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Hefeker, Carsten

Working Paper The political choice and collapse of fixed exchange rates

Diskussionsbeiträge - Serie II, No. 277

**Provided in Cooperation with:** Department of Economics, University of Konstanz

*Suggested Citation:* Hefeker, Carsten (1995) : The political choice and collapse of fixed exchange rates, Diskussionsbeiträge - Serie II, No. 277, Universität Konstanz, Sonderforschungsbereich 178 - Internationalisierung der Wirtschaft, Konstanz

This Version is available at: https://hdl.handle.net/10419/101491

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## Sonderforschungsbereich 178 "Internationalisierung der Wirtschaft"



Diskussionsbeiträge

Juristische Fakultät Fakultät für Wirtschaftswissenschaften und Statistik

Carsten Hefeker

The Political Choice and Collapse of Fixed Exchange Rates

1 2. OKT. 1995 Weltwirtschaft W 113 (2777) migusig gla

Serie II — Nr. 277 August 1995

# The Political Choice and Collapse

## of Fixed Exchange Rates

Carsten Hefeker



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Serie II - Nr. 277

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August 1995

## THE POLITICAL CHOICE AND COLLAPSE OF FIXED EXCHANGE RATES

Carsten Hefeker\*

University of Konstanz P.O.Box 5560, D 138 78434 Konstanz, Germany Tel.: +7531-88-2175 Fax: +7531-88-3130 E-mail: Carsten.Hefeker@uni-konstanz.de

Abstract:

Evidence suggests there is a strong tendency among states to choose fixed exchange rates. Yet the interpretation of fixed exchange rates as a monetary policy rule remains unconvincing. Adopting an endogenous policy perspective, this paper argues that political-support maximizing governments choose fixed exchange rates to benefit domestic interest groups. Exogenous shocks, however, may change domestic political equilibria, causing the collapse of international arrangements and the switch to flexible exchange rates. Institutional peculiarities make monetary unification a special case in this cycle.

JEL-Classification: D 72; F 02; F 33.

Keywords: exchange rate regime, monetary union, political economy.

\* I would like to thank Hans Peter Grüner, Ed Kane, Matthias Moersch, Kevin O'Rourke, Heinrich Ursprung, Tom Willett and seminar participants in Berkeley, Konstanz, Long Beach, and St. Gallen for comments and discussion. Financial support from the Deutsche Forschungsgemeinschaft through the SFB 178 is gratefully acknowledged.

#### 1. Introduction

The most striking impression the observer of historical and current exchange rate regimes gets is the strong and recurrent tendency among states to at least adopt fixed exchange rates if not to move towards a full monetary union. Beginning in the mid-19th century in the course of nation-building, formerly independent states moved towards the adoption of a national currency, sometimes even accompanied by attempts to form monetary unions across national borders. Likewise, the common gold standard of the 1880s was the adoption of a fixed exchange rate vis-à-vis a common monetary basis which broke down with World War I. The interwar years then saw a rapid sequence of different exchange rate regimes: from freely. floating rates via fixed rates to managed floating, being followed after the second World War by the Bretton Woods system of fixed exchange rates. After its formal dissolution in 1973, European economies made attempts to fix their exchange rates among themselves. First the "snake" was launched and in 1979 the European Monetary System followed. The latter, **in** turn, is itself characterized by phases of enthusiasm for full monetary union, expressed in the Werner and Delors reports and the Maastricht treaty, and phases when that idea was relegated to the future (see Gros and Thygesen, 1991, for a brief history of the EMS).

Astonishingly, the reasons for these observed cyclical movement has rarely been tackled in the literature. Empirical studies that try to assess which regime performs better in terms of output stabilization and price stability take the choice of the regime as given (Alogoskoufis and Smith, 1991; Baxter and Stockman, 1989; Bayoumi and Eichengreen, 1994). Recent theoretical studies, building on the well-developed literature of time-inconsistency problems in monetary policy and the superiority of rules compared with discretionary regimes, interpret a fixed exchange rate regime as a contingent commitment to an external anchor with an escape clause (Bordo and Kydland, 1990; De Kock and Grilli, 1993).<sup>1</sup> This interpretation, however, is not convincing.

First, why should a policy of pegging to a low-inflation currency be more reliable than a policy of maintaining a low growth rate for the domestic money stock under a regime of floating rates? This is only the case under two conditions: either the exchange rate is a more credible target than any other monetary target or the international monetary system has a built-

in feature that discourages global inflation (Giovannini, 1993a). While the international gold standard had a credible external anchor, it is not clear why under a fiat currency system a system of fixed exchange rates can qualify as a monetary rule.<sup>2</sup> Rogoff (1985) even argues that fixed exchange rates invite concerted inflation among the involved countries. Moreover, for the contingent rule to be credible, the public must believe in the ultimate return to the fixed rate (Giovannini, 1993a).

Furthermore, the basic assumption of these models is that a welfare-maximizing government chooses the exchange rate regime which is to the benefit of all citizens. Distributional conflicts arising from exchange rate regimes are neglected as the discussion is framed in terms of an one-good economy. Relaxing this assumption and adopting a view of policy making, where politicians are not welfare-maximizing but act to the benefit of interest groups, the distributional effects of fixed and flexible exchange rate regimes become important: who is to benefit from either regime and how do these interests gain influence on economic spolicy making?

