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The EMU's Exchange Rate Policy

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Contents

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Together with other members of the European Union, France and Germany are about to embark on an unprecedented cooperative venture. To be successful, Economic and Monetary Union will require a very high degree of mutual understanding among the policymakers of the participating countries. It will also require upgrading the dialogue between those who contribute to shaping the policy debates on both sides of the Rhine.

France and Germany have a long tradition of high-level dialogue and cooperation in the framework of bilateral and European institutions. But the dialogue between their civil societies does not match this spirit of cooperation. Economists and those involved in practical economic policy makink from both countries in particular rarely talk to each other to find out why they may have differing visions of the functioning of Economic and Monetary Union and of the associated challenges, and even more rarely try to narrow the divergence of their views. This lack of dialogue contributes to keeping alive entrenched prejudices on the other country`s supposedly hidden policy agenda.

Yet, an Economic and Monetary Union in which policy debates with a bearing on European policy choices remain confined within national boundaries would be prone to instability, because disagreements about policies would tend to end up in disputes between countries. It is, therefore, of utmost importance to foster the emergence of a genuine *European* professional discussion on major economic policy issues.

The purpose of the *Deutsch-Französisches Wirtschaftspolitisches Forum/ Forum économique franco-allemand* is to contribute to this discussion through the organisation of a series of informal meetings between French and German economists.

The Forum assembles professional economists from academia, business and the public sector. As a non-partisan institution, the Forum brings together participants from all strands of thinking about economic policy with the aim of stimulating fruitful debate. Each meeting is devoted to one or two major policy issues: employment, exchange rate policies, the organisation of economic policy in Economic and Monetary Union, its relations with non-participating countries, and the immediate policy challenges on the eve of monetary union, to name just a few. The Forum commissions papers to provide an informed basis for the discussion, but the focus will be on debate and the exchange of views, starting with reactions from discussants whose role will be to present alternative views and to frame the key issues for the debate.

The proceedings of each meeting are published in working paper format. With the present brochure, we present the opening address delivered by State Secretary Bünger together with papers and a summary of the discussion from the Forum's second meeting on 12-13 January 1998. We hope that this will be a useful input into an emerging public debate on Europe's economic policies in our two countries and beyond.

Jürgen von Hagen
Jean Pisani-Ferry

Opening Address

Klaus Bünger
State Secretary, Federal Ministry of Economics

Ladies and Gentlemen,

recently, a leading European central banker consulted the oracle at Delphi on the question which currency would be harder and more stable, the euro or the D-mark. He was given the notoriously unhelpful answer „The euro not the mark“, what can either mean „The euro not, the mark !“ or „The euro, not the mark“ depending on where you put the comma.

Well, so far for the bad news. The good news is that you don't have to travel to Delphi to learn the oracle's reply to the question which currency will be more important as an international currency in the 21st century, the euro or the dollar. You may well have guessed already, the answer most certainly would be „The euro not the dollar“.

Again, I would not expect any group of experts to come up with a definite conclusion on where the comma should be set. But I do think it is quite an achievement that the question is being discussed at all. Remember that not very long ago EMU was hardly taken seriously in the United States and other parts of the world, but was perceived to be an ambitious but unrealistic project that would never fly - just like an emu, the large Australian bird carrying - quite inappropriately - the same name. Today, the situation has changed remarkably. Not very long ago, Larry Summers, the US deputy secretary of the Treasury, pointed out in an article for the Financial Times that the single European currency - close to becoming a reality - was now attracting serious attention in the US and that particularly for two reasons:

First, because of its effects on prosperity in Europe and on transatlantic economic relations and *secondly*, because of its impact on the international financial system as a whole - or, putting it more bluntly - because of the potential role of the euro as a rival of the dollar.

Obviously, both aspects are closely interrelated. That is why I think that the international role of the euro can hardly be discussed meaningfully without taking recourse to the matter of domestic economic policies and reform. At least in the medium and long term, the strength of a currency is closely related to the strength of the underlying real economy.

What I would like to propose is that on the one hand, European countries have to proceed further with structural reforms to give their economies the flexibility and resilience they need to be able to cope with the challenges of EMU. On the other hand, however, I would expect that it will become easier to implement such reforms in countries which are sharing a common currency. My optimism is based on the fact that EMU will be adding to competition on all levels in Europe. On the level of individual companies, new opportunities will arise to do business and to adjust to different regulatory

environments. This in turn will intensify competition between regions and participating countries to provide attractive investment conditions.

In my view it will be decisive for the long-term success of EMU that such competition is allowed to work. In the European Union we have to be fully aware that the benefits of a denationalized money can only materialize if markets are sufficiently capable to adjust to changing circumstances. In their recent resolution on economic policy coordination the European Council has - for very good reasons - corroborated the principle of subsidiarity and competition in economic policy. This, however, does not preclude closer coordination of policies in Europe. On the contrary, policy makers need to have a clear picture of what is going on elsewhere in the Community and, furthermore, they have to learn from each other's failures and successes. For that purpose, we have to make maximum use of existing instruments of coordination, i.e. the broad guidelines and multilateral surveillance in particular. What really must be avoided is both harmonization where it is not really necessary and confusion about who is responsible for what in economic policy making.

Under the circumstances outlined above, I have no doubt that the euro will not only work for Europe in terms of the real economy, but that its introduction will also mark one of the most important changes the international monetary system has undergone for a long time. Yet, serious discussion about the implications of this development has begun only recently. For the time being, there seem to be more questions than answers. E.g., will the euro become a serious rival of the US-dollar and, hence, one of the two poles of a bipolar international monetary system ?

Fred Bergsten's best guess seems to be that the dollar would be reduced to about 40 percent of the global portfolio, that the euro would catch about 40 percent as well and other currencies such as the yen the remainder. He expects that, globally, the shift in official and private holdings of financial assets could amount to up to one trillion US-dollars in favour of the euro. That might lead to a considerable appreciation of the euro vis-a-vis the dollar.

On the other hand, supply of new euro-denominated financial instruments may easily keep pace with demand, in particular as intra-EMU official reserves have been netted out. But even if the euro were to assume an important international role, would it be a swift process or a gradual one ? Where the almost exclusive use of one currency adds to the efficiency of the respective market, it may not be easy for a new currency to make an inroad. What can we expect to happen during the crucial first couple of months and years of the new currency ? Much will depend on whether the transition will be a smooth ride. I would not expect any serious speculative attacks on individual currencies at this stage and, a fortiori, once the decisions in May have been taken. This does not mean, of course, that European countries in general, will be totally immune to the repercussions of the Asian financial crisis. But we should resist the temptation to join up with the Cassandras of our time. Cassandra, as you know, was always right. Either her predictions became true or, if not, she could claim that her warnings had prevented them from materializing. Today, a final verdict is simply not yet possible and we have to be cautious and prudent in our judgement.

If we concentrate on facts and figures known to us today, it can be expected that economic activity in Europe will be affected marginally, but that neither the candidates for EMU seem to be particularly vulnerable - nor the United States for that matter. Japan, on the other hand, with its economic weight, seems to be playing a key role when it comes to the question of whether the Asian crisis will spill over and have disruptive effects internationally. No doubt, the situation is to be taken very seriously. To what extent any such crisis is going to affect us, however, is also in our own hands. We have to keep our own house in order, to increase the capability of risk absortion and particulary to refrain from defensive and protectionist measures, as this would only make matters even worse. Our economic policy agents have to be fully aware of the fact that just as the affected countries in Asia have to adjust their economies, we ourselves have to adjust to increased competition in international markets. Whether transition to EMU will be smooth or not, I think, will not so much depend on the Asian crisis, however, but more on markets' perception of the European Central Bank's independence. Denationalized money is simply not credible without a denationalized guardian institution. Therefore, in the common interest, any step must be avoided that could convey the message to the markets that the ECB is susceptible to national influence and not primarily devoted to maintaining stable prices.

Other issues are real exchange rates and exchange rate volatility. Will a bipolar system be more or less prone to overshooting exchange rates compared to the present system and is there a danger of prolonged periods of misalignment ?

Some experts would argue that speculative movements of capital will - ceteris paribus - have less effect on exchange rates given the larger volume and greater depth of the future euro-denominated financial market. On the other hand it is being argued that the ECB will be even less concerned by the exchange rate than the Bundesbank for the simple reason that in EMU the ratio of foreign trade transactions to GDP will be considerably lower. Well, exchange rates between prospective EMU-currencies have been quite stable recently and, therefore, in that respect the ECB might not find itself in a situation completely different to the one of the Bundesbank at present. But anyway, is a policy of „benign neglect“ to be deplored ?

First, I think that the advocates of this line of thought must be very confident indeed that a central bank were capable of managing the exchange rate aginst market forces. And secondly, I wonder how that central bank would be able to do that and to maintain price stability at the same time.

Sir Nigel Wicks has made it perfectly clear in a recent statement to the European Parliament's monetary committee that maintaining price stability and an expectation of price stability is the best contribution monetary policy can make to fight unemployment. I have been glad to see, therefore, that the European Council in Luxemburg decided to abstain from formulating general orientations for exchange rate policy except under extraordinary circumstances. In my view, it was really essential for the success of EMU that politics could be kept out of monetary policy in this respect as well. Finally, it has also been suggested that, once EMU will have materialized, we might need a new international

monetary arrangement to limit fluctuations between euro, dollar and yen.

Well, there may occur extraordinary situations in the future, but I really don't know how such an arrangement would have coped with recent disruptions in the dollar/yen exchange rate in the wake of the Asian financial crisis.

This list of issues, ladies and gentlemen, is by no means meant to be exhaustive. I do envy you for the opportunity of discussing these matters in much more depth and detail later tonight as well as tomorrow and I would like to commend the organizers on their choice of a highly relevant subject for this second meeting of the Franco-German Forum. France and Germany are undoubtedly the most important prospective participants in EMU. That is why I think the idea of bringing together academics, politicians, and civil servants from both our countries has been a particularly excellent one and I wish you all a very successful meeting.

Thank you !

EMU and Transatlantic Exchange-Rate Stability

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1. INTRODUCTION

The question of the impact of EMU on the stability of the transatlantic exchange rate raises the more general question of whether the exchange rate is a useful adjustment instrument or an additional source of shocks. The end of the Bretton Woods system was motivated by the hope that flexible exchange rates would isolate the economies from shocks coming from their partners', and help them to stabilise their own economy. This hope was largely shattered by the experience of the post-Bretton Woods system. In particular flexible exchange rates did not translate into a reduced instability of other macroeconomic variables (Flood and Rose, 1995). Hence, fixing the intra-European exchange rates may not lead to more instability elsewhere and specifically on the transatlantic exchange rate.

