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## Heterogeneous policy responses and the risk of monetary disintegration in Europe

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# **Heterogeneous Policy Responses and the Risk of Monetary Disintegration in Europe**

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January 2000

## **Abstract**

Leaving EMU would create great legal uncertainty and costly litigation and would hence involve extremely high costs for a country that has fully been euronized. Nevertheless, it is conceivable that these costs are not high enough to eliminate fully the risk of monetary disintegration in Europe. In assessing this risk, the paper distinguishes several exit scenarios, whereby particular emphasis is paid to the case where a country decides unilaterally to leave EMU either because of the lack of stabilization efforts in the rest of the union, or, in turn, due to union-wide stabilization efforts which are regarded as excessively ambitious. The empirical results suggest heterogeneous policy responses to macroeconomic strains, implying a non-trivial possibility of escalating tension among the EMU members.

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## **Table of Contents**

I. Introduction	3
II. Scenarios of Monetary Disintegration	5
III. Giving Up Policy Independence	8
IV. Examining the Degree of Differences in Policy Objectives	12
V. Empirical Results	16
VI. Legal Uncertainty, the Bond Markets and Public Finance	23
VII. Conclusion	25
References	28

## **I. Introduction**

The creation of a common currency area in Europe represents the most important change in the international monetary regime since the Bretton Woods system was established in 1944. By introducing a single currency and creating financial markets whose size will rival those of the United States, the European Monetary Union (EMU) will bring about considerable economic effects reaching far beyond the euro zone itself. For the member countries, the EMU proponents expect major efficiency gains thanks in particular to the elimination of foreign exchange risk and transfer costs. In fact, monetary unification is often seen as an integral part of a broad-based European integration without which it would be difficult, if not impossible, to reap the ultimate potential benefits of the single market. Thus, EMU is generally expected to promote economic growth in the common currency area, particularly if the introduction of a single currency turned out to be a catalyst for structural reforms.

Monetary union has been on the agenda of the European Union (EU) for a long time. While the Treaty of Rome already acknowledged that exchange rates of member countries should be regarded as a matter of “common interest”, the initial roots of EMU are generally seen in the Werner plan of 1970.<sup>1</sup> Motivated by the incipient instability of the US dollar and by fears that a disorderly revaluation of European currencies would endanger the European Economic Community (EEC), this plan described a process by which monetary union could be achieved by 1980. While in retrospect it seemed naive to think that Europe would be ready for such a milestone transition within just one decade, the plan provided the basis for renewed efforts to limit the fluctuations of the bilateral European exchange rates. These efforts, which led to various exchange rate regimes, i.e. initially the so-called *Snake* and later the European Monetary System (EMS), were repeatedly frustrated by serious disturbances in the foreign exchange markets, however. New impetus came in 1986 from the Single European Act and in early 1990 when the EU heads of government agreed to set up a committee to study monetary union. On February 7, 1992 the Maastricht Treaty was finally signed, thereby paving the way for the creation of the single currency by the start of 1999.

Given the rather mixed experience with European monetary integration over the last few decades, many observers - who had doubted that EMU would materialize in the first place - remain skeptical as to how much will actually be achieved. Arguing that the euro zone can hardly be regarded as an optimum currency area, they have pointed especially to the low degree of labor mobility and to the potential problems involving the decentralized decision-making process in the fiscal area, which could make the absorption of asymmetric

shocks more difficult in the absence of exchange rate adjustments.<sup>2</sup> Others have even gone a step further, raising doubts as to whether European monetary unification will truly prove irreversible in the longer-run. While in the short-term important risks are seen in the numerous challenges facing monetary policy – aggravated by the lack of a track record for the European Central Bank (ECB) – longer-term concern has been expressed as to whether sovereign member states will remain committed to subordinating their national economic policy objectives to the requirements of monetary union.

Whereas EMU is effectively viewed as a permanent community based on the rule of law, with the Maastricht Treaty envisaging neither the withdrawal nor the exclusion of a member state, the possibility of monetary disintegration remains at least theoretically conceivable. In this respect, two different scenarios can be distinguished, i.e., the possibility that either (i) a particular country leaves EMU; or that (ii) monetary union is dissolved altogether (as has been the case in the former Soviet Union, the former Czechoslovakia, and the Austro-Hungarian Empire). As regards the first contingency, three sub-scenarios exist, namely that individual countries decide to leave monetary union because the national authorities (a) feel that economic policies in the common currency area are just too restrictive in terms of the country's own objectives ("excessive demands hypothesis"); or (b) are frustrated by the lack of stabilization efforts in other countries ("frustration hypothesis"). In an alternative scenario (c) where the authorities persistently disregard the need for budgetary discipline, the exclusion of a particular country would appear possible from a legal standpoint.<sup>3</sup>

What are the factors which determine a country's unilateral decision to leave EMU? In the same way that the decision to join EMU has been the result of a careful assessment of the relative benefits and costs of participating in a common currency area, it can be assumed that the decision to leave EMU would be based on a similar approach. This means that for a country to stay within the currency union, the net benefits derived from continued participation in EMU must outweigh the net benefits of departure. However, joining and leaving a currency union are likely to be associated with asymmetric costs and benefits. That is, once a country has already become a member of EMU and is thus subject to the constraints a currency union brings about, the relative costs of re-introducing its own national money can be assumed to differ significantly from the perceived costs of not joining monetary union in the first place.

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<sup>1</sup> See, for example, McNamara 1998.

<sup>2</sup> Bayoumi and Eichengreen 1993.

<sup>3</sup> Herdegen 1998.

Importantly, any break-up accompanied by the re-denomination of existing euro obligations, including government bonds, would create great legal uncertainty and costly litigation.<sup>4</sup> Thus, a fully *euronized* member country contemplating leaving the common currency area would be likely to suffer from a dramatic increase in yields, an outcome which represents an important barrier to exit. However, while there is almost universal agreement that the costs of re-introducing a national money would therefore be extremely high, arguably they may not be high enough to eliminate completely the risk of monetary disintegration. Essentially, this risk will be determined by the policy objective or loss functions in the individual member countries, the main focus of this paper.

In discussing the risk of monetary disintegration on the basis of the relative costs of leaving the common currency area, this paper is structured as follows: First, it outlines the different scenarios of disintegration. Second, a simple framework is presented in order to assess the costs of giving up policy independence. Third, the test approach is discussed. Fourth, the paper examines the empirical evidence concerning financial policies in individual countries in response to macroeconomic strains. Finally, the consequences of leaving EMU are studied with respect to the bond markets and public finance.

## **II. Scenarios of Monetary Disintegration**

EMU is conceived as a permanent “irrevocable” community based on the rule of law. Withdrawal from it or the exclusion of a member state - not even in the case where a country fails to fulfill its obligations under the stability pact - is not envisaged in the Maastricht Treaty. This does not necessarily imply, however, that monetary disintegration is impossible. As a matter of fact, various scenarios are conceivable under which (i) a member country decides to leave the common currency union or (ii) is expelled from it; or (iii) the member countries mutually agree on dissolving EMU.

While initial participation in a common currency area is essentially motivated by expectations of improving on the status quo in terms of economic performance, the decision to re-introduce a national money can be assumed to result from a sufficiently extreme disappointment of such expectations. For instance, the authorities may become frustrated concerning the lack of willingness demonstrated by other member countries in pursuing a stability-oriented policy stance. Alternatively, they may find the policy stance the majority has agreed upon to be excessively restrictive in terms of their own domestic preferences. In both cases, membership in the monetary union causes welfare losses, which need to be judged against the disadvantages of exiting the monetary union.

