary policy. If there was perfect independence before, monetary union provides fiscal discipline identical to the situation under fixed rates. It seems questionable, however, whether there can be perfect central bank independence as long as a central bank is a national institution. It is often argued, for example, that also the independence of the German Bundesbank before Maastricht was far from perfect, because the Bundesbank Law defining independence could have always been changed by a parliamentary majority in the Bundestag.

Summing up, it is possible that monetary union is associated with less fiscal discipline than fixed or even flexible exchange rates. It is important to note that this result does not require any impact of monetary union on bailout expectations. Condition (11)' was derived under the assumption of an equal bailout variable γ for all regimes. If monetary union actually feeds bailout expectations, this further increases the likelihood of the transition to monetary union weakening fiscal discipline.

5 Conclusions

The analysis of the relationship between the exchange rate regime and fiscal discipline based on the monetary approach of the exchange rate has obvious limitations. The constant real income specification excludes any output effects. Furthermore, effects that might arise through the channel of the foreign exchange risk premium are not included in the analysis: Due to the assumption of perfect substitutability of foreign and domestic currency assets (of an identical default risk), a possibly important real world dimension is not taken into account. An inclusion of a foreign exchange risk premium would probably further weaken fiscal discipline in a monetary union relative to other regimes. If there is a positive relationship between public debt and the foreign exchange risk premium element in the determination of domestic interest rate this would constitute a disciplining element that gets lost in a monetary union (see also section 2). It is also important to underline the absence of any real exchange rate effects. By the assumption of purchasing power parity changes of the real exchange rate can not occur. Apart from that perfect capital mobility is assumed. If there are restrictions to capital mobility disciplining effects will be negatively affected under all currency regimes. Finally, in the model any impact of the exchange rate regime on the intensity of tax competition is excluded.

Despite these simplifications the approach can put more precision to some aspects of the problem as it was set up in the initial very general considerations of section 3. These general considerations revealed the logical structure of any possible impact of exchange rate regimes on fiscal behavior. Such an impact could exist because the exchange rate regime is of relevance in respect of the interdependencies of the macroeconomic system, the political objective function and the government budget constraint. Behind this background, the specified model clearly underlines the importance of the link between the exchange rate regime and monetary institutions. In this model, the introduction of a monetary union is identical to the establishment of perfect central bank independence. With this interpretation it might be counterintuitive that a monetary union does not lead necessarily to more fiscal discipline. However, although perfect central bank independence might clearly be advantageous for price stability it might not always lead to lower deficits. Central bank independence implies that the fiscal authority loses any control of seigniorage. With this revenue source lost higher deficits might be the consequence.

A further insight from the model is the relevance of political preferences and their structure. If - *ceteris paribus* - for a fiscal authority there is a relative priority for avoiding depreciations it will tend to behave more disciplined

outside a monetary union whereas within a monetary union the depreciation threat has disappeared. If there is a relative priority for avoiding debt increases a fiscal authority will rather behave more disciplined within a monetary union. This is even more likely with a high debt level. Again the access to seigniorage finance is central for this result. As this access gets lost in a monetary union, a given level of primary deficit will lead to higher debt increases in a monetary union than outside of it. Because of these counteracting effects one certain type of country is rather likely to suffer from weakening fiscal discipline after the transition to monetary union: a low debt country which used to pay much attention to nominal exchange rate stability. For this country, the loss of the depreciation sanction will tend to weigh heavier than the loss of seigniorage control - with the result of higher deficits after the introduction of a common currency. The opposite is true for a high debt country which largely ignored nominal exchange rate changes. For this country monetary union is likely to foster fiscal discipline.

The model helps to clarify the interrelation between the bailout problem and fiscal discipline in a monetary union. The possibility of a weakening of fiscal discipline in a monetary union is not dependent on any bailout effect associated with the introduction of a common currency. Even with perfect credibility of a no-bailout clause such as it was written into the Maastricht treaty, the transition to monetary union could lead to higher deficits. If no-bailout provisions are not credible in a monetary union, this of course increases the likelihood of more fiscal laxity under a common currency.

The analysis furthermore reveals two channels over which a default risk premium affects fiscal behavior: Besides the well known debt channel - a higher default risk increases the growth of debt - there is an exchange rate channel: the larger the sensitivity of the default risk premium to an increase in the debt burden, the larger the depreciation that results from a primary deficit.

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Appendix

In matrix form, the system (3) - (6) can be written in the following way:

$$\begin{pmatrix} 1 & 1 & -debt \\ \gamma & 0 & -1 \\ 0 & 1 & -\alpha debt \end{pmatrix} \begin{pmatrix} \Delta debt \\ cd \\ r \end{pmatrix} = \begin{pmatrix} 1 & 0 \\ 0 & -1 \\ \alpha & 0 \end{pmatrix} \begin{pmatrix} prd \\ r^* \end{pmatrix}$$

The reduced form which supplies the equations (7) - (9) is

$$\begin{pmatrix} \Delta debt \\ cd \\ r \end{pmatrix} = \frac{\begin{pmatrix} 1-\alpha & (1-\alpha)debt \\ \alpha & \alpha debt \\ \gamma(1-\alpha) & 1 \end{pmatrix}}{1-\gamma(1-\alpha)debt} \begin{pmatrix} prd \\ r^* \end{pmatrix}$$

where $1-\gamma(1-\alpha)debt \neq 0$ is the condition for the non-singularity of the structural matrix.