Existing papers generally conclude that the creation of the euro will increase the variability of the dollar against European currencies, compared to with a flexible regime in Europe. This is because the euro zone will be larger and mechanically less open than the constituting member countries. Thus the European Central Bank (ECB) could be less interested in achieving exchange-rate stability (See Artus (1997a), Cohen (1997) and Bénassy-Quéré, Mojon and Pisani-Ferry (1997)). This view is challenged by Martin (1997) who argues that large countries (like the forthcoming monetary union) have less incentive to use their exchange rate strategically to stabilise the real economy, and by Artus (1997b) who thinks that the Federal Reserve may have more incentive to stabilise the dollar.

However, such theoritical analyses do not take into account structural asymmetries other than differences in openness: if monetary policy has the same impact in the various European economies, then switching from a floating regime towards the European Monetary Union (EMU) has little impact on the variability of the transatlantic exchange rate, except if the single monetary policy differs from the previous average of national policies due to a size effect, an openness effect or to coordination gains. By contrast, euro/dollar reaction to shocks in Europe may be different from the pre-EMU average reaction of individual currencies against the dollar. This might be due to asymmetries in the transmission channels of the monetary policy like those highlighted by Barran, Coudert and Mojon (1996).

In addition, a diagnosis on the likely variability of the Euro requires all macroeconomic shocks

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to be considered simultaneously. This is done by Masson and Turtelboom (1997) who perform stochastic simulations with Multimod and find an increase in the dollar variability in EMU compared to in the European exchange-rate mechanism (ERM) regime. However, this increased exchange-rate variability is difficult to analyse in a large macroeconometric model. Besides, Masson and Turtelboom do not compare EMU with a flexible regime in Europe, which European countries have not experienced since 1979. Yet, a free-floating regime can be viewed as the actual alternative to EMU since fixed exchange rates are hardly sustainable in a world with perfect capital mobility.

In this paper, we compare the role of the intra-European exchange rate as an instrument for economic stabilisation to its role as a source of economic instability, in order to infer the potential impact of EMU on the transatlantic exchange-rate variability. To do so, we estimate a simple, three-country model for the United States, Germany and France, over the 1972-1995 period. The structure of each economy is assumed to be independent of the exchange rate regime: a general floating regime, EMU and the ERM. Stochastic simulations are performed in order to compare the variability of various macroeconomic variables, including the transatlantic exchange rate, in the three regimes, and to highlight the role of the intra-European exchange rate as a source of shocks or as an adjustment variable.

Section 2 presents the model. In Section 3, the strategy for stochastic simulations is detailed. The results of the stochastic simulations are presented in Section 4. Conclusions are given in Section 5.

2. THE MODEL

2.1 Invariant structures

In line with most theoretical work on the external impact of EMU, we assume that the world economy is made up of three countries: the United States, Germany and France, the last two countries forming the euro-zone after EMU is completed [1]. Within each country, the specification of the model is a simplified version of Taylor (1993), Deutsche Bundesbank (1997), Masson *et al.* (1990) and some quarterly models of the French economy (OFCE, 1996). The behavioural equations, which are limited to dynamic wage and price settings, domestic demand, import and export demand equations, are estimated from 1972 to 1995 with quarterly data. The key long-run elasticities between prices and quantities, i.e. the impact of the output gap on prices and the impact of the real interest rate on domestic demand, are constrained to be the same in France and in Germany. This choice is motivated by the fact that in the EMU regime, symmetric shocks in Europe should not lead the real exchange rate between France and Germany to diverge in the long run. Thus, we consider that both countries have already converged in terms of the long-run transmission channels, although they may behave differently in the short run. It is also likely that the European economies have converged to some extent in the recent period, in part because of the Maastricht criteria, and that this convergence process is not accounted for by the average behaviour of the French and German economies over the period of estimation.

The main characteristics of the model are reported in Table 1 (identities and estimations are detailed in Appendix). Wage inflation depends on past wage inflation and on consumer price inflation, with a unit long-term elasticity. Producer prices are determined by a mark-up on wages and also depend on excess demand, defined as an output gap. The long-term elasticity of the producer price to the output gap is 0.42 in the European countries. Consumer, import and export prices are defined by identities for which coefficients are estimated over the sample period. As expected, the share of the import price in the consumer price index in France and Germany is twice as large as in the US. In addition, France is relatively more price-taker than the other two countries.

Domestic demand reacts negatively to the real interest rate and to the increase in consumer prices (real balance effect). In France and Germany, a one-point increase in the real interest rate and in inflation reduces growth of domestic demand by 0.14% and 0.09% respectively. Exports depend on the two foreign partners' domestic demand, as well as on the terms of trade. Imports are related to domestic demand and to the real, effective exchange rate [2]. As their major long-term elasticities are constrained to being equal, France and Germany mainly differ in their dynamics: growth of domestic demand exhibits more inertia in France than in Germany, while wages are more flexible in France

[1] The euro-zone will be called Europe for the sake of simplicity

[2] The terms of trade have no long term impact on US imports, while the effective exchange rate has no impact on German exports (like in Taylor, 1993).

than in Germany[3].

Table 1: Invariant behaviours

Nominal-wage inflation, year on year wage increase:

$dw_t = a\,dw_{t-1} + (1-a)\,[cpi_t - cpi_{t-4}]$ (1)

Output-price level:

$p_t = b\,p_{t-1} + (1-b)\,[g(L)\,w_{t-1} + d\,(y_{t-1} - \bar{y}_{t-1})]$ (2)

Domestic-demand growth:

$dd_t = r(L)\,dd_{t-1} + (1-r(1))\,[c\,r_{t-j} + f\,(cpi_{t-k} - cpi_{t-k-4})]$ (3)

Exports:

$x_t = h\,x_{t-1} + (1-h)\,[j\,(px_{t-1} - pm_{t-1}) + n\,ad_t]$ (4)

Imports:

$m_t = k\,m_{t-1} + (1-k)\,[q\,(pm_{t-1} - p_{t-1}) + z\,d_t]$ (5)

Greek letters stand for estimated parameters; d is the first difference operator; w, p_t, d_t, y_t, cpi_t, x_t, m_t, px_t, pm_t, ad_t and $\bar{y}_t$ stand respectively for the logarithm of wages, producer prices, domestic demand, output, consumer prices, exports, imports, export prices, import prices, addressed demand (the sum of the two partners domestic demand), and potential output, and r_t is the real interest rate. The results of the estimations and the identities are detailed in Appendix.

The real effective exchange rate is the average of the real bilateral exchange rates with respect to the two partner countries. Potential output is exogenous in the model. It is derived from a complementary-factor production function with long-term trends of employment and capital as inputs [4].

[3] It is a well-known feature of French macroeconometric models that wage inflation adjusts rapidly on CPI inflation (OFCE, 1996). Here, additional inertia stems from the fact that wage inflation is modelled in yearly growth rates, as in Deutsche Bundesbank (1997).

[4] We are grateful to Florence Thibault for providing the series of potential output (cf. Thibault, 1996).

2.2 Exchange rates and monetary policy

It is assumed that the monetary policy aims at minimising a loss function L(X), where X represents a set of macroeconomic variables. The choice of X can be discussed. Here a standard specification is assumed where the monetary authorities are concerned with the square deviations of consumer price inflation and of the output gap from some targets. The minimisation of the loss function determines the reaction function of the interest rate. Bénassy-Quéré *et al.* (1997) show that the switch to EMU may reduce the incentive of European countries as a whole to stabilise the consumer price index (which depends heavily on the exchange rate), and increase their incentive to stabilise output. However, this result does not necessarily apply here, as several simplifying assumptions are dropped. For instance, our macroeconometric model is truly dynamic: because output prices are sluggish, consumer prices *fall* in the short run after an inflationary shock (because the exchange rate appreciates due to monetary tightening). In addition, international linkages include quantity spillovers together with price spillovers. Here, all central banks (except the *Banque de France* in the ERM regime) are supposed to use the same reaction functions (Table 2) [5].

Table 2: interest rate and exchange rate equations across the monetary regimes

	Interest rates	Exchange rates
Float	$i_i = \frac{3}{2} dcpi_i + \frac{1}{2} dy_i$ i = F, G, U	e_G =E[e_G (+1)] + (i_U - i_G)/400 + rp_G e_F =E[e_F (+1)] + (i_G - i_F)/400 + rp_F
ERM	$i_i = \frac{3}{2} dcpi_i + \frac{1}{2}(y_i - \bar{y}_i)$ i=G,U $i_F = i_G + \frac{3}{2}(dcpi_F - dcpi_G)$	e_G =E[e_G (+1)] + (i_U - i_G)/400 + rp_G e_F =E[e_F (+1)] + (i_G - i_F)/400 + rp_F
EMU	$i_F = i_G = \frac{3}{4} d(cpi_F + cpi_G) + \frac{1}{4}((y_F - \bar{y}_F) + (y_G - \bar{y}_G))$ $i_U = \frac{3}{2} dcpi_U + \frac{1}{2}(y_U - \bar{y}_U)$	e_G =E[e_G (+1)] + (i_U - i_G)/400 + rp_G e_F is constant

i is the nominal interest rate, set by the central bank reaction function, *e* is the logarithm of the

[5] Such *Taylor-like* reaction functions are the most general representation of central bank strategies. For instance, the official *Bundesbank* strategy of targeting a money aggregate is not so different from a Taylor rule, because money demand increases with prices and output. Indeed, Clarida and Gertler (1996) and Bernanke and Mihov (1997) show that the operating interest rates of the *Bundesbank* can better be predicted by prices and /or output than by M3. Besides, Masson and Turtelboom (1997) obtain similar results with various monetary rules.

nominal exchange rate, *dcpi* is the year-on-year variation of the consumer price index, *y* is the logarithm of GDP, and *rp* is the risk premium. E[ ] is the expectation operator.