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<sup>4</sup> Herdegen 1998; and Scott 1998.

While in the case of a consensual withdrawal of a particular member country the law would probably not stand in the way, a unilateral exit would appear to be substantially more complicated from a legal point of view.<sup>5</sup> As a matter of fact, the participating states jointly bear a common responsibility for the realization of the stability goal, and the absence of a definitive agreement with the other members would be indicative of prevailing doubts with respect to the permissibility of the withdrawal. This observation could have important implications for the re-introduction of a national currency, in the sense that the remaining member states would be entitled to deny official recognition of the new money. Courts in third countries (e.g., the United States) could decide to adopt the same attitude, and creditors of obligations denominated in euros (including government bonds) would not need to accept payment in the national currency.<sup>6</sup>

For a unilateral withdrawal to be accepted by the remaining members, there must exist circumstances so severe as to leave absolutely no room for remaining in the common currency area. One possible scenario for such an emergency departure was described by the German Federal Constitutional Court in its 1993 “Maastricht judgement”. In this judgement, the court emphasized that Germany could leave the common currency area should the goal of stability not be attained,<sup>7</sup> a “frustration” scenario which was widely criticized as potentially destabilizing the convergence process towards EMU. In practice, however, the threats of monetary disintegration raised by the judgement might actually have helped to focus the attention in the member countries on monetary stability, as evidenced by the robust momentum of economic and financial convergence in Europe over the last few years. Against this background, the March 1998 “euro decision” of the Constitutional Court took a much more conciliatory tone, suggesting that even in the event of unexpectedly severe strains, a constitutional duty to withdraw may not be seriously contemplated. Thus, attention has recently shifted from the frustration scenario to one in which a country decides to leave the currency area in order to liberate itself from the policy constraints EMU inevitably brings about.

Participation in a common currency area entails giving up two essential policy instruments, namely monetary and exchange rate policy. While the budget officially remains under the auspices of national parliaments, it is clear that EMU will be successful only if fiscal policy is also geared towards macroeconomic stability. In order to ensure this, the

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<sup>5</sup> See, for example, Scott 1998.

<sup>6</sup> Herdegen 1998, 10.

<sup>7</sup> See Entscheidungen des Bundesverfassungsgerichts (BverfGE) 89, 155 (204) = [1994] 1 CMLR 57(101).

stability and growth pact sanctions fiscal policies, which are not consistent with the overall economic policy objectives of the common currency area. These sanctions are to be waived only under exceptional circumstances, namely in the case where GDP declines by more than 2 percent (year-over-year). Thus, for a country participating in EMU there is little room for discretionary macroeconomic policies. As long as the policy objective function in a particular country is largely in line with those in the rest of the union, the lack of policy instruments does not need to cause a problem. However, if significant differences exist, EMU membership might be perceived as too costly. This may apply not only to individual countries which get frustrated by the lack of stabilization efforts in the rest of the union but also to countries which feel excessively constrained by the lack of leeway in the application of macroeconomic policies to increase demand and combat high unemployment.

Conceivably, a member country may also be expelled from EMU should it continuously refuse to “play by the rules” (i.e., to adhere to the mechanisms agreed upon in the stability and growth pact). By virtue of such violations of elementary legal obligations, the duty to tolerate a member state within monetary union as a matter of solidarity would be deprived of its very foundations. However, such an exclusion may be contemplated only if all possible mechanisms for dispute settlement have already been exhausted. This observation applies equally well to the two previous scenarios, where individual countries decide to leave the common currency area.

Finally, it is conceivable that the member states of EMU mutually agree on dissolving the currency union. Such a scenario would appear particularly likely if a sufficiently large number of countries were frustrated by the policy constraints EMU inevitably brings about and favored the re-introduction of national monies in order to re-gain a higher degree of freedom. As a matter of fact, while examples of successful monetary unions are extremely rare (e.g., Italy, San Marino, and the Vatican; France and Monaco; Switzerland and Liechtenstein; and Belgium and Luxembourg), a substantial number of attempted currency unions were eventually dissolved.<sup>8</sup> More recent examples include the end of the Austro-Hungarian Empire<sup>9</sup> and the dissolution of the former Czechoslovakia and the former Soviet Union.

There are important differences concerning the reasons for monetary disintegration in individual cases. In the case of the former Soviet Union, for example, a key reason is seen in the fact that Russia lost control over centralized monetary policy in the ruble zone, resulting in a “free rider” problem for the other former republics: each state attempted to achieve the

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<sup>8</sup> For a detailed discussion about currency unions, see Muth 1997.



“local” benefits of deficit spending, without contributing significantly to “global” inflation in the common currency area.<sup>10</sup> In this regard, there are important similarities with the collapse of the Austro-Hungarian currency union where the distribution of seignorage and inflation tax revenues also played a key role. Moreover, the re-introduction of national currencies as a national symbol of independence likely played a crucial role in some former republics, notably the Baltic states. Notwithstanding the differences regarding the causes of monetary disintegration in individual cases, however, there seems to be one common lesson to be learned from the numerous episodes, namely that monetary union is unlikely to be sustained unless it is associated with political union (“*cuius regio eius pecunia*”).

### III. Giving Up Policy Independence

While Europe still remains far away from complete political union, at a minimum the policy objectives in the individual EMU member countries need to be sufficiently similar. Otherwise, a country that gives up its macroeconomic adjustment tools could incur significant welfare losses. Differing policy objectives and the desire to regain control over policy instruments can thus be assumed to comprise the single most important factor which could destabilize EMU – both under the frustration and the excess demands scenarios. Suppose the authorities in a particular country have a policy objective function of the following form:<sup>11</sup>

$$U = \lambda (y - y_n) - \frac{1}{2} \pi^2, \text{ where } \lambda > 0 \quad (1)$$

where  $y$  represents total output,  $y_n$  is the economy’s potential rate of output, and  $\pi$  stands for the inflation rate. According to this simple function, the authorities prefer more output to less output with constant marginal utility, while inflation is assumed to generate increasing marginal disutility. Thus, inflation enters the function quadratically whereas output is included linearly. The parameter  $\lambda$  reflects the relative weight the policy makers attach to the two variables.

Alternatively, the policy objective function might be expressed as a loss function whereby the authorities’ objective is to minimize the expected disutility arising from sub-optimal levels of output and inflation. Suppose that the policy makers care about deviations of output and inflation from the desired levels in the same way. Then, assuming a loss function that is quadratic in both variables, the expected disutility takes the following form:

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<sup>9</sup> Dornbusch 1993; and Garber and Spencer 1992.

<sup>10</sup> Miller 1993.

$$V = \frac{1}{2} \lambda (y - y_n - k)^2 + \frac{1}{2} \pi^2, \text{ where } \lambda, k > 0 \quad (2)$$

To the extent that the economy suffers from structural impediments, such as labor-market distortions or monopolistic competition, potential output would be inefficiently low. Under those circumstances, higher economic growth and hence more employment could be achieved by implementing structural reforms. However, given that such policies are generally unpopular and take time before they start to work, policy makers may be tempted to use financial policies instead. Thus, rather than attempt to raise potential output, policy makers may try to push actual output above the (inefficiently low) level of potential output. Indeed, from a political perspective, economic activity beyond the potential level is quite desirable for the national authorities - with unemployment falling, the probability that the incumbent officials will achieve reelection would be likely to rise. As is well known, such a strategy would work only in the short run, however. With private agents being surprised as actual inflation exceeds the expected rate, real wages fall and firms expand employment in response. In the longer run, inflationary expectations can be assumed to adjust, however, and as a result real wages eventually return to the level consistent with labor market equilibrium. With the aggregate-supply function assumed to be of the Lucas type given by

$$y = y_n + a (\pi - \pi^e) + e \quad (3)$$

where  $\pi^e$  denotes the expected rate of inflation, the long-term Phillips curve is vertical, and there would be no long-lasting impact on the labor market.

