

# ECONOMIC PAPERS

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**The European Monetary System during  
the phase of transition  
to European Monetary Union**

- Future scenarios and various reform options -  
Dipl.-Vw. Robert Vehrkamp\*



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European Commission  
Directorate-General for Economic and Financial Affairs  
200, rue de la Loi  
1049 Brussels, Belgium

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## **The European Monetary System during the phase of transition to European Monetary Union**

— Future scenarios and various reform options —

Dipl.-Vw. Robert Vehrkamp\*

\* Insitut für Wirtschaftspolitik und Konjunkturforschung,  
Universität Witten/Herdecke.



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## Short Version

### I. Introduction

(1) Fixed rate systems are institutions with economic benefits (or damages) determined by their inherent economic mechanics, the so-called "*rules of the game*" (Keynes, 1925). In a fixed rate system, the '*rules of the game*' are the result of the system's institutional design interacting with the prevailing conditions of the capital and foreign exchange markets. The market conditions can be described as the relevant environment of a fixed rate system. According to Mundell's terminology, a fixed rate system's set of rules is to its market conditions "*like a constitution (...) to a political or electoral system*" (Mundell, 1972). The market conditions prove to be the '*modus operandi*' of the rule system. Currency crises as specific malfunctions of a fixed rate system are, like the systems' functioning, the result of its institutional design under given market conditions. Therefore, analysing currency crises and reform considerations to avoid them also has to be orientated to the system's set of rules and its market conditions.

(2) The European Monetary System (EMS) is an institutionalized fixed rate system. Its rule system was established in 1978/79 by contractual agreements between the governments and central banks involved. Except for a few modifications by the Basle/Nyborg-Agreement in 1987, the initial set of rules has remained unchanged. The extension of the bilateral exchange rate bands to +/- 15% as a consequence of the currency crisis of July 1993, however, comes close to a de facto suspension of the systems' rules. It also fundamentally questions the way towards European Monetary Union scheduled in the Maastricht Treaty. Returning to the normal band of the EMS becomes a necessary precondition for further progress of the Maastricht integration strategy. Hence it follows, that the second stage's main focus should be to re-establish the EMS's exchange rate mechanism. This report, therefore, is to develop reform strategies for the EMS in order to re-establish its functioning during stage two of the European Monetary Union (EMU), which - on the basis of the Maastricht Treaty - is a prerequisite for the transition to the third stage by 1999 at the latest.



## II. Fixed Rate Systems: A General Institutional Framework

(3) The set of rules of a fixed rate system is essentially a mechanism for allocating its inherent monetary adjustment constraints. The allocation of monetary adjustment burdens among the participating member currencies is described by the system's symmetry characteristics. A fixed rate system of uncovered paper currencies can either be designed asymmetrically burdening hard currency countries (= '*weak currency standard*') or asymmetrically burdening weak currency countries (= '*hard currency standard*') or symmetrical (= '*compromise standard*'). The symmetry characteristics determine the system's internal monetary stability standard. These adjustment constraints are triggered by market transactions. However, the intensity and direction of the market transactions' impact is essentially determined by the specific design of the rules. The rule structure can be classified and described in five different categories of rules. Besides the *monetary coordination mechanism*, these categories contain the *intervention rules*, the *financing mechanism* (consisting of settlement rules and credit facilities), the *reserve rules*, and the *exchange rate adjustment mechanism*. A further structural determinant of a fixed rate system is the 'size' of a country as represented by its stock of intervention reserves and its monetary sterilization capacity. Within this structure the markets serve as a trigger for the rule-determined adjustment constraints.

(4) Monetary Coordination Mechanism: The monetary policy coordination of a fixed rate system can either be effected ex post through the resulting adjustment constraints of the system. Coordination is then the result of the system's adjustment mechanics triggered by the markets. It can be described as a *market coordination* or indirect coordination of monetary policy. On the other hand, monetary coordination can also be effected ex ante as a direct monetary coordination of the responsible currency authorities. Analogous to market coordination, the direct coordination can be described as *authority coordination*. As an additional terminological distinction, the term *simple fixed rate system* is used in the following in distinction to *complex fixed rate systems* when no mechanism for a direct coordination of monetary policy is provided.

(5) **Intervention Rules:** The intervention rules of a fixed rate system should unambiguously stipulate the circumstances and extent the member states are obliged to intervene in order to keep the system's exchange rate promise. Besides the choice of an *exchange rate standard* it is necessary to define and establish the *bilateral central rates, fluctuation margins* and *intervention points*.

■ When choosing an *exchange rate standard* it is important to take into account the consequences of the various standards for the distribution of intervention obligations among the member currencies. Three different types of exchange rate standards can be distinguished:

- The first option is the *key currency standard*. Here, all participating nations are obliged to establish a bilateral exchange rate of their currency towards the key currency. They have to defend this rate in the exchange markets by means of intervention. Only the key currency is not subject to any intervention obligations. Therefore, its monetary authorities are not forced to accept any monetary adjustment constraints caused by liquidity and reserve effects due to interventions. The remaining monetary degree of freedom is institutionally guaranteed by rule to the key currency as the n-th currency of the system. Consequently, a key currency standard is designed entirely asymmetrically burdening the (n-1)-countries of the system.