In a floating regime, each country sets its interest rate on the basis of its national inflation and output gap. In EMU, the ECB reacts to the European inflation and output gap. Finally, in the ERM regime, the *Banque de France* sets its nominal interest rate at the level of the German nominal interest rate plus 1.5 times the inflation differential between French and German inflation. This specification builds on the fact that the differential between French and German interest rates is cointegrated with the inflation differential between the two countries during the EMS period (Equipe Mephisto, 1992). The *Banque de France* raises its interest rate above the German one when nominal convergence is loosing pace. This formulation catches the functioning of a "convergence ERM". It does not deal with speculative attacks that would require either large movements in the interest rate differential or realignments to be modelled explicitly. Nevertheless, it is representative of the "competitive disinflation" policy of France since 1983, with the 1992 and 1993 crises appearing as exceptions.

The exchange-rate block of the model is the most delicate. We assume that DM/USD and FF/DM exchange rates are governed by uncovered interest parity (UIP) with rational expectations and stochastic risk premiums. Perfect arbitrage sets the FF/USD exchange rate. Over the estimation period, the risk premiums are calculated as differences between interest-rate differentials and exchange rate expectations. Therefore, the specification of expectations has an influence on the shocks introduced in the simulations, and consequently it affects the potential impact of EMU on stability. The calculation of the shocks to the risk premiums is discussed in Section 3.

2.3 Dynamic properties of the model

The dynamic properties of the model are captured through deterministic simulations where the UIP condition is specified with an exogenous risk premium and with model-consistent expectations. The terminal condition is given by the neutrality of temporary shocks to the real exchange rate in the long run, given the perfect indexation of wages to prices.

Due to model-consistent expectations, the bilateral nominal exchange rate initially jumps to ensure that the bilateral real exchange rate gradually comes back to the baseline within 24 quarters, which matches the period needed for the demand shock to adjust. The case of the real exchange rate between France and Germany in EMU differs: the FF/DM nominal exchange rate being fixed, there is no reason why the bilateral real exchange rate should return to the baseline in the long run. That is why we enforce symmetry between the two economies in the long run. The bilateral real exchange rate is then stabilised, although its level may differ from the baseline.

We simulate the impact of symmetric and anti-symmetric, demand and wage shocks [6]. A

[6] Symmetric shocks are identical shocks to both European economies, while anti-symmetric shocks are shocks of

temporary demand shock (four quarters) increases the output gap, which puts upward pressure on prices. The central bank raises the nominal interest rate so that the increase in the real interest rate drives demand back to the baseline after five years. A temporary, positive shock on wages (one quarter) behaves as a typical inflationary supply shock: the reaction of the central bank reduces the output gap *via* the increase in the real interest rate. As far as exchange rate regimes are concerned, the simulations show that demand shocks have more impact on most exchange rates (except on the FF) in EMU than in a floating regime, while results from wage shocks are more ambiguous.

These simulation exercises underline how the "country specificity" channel influences exchange rate variability. For instance, a transfer of demand from Germany to France (an anti-symmetric shock) is more inflationary in France than it is deflationary in Germany. In the EMU regime, the rise in the European interest rate is too small for France (which in addition cannot benefit from an appreciation of the FF against the DM) and too tight for Germany: the reaction of aggregate European inflation and interest rates to the shock is larger in EMU than in a floating regime, and so is the response of the transatlantic exchange rate. It is also interesting to note that the impact of EMU is different in France and in Germany. The latter is stabilised more rapidly after a shock while the former is stabilised more slowly.

However, the results differ according to the nature of the shocks. Before concluding on the overall variability of the forthcoming euro, it is thus necessary to take into account the different kinds of shocks simultaneously. This is the reason why we undertake the stochastic simulations.

3. THE STRATEGY FOR STOCHASTIC SIMULATIONS

The stochastic-simulation method builds on a constructive Lucas critique (Taylor 1993). It designates the structure of the economy as behaviours and shocks, which are assumed invariant to economic policy regimes. In particular, the shocks have some invariant stochastic properties estimated by their empirical covariance matrix over the period of estimation of the structural behaviour equations. Then, one can draw randomly from a joint distribution of shocks and rebuild sequences of shocks which have the assumed invariant stochastic properties. Eventually, the simulated variance of macroeconomic variables is computed *ex post,* and the instability of the variables of interest can be compared across the policy regimes.

The pioneer work of the European Commission was strongly criticised by Minford, Rastogi and Hughes Hallett (1992) who argued that the EC overestimated the volatility of the shocks to intra-European exchange rates by wrongly modelling exchange-rate expectations and the risk premium. This overestimation of the intra-European shocks leads to overestimating the welfare improvement when intra-European exchange rates are definitely fixed (in EMU). We first discuss this crucial point and justify our specification (3.1). Then the variance-covariance matrix of the shocks is presented

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equal magnitudes, but opposite signs.

and compared to available orders of magnitude (3.2). Finally, the "technology" for solving the model with rational expectations is explained, and some of its properties are underlined (3.3).

3.1 Defining the shocks to the foreign-exchange markets

Under the risk-neutrality assumption, the exchange rate is determined by the UIP condition:

$$e_t = i^*_t - i_t + e^a_{t,t+1}$$

where e_t stands for the logarithm of the nominal exchange rate at time t, i_t the domestic interest rate, i^*_t the foreign interest rate and $e^a_{t,t+1}$ the logarithm of the exchange rate expected in t for t+1. There are two major problems with this specification. Firstly, it does not allow for specific shocks to the foreign-exchange markets; the excessive volatility of the exchange rate compared with its macroeconomic determinants must be accounted for by overshooting effects. Secondly, the UIP does not hold for a large range of assumptions concerning exchange-rate expectations.

Therefore, it is necessary to drop the risk-neutrality assumption and to include a risk premium rp_t in the foreign-exchange equilibrium condition:

$$e_t = i^*_t - i_t + e^a_{t,t+1} + rp_t$$

Shocks to the foreign exchange market can now be introduced as shocks to the risk premium. But the assumption made for exchange rate expectations is crucial for the amount and volatility of the risk premium. Following the EC (1990) four solutions can be suggested:

(i) Exact expectations: $e^a_{t,t+1} = e_{t+1}$. At first sight, this solution is consistent with the rational expectations used in the simulations. But rational expectations at time t are based on the *available* information, while the actual exchange rate at t+1 depends on the news in t+1, which cannot be expected in t: the news at t+1 should not impact on the exchange rate at t. This first solution is rejected by the EC (1990), Minford *et al.* (1990) and Masson and Symansky (1992).

(ii) Naive expectations: $e^a_{t,t+1} = e_t$. This specification is consistent with the random-walk hypothesis supported by Meese and Rogoff (1983), but it is inconsistent with the forward looking expectations of the model. Being equal to the interest-rate differential, the risk premium may appear to be insufficiently volatile. This solution is rejected by the EC, as well as by Minford *et al.*, but Masson and Symansky select it as the most realistic time-series model.

(iii) Model-consistent expectations: the expected exchange rate is given by the dynamic simulation of the model itself. By construction, this specification is consistent with the model, and with the idea that the model is a good proxy for the technology which is available to predict exchange rates. Minford *et al.* use this specification (within the Liverpool World model). But Masson and

Symansky point out that, in one sense, (iii) is equivalent to (i) since exact expectations have to be made for all exogenous variables until the terminal condition holds.

(iv) A partial model for expectations: exchange rate expectations are modelled as a function of selected variables, with long-run consistency with the full model. This is the specification chosen by the EC. It is criticised by Minford *et al.* as inconsistent with Multimod, which is the model used for the simulations, and because it leads to excessively volatile risk premiums.

In this paper, the risk premium is calculated with the assumption that forecasters expect the nominal exchange rate to move in compensation for the inflation differential and to allow a partial adjustment of the real exchange rate towards its long-run value $\tilde{q}_t$:

$$e^{a}_{t,t+1} = e_t + (p_t - p_{t-1}) - (p^*_t - p^*_{t-1}) + a(\tilde{q}_t - q_t), \; 0 < a < 1$$

This specification is consistent with the model where the real exchange rate returns to the baseline in the long run, the baseline level being calculated with a Hodrick-Prescott filter. Hence, this formulation can be called *semi-rational expectations*. The parameter *a* is chosen to be roughly consistent with the speed of adjustment of the model. We take a = 0.1, meaning that the adjustment is expected to take 10 quarters.

As in EC (1990), the risk premium is modelled as an autoregressive process, so that shocks to the risk premium have a lasting effect: $rp_t = b\, rp_{t-1} + u_t$ This assumption is consistent with the nature of the risk premium which depends on risk aversion, on perceived risk and on accumulated external disequilibria, all three variables exhibiting some inertia. The error terms u_t are then identified to the shocks to the risk premium.

At the stage of the simulations, we assume rational expectations (see Table 2). The expected path of the exchange rate is assumed consistent with the model. Thus, the exchange rate at time t depends on the sum of the risk premiums from t to the end of the simulation. Because shocks to the risk premium have a lasting effect, the exchange rate jumps in the short run, and the amount of the jump is 1/(1-b) times the shock. That is why shocks to the exchange rate are much larger than shocks to the risk premium. This overshooting pattern of the exchange rate dynamics can be very destabilising if the autoregressive coefficient is high, as in estimations reported in Table 3. Following Taylor (1993), we limit the overshooting effect by setting the autoregressive coefficient of the risk premium to 0.25. Thus, the shock to the exchange rate is 1.33 times the shock to the risk premium. Altogether, this assumption reduces the volatility of the exchange rate stemming from shocks to the risk premium. It also reduces the possibility that EMU appear a better regime because it erases some artificially boosted sources of instability (cf. Minford *et al*., 1992).

Table 3: quarterly shocks on the foreign exchange markets: 1972-1995 (1)

In % per quarter	DM/$	FF/DM
S.D. of the log-variations of the exchange rate	5.24	2.31
S.D. of the risk premium	1.1	1.0
Estimated autoregressive coefficient b	0.67	0.51
S.D. of the shocks to the risk premium	1.0	0.9
S.D. of the shocks to the exchange rate (2)	3.0	1.8
Correlation of the shocks to the risk premiums	-0.49	
Calibrated autoregressive coefficient b	**0.25**	**0.25**
S.D. of the shocks to the risk premium	**1.0**	**1.0**
S.D. of the shocks to the exchange rate (2)	**1.33**	**1.33**
Correlation of the shocks to the risk premiums	**-0.32**	

(1) 1972-1979 for FF/DM (2) 1/(1-b) x S.D. of the shocks to the risk premium.

Bold-face letters designate the variability properties with the assumptions used in the simulations.