Over the last few decades, a rapidly growing literature has focused on the question of why we observe average rates of inflation that are consistently positive despite the fact that there is no real benefit to having, say, 5 percent inflation on average as opposed to 1 percent or even 0 percent inflation. Most explanations have built on the time-inconsistency analysis of Kydland and Prescott and Calvo,<sup>12</sup> which found that while it may be socially optimal to achieve a low average inflation rate, such a policy is not consistent with the nature of agents' goals and objectives over time. Specifically, if private agents were to expect low inflation

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<sup>11</sup> Barro and Gordon 1983.

<sup>12</sup> Kydland and Prescott, 1977; and Calvo 1978.

and form their nominal wage demands accordingly, then the authorities would have an incentive to inflate at a higher rate to expand output, according to their objective function specified above. On the basis of this analysis, it has been shown that society is clearly worse off under a discretionary policy regime because it experiences a positive average inflation rate with no systematic improvement in output performance. As an alternative, restricting the flexibility of economic policies through the imposition of certain rules may result in a superior outcome with increased welfare. In discussing potential economic policy solutions to the inflation bias problem, the recent literature has concentrated primarily on issues pertaining to central bank independence, pre-commitments, reputation, and credibility.

As a matter of fact, these issues have played an instrumental role in the very creation of EMU. The ECB has been granted a maximum degree of independence, and by pre-announcing both a monetary growth target and an inflation target ( $\pi \leq 2$  percent), the institution has chosen a strategy which it perceives as conducive to establishing a good track record right from the start. For the individual member countries participation in EMU means that monetary and exchange rate policies are no longer under the control of the national authorities. Moreover, given the constraints imposed by the stability and growth pact, the degree of freedom of fiscal policy in the common currency area is also severely restricted. Thus, by subjecting themselves to the rules of the game of EMU, it has been argued that especially for countries with an imperfect reputation as “inflation fighters” the introduction of the euro could be an important way to import credibility and to thereby systematically impact inflationary expectations.

Tying one’s hands involves a non-trivial risk of escalating tension within the common currency union, however. To begin with, countries participating in EMU have no longer control over revenues from money creation in the form of seignorage and inflation tax revenues.<sup>13</sup> With the rate of inflation having declined to very low levels in the euro zone, these revenues - distributed according to the capital shares in the ECB - play a minor role with respect to a country’s overall budgetary incomes from direct and indirect taxes and other sources. However, in the pre-EMU era they represented a non-trivial part of total revenues in some countries, ranging up to almost 12 percent of total tax revenues in the case of Portugal in the first half of the 1980s.<sup>14</sup> Amounting to around 6 percent during this period, the share of revenues from money creation was somewhat less extreme in Italy and Spain but still sizeable. Since reliance on these revenues had to be reduced sharply in the wake of the disinflation process prior to EMU, it was clear that these countries had to implement

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<sup>13</sup> On revenues from money creation, see, for example, Walsh 1998.

<sup>14</sup> Drazen 1989.

offsetting budgetary measures – or else allow their debt to grow rapidly. Some observers regarded this as one of the most important challenges facing the EMU aspirants.<sup>15</sup>

As a matter of fact, the debt-to-GDP ratio increased significantly in Italy and Spain between 1992 and 1997, the Maastricht test year. In the former, it rose by about 13 percentage points to almost 122 percent of GDP; in the latter, an even more drastic increase of 21 percentage points to almost 70 percent of GDP was recorded during this period. By contrast, the debt-to-GDP ratio in Portugal remained almost constant in 1992-97, largely thanks to an aggressive privatization policy under the new government that came into power in 1995. Regaining monetary policy independence would allow the authorities to choose a policy stance, which maximizes the country's revenues from money creation and thus alleviates the need for fiscal restraint. This could be seen as an important advantage of leaving the common currency area, in particular in periods where a country is hit by an exogenous shock that results in lower fiscal revenues.

More importantly, however, as Eichengreen and Wyplosz have pointed out, strict adherence to the stability pact involves much more than just 'a minor nuisance', even under the assumption that the euro zone economies expand roughly in line with trend growth.<sup>16</sup> This observation is particularly relevant for countries with very high debt levels like Italy and Belgium. Both countries will need to maintain primary surpluses on the order of 5-6 percent for more than a decade, and not until well after the year 2010 will the authorities be permitted to relax this figure to around 3 percent. This draconian requirement appears overly ambitious. In Eichengreen's and Wyplosz's view, policy makers will compromise by eliminating deficits that egregiously violate the pact while at the same time modifying fiscal policies only enough to avoid the imposition of fines and punitive measures by other EMU participants.

This view of tension with respect to austerity requirements is based less on the long-term potential impact of fiscal restraint on economic activity than on the inherent difficulties associated with the process of adjustment. As a matter of fact, Eichengreen and Wyplosz provide some counterfactual evidence according to which the stability pact would not have had a devastating effect on the level and variability of output in the member countries had it already been in place in the past. Indeed, even in the case of Italy their simulations suggest that the output gap would not have been immensely worse if the authorities had not been awarded exceptional suspension of the pact. Nevertheless, fiscal adjustment over a prolonged period of time could prove costly, even if the stability pact were not adhered to in the strict sense. While a brief, even sharp transition may be viewed by the voters as a necessary

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<sup>15</sup> See, for example, Dornbusch 1988.

medicine, a prolonged period of economic pain may lead to the resurgence of populist tendencies and to reform fatigue.<sup>17</sup> Moreover, keeping the fiscal adjustment process on track could require all the available political capital of elected officials, and, as a result, they may have less scope in accomplishing an even more important mission: namely, reforming the labor market and the welfare system, pushing ahead with privatization, and deregulating the economy.<sup>18</sup>

However, in the absence of structural reforms the outlook for Europe's labor markets appears rather bleak. In fact, with the room for fiscal manoeuvre being restricted by the stability pact – even if it were not genuinely adhered to – the actual rate of unemployment could embark on an uptrend, as IMF simulations have suggested.<sup>19</sup> The rate of output growth might thus prove inconsistent with the authorities' policy objective/loss function, which leads us to the central question: specifically, how much disutility would be accepted before the national authorities decide to ignore the stability pact altogether and possibly even start to contemplate leaving the common currency area?

#### **IV. Examining the Degree of Differences in Policy Objectives**

One method for addressing this crucial question involves analyzing the degree of labor market disequilibrium which has triggered more expansionary demand-management policies in the individual EMU member countries in the past – a possibility which in the common currency area exists only to a very limited degree. However, rather than focusing on the absolute level of unemployment, which varies across the individual EMU nations due to the complex structural characteristics of the respective economies, it is preferable to examine the deviation of the rate of unemployment from the non-accelerating inflation rate of unemployment (NAIRU). In our view, this deviation is a better measure of the domestic economic burden imposed by excessive joblessness. When this proxy for unemployment burden is juxtaposed with measures of the fiscal policy stance, such as changes in government expenditure and the budget balance (both in terms of GDP), the estimated relationship provides a framework for comparing the differential response of the participant countries to a given level of 'macroeconomic discomfort'.