- The *bilateral parity grid* is the second type of exchange rate standard. For a bilateral parity grid symmetrical intervention obligations can be expected at least in a formal sense.

- As a third option, the central rates can be defined with respect to a *currency basket* in which each participating currency counts for a certain weight. The symmetry characteristics of a currency basket are more complicated since a currency's exchange rate towards the basket currency is the weighted average of its bilateral exchange rates towards the individual currencies participating in the basket. In a currency basket standard, therefore, one can assume symmetry characteristics unilaterally burdening the currencies counting for the highest weights in the basket and whose exchange rate deviates the most from the basket average.

■ Establishing bilateral central rates one can refer to normative models of defining the 'correct' exchange rate or simply follow the given market rates.

■ An important aspect for defining the fluctuation margins is the criterion of *overlapping bands* in case of central rate adjustments. Overlapping bands can help to reduce the probability of 'one-way bets' of the markets.

■ We speak of symmetrical intervention points if the upper and lower point of intervention are in the same distance from the bilaterally defined central rate. With asymmetrically constructed intervention points, obligations to intervene exist either at the upper (= 'soft currency version') or at the lower (= 'hard currency version') intervention points.

(6) Mechanisms of Intervention Financing: Analyzing the intervention rules of fixed rate systems it is important to examine if and to what extent the symmetry characteristics of the intervention rules are concealed by the corresponding financing mechanism of the system. Even formally symmetrically designed intervention rules may result in asymmetrical systemic adjustment constraints due to the corresponding settlement rules. The finance mechanism of a fixed rate system consists of *credit facilities* and *settlement obligations*.

■ In order to relax the existing budget restriction for weak currency countries intervening at their lower intervention point, a fixed rate system with intervention obligations needs corresponding intervention *credit facilities*. Besides the overall amount of the credit facility the most important conditions are the maturity, interest rate, and the denomination of repayment obligations.

■ In contrast to credit facilities, *settlement obligations* do not help to finance interventions of weak currency countries at their lower intervention limit but stipulate the financing of interventions carried out by a hard currency country reaching its upper intervention point. In the context of settlement rules weak currency reserves of hard currency central banks accumulated by obligatory interventions establish a claim towards the central bank of the weak currency to re-exchange the reserves into hard currency. With settlement obligations the weak currency central bank is obliged to finance the hard currency central bank's interventions. Similar to credit facilities, for designing a settlement obligation it is especially important to fix its amount, maturity, and the denomination of the settlement transactions.

(7) Reserve Rules: The purchase, holding, investment, and employment of intervention reserves can produce liquidity and other monetary policy effects for the reserve currency's central bank. Therefore, certain reserve rules should be agreed upon. Reserve rules determine in what form central banks are allowed to hold their intervention reserves in member currencies (= 'reserve investment rules') and to what extent they are allowed to accumulate those currencies (= 'reserve limitation rules'):

(8) Exchange Rate Adjustment Mechanism: For each fixed rate system, the possibility of an exchange rate adjustment is a sort of loophole to evade the system's adjustment con-

straints or to forestall the markets' pressure towards such adjustment constraints. The institutional design and operation of the exchange rate adjustment mechanism, therefore, is an important determinant for the degree of system inherent economic adjustment pressure and the credibility of the exchange rate promise from the markets' point of view. Rule determined or discretionary exchange adjustment mechanisms are the basic design alternatives:

- Rule-determined adjustment mechanisms can also be described as *formula flexibility*. The changes in the exchange rates follow a specified rule or formula and are 'objectively' given for all countries involved.

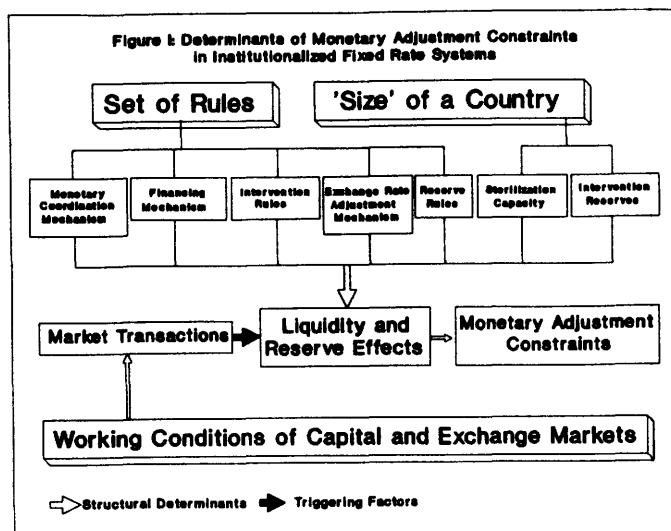
- As an alternative to the rule-determined formula flexibility exchange rate adjustment mechanisms can follow a discretionary case by case strategy. In principle, *discretionary adjustments* of the exchange rate can be carried out within a 'governance structure' or without being tied to specific procedural rules. Thereby the most important institutional choice alternatives are whether the governments (= *political exchange rate competency*) or the central banks (= *monetary exchange rate competency*) have the exchange rate competency and in which way the institutionalized discussion and decision process within the 'governance structure' is organized.