Source: authors' calculations.

3.2 The variance-covariance matrix of the shocks

The other major macroeconomic disturbances of the model are the shocks to domestic demand, to producer prices and to wages. Their distributions are those of the residuals of the estimations (Table 4). The magnitudes of the shocks are standard (Taylor, 1993). The standard deviation of domestic-demand shocks amounts to about 1 %, while it is inferior to 0.5 % for price shocks and around 0.7 % for wage shocks, in Europe. It is interesting to note that demand shocks as well as wage shocks are positively correlated, although the correlation within Europe is not much superior to what it is across the Atlantic, and that the shocks to the risk premiums have the same order of magnitude as demand shocks.

Table 4: Correlation matrix of the major macroeconomic shocks, standard deviations (in %) on the diagonal, 1972-1995

		1	2	3	4	5	6	7	8	9	10	11
price fr	1	0.43										
price ge	2	0.04	0.49									
price us	3	-0.18	0.03	0.27								
wage fr	4	-0.28	0.00	0.26	0.79							
wage ge	5	-0.18	0.16	0.19	0.22	0.69						
wage us	6	-0.00	-0.15	0.11	0.26	0.18	0.53					
demand f	7	0.13	0.09	0.13	0.00	-0.16	-0.26	0.92				
demand g	8	-0.08	-0.12	0.07	0.21	-0.08	-0.00	0.26	1.0			
demand u	9	-0.04	-0.03	-0.03	-0.24	-0.11	-0.11	0.22	0.14	0.84		
risk dm $	10	-0.11	-0.34	0.20	0.06	-0.10	0.14	-0.08	0.04	-0.00	1.0	
risk ff dm	11	-0.38	0.57	0.04	-0.12	0.23	-0.08	-0.02	-0.13	0.02	-0.32	1.0

Source: authors' calculations

3.3 Implementing stochastic simulations with rational expectations

Three sets of stochastic simulations are implemented. In each one, 20 histories of shocks, each of 30 quarters in a row, are drawn from a joint normal distribution with a zero mean and a covariance matrix corresponding to the residuals of the estimations. Each simulation starts on the first quarter of 1985. In each period t, the model is shocked and solved forward. The value of all of the variables of the model in period t is set when the paths of exchange rates have converged to the paths consistent with the terminal conditions, the latter being defined as the neutrality of shocks to real bilateral exchange rates. The same procedure is started again in period t+1 [7].

After the 30 periods have been simulated, a new 30-quarter history of shocks is drawn out of the joint distribution. After the 20 simulations have been performed over 30 quarters, the standard deviations and correlations of endogenous variables are calculated, dropping the 10 first quarters of each simulation in order to provide independence from initial conditions.

The joint distribution used to draw the shocks corresponds to the residuals of estimations over the whole 1972-1995 period, except for the shocks to the risk premiums, for which the three sets of simulations differ. In the first set of simulations (standard simulations), shocks to the risk premiums are calculated on the whole estimation period for DM/USD, but over the 1972-1979 quasi-floating sub-period for DM/FF. In the second set of simulations, all shocks to the risk premiums are set to zero. In the third set of simulations (which allows a comparison with the ERM regime), the shocks to DM/USD

[7] The horizon is limited to twelve quarters in order to limit computations. Exchange-rate expectations are rational, but not perfect: at time t, agents forecast the model-consistent paths of exchange rates stemming from all shocks until t, but not the paths stemming from shocks in t+1 or later.

are drawn in the same way as in the first set, but shocks to FF/DM are set to zero, as in the second set.

4. RESULTS FROM THE STOCHASTIC SIMULATIONS

4.1 EMU versus a floating regime: standard simulations

In this first set of simulations, the exchange rates (when flexible) are considered both instruments for domestic stabilisation and sources of additional shocks to the economies. Hence, the exchange rates are both stabilising and destabilising. Following the terminology employed by Flood and Rose (1995), we call *useful adjustment* the first effect and *useless volatility* the second one. Useless volatility stemming from shocks to the FF/DM risk premium disappears in EMU. The results are reported in Table 5.

Table 5: EMU *versus* a float: standard simulations.

Simulated	France		Germany		Europe		United States	
standard deviations (%)	Float	EMU	Float	EMU	Float	EMU	Float	EMU
CPI inflation (1)	1.55	1.45	1.25	1.08	1.13	1.02	1.48	1.68
Output gap	2.46	2.00	2.54	2.55	1.90	1.89	1.89	2.14
Correl. infl./output gap	0.11	0.58	-0.19	0.14	-0.17	0.37	0.09	0.35
Nominal interest rate	3.09	2.03	2.19	2.03	2.09	2.03	2.49	3.07
Real interest rate	2.15	1.46	1.74	2.03	1.39	1.54	1.81	2.17
Nominal exchange rate (2)	10.14	0.00	15.04	9.71	13.22	9.71	13.22	9.71
REER (3)	9.66	4.98	11.74	5.50	13.82	10.16	13.82	10.16

Simulated correlations	CPI inflation		Output gap		Nom. interest rate	
	Float	EMU	Float	EMU	Float	EMU
France/Germany	0.06	0.11	0.20	0.38	-0.04	1.00
Europe/United States	0.14	-0.15	-0.52	-0.66	0.04	-0.46

(1) S.D. of the year-to-year CPI log-variation. (2) S.D. of year-to-year log-variation of FF/DM, DM/USD and USD/European average. (3) S.D. of year-to-year log-variations in the real, effective exchange rate.

Source: model simulations.

4.1.1 The stabilisation of the European economies

In EMU, each European country suffers from the loss of a useful adjustment variable, but it benefits from the elimination of useless volatility. The second effect is dominant. However, France and Germany are unequally affected by the regime shift, which can be explained by structural asymmetries. Specifically, the ECB reaction to a positive, symmetric demand shock is tighter for Germany and looser for France compared to national reactions in a floating regime. Thus, the volatility of the interest rate is reduced by 1.06 points in France and by only 0.16 points in Germany.

The European economy as a whole is merely affected by the regime shift: CPI inflation variability is reduced both in France and in Germany, but as the correlation between prices in the two countries increases (because the FF/DM adjustment no longer isolates the economies), the European inflation rate is not much stabilised. The same thing applies to the European output gap and to the European interest rate (by definition, the correlation between French and German interest rates rises to 1 by definition in EMU).

4.1.2 The stabilisation of the transatlantic exchange rate

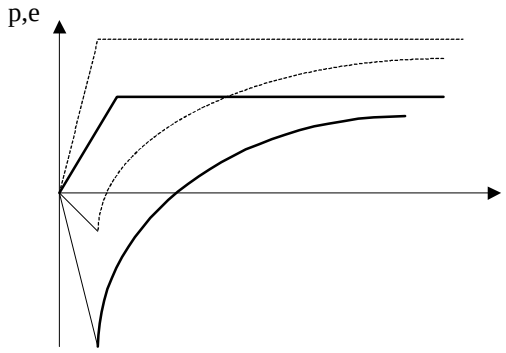
The main result of the simulations is the reduction in the transatlantic exchange-rate volatility in EMU, compared to in a floating regime. This is the net effect of three different channels:

(i) The useful adjustment effect: EMU raises the correlation between CPI inflation and the output gap in each European country. For instance, a positive demand shock in France is no longer stabilised by an appreciation in the FF/DM exchange rate. Thus, inflation increases with the output gap. In the case of an inflationary wage shock in France, no FF/DM appreciation occurs in the short run, and demand is reduced less. Because the two target variables are positively correlated in EMU, the monetary policy no longer faces a conflict between them: the European interest rate reaction to given shocks is stronger.

(ii) The useless volatility effect: the removal of the shocks to the FF/DM risk premium in EMU stabilises the European economies, which leads to lesser needs for monetary policy. Because shocks are weaker, the European interest rate is less volatile. But EMU also removes the asymmetry of the shocks to the risk premiums: in a floating regime, the DM appreciates against the FF when it appreciates against USD, which makes the German REER relatively more unstable and the French and US REERs relatively more stable compared to in EMU.

(iii) The expectation effect: the correlation between European and US inflation becomes negative in EMU, leading to larger swings in the inflation differential. Because private agents expect the real exchange rate not to be affected by inflationary shocks in the long run, larger inflation differentials mean larger expected variations in the transatlantic, nominal exchange rate. This reduces the initial jump of the nominal exchange rate after an inflationary shock (Figure).

Figure: The price and exchange rate reactions to an inflationary shock, in a float (plain) and in EMU (dots).



In EMU, the increase in the transatlantic price differential (p_E - p_U) is larger. Thus, a larger depreciation is expected. This limits the initial appreciation of the transatlantic exchange rate *e* due to the European monetary tightening.

Table 5 shows that the useless volatility effect and the expectation effect outweigh the useful adjustment effect: altogether, the transatlantic exchange rate is more stable in EMU than in a floating regime, and this is more the case for Germany than in France or in the US.

4.1.3 The destabilisation of the US economy

Because it is hardly transmitted to European aggregates, the stabilisation of each European economy does not stabilise the US partner. On the contrary, the US economy is destabilised by the regime shift. This is because the stabilisation of the transatlantic exchange rate weakens the useful adjustment role of the exchange rate for the US, while useless volatility stemming from shocks to the risk premium remains.

The loss in terms of useful adjustment is the following: in both regimes there is a strong, negative correlation between the output gap in Europe and in the US, meaning that a boom in Europe is concomitant with a recession in the US. In a floating regime, dollar depreciations coincide with falls in the US output gap, which is stabilising. In EMU, the smaller dollar fluctuations fail to stabilise the US economy. By stabilising the transatlantic exchange rate, EMU reduces the role of the exchange rate as a useful adjustment variable in the US. This effect is confirmed by the large, negative correlation between interest rates in Europe and in the US that appears in EMU: because the exchange rate is less stabilising for the US economy, the Federal Reserve uses the interest rate more actively [8].

[8] The negative correlation between European and US interest rates is not inconsistent with reduced volatility in

4.2 EMU versus a floating regime: the role of shocks to the risk premiums

Minford *et al.* (1992) claim that removal of shocks to the FF/DM risk premium should not be attributed to EMU. They say that the UIP, which is a market-equilibrium condition, is a non-stochastic relationship: the residuals should be interpreted as a model error rather than as a time-varying risk premium, and no stochastic term should be included in the equation. Yet it can be argued that the risk premium varies according to changes in the perceived risk when agents are risk-averse. Nevertheless, the measurement of the shocks to the risk premiums is a debatable issue. In order to study whether our results derive from specific assumptions concerning risk premiums, we implemented stochastic simulations where all shocks to the risk premiums are set equal to zero. Thus, FF/DM and DM/USD exchange-rate movements are due to shocks to other macroeconomic variables which affect both interest rates and exchange-rate expectations. The results are reported in Table 6.