In estimating the NAIRU for individual countries over different time periods, we assume for simplicity a linear, inverse relationship between the rates of inflation and unemployment of the form

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<sup>16</sup> Eichengreen and Wyplocz 1998.

<sup>17</sup> Alesina, Perotti, and Tavares 1998.

<sup>18</sup> Alesina and Ardagna 1998.

<sup>19</sup> International Monetary Fund 1997.

$$\Delta\pi = \beta(u - u^*) + \gamma\Delta\pi^e; \beta \leq 0, \gamma \geq 0 \quad (4)$$

where  $u$  represents the rate of unemployment and  $u^*$  is the NAIRU. In addition, following Gordon, we include several lags of the right-hand side variables in the inflation equation to allow for varying effects at multiple horizons.<sup>20</sup> Thus, the deviation of unemployment from its natural rate is allowed to feed through into higher inflation on time frames ranging from contemporaneous impacts to longer-term effects delayed several quarters. From an economic perspective, it seems important to take these lagged influences into account. A decline in unemployment can take time to exert pressure on consumer price inflation, as a tightening in labor market conditions gradually causes businesses to mark up prices in response to increased factor costs. Furthermore, upward pressure on salaries could require time to manifest itself due to the existence of wage contracts at fixed intervals. Thus, the change in inflation at time  $t$  is related to our proxy for labor market tightness and forecasted inflation increment as follows:

$$\Delta\pi_t = \beta(L)(u_t - u_t^*) + \gamma\Delta\pi_t^e + \varepsilon_t; \varepsilon_t \geq 0 \quad (5)$$

where  $\beta(L)$  represents a polynomial in the lag operator  $L$ . While the estimates of the coefficients on contemporaneous and lagged measures of the unemployment strain should be negative for the most part, given the assumption that increased labor market tightness generally feeds through into escalating inflationary pressures, it should not be surprising if some elements of  $\beta(L)$  are actually positive. This might occur, for example, if a macroeconomic shock tends to both increase the overall price level and to weigh on the prospects for economic growth and employment at the same time. The oil price shocks represent the most obvious candidate in this regard. Based on the assumed trade-off between unemployment and inflationary pressures embodied in equation (4), we proceed to describe the econometric approach taken to calculate the evolution of the NAIRU over time and to compare fiscal policy responses to changing unemployment burdens, and then present the empirical results and their implications.

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<sup>20</sup> Gordon 1997.

For each EMU nation considered, the estimated relationship between fiscal policy and the domestic unemployment burden (defined as the deviation of unemployment from its natural rate) are investigated using standard techniques. The calculation of the NAIRU relies on a method for forecasting the changes in inflation. We choose a particularly convenient framework in which inflation is predicted using an autoregression with lags extending four quarters back. An important advantage of such a framework is that it takes into account the fact that the time series characteristics may display both trending behavior and negative serial correlation, which in general depend on the horizon of interest. Since a priori it is not clear how each of the unique inflation processes behaves statistically in terms of its temporal dependence, this general approach provided by the multi-lag autoregressive procedure seems desirable.<sup>21</sup> The inflation forecasts are then used in equation (5), together with a model capturing the time evolution of the NAIRU, to estimate the quarterly natural rate of unemployment. Finally, the unemployment burden is calculated from this natural rate along with the current joblessness level and then compared with the annual budget deficit.

In specifying the time evolution of the NAIRU we adopt an approach similar to Gordon and Staiger et al., who assumed the NAIRU to adjust as follows:<sup>22</sup>

$$u_t^* = u_{t-1}^* + v_t, \quad \text{where } v_t \sim N(0, \sigma_v^2) \quad (6)$$

Hence the natural rate is allowed to change by a random amount each period, according to the variance of  $v_t$ . Completing the specification requires determining the appropriate value of  $\sigma_v^2$ . However, while establishing the fixed conditional variance as a free parameter in estimation might seem appealing from an econometric standpoint, such a procedure could lead to an unrealistically large degree of period-to-period volatility in the NAIRU, as this quantity will tend to absorb a high proportion of the residual variance of the relation embodied in (5). Therefore, we assign an approximate value to the permissible quarter-on-quarter variation in the NAIRU, which conforms to a reasonable economic

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<sup>21</sup> Although the methodology used here to generate inflation forecasts seems appealing both from the standpoint of an interpretation based on rational expectations and in view of its parsimonious nature, complex structural models can in general be expected to produce more accurate forecasts in certain instances. The use of an autoregression conforms well to the flavour of rational expectations - agents are assumed to extrapolate the major characteristics of past fluctuations into the future and in doing so, look at how previous changes have influenced subsequent adjustments in the past. While it might be difficult to defend the notion that the typical rational agent applies intricate non-linear frameworks to predict inflation, the idea that the representative agent uses lagged values to forecast future ones appears reasonable.

<sup>22</sup> Gordon 1997; and Staiger et al. 1997.

interpretation of this important parameter. That is, the natural rate of unemployment, given that it is based upon the detailed workings of the labor and goods markets in a general equilibrium, should evolve gradually over time as the determinants of this equilibrium adjust.

As technological progress, institutional reform, and major government transitions occur rather slowly, one would expect the NAIRU to move in small increments for the most part without sharp adjustments and retracements. We estimate the full model under several scenarios for the magnitude of the variance. Similar to the procedure of smoothing macroeconomic time series with suitable filters as preparation for an analysis of fundamental stochastic properties, the goal for the current situation is to roughly obtain the optimal trade-off between freedom in the evolution of the natural rate and minimization of short-term fluctuations representative of noise. The resulting smoothed quarterly estimates of the natural rate are then used in the subsequent analysis of fiscal policy response.

Defining the burden of unemployment as the deviation of the current unemployment rate from the estimated NAIRU rate facilitates a comparison across EMU nations since a given level in joblessness figures will have greater or less significance depending upon the baseline rate of the country in question. The analysis throughout focuses on the largest three nations in Euroland: Germany, France, and Italy. EMU-3 collectively accounts for almost 75 percent of total GDP, and, as a matter of fact, major economic trends across the whole of Europe tend to originate in these countries. In general, concentration on these core economies loses little in the way of overall insight into broad developments in European growth and inflation. More importantly, however, the arguments concerning unilateral exit from EMU take on a far greater importance for the EMU-3 nations. Should Germany, France, or Italy decide to depart from the currency union, the consequences would likely prove devastating. On the other hand, if Ireland were to re-introduce its own national currency for the purpose of expanding its menu of options in countering excessive inflation (a non-trivial risk, given an average annual growth rate of 9 percent in 1996-98), the risk of overall disintegration could very well remain quite low.

Two key assumptions which underpin the use of equations (5) and (6) for calculating the NAIRU are that the inflation change forecasts are both unbiased and efficient, and hence form rational expectations. It would not be surprising if, during specific periods, the inflation forecasts did not appear optimal from this perspective. We apply the AR approach as a parsimonious approximation, while recognizing that inflation is in reality a time series with a rich macroeconomic structure which has also been subject to various shocks in history. Nonetheless, if one soundly rejects either of these rational expectations hypotheses for the full



sample, then considerable doubt would arise as to the general validity of the framework employed here.