The scarce literature to answer this question is usually based on class conflicts between labor and capital (see e.g. Epstein, 1991). This is, however, not consistent with reality where most policy positions are taken along industry lines rather than factor lines because adjustment costs induce factor owners to prefer staying in their sector even if long-term income in other sectors might be higher. While Ruland and Viaene (1993) explicitly address the preferred choice of sectors, stakes in their model depend on current account positions and should thus result in frequent changes of the preferred regime for a certain group. This is also true for attempts to derive exchange rate regime choice from traditional Mundell-Fleming models as in Giovannini (1993b). None of these approaches can explain the rather lengthy periods of regimes. Gärtner and Ursprung (1989), however, derive political-economic reasons for longrun changes between exchange rate regimes.

Eichengreen (1992), in contrast, endogenizes the collapse of exchange rate regimes. He shows for the interwar period that the decision of most countries to stay on the gold standard or to leave it was strongly influenced by internal and external political factors. In his view credibility and cooperation are decisive for the survival of a fixed rate regime. A country's

commitment to a common standard is undermined by domestic considerations. International cooperation, necessary to defend fixed rates in times of stress, is not forthcoming when domestic considerations become more important for a government. Financial markets, expecting a shift in the exchange rate regime, cannot be tamed under full capital mobility and hasten the collapse of the system.

This paper combines the literatures on choice and collapse of exchange rate regimes and addresses the cycle which can be observed between exchange rate regimes from a politicaleconomy perspective. Although interest groups have also a preferred exchange rate level (see Stephan, 1994), I focus on the choice of the regime here. One would expect the non-tradables goods producing sector to prefer appreciations while the exporting and import competing sector would benefit from devaluation. Hence those exposed to exchange rate fluctuations have to decide what matters more to them, the level of exchange rates or their variability (see Frieden, 1994). It becomes clear later why I think the latter is more important to them.

Starting out with an industrial interest group-based choice of the exchange rate regime, conditions are derived which influence the stability of a regime and determine when external circumstances become strong enough to change the domestic political equilibrium and to cause the collapse of a regime.<sup>3</sup> The basic argument derived is that economic shocks, by causing self-interested governments to expand the money supply, might make monetary policies of countries with a fixed exchange rate incompatible with each other, thereby ultimately causing the collapse of fixed rates. Whether monetary regimes are viable even under the occurrence of shocks is dependent on the relative influence of interest groups and the nature of shocks. The paper therefore offers one explanation to the question of feasible or politically optimal currency areas as a counterpart to optimum currency areas in normative perspective (see Bofinger, 1994; Melitz, 1993 and Wihlborg and Willett, 1991, for recent contributions). Although many of the results are compatible with the traditional literature, they derive from a different reasoning. Finally, I explore when monetary union will be the alternative to fixed exchange rates and how long a monetary union is viable.

#### 2. An Interest Group Approach to Exchange Rate Regimes

Contrary to the expectations of proponents of flexible exchange rates (see Friedman, 1953), flexible exchange rates do not lead to a stabilization of the real exchange rate. Under full capital mobility the reasons for these swings in the exchange rate are seen in the effects of speculation. It is argued that financial markets might be subject to destabilizing speculation. Market participants, when expecting a future devaluation, will speculate against a currency and thereby cause the devaluation immediately (Krugman, 1979). Obstfeld (1986) shows that indeed expectations can trigger such a crisis, regardless of the underlying fundamentals of the economy. Multiple equilibria are possible which could lead to the collapse of an exchange rate not justified by fundamentals. The main problem with adjustable or managed exchange rates under full capital mobility is therefore that speculators try to anticipate changes, thereby provoking occasional speculative attacks on currencies.

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#### 2.1. Interests in Favor of Fixed Exchange Rates

Given that exchange rates swing widely, their instability should influences firms' behavior, and interest groups preferring fixed exchange rates can naturally be found in those sectors exposed to international trade (Eichengreen and Frieden, 1993). The reason why this sector prefers fixed exchange rates is that with exchange rate variability foreign trade is exposed to uncertainty in addition to the unavoidable uncertainties created by relative price and aggregate demand variations (Perée and Steinherr, 1989). Although it is often argued that short-term risk can easily, albeit not costlessly, be hedged in financial markets, this is much more difficult beyond a one-year period as forward markets are virtually non-existing for periods beyond that period. Furthermore, it is generally very difficult to buy insurance against this long-term uncertainty because its pricing is impossible (De Grauwe and de Bellefroid, 1987).

It has, hence, frequently been shown theoretically that exchange rate variability decreases the level of activity of a risk-averse firm if hedging is not available. The evidence that exchange rate variability is destructive for the level of international trade is, nevertheless, far from being conclusive. On the whole, the majority of studies has failed to find evidence supporting this

hypothesis. However, when turning to time-periods longer than one year, the evidence is much stronger that the volume of trade is indeed negatively affected by exchange rate uncertainty (De Grauwe and de Bellefroid, 1987; Perée and Steinherr, 1989).

While it is debated whether exchange rate changes really lead to reduced international transactions, it is undisputed that currency hedging involves costs. Hedging costs are, however, not the only costs of varying exchange rates. Krugman (1989) refers to the widespread pricing to market behavior of international firms. Firms set prices in domestic currencies in that country in which they supply their product. Due to high competition in the foreign market they are forced to fix their prices in the foreign currency and are not able to adjust them according to exchange rate changes. This implies that an exporting firm has to bear the costs of an appreciating home currency and a loss of profits if the exchange rate changes unfavorably.