Table 6: EMU *versus* float: simulations without shocks to the risk premiums.

Simulated	France		Germany		Europe		United-States	
standard deviations (%)	Float	EMU	Float	EMU	Float	EMU	Float	EMU
CPI inflation (1)	1.04	1.37	1.14	1.24	0.82	1.04	1.74	1.93
Output gap	1.31	1.95	2.36	2.55	1.43	1.81	1.74	2.11
Correl. inflation/outputgap	-0.11	0.67	-0.31	0.15	-0.34	0.44	0.13	0.44
Nominal interest rate	1.57	2.08	1.74	2.08	1.23	2.08	2.73	3.32
Real interest rate	1.00	1.59	1.27	1.89	0.87	1.47	1.66	2.24
Nominal exchange rate (2)	6.70	0.00	11.96	9.09	9.77	9.09	9.77	9.09
REER (3)	5.56	5.01	9.60	5.00	10.60	9.60	10.60	9.60

Simulated correlations	CPI inflation		Output gap		Nom. interest rate	
	Float	EMU	Float	EMU	Float	EMU
France/Germany	0.21	0.28	0.17	0.29	0.03	1.00
Europe/United States	0.24	-0.25	-0.43	-0.66	0.12	-0.54

Notes: see Table 5.

Source: model simulations.

When shocks to the risk premiums are eliminated both in a floating regime and in EMU, the volatility of all variables is lower in both regimes, but the shift from a floating regime to EMU

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the transatlantic exchange rate. This is because the interest-rate differential equals the *forward* variation of the exchange rate, while the exchange-rate volatility is computed with *backward* variations (initial jump). EMU may reduce the initial jump of the exchange rate, while increasing the rate of adjustment towards the long term. However, the path towards the long run remains hypothetical since new shocks lead to new jumps at each period.

destabilises the European economies (and not only the US economy). This is because European countries lose a useful adjustment variable, whereas the exchange rate is already not a source of useless volatility in a floating regime.

Nevertheless, EMU still stabilises the transatlantic exchange rate, although the contrast between the two regimes is smaller than in standard simulations. This results can be explained by the expectation effect, which dominates the useful adjustment effect even in the absence of the useless volatility effect.

The French REER is not much stabilised in EMU compared to in a floating regime, while its stabilisation is clear cut in standard simulations. This can be explained by the fact that France suffers from more volatile inflation in EMU, without being able to stabilise its real, bilateral exchange rate against Germany through FF/DM adjustment. This mechanism does not apply to Germany where inflation is positively correlated to the FF/DM nominal exchange rate (i.e. the DM appreciates when German inflation rises): FF/DM variations destabilise the German REER in a floating regime.

Our results confirm that the shocks to the risk premiums are determinant for the EC result of more economic stability in an EMU regime. However, the reduction in the volatility of the transatlantic exchange rate remains when EMU is no longer held responsible for the removal of the shocks to the FF/DM.

4.3. EMU versus a floating regime and the ERM

Our specification of the ERM does not consider the possibility of speculative attacks or realignments, so that the French monetary rule only applies if there are no shocks to the FF/DM risk premium. The model is simulated with the same shocks (randomly drawn from the whole-period variance-covariance matrix) under the three regimes: free-float, ERM and EMU. But the shocks to the FF/DM risk premium are set to zero in the three regimes. The results are reported in Table 7.

Table 7 : Float, ERM, EMU: simulations without shocks to the DM/FF.

Simulated	France			Germany			Europe			United States		
standard dev. (%)	Float	ERM	Emu	Float	ERM	Emu	Float	ERM	Emu	Float	ERM	Emu
CPI inflation (1)	1.06	1.26	1.25	1.16	1.18	1.07	0.96	1.12	0.94	1.53	1.53	1.67
Output gap	1.64	2.12	2.06	2.36	2.50	2.49	1.66	1.72	1.92	1.77	1.80	2.14
Corr. infl/output gap	-0.01	0.37	0.71	-0.51	-0.49	0.03	-0.38	-0.27	0.48	0.23	0.14	0.57
Nom. interest rate	1.79	1.91	1.96	1.69	1.71	1.96	1.48	1.66	1.96	2.60	2.62	3.08
Real interest rate	1.19	1.47	1.38	1.40	1.34	1.86	1.07	1.30	1.43	1.74	1.85	2.38
Nom. exch. rate (2)	5.86	4.85	0.00	14.7	15.6	9.56	12.8	14.8	9.56	12.8	14.8	9.56
REER (3)	5.79	8.12	5.13	10.2	9.56	4.95	13.4	15.2	9.80	13.4	15.2	9.80

Simulated correl.	CPI inflation			Output gap			Nominal interest rate		
	Float	ERM	EMU	Float	ERM	EMU	Float	ERM	EMU
France/Germany	0.25	0.48	0.14	0.31	0.02	0.44	0.17	0.51	1.00
Europe/UnitedStates	0.38	0.26	-0.33	-0.52	-0.41	-0.71	0.25	0.12	-0.61

Notes: see Table 5. Source: model simulations.

4.3.1. EMU versus a floating regime again: the role of the shocks to the FF/DM

Not surprisingly, the comparison between a floating regime and EMU is in the way between the results from the standard simulations and the simulations with no shocks to the risk premiums (FF/DM and DM/USD). The variability of the transatlantic exchange rate is reduced in EMU compared to in a floating regime, the difference between the two regimes being smaller than in standard simulations, but larger than in the simulations without shocks to the DM/USD risk premium: *shocks to the DM/USD risk premium appear relatively more destabilising for the transatlantic exchange rate in a floating regime than in EMU*.

4.3.2. EMU versus ERM

As in Masson and Turtelboom (1997), switching from the ERM regime towards EMU has little impact on the European economies. This is because in the ERM regime, the intra-European exchange rate is already a limited adjustment variable, while its useless volatility is already much reduced. In the ERM regime, the French interest rate only reacts to the German interest rate and to the inflation differential. In EMU, the European interest rate takes the French output gap into account, which slightly stabilises the latter. As in other simulations, the ECB policy is more reactive for Germany than was the policy of the *Bundesbank*, and the inflation rate is stabilised. At the European level, inflation is stabilised while the output gap is destabilised. This scisor effect can be explained by the fall in the correlation of inflation in the two countries (from 0.48 to 0.14) and by the rise in the correlation of the output gap (from 0.02 to 0.44).

Because it is asymmetric, *the ERM regime is the regime producing the highest volatility in the transatlantic exchange rate*. This can be explained by the reaction to asymmetric shocks in Europe. For instance, assume a transfer of demand from Germany to France (anti-symmetric shock). The European interest rate falls *ex ante* in the ERM regime, while it rises very slightly in EMU. In the ERM regime, European currencies depreciate against the USD, whereas in EMU, the euro appreciates slightly. In brief, the French monetary policy aiming at stabilising the FF/DM in the ERM destabilises the transatlantic exchange rate in the presence of asymmetric shocks [9]. Hence, the ERM is not a compromise between EMU and a floating regime. The anti-symmetric component of the shocks is neutral on the USD in EMU and in a floating regime, but not in the ERM.

Finally, the worst regime for the United States is EMU, where both inflation and the output gap are destabilised compared to in the ERM regime. These results stem from the loss of the stabilising impact of dollar fluctuations. Artus (1997b) suggested that EMU might force the Federal Reserve to use the monetary policy partly to stabilise the transatlantic exchange rate because the ECB would have less incentive to do so. Our simulations show that the US interest rate may become more variable in EMU than in both a floating regime and the ERM *despite* reduced volatility in the transatlantic exchange rate. In fact, dollar fluctuations are stabilising for the US economy, and moving to EMU weakens this source of automatic adjustment.

5. CONCLUSIONS

Our simulations show that EMU could reduce the variability of the transatlantic exchange rate compared both to the ERM and to a floating regime. Eliminating the shocks to the intra-European exchange rate is crucial for the stabilisation of the European economies, as suggested by Minford *et al.* (1992). However, EMU stabilises the transatlantic exchange rate even if the removal of shocks to the intra-European risk premium is not attributed to the regime shift. By contrast, the ERM is the regime producing the most unstable transatlantic exchange rate.

Due to structural and stochastic asymmetries, the benefits of EMU are smaller for France than for Germany, in terms of the variability of inflation and of the real effective exchange rate. Finally, EMU is the regime producing the largest instability in the US economy, because it eliminates the stabilising fluctuations of the transatlantic exchange rate.

More generally, our simulations show that the transfer of volatility is not systematic and can be indirect. Here, fixing the intra-European exchange rate does not increase the variability of the extra-European exchange rate, but it destabilises a third economy. Of course, our results depend on

[9] The destabilising impact of the ERM on the transatlantic exchange rate is confirmed by the reduced variability of the dollar effective exchange rate after the ERM had partially broken up (1993-1996), compared to the hard ERM period (1987-1992).

several debatable assumptions.

First, the monetary policy, when independent, is the same across the monetary regimes. It may be argued that reaction functions are derived from optimisation behaviours that take the change in the interest-rate multipliers into account (see Bénassy-Quéré *et al*., 1997). However, modifying the monetary rules would need solving the model analytically in order to control for the optimality of the rules.

Second, our modelling of the ERM is rather crude. It matches the functioning of the ERM between 1987 and 1992 but ignores speculative attacks and realignments. Despite this deficiency, however, the ERM regime leads to the greatest volatility both in European economies and in the transatlantic exchange rate.

Finally, both stochastic and structural asymmetries in Europe are minimised in the model which reduces Europe to France and Germany. Enlarging the model to other European countries would provide a better, more exhaustive, stochastic representation of European-wide sources of shocks, but this would have the drawback of impeding the interpretation of the results.