After confirmation of the consistency of the forecasts with respect to rational expectations, the methodology produces a quarterly time series of NAIRU estimates, which is then used to construct the quarterly unemployment burden. The yearly average of these figures forms the annual unemployment burden, which is compared with the fiscal deficit. Such an analysis can help answer the question of whether the countries respond uniformly to inflated joblessness in terms of fiscal policy, which could have implications for the likelihood of mutual disintegration versus individual exit.

To construct the rational-expectations based estimate of the NAIRU, appropriate forecasts for successive changes in inflation are first required. This paper uses the following specification:

$$\Delta\pi_t^e = \alpha_1\Delta\pi_{t-1} + \alpha_2\Delta\pi_{t-2} + \alpha_3\Delta\pi_{t-3} + \alpha_4\Delta\pi_{t-4} + \eta_t \quad (7)$$

The error term is assumed to be normally distributed with zero mean and constant variance,  $\sigma_\eta^2$ . Thus, one year of past inflation-increment data is used in predicting next period's movement, with the lag coefficients  $\alpha_1, \dots, \alpha_4$  calculated using OLS. To be applied in the context of equation (6), the forecasts generated by these models must satisfy the constraints imposed by the rational expectations hypothesis. In particular, these one-step ahead predictions must be both unbiased and efficient. We test the bias characteristic by regressing the forecast errors on a constant, with an insignificant parameter estimate leading to acceptance of the hypothesis of zero bias. The efficiency of the predictions are examined by performing a regression of the forecast error on a constant and the forecasts themselves, with a slope coefficient insignificantly different from zero implying efficiency.

## V. Empirical Results

The quarterly consumer price index (calculated as the quarterly average of the monthly figures) for Germany, France, and Italy was obtained for the 1960 to 1998 period from the Main Economic Indicators database of the OECD. Quarterly unemployment data for Germany was computed as the average of monthly nonseasonally adjusted figures from the German Bundesbank. Data for French unemployment was available from the last quarter of 1967 in the WEFA database - in each case, the estimate for the third month in each quarter

was taken (only last month figures were reported). For Italy, unemployment data from 1960, measured in the first month of each quarter, were obtained from the OECD.

In each case, inflation change forecasts are generated from the first quarter of 1973 (1973:1) to 1997:4, for a total of 100 quarters, or 25 years, of predictions. Since the inflation data starts in 1960:1, the initial observation on the change in inflation (percent yoy) occurs in 1961:2. Thus, the first inflation forecast uses a sample running from 1961:2 to 1972:4 (47 quarters). We calculate the ex-ante predictions by re-estimating the AR(4) model at each stage, using data up to the quarter immediately preceding the date of the forecast, while keeping the length of the rolling sample fixed. As mentioned above, since the parameters are allowed to change, the nature of the relationship between the contemporary inflation-increment and its lagged values is permitted to adapt as the process undergoes possible structural adjustments. However, excessively abrupt transitions in the nature of the process (for example, a shift in the level of volatility) can present difficulties, particularly those that occur on a time-scale well below a 12-year horizon. While using a narrower length for the rolling sample could improve the adaptability of the forecasts, it would also bring about a decay in the precision of the estimated coefficients. On the other hand, expanding the length would give the model less leeway in adjusting and would also lessen the number of computed forecasts. The paper's convention of using a window length of about 12 years allows for 100 quarterly inflation change forecasts while allowing for a reasonable pace of evolution in the coefficient values governing the process.

As discussed below, however, Italian inflation does not seem to be well-described by this framework. Yet, the deviations of the forecasts from the realizations in this instance appear to stem more from the apparent volatility persistence in this time series rather than from a poor choice of the conditional mean specification or estimation window. In fact, an augmentation of equation (7) that takes this additional structure in the error term into account leads to coefficient estimates which produce forecasts consistent with rational expectations.

**Table 1.** Rationality tests for inflation forecasts

Country	Error process	Test type	t-ratio
Germany	Const. Var.	Bias	-0.187
Germany	Const. Var.	Efficiency	-1.469
France	Const. Var.	Bias	-0.097
France	Const. Var.	Efficiency	0.374
Italy	Const. Var.	Bias	-0.734
Italy	Const. Var.	Efficiency	-2.371*
Italy	GARCH	Bias	0.206
Italy	GARCH	Efficiency	-1.401

Note: In the above table, the error process refers to the assumed specification for the residual in equation (7). This term was either assumed to have constant variance, or alternatively, to follow a GARCH(1,1) parametrization. Quarterly one-step ahead forecasts for successive changes in inflation were produced from (7) starting in 1973:1 and ending in 1997:4, for a total of 100 periods, with the rolling sample length kept fixed at 47 quarters. These forecasts were then examined for consistency with the rational expectations framework. The bias test involves calculating the t-ratio for a regression of the forecast error on a constant while the efficiency test statistic equals the t-ratio on the coefficient in a regression of the forecast error on a constant and the forecast. The t-ratios were calculated using Newey-West HAC standard errors to correct for potential temporal dependence in the residual processes of these relations. The symbol \* denotes significance at the 5% level.

Table 1 shows the results of these tests for the full sample for Germany, France, and Italy. The insignificant t-statistics indicate the acceptance of the null hypothesis of rational expectations for German and French inflation forecasts. In contrast, the forecasts for Italian inflation appear inefficient, with the t-statistic in the second test significant at the 5% level. Hence, it seems that either the conditional mean specification, involving a simple autoregression, or the assumption of a constant Gaussian conditional variance is violated. As it turns out, the simplistic structure assumed for the error process in (7), which appears adequate for French and German inflation forecasts, represents a rather poor fit for Italian data.

As a matter of fact, inflation in Italy has undergone marked changes in the behaviour of volatility, a finding, which leads one to suspect that the conditional variance has changed through time. Yet equation (7) assumed that the error term was normally distributed with constant variance. Rational forecasts for German and French inflation are generated by (5) under the assumption of a constant variance error term, connected with the apparent lack of serial correlation in successive squared errors.

Indeed, estimation of the inflation forecast equation (7) with French inflation data produces residuals whose squares have insignificant autocorrelations at every one of the first 12 lags. For German data, only the fourth and fifth sample autocorrelations out of the first 12 lie near the boundary of significance (5% level). All other estimates do not differ significantly from zero. Since Italian inflation increments, on the other hand, exhibit volatility clustering, they are not well-described by the normal distribution with fixed variance. Several highly significant low-order sample autocorrelations provide statistical evidence for this observation. It follows that estimating the coefficients of (7) based on this assumption with the OLS procedure can result in inefficient figures, since the model (in particular, the residual process) would be misspecified in this case. The one-step ahead forecasts generated by repeated application of this framework would then clearly be sub-optimal. In light of these observations, it is not surprising that using (4) with Italian inflation data produced inefficient predictions.

Motivated by the success of ARCH-class models in capturing volatility persistence in a wide range of economic and financial time series, we augment (7) by allowing the error term to follow a GARCH(1,1) process. Hence,  $\eta_t$  evolves according to:

$$\eta_t \sim N(0, \varphi_t) \quad (8)$$

$$\varphi_t = \lambda + \kappa \eta_{t-1}^2 + \xi \varphi_{t-1} \quad (9)$$

Thus, the conditional variance of the inflation change prediction,  $\varphi_t$ , is updated each period depending on the previous squared residual,  $\eta_{t-1}^2$ , as well as last period's forecast variance,  $\varphi_{t-1}$ . The pioneering work by Engle involved the application of a similar model (the ARCH(q) process) to UK inflation while Bollerslev generalized this specification to include lagged conditional variance terms as well.<sup>23</sup> Researchers have found the parsimonious GARCH(1,1) version to suffice for many important macroeconomic time series.