Moreover, there are considerable long-term effects involved with exchange rate uncertainty. Dixit (1989) argues that, when future exchange rates are uncertain, there is an incentive for a firm to adopt a wait-and-see attitude towards investment which in turn reduces the rate at which investment adjusts to fundamental factors. If a firms faces costs of entry and exit in a market, the firm will delay the investment even if appreciation and depreciation are equally likely. This will create a corridor of exchange rate changes in which no adjustments are made by a firm. Exchange rate uncertainty thus leads to too slow an adjustment to changing patterns of comparative advantage. If, however, firms stay in a market although it is temporarily unprofitable, they lose money. There are thus implicit costs of exercising an investment option which have to be added to the visible costs of investment. Consequently, firms invest less which implies opportunity costs which otherwise would not have been present.

Likewise, market structures could be influenced by exchange rate variability. Baldwin and Krugman (1989) show that, for large exchange rate changes, a temporary overvaluation is followed by a persistent reduction in the equilibrium exchange rate which is enough to correct the trade balance but not enough to regain once lost markets. For all these reasons it seems obvious that industries would prefer fixed exchange rates even if they forego the opportunity to benefit from a devaluating home currency.

A final reason why the exchange regime is more important than a particular level is that the efficacy of the exchange rate instrument has been considerably reduced in recent years. Increased intra-industrial trade and similarity in production structures in European countries have made the exchange rate an inappropriate instrument of adjustment. Exchange rate changes have lost their function as asymmetric shocks became less frequent and important (Gros and Thygesen, 1992).

#### 2.2. The Costs of Fixed Exchange Rates

Those for whom cross-border and foreign currency transactions are inconsequential stand to lose the most from fixed parities. For them predictable exchange rates are of little or no value, whereas national reduced autonomy in the formulation of macroeconomic policy may be important.

The possibility of an expansive monetary policy, however, is esteemed because monetary policy can have at least short-run effects on output and employment in the economy. One explanation for this may be sticky wages because of long-term nominal contracts, union monopoly power or price-adjustment costs. Another reason can be found in the literature on coordination failures (see Blanchard, 1990, for an overview). If the willingness of an agent to reduce his nominal wage depends on the willingness of others to do so, then a coordination problem arises. That means, no agent is willing to be the first to lower his nominal wage demand. The real wage can nevertheless be brought back in line with prices by inflation.

A fixed exchange rate in contrast reduces the flexibility of monetary policy. Imagine a country subjected to a negative shock. If the exchange rate were of no concern, the central bank could initiate expansionary open-market policies to stabilize output. Were it however committed to the maintenance of an exchange rate target, reflation would be impossible because a rapid increase in domestic credit would threaten to produce a loss of international reserves, causing a fatal blow to confidence in exchange rate stability.

Absent the possibility of reflation, other channels of adjustments would be required. The most obvious would be increased wage flexibility. Workers would have to lower their nominal wage demands to provide the necessary real wage flexibility. Therefore, labor would suffer

from either unemployment or wage reductions. Another adjustment mechanism would be increased labor mobility between sectors and countries. <sup>4</sup>

The same external constraint limits the use of fiscal policy. By limiting the availability of seigniorage revenue, reduced monetary autonomy influences the range of feasible fiscal policy. Therefore, De Kock and Grilli (1993) identify the need of seigniorage revenue in case of large asymmetric external shocks like wars to be responsible for the collapse of fixed exchange rates. Were a group of countries tied by fixed exchange rates similarly affected by negative shocks, it would be possible to initiate an internationally coordinated monetary expansion in a way that no exchange rate suffered under weakness. In that case, foregoing exchange rate flexibility would incur no costs because the optimal monetary response would be similar for all countries. Only asymmetric shocks require asymmetric responses.

#### 3. A Model of Endogenous Exchange Rate Regimes

In this section a model is developed to analyze the distributional conflict between the tradables and the non-tradables sector implied by exchange rate regimes. The interests of both factors of production are derived along industry lines because factors of production are industry-specific and cannot move across industries instantaneously and without costs. Decreasing output thus results in unemployment and profit loss. Hence, in this model workers and capital owners in a sector have similar interests and unite in their political position.<sup>5</sup>

The model is a two-sector, two-country model, formulated in logs. The rate of change in output in the tradables sector in the home country

$$y_{T} = \gamma \left[ \pi + e(1 - \sigma^{2}) \right]$$
(1)

is a function of a home component and of net-exports. In this short-run model, an increase in  $\pi$  raises the output of that sector. This relationship could arise from imperfect information about the aggregate price level or from incomplete price adjustments (see e.g. Romer, 1993). Nominal contracts and adjustment costs imply that demand management policies can influence output (Blanchard, 1990).<sup>6</sup> The second term e, the domestic currency price of a unit of foreign

currency, captures the change in net-exports. A devaluation makes home-produced goods more competitive internationally and increases exports and output. Profits from and production of exports goods, however, are negatively affected by the costs of hedging and by exchange rates variability.  $\sigma^2 = Var(e)^2$ , with  $0 \le \sigma^2 < 1$ , captures their adverse influences. It is squared to stress the increasing adversity of the tradables sector towards exchange rate fluctuations.

The change in output in the non-tradables sector

$$y_{N} = \gamma \pi \tag{2}$$

is also positively dependent on money supply increases. For simplification, I exclude any substitutional relation between both goods. This excludes many of the distributional conflicts about the level of exchange rates between the two sectors and allows hence to focus on the exchange rate regime choice.