Appendix: The Estimated Model

F: France; G: Germany; U: the US. All variables are in logarithms, except growth rates (which are log-differences) and interest rates (which are in percentage points). Estimation period: 1972:1-1995:3. Bold-face coefficients are constrained to be equal in France and in Germany. Estimations are run with TSP. There are two blocks in the model: a wage-price block and a volume block. The structure is a block-recursive, as prices depend on lagged ouput gap to avoid simultaneity between the two blocks. The wage and price equations are estimated with FIML, which allows accounting for the relevant identies, thus taking into account simultaneity. The volume block is estimated with the TSP non-linear, least-square estimator (LSQ), because it involves no identities, and it converges to better estimates than the FIML procedure.

WAGE-PRICE BLOCK

Nominal wage inflation (with $\dot{w}_i(t) = w_i(t) - w_i(t-4)$)

$\dot{w}_F =$ 0.009 - $1.2\ 10^{-4}$ time + 0.80 $\dot{w}_F$ (-1) + 0.20 [cpi_F - cpi_F (-4)]
(0.002) ($5\ 10^{-5}$) (0.05)

$\dot{w}_G =$ 0.002 + 0.88 $\dot{w}_G$ (-1) + 0.12 [cpi_G - cpi_G (-4)]
(0.002) (0.03)

$\dot{w}_U =$ - $5\ 10^{-4}$ + 0.95 $\dot{w}_U$ (-1) + 0.05 (cpi_U - cpi_U (-4))
(0.002) (0.03)

with cpi_i the logarithm of the consumer price index (i = F, G, U).

Output price level[A1] **,** with og_i the output gap (i = F, G, U)

$p_F =$ 0.20 + 0.88 p_F (-1) + 0.49 w_F - 0.40 w_F (-1) + 0.12* **0.42** og_F(-1)
(0.06) (0.04) (0.06) (0.08) (0.18)

$p_G =$ 0.25 + 0.86* p_G (-1) + 0.10* w_G + 0.14 * **0.42** og_G (-1)
(0.04) (0.03) (0.02) (0.18)

$p_U =$ - 0.002 + 0.70 p_U (-1) + 0.30 w_U + 0.30 * 0.06 og_U (-1) + *u_pu*

[A1] The producer prices are estimated in levels in spite of unit roots. This is the common practise in macroeconometric models where such prices result from a mark-up over wages (cf Taylor 1993).

(0.001) (0.06)

u_pu= 0.87 u_pu(-1)

(0.06)

VOLUME BLOCK

Domestic demand growth

$\dot{d}_F$ = 0.016 + 0.67 $\dot{d}_F$(-1) - 0.34 $\dot{d}_F$(-2) + 0.23 $\dot{d}_F$(-3) - 0.19 $\dot{d}_F$(-4)

(0.003)(0.12) (0.14) (0.12) (0.09)

+ 0.63 [- **0.14** r_F (-3) - **0.09**(cpi_F(-2) - cpi_F(-6))]

(0.02) (0.02)

$\dot{d}_G$ = 0. 016 + 0.08*d911 + 0.26 $\dot{d}_G$(-1) - 0.24 $\dot{d}_G$(-2) + 0.20 $\dot{d}_G$(-3)

(0.29) (0.008) (0.08) (0.08) (0.06)

+ 0.78[-**0.14** (r_G(-1) - **0.09**(cpi_G(-3) - cpi_G(-7))]

(0.02) (0.02)

with a first-order autocorelation for both $\dot{d}_F$ and $\dot{d}_G$:

u_di = - **0.62** u_di(-1) for i= F,G

(0.09)

$\dot{d}_U$ = 0.01 - 0.20 $\dot{d}_U$(-1) + 1.20 [-0.21 (r_U(-2) - 0.17 (cpi_U(-1) - cpi_U(-5))]

(0.002) (0.11) (0.06) (0.06)

u_du = 0.56 u_du(-1)

(0.10)

with r_i the real interest rate and d911 a German reunification dummy.

Exports

x_F = - 1.54 + 0.73 x_F(-1) + 0.27 [- 0.68 (px_F(-1) - pm_F(-1)) + 0.81 (d_G + d_U)]

(0.31) (0.05) (0.11) (0.02)

x_G = - 2.64 + 0.56 x_G(-1) + 0.44 [- 0.38 (px_G(-1) - pm_G(-1)) + 0.79 (d_F + d_U)]

(0.40) (0.06) (0.07) (0.02)

x_U = - 0.36 + 0.92 x_U (-1) + 0.05 [-1.2 Δ(px_U (-1) - pm_U (-1)) + 1.94 (d_G + d_F + d_W)]
(0.09) (0.02) (0.34)

with px_i the price of exports, pm_i the price of imports, and d_W the exogenous volume of the domestic demand in G7 countries, other than the three mentionned.

Imports

m_F = - 1.34 - 0.05 (pm_F (-1) - p_F (-1))+ 1.78 d_F with autocorrelation u_*mf* = 0.79 u_*mf*(-1)
(0.35) (0.05) (0.07) (0.05)

m_G = - 1.97 + 0.02 d904 + 0.68 m_G (-1) + 0.32 (1.75 d_G)
(0.32) (0.01) (0.05) (0.04)

m_U = -3.24 - 0.21 (pm_U (-1) - p_U (-1))+ 2.06 d_U with autocorrelation u_*mu* = 0.67 u_*mu*(-1)
(0.62) (0.06) (0.06) (0.05)

MAIN IDENTITIES

Consummer price index

cpi_i = 0.63 cpi_i (-1) + 0.33 p_i + 0.04 pm_i + $p0_i$ i = F, G

cpi_i = 0.70 cpi_i (-1) + 0.28 p_i + 0.02 pm_i + $p0_i$ i = U

with $p0_i$ representing other determinants of consumer prices (exogenous).

Price of exports

px_F = 0.3 px_F (-1) + 0.4 p_F + 0.15 (e_F + p_U) + 0.15 (e_F - e_G + p_G) + pv_F

px_G = 0.5 px_G (-1) + 0.4 p_G + 0.1 (e_G + p_U) + pv_G

px_U = 0.84 px_U (-1) + 0.11 p_U + 0.05 (-e_G + p_G) + pv_U

with e_G the DM/USD nominal exchange rate, e_F the FF/USD nominal exchange rate, and pv_i the exogenous price of partners other than F,G,U.

Price of imports

pmF = 0.4 pmF (-1) + 0.6 [(eF - eG + pG)/2 + (eF + pU)/2] + pwF

pmG = 0.4 pmG (-1) + 0.6 [(-eF + eG + pF)/2 + (eG + pU)/2] + pwG

pmU = 0.84 pmU (-1) + 0.16 [(-eG + pG)/2 + (-eF + pF)/2] + pwU

with eG the DM/USD nominal exchange rate, eF the FF/USD nominal exchange rate, and pwi, the exogenous price of partners other than F,G,U.

Real effective exchange rate

qF = [(eF - eG + pG)/2 + (eF + pU)/2] - pF

qG = [(-eF + eG + pF)/2 + (eG + pU)/2] - pA

qU = [(-eG + pG)/2 + (-eF + pF)/2] – pU

Aggregate demand

yi = log [exp(di) + exp (xi) - exp (mi)] i=F,G,U

Real interest rate

ri = ii/100 - [pi - pi (-4)] i = F, G, U

with ii the nominal interest rate

Output gap

ogi = yi - $\overline{y}_i$ i = F, G, U

with $\overline{y}_i$ the exogenous volume of supply proxied by a Hodrick-Prescott output trend, with a 1600 smoothing parameter.

INTEREST RATES AND EXCHANGE RATES

See Table 2 in the text.

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What Exchange Rate Policy in EMU?

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When the European Central Bank (ECB) starts operating by 1999, exchange rate policy will hardly be the first thing to worry about. Since the ECB takes over from the Bundesbank, the bank will have to adopt and explore an appropriate targeting procedure for guiding inflationary expectations. Apart from pure discretion, the options are monetary targeting or inflation targeting. Given that the United Kingdom does not wish to participate from the start of European Monetary Union (EMU), it is likely that monetary targeting will be chosen. Even so it will be no easy task to convince the international financial markets as well as a wider public that the switch of authority will not go at the expense of monetary stability. In fact, it will be a tricky issue to continue monetary policy smoothly, given that we cannot know in advance with any degree of precision how the domestic as well as the external demand for the Euro will behave, after intra-EMU exchange rates have been fixed irrevocably.

For the ECB it will be of utmost importance to gain credibility vis-a-vis the citizens of the Euro-area as well as vis-a-vis external observers as rapidly as possible. On this consideration it is likely that the ECB will imitate the Bundesbank's way of policy-making, i.e. put the main focus of monetary policy on the objective of price stability, emphasize the importance of a medium-run orientation over the short run, and adopt, if at all, a very moderate leaning-against-the-wind policy on occasions when the exchange rate vis-a-vis the U.S. dollar moves in a disruptive fashion. It may even happen - in fact, I believe it is advisable - that the ECB initially tries to appear more hard-nosed than the Bundesbank by signalling that it does not care about the exchange rate.

We are free to speculate a lot on the type of monetary and exchange rate policies the ECB will adopt a year from now. The more important question is whether and which type of exchange rate policy may be advisable. In this position paper I will discuss a few aspects. My general conclusion is that exchange rate policy should be considered verry, verry low key. However, I suspect that this is not the dominant view in Brussels. After all, in the conclusions of the presidency of the Amsterdam summit it is stated that the Ecofin and the commission should prepare, in collaboration with the European Monetary Institute, options for an efficient implementation of the general exchange rate orientations vis-a-vis third currencies.[10] On this observation it should be a nice surprise if the commission does not use this channel to get some influence on the ECB's conduct of monetary policy.

[10] See also the Commission (1997).

I. What Do We Know About Exchange Rates?

It may be useful to recall a few simple truths about exchange rate issues.

Exchange Rate Policy Versus Monetary Policy

The first thing to recall is that the objectives of price stability and nominal exchange rate stability are in basic conflict. In a multi-currency world the domestic purchasing power of money can be kept only if the exchange rate is permitted to move freely in order to neutralize the impact of foreign inflation on the domestic price level. The alternative option of pegging the exchange rate to a major currency implies to eventually accept the policy objectives embodied in the monetary policy course of the foreign currency domaine.

From these basic considerations it follows that one cannot enjoy both, a stability oriented monetary policy and a stability oriented exchange rate policy. One has to give. Moreover, since money is a matter of trust, it needs to be clarified within the monetary constitution which type of policy is subordinated. The Maastricht treaty is built on two fundamental principles supported for long by any liberal economist: permitting competition in open markets and maintaining price stability. It follows that neither protectionism nor exchange rate interventionism are admissable policy regimes.