The results of the rationality tests for this more general specification are displayed at the end of table 1. The augmented model provides a substantial improvement, with the forecasts now appearing both unbiased and efficient. We thus adopt the GARCH(1,1) specification for the error term in the case of Italy and retain the constant variance assumption

for Germany and France. In this way, we obtain rational predictions for changes in inflation within a relatively simple framework.

Given this general verification of our parsimonious inflation forecasting methodology, we then proceed to estimate the quarterly evolution of the NAIRU, based on equation (5) coupled with equation (6) which governs the movement in the NAIRU. This approach is analogous to the one used in Gordon and Staiger et al. and represents a special case of the time-varying parameter model, as described by Hamilton.<sup>24</sup> In addition, following Gordon, we include several lags of the unemployment burden. In particular, one year of lagged values were found appropriate for Germany, while data for France and Italy displayed a more complex inter-relationship which warranted the use of 2 years of lags. Estimation of this specification is achieved by maximizing the log-likelihood function, a procedure facilitated by applying the Kalman filter.

Both the variance of quarterly changes in the NAIRU,  $\sigma$ , as well as prior assumptions for the initial natural rate, must be specified to permit estimation of the complete model. Although selection of the former quantity can be quite influential for the ultimate implications regarding the NAIRU time series, affecting as it does the overall smoothness of the estimates, the particular choices for the mean and variance of the starting natural rate have less of an impact. The results, in terms of the qualitative behaviour of the NAIRU over time (that is, is it rising steadily, remaining flat, or exhibiting volatility?) and the estimated values toward the latter part of the sample were found to be relatively insensitive. For the current study, natural rates over the last 20 years (1979:1 to 1998:4) were estimated, and the mean of the initial NAIRU (in 1978:4) was taken to be the quarterly average unemployment rate for 1977-8, with an assumed variance of 0.5.

While in the case of Italy the assumption of a 0.3 standard deviation led to undesirable sharp reversals in the natural rate, which are implausible from an economic standpoint, the use of 0.1 implied an almost perfect upward trend. Since it seems appropriate to allow for a limited degree of back-and-forth variation in the natural rate from year to year as supply shocks arise and dissipate and other structural conditions evolve imperfectly, we opted for a standard deviation of 0.2. The selections for Germany and France were made on a similar basis, resulting in a standard deviations of 0.4 and 0.3, respectively.

The analysis proceeds by investigating the fiscal policy response to the unemployment burden, calculated as the deviation of quarterly unemployment from the

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<sup>23</sup> Engle 1982; and Bollerslev 1987.

estimated natural rate. These quarterly 'macroeconomic strain' figures were aggregated into yearly ones. Although the use of data at the quarterly level would provide more observations, and hence endow our results with greater statistical significance, this does not seem appropriate in the current context involving government spending figures. State budgets are typically planned on an annual basis, usually as part of a longer-term fiscal policy framework, and quarter-to-quarter fluctuations in expenditures within a given year are likely to stem primarily from seasonal effects and other special factors possessing limited economic significance.

The annual estimates for net lending and real GDP (in domestic currency) for the EMU-3 nations were taken from OECD statistics. The percentage deficit was then calculated by dividing net lending by real GDP. The analysis focuses on the relationship between the deficit and the adjustment in the unemployment burden, given as the first difference. The changes in the macroeconomic strain measure are used both for econometric and intuitive rationales. First, levels of the unemployment burden appeared nonstationary in many cases, implying that interpreting the coefficient of this variable in a basic regression set-up could be problematic.<sup>25</sup> More importantly, it seems likely that the movements in the strain proxy would prove particularly crucial for budgetary allocation decisions based on political motivations. Flat joblessness figures are much less likely to make media headlines than are rapidly advancing numbers. Along these lines, political pressure on the establishment to expand government spending programs will typically intensify during times of worsening macroeconomic conditions. As long as a reasonable status quo is maintained, public demands for remedying the situation often tend to be limited. This is clearly not the case for regimes on a downward trend. In addition, during times of economic improvement with falling unemployment burdens, governments generally have more leeway in constraining fiscal policy. As discussed below, however, adjustments to macroeconomic strain do not appear to impact the deficit in the same way for each EMU-3 nation, with evidence for Italy rather weak.

For each EMU-3 country, the deficit level was regressed on the current unemployment burden adjustment as well as one lag of the adjustment. The results are summarized in table 2.

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<sup>24</sup> Gordon 1997; Staiger et. Al. 1997; and Hamilton 1994.

**Table 2.** Estimation of fiscal policy response

Nation	Variable	Coefficient	T-ratio
Germany	Current	0.004938	3.407216*
Germany	1 <sup>st</sup> lag	-0.000178	-0.183062
France	Current	0.000679	0.187158
France	1 <sup>st</sup> lag	0.0089	3.094744*
Italy	Current	0.002771	0.311944
Italy	1 <sup>st</sup> lag	0.001585	0.674501

Note: For each of the 3 country regressions, the fiscal deficit, measured as net lending's percentage of real GDP, serves as the dependent variable while a constant and the current and lagged burden adjustment are used as independent variables. The burden adjustment is defined as the change in the unemployment burden, given as the unemployment rate minus the estimated NAIRU. Annual data for a twenty year sample, 1979-1998, were used. The t-ratios were calculated using Newey-West HAC standard errors to correct for potential temporal dependence in the residual processes of these relations. The symbol \* denotes significance at the 5% level.

For Germany, the t-ratio for the current adjustment is significant, but the lagged regressor is not, suggesting that the fiscal policy response to rising and falling levels of macroeconomic tension occurs within a short time span, while delayed measures are limited. For France, however, the opposite case holds - the t-ratio for the lagged adjustment responses to changing macroeconomic burdens differs is significant while contemporaneous effects do not appear so, implying a later fiscal policy response on average. For Italy, neither coefficient exceeds the 5% confidence band, suggesting that government expenditures are not influenced to a large extent by changing labor market conditions, at least at relatively short horizons within a few years.

While it is clear that many factors, particularly political motivations, remain absent from this simple framework and that the limited number of observations preclude a more detailed causality analysis, the results do seem to imply that fiscal policy responses to changing macroeconomic burdens differ across the EMU-3 nations. In particular, the coefficients on the current adjustment and the lagged adjustment diverged substantially across the three cases. It is unclear, however, why estimation with Italian data uncovered no definitive pattern. This finding appears indicative that the effects of political and institutional factors not considered in the analysis play an especially important role in the case of budget allocation decisions in Italy.

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<sup>25</sup> Hamilton 1994.

On the whole, the results suggest heterogeneous fiscal policy responses to macroeconomic strains. Thus, even if all EMU nations face increasing burdens of rising unemployment and stalling growth at the same time, there could be disagreement among participants as to the magnitude and timing of appropriate fiscal measures. Certainly, should an individual nation experience heightened tension, there might be limited tolerance on the part of other EMU participants regarding the extent to which fiscal constraints could be temporarily eased. The fact that nations have reacted in different ways to increasing joblessness burdens over the past couple of decades supports this concern. In general, varied policy responses by member nations poses a significant risk to monetary cohesion, whether in instances of isolated difficulties or during times of widespread economic stagnation.