The exchange rate

$$\frac{e}{\kappa} = \pi - \pi^* \tag{3}$$

is given by the difference in rates of inflation in the two countries. This is, of course, a simplification since output effects which also influence the exchange rate are excluded. The parameter  $\kappa$  measures restrictions on capital mobility, where  $1 \le \kappa < \infty$ . If  $\kappa$  approaches infinity, capital controls ensure that deviations in money supply of the two countries do not affect the exchange rate.  $\kappa = 1$  portrays complete capital mobility and the exchange rate reflects instantaneously deviations in money supplies.  $\kappa$  should be interpreted as a change in the degree of capital restrictions because levels would induce adjustment behavior by agents and lose their effectiveness over time. Wyplosz (1986) argues that capital controls are used in an "on-and-off" fashion, being relaxed in tranquil periods and reinstated when pressures build up on a currency.

The politically self-interested government's objective function, a political support function, is given as

$$\mathbf{V} = -\left\{ (1-\alpha)\mathbf{y}_{\mathrm{T}} + \alpha \mathbf{y}_{\mathrm{N}} \right\}^{2} - \omega \pi^{2}.$$
(4)

The government has a short-time-horizon, wants to be reelected, and is thus interested in maximizing political support.<sup>7</sup> The first term captures the political support the government receives from both sectors by making a policy which helps them to expand their output.  $\alpha$  is the political weight the nontradables sector has which can be interpreted as a function of the size of that sector.  $y_{T,N}$  describe deviations from the target level of employment, i.e. full-employment, in the two sectors, and  $\pi$  deviations of the actual rate of inflation from its target level, assumed to be zero. Inflation is assumed to depend only on the country's own money growth rate and to be under the direct control of the government.

Maximum political support could be hence obtained with full employment and no inflation. All deviations are squared to express increasing marginal dissatisfaction with  $\square$  deviations from the targets. Voters have an increasing aversion to inflation and would thus punish an inflationary government policy. Because both factors of production are, at least in the short run, immobile and mobility entails switching costs, both factor owners prefer to stay in their respective industry. Therefore, factor owners employed in the two industries face a trade-off in their support for monetary expansion and in their inflation aversion. The tradables sector faces, moreover, a trade-off between the positive effects of monetary stimulation and the implied devaluation, while on the other side exchange rate movements affect it negatively via  $\sigma^2$ . The non-tradables sector only experiences positive output effects from money creation.

The foreign country exhibits the same structural relationships. Foreign variables are marked with an asterisk. The output of the foreign tradables sector is

$$\mathbf{y}_{\mathrm{T}}^{*} = \gamma \left[ \pi^{*} - \mathbf{e} (1 - \sigma^{2}) \right], \tag{5}$$

where the exchange rate exerts the opposite effect to that in the home country. Since the exchange rate is the only channel of transmission between the two countries, positive spillovers

are excluded (for a rich variety of spillover effects see Canzoneri and Gray, 1983). The output of the foreign non-tradables sector is

$$\mathbf{y}_{\mathrm{N}}^{*} = \gamma \pi^{*} - \varepsilon^{*}. \tag{6}$$

To capture the possibility of asymmetric shocks, I introduce a country and sectorspecific supply shock  $\varepsilon^*$  for the foreign country. I focus here only on asymmetric shocks because a common shock on the tradables sector of the two countries would be countered by a common money supply increase. There would be thus no problem for the cooperation between the two countries. Since I am concerned with the viability of cooperation, I only consider asymmetric shocks.

The foreign government maximizes its political support function

$$\mathbf{V}^{*} = -\left\{ (1-\beta)\mathbf{y}_{T}^{*} + \beta \mathbf{y}_{N}^{*} \right\}^{2} - \nu \pi^{*2}.$$
<sup>(7)</sup>

Both countries hence differ only in their industry structures, as measured by  $\alpha$  and  $\beta$ , the degree of aversion to inflation, and the possibility of an asymmetric shock.

Both governments maximize their respective political support function. This implies as the reaction function of the home country

$$\pi = \frac{\pi^* \Delta \Gamma}{\Gamma^2 + \omega} \tag{8}$$

with  $\mathbf{a} \equiv (1-\alpha)(1-\sigma^2) > 0$ ;  $\Gamma \equiv \gamma(1+a\kappa) > 0$ ;  $\Delta \equiv \gamma a\kappa > 0$ .

The home country expands its money supply if the foreign country does to counter negative exchange rate effects which would hurt the tradables sector. This can be interpreted as competitive devaluation. Moreover, the less the degree of asset substitutability, the larger the  $\kappa$ , the more the domestic money supply can be increased without leading to exchange rate movements which are opposed by the tradables sector.

The foreign country's reaction function is

$$\pi^* = \frac{\pi \Omega \Psi + \Psi \beta \varepsilon^*}{\Psi^2 + \nu} \tag{9}$$

with  $b \equiv (1-\beta)(1-\sigma^2) > 0$ ;  $\Psi \equiv \gamma(1+b\kappa) > 0$ ;  $\Omega \equiv \gamma b\kappa > 0$ .

The reaction of the foreign country to the home country's money supply is similar, i.e. devaluations are countered by expansive monetary policy. In addition, the foreign country will react to the country specific shock  $\varepsilon^*$  by increasing its money supply. Exchange variability and inflation aversion, however, restrict the expansive monetary policy.