Exchange Rate Variability and International Trade

A common conviction of politicians is that exchange rates should be fixed to avoid harmful effects from exchange rate variability on international trade. Indeed, it is easy to see that exchange rate volatility puts an extra cost on international trade by forcing traders to buy insurance against an adverse change of the exchange rate. However, politicians as other laymen have too narrow a view. They tend to believe that the volatility of exchange rates is produced by unjustified speculation. They do not comprehend that volatility reflects and dampens the effects of macroeconomic shocks, from inside the currency area as well as from the outside. To the extent that those shocks are real demand or supply shocks fixing the exchange rate does not eliminate them but amplifies their effects in the goods markets. This is a macroeconomic type of cost that is difficult to measure but must not be underestimated.

Note that as regards the direct effects of exchange rate uncertainty on the volume of international trade the collected evidence is inconclusive.

Misalignments

Any violation of purchasing power parity may be called a misalignment of exchange rates. But given that purchasing power parity holds only in the medium to long run, it is useful to reserve the term misalignment for cases where the nominal exchange rate enforces a major and long lasting real overvaluation or undervaluation of the domestic currency. If the prices in the goods markets would adjust to changes in demand and supply as flexibly and speedily as the prices of financial assets do, there were no misalignements. Typically, misalignements evolve in fixed exchange rate systems when domestic policies - monetary and fiscal policies - increasingly diverge from the policy stance required by the obligation to keep the nominal exchange rate parity.

Thus, the cause of a misalignement is a policy failure. One of the policies mentioned does not play to the rules of the regime of fixed exchange rates. The problem with such type of misbehaviour is that it may go unchecked by the financial markets for quite some time. This will happen if the belief dominates that the misbehaviour will be corrected in the not too distant future. In a way biased expectations contribute to stabilizing the exchange rate regime for quite a time though the longer this lasts, the more disruptive will be the eventual exchange rate crisis.

With flexible rates, in contrast, any change in domestic policies has immediate implications for the nominal exchange rate. A misalignement in the sense of a lasting bias in the real exchange rate does not occur because the nominal exchange rate is free to adjust. However, due to the fact that foreign exchange markets adjust much quicker than goods markets, changes of the policy stance may induce a temporary overshooting of the exchange rate. While this is undesirable, it is not clear that it can be easily avoided.

II. Openeness and Effective Exchange Rates

This section serves to present data on the degree of openess of the EU-economies and of the future Euro-area and to provide a comparative look at the evolution of the effective exchange rates of the U.S. dollar and the Deutsche Mark.

Openess

The more open an economy is, the more will it be exposed to the unfavourable or favourable consequences of moving exchange rates. Consequently, the larger will be the interest in controlling the exchange rate.

Openness of an economy depends on many aspects. Given free access to markets across borders, a natural determinant is country size. The European economies, especially the smaller ones, belong to the most open economies. Measuring the degree of openness by relating the volume of the

country's international trade, defined as 50 percent of the sum of exports and imports, to the level of gross domestic product, yields 59 percent for Ireland, 51 percent for Belgium and Luxemburg or 38 percent for the Netherlands.

The larger European economies naturally are less open. For example, the degree of openess is 18 percent for France and 20 percent for Germany. Yet, this is a lot if we compare these countries with important non-European traders. Table 1 provides 1995-data. For the largest international trader, the U.S., we observe an degree of openess of no more than 9 percent and
for Japan even less than 8 percent. If we assume that EMU will start with eleven countries, excluding Denmark, Greece, Sweden and the U.K., we find an degree of openess of about 11 percent. Thus, the Euro-area will be more open than the U.S. or Japan though not by much.
Moreover, it is to be expected that the EU-11 will become more closed once EMU has been started. The reason is that the saving on information costs and other transactions costs that the common currency provides will favour the internal market integration and a partial redirection of trade.

Effective Exchange Rates of the U.S. dollar and the Deutsche Mark

Given that Germany's degree of openess to date is double the size of the U.S.'s, it is of interest to check whether the effective exchange rates have shown a similar or very different degree of volatility. On the contrafactual assumptions that (i) both economies were hit by similar nominal and real shocks over time and (ii) trading partners and trading shares were about the same, one would expect that the observed volatilities reflect the different attitudes of policy makers towards exchange rate smoothing. Specifically, one should expect a higher volatility for the U.S. dollar.

The assumptions are clearly violated and, therefore, one has to be very cautious in drawing strong conclusions from eyeballing the actual data. Nevertheless it is useful to inspect the period 1987-96. During this period inflation was low in both countries as well as most industrialized countries. The CPI-rate of inflation was 3.6 percent in the U.S. and 2.4 percent in Germany, while the (annual) standard deviations were about the same, 0.9 and 1.1, respectively. Figure 1 shows weekly figures for the effective dollar and monthly figures for the effective D-Mark (January 1987 = 100).[11] While the dollar exhibits almost no trend, the D-Mark has followed a marked upward trend between 1989 and early 1995.

As regards measuring the degree of volatility one would have to correct the data for trend. In the absence of refined econometric techniques one may take the difference between the sample period's maximum and minimum as a first rough approximation. This difference has been 16 percentage points for the dollar and 18 percentage points for the D-Mark. Thus, on that account the dollar has not been more volatile than the D-Mark. On the other hand, there can be no doubt that a

[11] The data on the effective dollar exchange rate are taken from Begg et al. (1997). The data on the effective D-Mark rate are published by the Bundesbank.

correction for trend would yield a markedly higher volatility of the dollar. And this is no surprise given that the U.S. authorities have shown a tendency of "benign neglect" of the exchange rate for most of the time.

The Bundesbank, in contrast, has tended to follow a moderate policy of leaning against the wind of real exchange rate appreciation. This is suggested by estimates of the Bundesbank's reaction function. For the period 1979-89 Neumann and von Hagen (1993) estimate a response coefficient of 0.4; for the extended sample period 1979-94 Neumann (1997) finds a much lower coefficient of 0.2. This result means that the Bundesbank responded to a one percent increase in the real effective exchange rate by raising the actual growth rate of the target aggregate by 0.2 percent above the midpoint target rate.

III. Options for Exchange Rate Policy

Complete Neglect

The most radical option is a policy of completely neglecting the exchange rate. There are two major arguments in support of that option.

First, we have seen that the Euro area will be much less open than any of its member countries. This implies that similar to the U.S. economic growth and employment will be much more affected by domestic policies than by the international competitiveness of the export sector. International competitiveness suffers from exchange rate variability, however, the traditional export and import industries will become less vulnerable in EMU. Given that a much smaller share of their trade will be affected by adverse exchange rate changes, the capacity for adjustment at the micro level will be larger. This implies that in EMU the pressure on governments to manipulate the exchange rate will be considerably weaker or, to put it differently, it will be easier for governments to resist to such lobbying.

Second, the ECB will start from scratch. In order to lay the foundation for price stability in the long run, the ECB will have to try to gain as rapidly as possible the reputation that what matters to the bank is the internal stability of the Euro and nothing else. Buba's credibility is what Euceba will long for. Once this reputation is firmly established - and that may take a decade or more -, other policy considerations, such as exchange rate issues, may be taken into account, provided they are consistent with the dominant objective of keeping money growth at a non-inflationary track. But in the years to come the ECB will have to concentrate almost exclusively on accumulating credibility capital. An exchange rate regime of declared neglect vis-avis key currencies, such as the dollar and the yen, will be conducive to reputation building.

In the long run the ECB's reputation will depend on the track record. But what is to be done

immediately after take-off?

I believe the best strategy for the ECB is to signal to markets and the European public at large that it is determined to continue the Bundesbank's success story. This requires to present clear evidence. In the absence of a track record the only convincing piece of evidence is the adoption of the rules of annual monetary targeting. The great advantage of that approach is to be seen in the likelihood that signalling continuation will induce Europe's citizens to keep trust that replacing the national currency by the Euro will not lead to a burst of inflation. Norishing this belief is of utmost importance because we know how costly it may be if a central bank is forced to fight entrenched expectations of inflation.

Of course, monetary targeting is not without problems. There is some evidence suggesting that the function of domestic Euro demand is likely to be less stable than the German money demand function. Moreover, we do not know to what extent non-residents will accept the Euro as a substitute for the D-Mark implying that external cash holdings - that cannot be distinguished from domestic holdings - may be more volatile for a couple of years than the Bundesbank has experienced in the past. Therefore, monetary targeting is likely to become more difficult in the future. While one cannot exclude the possibility that for lack of reliable information about changes in the behaviour of money demand a chosen target range will be biased, this danger can be reduced by reviewing the target semi-annually. Responding to changes in the external cash demand for Euros is an indispensable part of the attempt to stabilize the internal value of the Euro. As a by-product it also contributes to avoid demand-induced exchange rate swings.

Another important aspect of early reputation building is a public demonstration of the ECB's independence from the political processes in Brussels as well as in member states. In a way, it should be helpful if an open conflict over the appropriate course of monetary policy would arise. This should give the ECB an excellent opportunity to prove its determination to reject any attempt at political interference. This is where the Council's right of issuing general orientations for exchange rate policy comes in; see Article 109(2) Maastricht Treaty. In fact, the Commission would be doing the ECB a great favour if it presented such a proposal very early in the EMU game. This should give the ECB the unique opportunity of gaining credibility by pointing out in public that any attempt at targeting the exchange rate goes at the expense of safeguarding the internal value of the Euro and, therefore, is to be rejected.

Benign Neglect as a Rule with Exceptions

Asking for an exchange rate regime of complete neglect may be asking for too much. In fact, we cannot rule out cases where the attempt at dampening a high-frequency fluctuation of the exchange rate may be appropriate. This suggests that the ECB should follow the principle of neglecting the exchange rate but not be rigid about it. To be sure, this type of policy regime is not compatible with a practice of general orientations for exchange rate policy. It is advisable, therefore,

that the ECB clarifies the issue.

The line of reasoning could be roughly as follows: (i) the predominant duty of the ECB is maintaining the internal stability of the Euro; (ii) exchange rate considerations must, therefore, be subordinated to that objective; (iii) any attempt at prescribing a target range for the exchange rate is to be rejected as it undermines the de-facto independence of the ECB and, consequently, its ability to maintaining price stability; (iv) the ECB does not exclude the option of intervening in the dollar-Euro market but is convinced that such intervention should be an exeption preserved for the rare cases of turmoil; (v) the ECB has no need for general exchange rate orientations to know when and how to act.