## **VI. Legal Uncertainty, the Bond Markets and Public Finance**

Regaining the freedom to pursue an independent policy stance would involve enormous costs, however. In the extreme case, the remaining member states may deny recognition of the new currency, and holders of euro-denominated debt might not need to accept payment in the new national currency. But even in the less extreme case of a consensual withdrawal the costs of such a step would be substantial. Under the excessive-demands hypothesis, there would likely be a tremendous loss in confidence, and financial markets can be expected to price in a move to an more expansive and inflationary policy stance. Indeed, such a market expectation would appear rational, given the authorities' motivation to leave EMU in the first place. As a result, bond prices would fall, driving yields higher in the process.

The critical question becomes: to what extent could these adjustments take place? If historical spreads between individual EMU member countries prior to joining the currency union were to provide any guidance, a spread widening to 600 basis points or more vis-à-vis bonds issued by the remaining countries should be expected. Indeed, one does not have to look back too far to observe spreads of such a magnitude. As far as Italy is concerned, for example, Italian BTPs traded at more than 600 basis points over German Bunds in 1995 when there still existed widespread doubts whether Italy would actually join EMU at inception. Similar spreads were recorded for Portugal and Spain.

As much as these countries have benefited from the narrowing of spreads in the run-up to EMU to about 25 basis points versus German Bunds, a spread widening to previous levels would result in substantial costs for the budget. With the debt-to-GDP ratio amounting to almost 120 percent, interest payments in Italy, for example, still represent more than 7



percent of GDP. While this percentage has already come down significantly from much higher levels – interest expenditure peaked at over 12 percent in 1993 – the fact remains that Italy would need to continue to run substantial surpluses in the primary balance for a long time to adhere to the stability pact. Leaving the euro zone would free Italy from these constraints. However, to the extent that bond prices fall, interest expenditure would likely increase significantly. Given the budgetary arithmetic in Italy, *ceteris paribus* for every 100 basis point increase in yields (over the whole yield curve) the deficit-to-GDP ratio would rise by about one-seventh of a percentage point. Suppose, for example, a deficit of about 2 percent of GDP in 2000, and a further reduction to 1 percent of GDP by 2003 (which is basically in line with government projections). All else equal, an increase in yields by 600 basis points would under such assumptions propel the deficit-to-GDP ratio to more than 5 percent. However, given that under the excessive-demands hypothesis the authorities should be expected to move to a more expansive policy stance, this ratio would be likely to rise even more.

Such an increase would not prove sustainable in the longer run. As estimates by the EU Commission indicate, a significant primary surplus would need to be achieved every year, and even then it would take Italy almost two decades to meet the Maastricht criterion limiting the debt-to-GDP ratio to 60 percent. These estimates are predicated on the assumption that interest rates on government debt remain fixed at 6 percent. Any increase above this level would require an even higher primary surplus for the debt target to be met. Such optimistic expectations appear, however, unlikely. On the contrary, as argued above, the opposite might occur, with the distinct possibility that the debt-to-GDP ratio not only stagnates at the current high level but possibly even increases.

As is well known, for the fiscal deficit to be sustainable the real growth rate of the economy has to exceed the real interest rate on government debt. If this is not the case then some unpleasant monetary arithmetic may arise. As Sargent and Wallace show in a rational expectations model, where the government acts as a Stackelberg leader and the central bank is left in the position of ensuring the sustainability of an otherwise unsustainable fiscal policy, a constant primary deficit necessarily leads to higher inflation.<sup>26</sup> Under certain conditions, including those pertaining to the interest rate elasticity of demand for money, inflation may even result from a contractionary monetary policy.

However, a return to pre-EMU yield levels appears to be an overly optimistic assumption, at least for the short and medium term. Temporarily at least, yield spreads might

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<sup>26</sup> Sargent and Wallace (1981).

widen substantially more, and given the enormous uncertainties associated with a country's exit, in particular with respect to the tradability and market liquidity of instruments, the demand for government debt might even prove completely inelastic. Under such circumstances, countries with a high debt burden would incur tremendous costs, which would render their fiscal positions unsustainable virtually immediately. With government borrowing drying up instantaneously, deficit financing has to come from the central bank – unless of course the authorities achieve a balanced budget through tax increases and spending cuts. However, this raises the question why the authorities decided to leave EMU in the first place.

Under the frustration scenario, where stabilization efforts in the EMU area are perceived to be insufficient, the situation would be different. Leaving EMU would enable the authorities of a particular country to pursue a tighter policy stance aimed at reducing inflation. Notwithstanding similar uncertainties as regards the introduction of a national currency, it would be conceivable that nominal interest rates actually decline, with positive implications for the budget. Re-introducing a national money could, however, have important implications for the rest of the common currency area, depending on the economic significance on the particular country. If the country accounted for a relatively small fraction of Euroland economic activity, the rest of the union would probably survive. If, however, the country was either Germany or France, for example, this could have serious implications, including the dissolution of EMU altogether.

## **VII. Conclusions**

In investigating the risk of monetary disintegration, this paper started from the notion that for a country to remain in the common currency area the benefits of participation must be at least as high as the benefits of re-introducing a national money. Various possible scenarios were distinguished, namely the cases where (i) a member country is frustrated by the lack of stabilization efforts in the rest of the union; (ii) a country finds the group stabilization efforts excessively ambitious; (iii) the rest of the union expels a particular country; and (iv) the member countries mutually agree on dissolving the union. Focusing on the first two scenarios, the paper then presented a simple framework in order to examine the costs of giving up policy independence. The empirical results indeed suggested heterogeneous policy responses to macroeconomic strains, implying a non-trivial possibility of escalating tension within the common currency union.

While the probability of monetary disintegration in Europe thus appears to be different from zero, the risk that EMU actually falls apart is in our view very small. Leaving EMU would involve tremendous costs, given that any break-up accompanied by the re-

denomination of existing euro obligations, including government bonds, would create great legal uncertainty and costly litigation. Indeed, as the paper emphasized, re-introducing a national currency should be considered as switching to an entirely new regime and should not be confused with a mere reversal of a country's preceding decision to join EMU. Only under extraordinary circumstances, which would likely entail political disintegration in Europe, does it therefore become conceivable that individual countries decide to leave EMU.

This paper focused only on a limited number of factors influencing a country's decision to remain in the common currency area or to exit. Other determinants would need to be taken into account, such as the future exchange rate policy, the impact on foreign trade under alternative regimes, or the potential benefits EMU might bring about for member countries in terms of efficiency gains and economic growth. Moreover, a complete cost-benefit analysis would need to incorporate the possibility that member countries decide to compensate other countries for welfare losses arising from the violation of their policy objective functions. Conceivably, such an analysis could be pursued in a game-theoretical framework.

Finally, the paper did not consider the case where financial instability forces EMU to fall apart. Such a risk could, in principle, result from two factors, namely a speculative attack and a systemic banking crisis. As regards the former, a hypothetical case has been construed by Garber, emphasizing some important institutional weaknesses in Stage III.<sup>27</sup> A key problem results from the lack of clarity as to whether the national currency notes and euro notes issued by individual national central – and the reserves held by credit institutions in member states on accounts with the national central banks – are the legal liability of the ECB rather than the national monetary authorities. However, as Buiter and Sibert convincingly argue, a speculative attack can not succeed unless a country actually wishes to leave the common currency area, the central issue of our study.<sup>28</sup>

The risk of a systemic banking crisis might be a more serious omission. Indeed, as the IMF warned in its 1998 International Capital Markets Report,<sup>29</sup> a number of different sources of systemic risk may pose important challenges to the smooth functioning of financial markets. To begin with, TARGET might face competition for providing payments settlement services from other real-time gross settlement payments systems and private netting schemes. While these systems need to satisfy minimum standards for the design and operation of cross-

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<sup>27</sup> See Garber 1998; for a broader discussion about whether speculative attacks are conceivable in a monetary union, see also Dooley 1998.