The resulting Nash-equilibrium money supplies from (8) and (9) are

$$\pi = \frac{\varepsilon^* \, \mathcal{Y} \beta \Delta \Gamma}{\Theta} \tag{10}$$

and

$$\pi^* = \frac{\varepsilon^* \Psi \beta (\Gamma^2 + \omega)}{\Theta} \tag{11}$$

•

with  $\Theta \equiv (\Gamma^2 + \omega)(\Psi^2 + \nu) - \Delta \Gamma \Omega \Psi$ .

By using the optimal rates of inflation, (10) and (11) in (4) and (7), the political support for the two governments is then given as

$$\mathbf{V} = -\left\{-\varepsilon^* \beta \Delta \Psi \frac{\omega}{\Theta}\right\}^2 - \omega \left\{\varepsilon^* \frac{\beta \Delta \Gamma \Psi}{\Theta}\right\}^2 \tag{12}$$

and

$$\mathbf{V}^{*} = -\left\{ \boldsymbol{\varepsilon}^{*} \boldsymbol{\beta} \boldsymbol{\Psi} \left[ \frac{\boldsymbol{\gamma} (\boldsymbol{\Gamma}^{2} + \boldsymbol{\omega}) + \boldsymbol{\Omega} (\boldsymbol{\gamma}^{2} + \boldsymbol{\omega})}{\boldsymbol{\Theta}} \right] - \boldsymbol{\beta} \boldsymbol{\varepsilon}^{*} \right\}^{2} - \nu \left\{ \boldsymbol{\varepsilon}^{*} \boldsymbol{\beta} \boldsymbol{\Psi} \frac{(\boldsymbol{\Gamma}^{2} + \boldsymbol{\varpi})}{\boldsymbol{\Theta}} \right\}^{2}$$
(13)

respectively.

#### 4. When Fixed Exchange Rates?

Governments are interested in maximizing political support, not only when elections approach but also during their term in office because political support raises funding and donations. It is obvious that the government can benefit its tradables sector by reducing the degree of currency fluctuations,  $\sigma^2$ , to zero. By fixing the exchange rate, the output of the tradables sector will increase as described above, since exchange variability decreases that sector's output. Although devaluation would also benefit the tradables sector, risk-averse traders would prefer fixed rates and secure profits as argued in section 2. Thus, the tradables sector prefers fixed rates and will support such a policy. On the other hand, the non-tradables sector has an incentive to require monetary expansion. Monetary expansion, however, would increase the rate of inflation and hence cost political support. The decisive factor will thus be the relative size of both sectors and the degree of inflation aversion. The larger the tradables sector, the more the government will care for its interests and pursue a policy of fixing exchange rates.

While the sectoral impact of exchange rate regimes helps explain political conflict over this issue, it can explain changes in the support for one or another system over time only if the relative importance and influence of different groups changes. This could be due to changes in the relative size of sectors, their degree of political organisation and the electoral system. If a political system is more responsive to a certain sector, its influence might be more than proportional. Organizational capacities of a sector also affect its political influence. Therefore, one would expect that opening up a country to foreign trade or restructuring the economy towards tradables goods would increase the tradables sector's political influence.<sup>8</sup> As Hefeker (1995) shows, the industrial revolution in the 19th century and the resulting expansion in international trade caused governments to move towards a policy of monetary integration. Likewise, in the European Community increased trade among the countries increased the support for fixed rates, visible in the rapid adoption of the snake-arrangement after the collapse of the Bretton Woods system and the creation of the EMS in 1979.

One special reason for the European countries to persue fixed fixed rates is the Common Agricultural Policy (CAP) of the European Union. A significant change in intra-European

exchange rates creates an incentive for producers in the depreciating country to export agricultural products to other member countries. In order to insulate domestic markets from these pressures, intra-European trade in agricultural commodities is supposed to take place at "green exchange rates" which differ from market rates (see Giavazzi and Giovannini, 1989). Adjusting these rates, however, becomes increasingly difficult if the nominal rates frequently change. Moreover, the recent reform of the price mechanism in the CAP has caused political pressure in the revaluing countries, like Germany, because peasants are no longer fully compensated for their exchange rate losses. Therefore, floating rates constitute a serious obstacle to the survival of the CAP in the common market.

The institutional peculiarity of a fixed exchange rate regime is that one country usually sets the money supply, while the other countries follow by setting the exchange rate. Under the classical gold standard this country was England where the Bank of England acted as the Stackelberg leader for the system. The same role was fulfilled by the U.S. under the Bretton Woods system and by Germany in the EMS. Therefore, the home country is assumed to set the rate of inflation in the fixed exchange rate regime  $\pi_F$  while the foreign country fixes the exchange rate in the model. Hence the home country is the Stackelberg leader which optimizes by taking into account the reaction function of the foreign country. If the foreign country were the Stackelberg leader, it would set the money supply higher to counter the negative shock. The results would be, however, symmetric in what follows. Only the argumentation for the two countries would be changed.

The political support in the home country for the case of fixed exchange rates is, analogue to (4), given by

$$\mathbf{V}_{\mathrm{F}} = -\left\{ (1-\alpha)\gamma \pi_{\mathrm{F}} + \alpha \gamma \pi_{\mathrm{F}} \right\}^{2} - \omega \pi_{\mathrm{F}}^{2}.$$
(14)

The foreign country's support function is, analogue to (7),

$$V_{\rm F}^{*} = -\{(1-\beta)\gamma\pi_{\rm F} + \beta(\gamma\pi_{\rm F} - \epsilon^{*})\}^{2} - \nu\pi_{\rm F}^{2}.$$
(15)

In this scenario the Stackelberg leader's choice is to set inflation to zero because it experiences no shock while the foreign country follows domestic monetary policy to keep the exchange rate fixed. Notice that the Stackelberg leader only considers domestic influences when setting his optimal monetary policy in this model because spillover effects are absent under fixed rates.