A public statement along those lines would be very helpful as it is likely to promote the public's trust in the Bank as the guardian of the currency and to contribute to containing inflation expectations. Moreover, the chances are that the Council will never execute the rights provided by Article 109 if the ECB gains the support by the public. Therefore, even if the Commission will abstain from drafting a general exchange rate orientation to avoid a clash with the ECB, the ECB should consider to publish such a statement shortly after the start of operations. Note that the ECB will have to lay down in public the guiding principles and procedures of its policies anyway. This will be the opportunity to make the point.

IV. A Formal Exchange Rate Arrangement with the U.S. and Japan?

Article 109 Maastricht Treaty permits the Council to conclude a formal exchange rate arrangement with third countries, such as the U.S. and Japan. It is not clear whether this provision is worth the paper it is written on. Suppose the ECB would object to concluding a system of fixed exchange rates by pointing out that the arrangement is likely to destroy its power of maintaining the internal value of the Euro. In that case the Council will hardly be able to enforce its intention, because it is bound by the Treaty to respect the objective of price stability.

Legal aspects aside, a system of fixed exchange rates that includes two big players of about equal strength, the U.S and the EMU, cannot be stable. The reason for this is that stability requires asymmetry, hence requires that one of the big players accepts the monetary leadership of the other. This to happen is unthinkable.

In sum, we do not have to give this type of arrangement further reflection. The same applies with respect to establishing a flexible target zone where targets are moved using some method to compute the exchange rates that reflect fundamental equilibrium (Begg et al., 1997).

Nevertheless, it may be of interest to note that of the three areas mentioned it should not be Europe but Japan who potentially has the greatest interest in negotiating a formal exchange rate arrangement. This can be read from the distribution of trade flows between the three areas, provided

by Table 2. About 25 percent of Japan's trading volume is connected with the U.S. and another 12 percent with the EU-11, totalling about 37 percent. The total trade share of the U.S. with EU-11 and Japan, in contrast, is less than 30 percent. However, this is large compared to the total trade share of the EU-11 with the U.S. and Japan. It is less than 25 percent.

Ruling out formal exchange rate arrangements at the global level does not imply to reject any type of infomal cooperation. However, it seems that such cooperation should not be directed at trying to manipulate an exchange rate but rather at encouraging all countries to run macroeconomic policies that promote internal stability at home. This is the most promising approach to avoid misalignments of exchange rates.

V. The ECB and the Outs

The EU has agreed on a new exchange-rate mechanism (ERM 2) designed to facilitate the convergence of member countries not participating in the single currency. There is no need to review the arrangement in detail.

A potentially troublesome feature of ERM 2 is to be seen in the provision that intervention at the margins will in principle be automatic and unlimited. The danger is that this may invite countries to commit the policy failures known from the history of ERM 1 and speculators to try speculation on a realignment. A cleaner solution would have been to absolve the ECB from the obligation of intervention. Fortunately, the ECB has the right to suspend intervention if this were to conflict with the objective of maintaining price stability. But note that that the latter provision may be useless if it is taken literally. Suppose, for example, that the ECB would have to intervene in support of th currency of a small country like Greece. In this case it might be difficult to argue that such intervention is large enough to force the ECB's monetary policy off track. In any case the ECB is well advised to be tough with a not participating member country should that country try to shift the responsibility for the stability of its exchange rate vis-a-vis the Euro to the ECB.

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SUMMARY OF THE DISCUSSION

This summary of the general discussion focuses on the central aspects of the expected role of the Euro in the international monetary system and economic policy in EMU.

1. Expected Role of the Euro in the International Monetary System

The role of the Euro as an international reserve currency will be strongly determined by portfolio allocation considerations. As EU currencies are partly held as a hedge against other EU currencies, the market share for the Euro will c.p. be smaller than today´s EU currencies´ holdings.
Among the factors determining portfolio allocation, the availability of products and the liquidity of markets were regarded as advantages of the dollar. Public debt markets in Europe were expected to remain more segmented than in the US. As fast changes in these respects were deemed unlikely, no large decline in the importance of the dollar was expected in the near future. It was also suggested that Asian investors would first want to see a stable Euro before they would shift their investments to it.

There was no general agreement that the Fed would be more interested in stabilizing the Euro-$ rate than the DM exchange rate today. It was seen as improbable that Asian currencies, after having abandoned their peg to the US dollar, would now choose the Euro for a new peg. Furthermore, due to the larger Euro zone compared to the individual EU countries, the immediate interest in stabilizing the exchange rate stemming from the degree of openness should decrease, which might lead to higher volatility in the exchange rate.

It was argued that one could not really talk about exchange rate variability without talking about fiscal policy. Here the development in recent years was considered as dangerous, because from it one could well conclude that the stability pact would not work, and in this case one should see an increase in exchange rate variability when fiscal policy would become more disruptive. Due to the limits imposed by the stability pact, hard adjustments necessary to satisfy the 3% criterion might lead to a rise in volatility in the short run - because of economic policy coordination failure. To decrease the pressure of the Länder budget deficits on overall Germany on the other hand and to increase the disciplinary power of the stability pact, the proposal of an additional national stability pact e.g. in Germany was brought up.

It was suggested that from current account developments over the last years one might expect the US $ to get weaker, while the Euro should be strong. However, as the cumulated current account deficits of the US were met by a large demand for dollars at the world level, this point was not accepted by all. While there was a large supply of US bonds outside the US today, due to higher growth in the US than in the EU the US could also afford a higher external debt.

The strength of the Euro would depend on international expectations. With regard to this, not only were budget constraints for US states deemed much harder today, but it was also regarded as questionable how effective the no-bailout clause would be in EMU.

Furthermore, the bad banking system in East European countries was regarded as another potential source of instability. A banking crisis there might cause an excess demand for US dollars and so an appreciation of the dollar vs. the Euro. This in turn could well lead to additional protectionism in the US, which would have an adverse effect on trade.

2. Economic Policy under EMU

Both France and Germany will have a far lower degree of openness under EMU compared to today´s situation, and so the desirability of exchange market interventions should decrease. Although exchange rate arrangements providing markets with an anchor for expectations were regarded as necessary, it was argued that sustainable exchange rates could have quite a wide range. The result that formal exchange rate arrangements empirically lead to a reduction in nominal exchange rate volatility was cited as an argument for a possible arrangement between the US and EMU.

The main point for opponents of interventions - and so of active exchange rate management - was the belief that markets are efficient or at least informationally efficient and that there really was no correct basis for determining over- or undervaluation of a currency and so the correct amount of intervention necessary at a certain point of time.

Proponents of interventions however thought that interventions were necessary for bringing exchange rates back to reasonable levels, as exchange rates in the short run were partly driven by pure speculation. However, it was recognized that this would require a judgment on what constitutes the "sensible level" first of all.

General agreement was reached on the priority of price stability as a monetary policy goal. Exchange rate policy should not dictate the policy of the ECB and misalignments - having possibly serious effects on economies, but being difficult to identify - were more serious than volatility.

A potential problem of political economy - especially in the initial years of EMU - was seen in the different views of the peoples united in EMU, as e.g. "for France the fear of an overvalued Franc would rank the same on a scale as the fear of inflation in Germany".

The process of exchange rate policy formulation was regarded as another source of problems: while it seemed possible that ministers voicing their opinion on the real exchange rate might just add to the noise in the market, the way the European Council formed its opinion and "informed" the public and the ECB would influence the public standing of the ECB.

Some participants regarded public discussions of exchange rate policy and other matters of monetary policy as jeopardizing the public belief in the stability of the common currency. Discretion was deemed necessary if ministers really wanted to influence the ECB. Others, however, argued that the ECB would have to publicly defend its policies, taking into account current developments.

Mutual influence and cooperation of the ECB and the governments due to information needs seemed plausible. As the ECB will have an interest in knowing the expectations of the governments regarding exchange rates, this would give the Council a chance to express its views on exchange rates.

To achieve price stability, the best approach seemed to give as much information about future policy as possible to the public. All recognized that "credibility" was an important factor for the new institution in order to achieve this aim, however, there was disagreement on how to gain this credibility in the first place. For some, credibility relied primarily on the institutional setup - especially on the independence of the ECB e.g. vs. the politicians; others saw credibility relying mainly on "fundamentals and the macroeconomic environment" and cited the trend of convergence of long-run interest rates in EU countries as an indication that markets would already attach "credibility" to the future monetary policy of the ECB and its prospects for achieving price stability.

Some in the first group regarded a "clash" between the ECB and the Council early on as helpful for identifying the ECB as "strong". This would boost its image in the public and thereby help gain credibility. The idea was strongly opposed by other participants, however, who thought that breaking up the "unified front" could really have the opposite effect on the public`s belief in stability - and that a public confrontation might also show that the ECB was weak.

It was recognized that monetary policy - according to the assignment problem - cannot be assigned both to a monetary target and an exchange rate target at the same time. With price stability being the primary target, the latter would have to be dropped. Therefore proponents of exchange rate management proposed more indirect means like international (informal) cooperation.

It was argued that after the creation of EMU, monetary policy should be responsible for internal equilibrium and fiscal policy for external equilibrium including the exchange rate. Contrary to considering exchange rate problems as short-run and therefore assigning monetary policy as a short-run policy to them, the exchange rate was regarded as being related to fiscal policy and exchange rate volatility to monetary policy.

As to the formulation of monetary policy, considering inflation targeting - represented by the UK system- and the "monetary targeting" of the Deutsche Bundesbank as two totally separate concepts with regards to targets was considered misleading, as the policy of the Deutsche Bundesbank contains elements of long-run inflation targeting.

International responsibility of central banks in the case of international crises was regarded as being mainly in the hands of the US Federal Reserve Bank. However, it was suggested that an international financial crisis might lead to more cooperation. Furthermore, a change in the role of G-7 was considered inevitable. As finance ministers of the EU would not resign from G-7, this would imply that they had to think of policy coordination on an EMU scale, including exchange rate policy. This was considered to be perfectly consistent with the ECB being committed to price stability.

Chances for a greater cooperation with the United States were seen as dim, because compared to Asia, Europe would rank far lower in importance, meaning that the US should be more interested in an international policy coordination with Asia.

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