<sup>28</sup> Buiter and Sibert 1998.

<sup>29</sup> IMF 1998.

border and multicurrency netting and settlement schemes for clearing houses (the “Lamfalussy standards”), to the extent that they continue to be used, TARGET will not yield the expected reductions in systemic risk. Moreover, as new pan-European markets emerge, cross-border unsecured interbank lending may be expected to increase, resulting in higher risk of international contagion and EMU-wide crises as opposed to national ones. Finally, by fostering competition, the euro is likely to accelerate the restructuring of European banking systems in an environment in which it may be difficult to close banks and to reduce costs through downsizing. Inefficient and unprofitable institutions may thus continue to operate, engaging in increasingly risky activities.

Coping with these systemic risks requires an adequate institutional framework for banking supervision. However, as some argue such a system is sorely missing.<sup>30</sup> Essentially, the task of prudential supervision remains in the hands of the national authorities – in some cases the national central bank, and in others, the ministry of finance or a separate institution. However, there is no institutional mechanism in place through which the ECB receives supervisory information on a systematic basis. Moreover, it remains unclear how a banking crisis would actually be handled under the existing institutional framework. While it has been suggested by some European authorities that a general agreement has been reached by all EU supervisors through memoranda of understanding about how to deal with cross-border crises, there remains much uncertainty as regards the lender of last resort function of the ECB or the national central banks. In the absence of a lender of last resort, however, no secure mechanism exists for creating liquidity in the event of a crisis.

Thus, EMU does not seem properly equipped with an efficient and transparent system for solving bank crises, whose probability could actually increase in the wake of continued financial market integration. There appears to be a non-trivial risk, therefore, that monetary disintegration could result not only from a deliberate decision of EMU’s member countries - the focus of this study - but also from financial instability. However, assessing this risk is left for future research.

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<sup>30</sup> See, for example, Begg et al. 1998.

## References

Alesina, Alberto, R. Perotti, and J. Tavares. 1998. The Political Economy of Fiscal Adjustments. *Brookings Papers on Economic Activity* 1: 197-266.

Alesina, Alberto, and S. Ardagna. 1998. Tales of Fiscal Adjustment. *Economic Policy* 27: 489-517.

Barro, Robert J., and D.B. Gordon. 1993. Rules, Discretion, and Reputation in a Model of Monetary Policy. *Journal of Monetary Economics* 12: 101-121.

Bayoumi, Tayoumi A., and Barry Eichengreen. 1993. Shocking Aspects of European Monetary Unification. In *Adjustment and Growth in the European Monetary Union*, edited by F. Torres and F. Giavazzi. Cambridge: Cambridge University Press.

Begg, David, Paul de Grauwe, Francesco Giavazzi, Harald Uhlig, and Charles Wyplocz. 1998. *The ECB: Safe at Any Speed?* London: Centre for Economic Policy Research.

Bollerslev, Tim. 1987. Generalized Autoregressive Conditional Heteroskedasticity. *Journal of Econometrics* 31: 307-27.

Buiter, Willem H., and Anne C. Sibert. 1998. Transition Issues for the European Monetary Union. Working Paper 6292, National Bureau of Economic Research. Cambridge, MA.

Calvo, Guillermo A. 1978. On the Time Consistency of Optimal Policy in a Monetary Economy. *Econometrica* 46: 1411 – 1428.

Dooley, Michael. 1998. Speculative Attacks on a Monetary Union? *International Journal of Finance and Economics* 3: 21-26.

Dornbusch, Rudiger. 1988. The EMS, the Dollar and the Yen. In *The European Monetary System*, edited by F. Giavazzi, S. Micossi, and M. Miller, 23-41. Cambridge: Cambridge University Press.

Dornbusch, Rudiger. 1993. Monetary Problems of Post-Communism: Lessons from the End of the Austro-Hungarian Empire. In *Stabilization, Debt and Reform. Policy Analysis for Developing Countries*, edited by Rudiger Dornbusch, 142-170. Englewood Cliffs.

Drazen, Allan. 1989. Monetary Policy, Capital Controls and Seignorage in an Open Economy. In *A European Central Bank. Perspectives on Monetary Unification after Ten Years of the EMS*, edited by Marcello de Cecco and Alberto Giovannini, 13-32. Cambridge: Cambridge University Press.

Eichengreen, Barry, and Charles Wyplosz. 1998. The Stability Pact: More Than a Minor Nuisance? *Economic Policy* 26: 65-104.

Engle, Robert F. 1982. Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica* 50: 987-1006.

Garber, Peter. 1998. Notes on the Role of TARGET in a Stage III Crisis. Working Paper 6619, National Bureau of Economic Research. Cambridge, MA.

Garber, Peter, and Michael Spencer. 1992. The Dissolution of the Austro-Hungarian Empire: Lessons for Currency Reform. Working Paper WP/92/66, International Monetary Fund. Washington, D.C.

Gordon, Robert J. 1997. The Time-Varying NAIRU and Its Implications for Economic Policy. *Journal of Economic Perspectives* 11: 33-49.

Hamilton, James, 1994. *Time Series Analysis*. Princeton: Princeton University Press.

Herdegen, Martin. 1998. Monetary Union as a Permanent Community Based on the Rule of Law. EMU Watch 52, Deutsche Bank Research. Frankfurt.

International Monetary Fund. 1997. *World Economic Outlook*. Washington, D.C.: International Monetary Fund.

International Monetary Fund. 1998. *International Capital Markets. Developments, Prospects, and Key Policy Issues*. Washington, D.C.: International Monetary Fund.

Kydland, F.E., and E.C. Prescott, E.C. 1977. Rules Rather Discretion: The Inconsistency of Optimal Plans. *Journal of Political Economy* 85: 473-491.

McNamara, Kathleen R. 1998. *The Currency of Ideas. Monetary Politics in the European Union*. Ithaca and London: Cornell University Press.

Miller, Marcus H. 1993. The Break-up of the Ruble Zone and Prospects for a New Ukrainian Currency: A Monetary Analysis. In *The Economics of New Currencies*. Paper presented at a Conference Organized by the Centre For Economic Policy Research and Hosted by the Landeszentralbank in Hessen, in Frankfurt am Main on 28/29 June.

Muth, C. 1997. *Währungsdesintegration – Das Ende von Währungsunionen*. Heidelberg: Physica-Verlag.

Sargent, Thomas, and Neil Wallace. 1981. Some Unpleasant Monetarist Arithmetic. *Federal Reserve Bank of Minneapolis Quarterly Review* 5: 1-17.

Scott, Hal S. 1998. When the Euro Falls Apart. *International Finance* 1: 207-228.

Staiger, D., J. Stock, and M. Watson. 1997. The NAIRU, Unemployment, and Monetary Policy. *The Journal of Economic Perspectives* 11: 33-49.

Walsh, Carl E., 1998. *Monetary Theory and Policy*. Cambridge, MA: MIT Press.

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