The home government prefers the fixed exchange rate regime as long as political support in this regime is higher than under floating rates, hence  $V(m) < V_F(m_F)$ , where a regime change is assumed to be costless. I thus abstract from exit costs in the form of lost prestige as is often assumed for countries on a fixed rate. Obviously such costs would prolong the survival of a fixed rate regime (see Okzan and Sutherland, 1995).

The condition is fulfilled if

$$\mathbf{V}_{\mathrm{F}} - \mathbf{V} = \left(\beta \varepsilon^{*}\right)^{2} \left\{ \left(\frac{\Psi \Delta}{\Theta}\right)^{2} \left(\omega \Gamma^{2} - \omega^{2}\right) \right\} \ge 0.$$
 (16)

A country does not necessarily prefer being the Stackelberg leader. However, as long as (16) is satisfied, the home country willingly accepts its leadership role and abstains from obstructing the unilateral peg of the foreign country.<sup>9</sup> If the condition is no longer fulfilled, the country will leave the system or actively try to undermine the peg of the foreign authority. The condition is more likely to be fulfilled if the political influence of the non-tradables sector is small and the negative influence of exchange variability is large. Then the desire for fixed exchange rate from the tradables sector is decisive. Capital controls also make this condition more likely to hold because they make a money supply increase compatible with fixed exchange rates.

The foreign country chooses fixed exchange rates as long as  $V^*(m^*) < V_F^*(m_F^*)$  holds. That is true if

$$\mathbf{V}_{\mathrm{F}}^{*} - \mathbf{V}^{*} = \left(\beta \varepsilon^{*}\right)^{2} \left\{ \left(\frac{\Psi}{\Theta}\right)^{2} \left[ \left(\gamma \left(\Gamma^{2} + \omega\right) + \Omega \left(\gamma^{2} + \omega\right)\right)^{2} + \nu \left(\Gamma^{2} + \omega\right)^{2} \right] \right\} \ge 0.$$
(17)

Again, the interest of the tradables sector in fixed exchange rate will support the maintenance of fixed exchange rates, whereas the non-tradables sector pushes for the expansion of monetary policy which conflicts with the exchange rate target. Once more,  $\kappa$  broadens the range of feasible monetary policy compatible with the fixed exchange rate.

The binding condition is, of course, (16). The home country is only willing to account for the expansionary monetary policy of the foreignh country to a certain degree. Inflation aversion and the influence of the non-tradables sector in the home country will ultimately undermine support for the fixed exchange rate in the home country. Hence, countries will support fixed rates as long as asymmetric shocks do not become too large.<sup>10</sup> Whenever (16) or (17) are no longer fulfilled, the respective country will abandon a fixed rate regime and return to an independent float. Since a large  $\kappa$  makes diverging money supplies between the two countries compatible with the goal of fixed rates, capital controls support fixed exchange rates to a certain degree (Okzan and Sutherland, 1995).<sup>11</sup> This might be the reason why the Bretton Woods survived for such a long period regardless of divergent inflation performance of the countries involved. Only the massive monetary expansion in the U.S. following the Vietnam war caused its collapse.

Capital controls absent, the setting of monetary policy must be tightly coordinated as markets otherwise will test the fixed exchange rate. An example could be seen in the latest EMS crises (see Hefeker, 1994). There, because of the recession in Europe, the EMS partners were no longer willing to follow the tight monetary policy of Germany. They abandoned the exchange rate target thereby causing the collapse of the EMS.

#### 5. Why and For How Long Monetary Union?

This section explains what is special about the European case and why European countries intend to go much further than only fixing their exchange rates although full monetary union as opposed to a fixed but adjustable exchange rate regime involves abandoning the flexibility of suspending the fixed exchange rate when necessary.

One reason for complete monetary union instead of only fixed rates is certainly that conversion costs can be reduced. Giovannini (1993b) cites estimates that currency conversion

costs average 2.5 percent for travellers and that they fall to 0.05 percent for transactions in excess of \$ 5 million. Averaging across individuals and firms he concludes that conversions costs amount to 0.4 percent of GDP for the EC as a whole. Although no convincing motive for moving towards full monetary union alone, this effect contributes to the gains for the tradables sector from monetary union.<sup>12</sup>

The deep reason for monetary union, however, must be seen in the European integration process. Support for EMU increased especially in the 1980s as a result of increasing levels of European trade, reflected by decreases in the  $\alpha$  and  $\beta$  terms in the model (see Frenkel and Wei, 1993). The increased degree of trade among EU members, especially increased intra-industrial trade, reduced the interests of industries in protection because of the danger of retaliation. This gave rise to the wave for economic integration and finally the Common Market Program (see Schuknecht, 1992). The Single European Act of 1986 committed the member countries to reach full mobility of factors of production by 1993.

It is this requirement of full capital mobility which undermined the viability of the EMS in its old form. Periods of fixed exchange rates, accompanied by occasional suspensions as modeled in section 4 were possible only because temporary capital controls protected exchange rates and central banks' reserves against speculative attacks (see Wyplosz, 1986 for a discussion of temporary capital controls). Firmly fixed exchange rates without the possibility to realign are not credible because it is impossible and undesirable for a political supportingmaximizing government to preclude utilizing the exchange rate instrument. Obstfeld (1994) shows that the existence of an escape clause, as given with adjustable exchange rates, may undermine a government's attempt to defend exchange rates. Therefore, absent the possibility to combine (at least reduced) monetary autonomy with fixed rates, fixed rates are not taken to be irrevocably fixed. Under full capital mobility speculators will test the commitment of central banks and governments to defend the rates and ultimately cause the collapse of the arrangements, as the EMS experience has shown. The only alternative to full monetary union then is a free float. Consequently in the late 1980s and early 1990s the Delors report and the Maastricht treaty followed, proposing monetary union.

Hence, under full capital mobility, where  $\kappa = 1$ , the choice problem for the home country is between monetary union and flexible exchange rates. The political support for monetary union is given by, analogue to (4) and (7),

$$\mathbf{V}_{\mathrm{U}} = -\left\{ (1-\alpha)\gamma \pi_{\mathrm{U}} + \alpha \gamma \pi_{\mathrm{U}} \right\}^{2} - \omega \pi_{\mathrm{U}}^{2}$$
(18)

and

$$\mathbf{V}_{\mathrm{U}}^{*} = -\left\{ (1-\beta)\gamma\pi_{\mathrm{U}} + \beta(\gamma\pi_{\mathrm{U}} - \varepsilon^{*}) \right\}^{2} - \nu\pi_{\mathrm{U}}^{2}$$
(19)

in the two countries.

The common money supply chosen in the monetary union follows from the joint maximization of the two individual support functions (18) and (19)

$$\pi_{\rm U} = \frac{\beta \varepsilon^*}{2\gamma + \omega + \gamma} \equiv \beta \varepsilon^* \eta.$$
<sup>(20)</sup>

The assumption is as before that the central bank follows the direction of the governments. This is obviously a simplification since at least the European Central Bank will be, according to the Maastricht treaty, independent. Thus, the actual money supply set by the European Central Bank might differ from the one derived here. Von Hagen and Süppel (1994) analyze in detail the power distribution between the center and the regions in the European Central Bank. This is, however, not the focus of this paper.

Notice that monetary union would imply for the home country that its rate of inflation would increase because of joint decision making in the common central bank since  $\pi_U > \pi_F$ . By how much it would increase is dependent on the bargaining power of the countries. For simplification, I assume equal bargaining power.

Political support under monetary union in the two countries is then

$$V_{\rm U} = -\left\{\gamma\eta\beta\epsilon^*\right\}^2 - \omega\left\{\eta\beta\epsilon^*\right\}^2,\tag{21}$$

and

$$V_{\rm U}^* = -\left\{\gamma\eta\beta\epsilon^* - \beta\epsilon^*\right\}^2 - \nu\left\{\eta\beta\epsilon^*\right\}^2.$$
(22)

Given that monetary union constrains monetary policy in the countries, the question is how long it will a viable. Examples for dissolutions of monetary unions can be found in the Latin and the Scandinavian Monetary Unions (Hefeker, 1995), the Austro-Hungarian empire after World War I (Garber and Spencer, 1994) and the countries of the ruble zone in the former Soviet union (Goldberg et al, 1993) where asymmetric shocks were strong enough to make floating the preferred alternative. Notice, however, that the reasons behind the formation of these currency unions were different to those in the case of the envisaged European monetary union, but political reasons behind monetary unions are exogenous to this model

The home country supports monetary union as long as  $V(m) - S < V_U(m_U)$ , where S captures the costs to a country when breaking up a monetary union. These costs can be imagined as the costs of setting up a new central bank, printing new notes and, most importantly, the prestige lost when leaving a monetary union. Moreover, one could imagine that a monetary union treaty involves a penalty for countries breaking their commitment. Although this is only a one time cost, it influences short-term political support and is thus important to the government. For a detailed discussion of switching costs see Dowd and Greenaway (1993).

The home country will fulfill its commitment as long as

$$\mathbf{V}_{\mathrm{U}} + \mathbf{S} - \mathbf{V} = \left(\beta \varepsilon^{*}\right)^{2} \left\{ \left(\frac{\Psi \Delta}{\Theta}\right)^{2} \left[\omega \Gamma^{2} - \omega^{2}\right] - \eta^{2} \left(\gamma^{2} + \omega\right) \right\} + \mathbf{S} \ge 0$$
(23)

while the foreign country requires that  $V^*(m^*) - S < V_U^*(m_u^*)$ , where switching costs are assumed to be equal for the two countries. That is given if

$$V_{U}^{*} + S - V^{*} =$$

$$\left(\beta\epsilon^{*}\right)^{2} \left\{ \left(\frac{\Psi}{\Theta}\right)^{2} \left[ \left(\gamma\left(\Gamma^{2} + \omega\right) + \Omega\left(\gamma^{2} + \omega\right)\right)^{2} + \nu\left(\Gamma^{2} + \omega\right)^{2} \right] - \eta^{2}\left(\gamma^{2} + \nu\right) \right\} + S \ge 0.$$

$$(24)$$

Both conditions are similar to (16) and (17) respectively. Only  $\eta^2(\gamma^2 + \nu)$  and  $\eta^2(\gamma^2 + \omega)$  are substracted respectively. But that influence is small since the denominator is very likely to be larger than the numerator in each case. The size of switching costs is, however, very important in the decision whether to abandon the monetary union. Hence the establishment of a common central bank and the introduction of one physical money system will unambiguously prolong the survival of a monetary union. Switching costs can therefore compensate for the abolition of capital controls whose absence make the conditions harder to fulfill.

Notice finally that disregard of the employment and output aim in the two objective functions of the governments will not create the kind of tension between the fixed exchange rate goal and the output stabilization goal. Thus the classical gold standard might have survived until the first World War, regardless of full capital mobility, because the commitment to the common monetary standard and to monetary stability were tantamount to the output stabilization aim (Eichengreen, 1992).

#### 6. Conclusion

The model developed in this paper is used to analyze cycles in the choice of exchange rate regimes across time and countries. It is shown that sectoral shifts, especially the enlargement of the tradables sector, implies a shift in the political equilibrium in a country towards fixed exchange rates. Because the tradables sector suffers from floating rates it will prefer fixed rates. The occurrence of asymmetric shocks, however, will induce a political support-maximizing government to increase the money supply. If shocks are large enough and asymmetrically distributed, political equilibria will shift towards floating rates because fixed rates are incompatible with monetary autonomy.

Institutional changes in the economic environment, especially the abolition of capital controls, make fixed but adjustable rates no longer viable. Hence, the choice for a government

shifts to that between floating rates and full monetary union. This particularly explains the desire to reach full monetary union in Europe. In this logic monetary union will inevitably follow and its survival will depend on the costs of abandoning that regime and, most importantly, on the occurrence and nature of asymmetric shocks. Increased similarity and trade among the European economies will, however, increase the viability of that arrangement. Large tradables sectors will push for monetary integration and since they are similarly affected by shocks, there is no reason for a government to break up the arrangement because a concerted action to help the sector is possible. Only when the size of  $\alpha$  and  $\beta$  is too far apart conflicts arise. Economically, less support for EMU could be expected from large countries with a probably larger non-tradables sector. Those results are very similar to the one derived by optimum currency area theory but are based on an explicit formulation of the governments' behavior.

The question about the distribution of shocks in an EMU is finally an empirical one. Studies looking into the likelihood of asymmetric shocks come to opposing results depending on the development of the production structures in EMU. Asymmetric shocks, or the expectation of such shocks, like oil-price shocks for the U.K., should seriously undermine support for EMU in those countries as well.

The argumentation here was based on a theoretical model and supported by references to historical and recent developments in the international monetary system. The test of the hypotheses derived is the next logical step. As argued, the stability of a fixed exchange rate system is dependent on the size of the two sectors in a given economy and the distribution of asymmetric shocks among countries. The responsiveness of governments to large asymmetric shocks determines whether the output stabilization aim is stronger than the interests of the tradables sector. Hence the political system across countries and over time, in combination with the structure of the economy should allow to predict its decisions concerning the choice and the stability of the exchange rate regime.

Endnotes

<sup>1</sup> Another interpretation views fixed exchange rates as a commitment against exchange rate protectionism (Aschheim et al. 1993).

 $^2$  Flood and Mussa (1994) even show that income stabilization rules perform better in terms of output and inflation stabilization than exchange rate rules in a large variety of models.

<sup>3</sup> This paper thus disregards the literature which focuses on the interests of central banks with regard to monetary union (Vaubel, 1990; Hefeker, 1994).

<sup>4</sup> This is Mundell's (1961) classical criterion for optimum currency areas. Blanchard and Katz (1992) show for the U.S. that most regional adjustment between depressed and prospering regions is provided by labor movements instead of wage adjustments. For the European Union, however, the degree of labor mobility is much smaller, hence wage flexibility would have to substitute for labor mobility in Europe.

<sup>5</sup> Fixed nominal exchange rate might lead to real exchange variability. That would, of course, imply that the non-tradables sector suffers since non-tradable prices would have to adjust to stabilize the real exchange rate. Likewise, fixing exchange rates between countries at misaligned rates implies redistribution between them. For example, it is a widely held view that Germany's export sector benefited from the EMS because it lead to real overvaluation in higher inflation countries like France or Italy. These effects are disregarded here.

<sup>6</sup> The assumption is that monetary policy is the only instrument the government can use. This could be explained by the slow working of fiscal expenditures or some balanced budget requirement. Would budget expenditures be financed by seigniorage (as in DeKock and Grilli, 1993) the model could also be applied.

<sup>7</sup> This formulation only allows for one kind of influence on political decision making. It does not capture lobbying expenditures or corruption. The government does not "sell" policies and the sectors "play fair" in the sense that they only offer votes, but not money. Moreover, any direct foreign influence on domestic decisions is ruled out. This is, of course, a simplification.

<sup>8</sup> Note that this corresponds to McKinnon's (1963) optimum currency area criterion.

<sup>9</sup> If an intervention requirement is part of a formal agreement, active support will be necessary. These institutional details are, however, not modeled.

<sup>10</sup> Cases where realignments of fixed rates suffice are not modeled. One justification for this might be that large shocks are followed by continued monetary expansion. Eichengreen (1992) for instance shows that a fiscal war of attrition followed World War I which forced governments to continue money creation instead of tax-financing the budget.

<sup>11</sup> Gros (1992), however, argues that it is less due to capital controls than to the willingness of governments to defend their exchange rate target that the EMS survived for such a long period.

<sup>12</sup> As these costs constitute to a large extent profits for the financial industry, Giovannini (1993b) concludes that this industry tends to lose from monetary union. Others identify this industry as behind the movement towards monetary union (Eichengreen and Frieden, 1993).

Grüner and Hefeker (1994) offer a solution to this apparent paradox. They explain why large banks are especially interested in achieving full monetary union.

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