(9) Size of a Country: A country's relative size within a fixed rate system is essentially determined by its monetary sterilization capacity and the amount of its freely available hard currency intervention reserves. Consequently, the bigger a country in terms of its sterilization capacity and its currency reserves, the more likely it can - at least temporarily - evade rule-determined liquidity and reserve effects and the resulting adjustment constraints. Intensity and direction of rule-determined symmetry characteristics, therefore, can be (over-)compensated by the relative size of the countries involved.

(10) The Part of Capital and Foreign Exchange Markets: The markets take the part of a 'judge' who has to decide which of the member currencies are weak or strong according to the rules. *The system's institutional settings are blind to this kind of identification problem*. A currency, therefore, is by definition a hard currency when its exchange rate is subject to a revaluation pressure in the foreign exchange market. A currency is called weak when it is subject to a devaluation pressure. In case a currency is subject to revaluation or devaluation pressures, the intervention mechanism and with it the systemically determined liquidity and reserve effects are virtually automatically activated. For that a revaluation or

devaluation pressure of the market is the necessary and sufficient condition at the same time, regardless of its underlying degree of fundamental rationality. *Activating the adjustment constraints is entirely the job of the markets.*

(11) Summary: From the above analysis, figure I can be derived which contains an overall description of the 'rules of the game'. The figure shows the structural determinants of the system's economic mechanics as well as the way they are released by market transactions. The set of rules and the relative size of the countries involved can be described as a fixed rate system's structural determinants. They determine the system-inherent liquidity and reserve effects which in turn trigger the monetary adjustment constraints.



However, the system structures are activated solely by corresponding market transactions. The market transactions' fundamental rationality, therefore, determines at the same time the economic rationality of the overall adjustment constraints effectively resulting from the system's structures in action. *A fixed rate system's constitution can only be as good as its 'modus operandi' in the shape of the markets.*

### III. The European Monetary System (EMS): Functioning, Symmetry Characteristics, Market Conditions

(12) The EMS is an asymmetrically designed simple fixed rate system burdening weak currency countries, in which the part of the key currency is not determined by rules but is awarded by the capital and exchange markets. It, therefore, can be called a *market-determined anchor currency system*. The economic rationality of the monetary coordination mechanism within the EMS, therefore, corresponds to the degree of fundamental rationality of the capital and exchange markets. Following the general framework of chapter II, the elements

of the institutional arrangement determining the system's adjustment constraints are analyzed at first. From that the systemically determined liquidity and reserve effects are derived. The concluding chapter then describes the monetary adjustment constraints triggered by market transactions under the new conditions of fully liberalized capital and exchange markets.

(13) Indirect Coordination of Monetary Policy: The EMS is a *simple fixed rate system*. Mechanisms for a direct coordination of national monetary policies are not assigned. The coordination of monetary policy is managed indirectly by means of the system's inherent adjustment and coordination constraints. As the following will show, these constraints are designed almost entirely asymmetrically for the weak currency countries and are activated by market transactions. The monetary adjustment constraints within the EMS, therefore, are essentially market-determined. The currencies' hierarchy in the capital and exchange markets determine the allocation of the remaining degree of freedom. The strongest currency is *awarded* for the key currency role and, thereby, determines the monetary stability standard of the overall system. As long as the markets award the most stable currency of the system, a desirable convergence pressure towards the stability standard of the anchor currency country develops for the weak currencies. The EMS's success story during the 1980s was based on this convergence pressure, when the D-Mark functioned as stability standard and credibility anchor for the monetary policy of the traditional weak currencies. However, if the markets continue to devalue traditionally weak currencies with no regard to already succeeding adjustment policies, an inherent *deflationary bias* for the 'supposed to be weak-currencies' may occur. They are then forced to compensate the markets' devaluation speculations by interest rate differences in favour of its irrationally attacked currency. In an economic downward trend with low inflation and growth rates, such a policy may lead to considerable inadequate macroeconomic adjustment costs. These market-determined inadequate adjustment constraints make the system intolerable (from the point of view of the governments and central banks involved) and implausible (from the markets' point of view).

(14) Symmetrical Intervention Rules: The intervention obligations are committed to the upper and lower intervention points, which result from the agreed fluctuation margins of  $\pm 2,25\%$  around the bilateral central rates, and they are unlimited in amount. In a parity grid of this kind, two currencies reach their upper respectively lower intervention points

simultaneously. The hard currency's bilateral exchange rate at the upper intervention limit exactly corresponds to the lower intervention limit of the weak currency. In this respect, at least the formal design of the EMS's intervention rules is entirely symmetrical.

In contrast to the EMS's formal intervention obligations the adjustment impact of the individual member country's sterilization policy is asymmetrical. Whereas hard currency countries sterilize the primary liquidity effects of their interventions almost entirely, weak currency countries have only little inclination to sterilize. As a consequence of the asymmetrical sterilization behaviour the monetary policy of hard currency central banks is not weakened by any expanding money supply and interest rate effects while the restrictive effects for the weak currencies lead to adjustment constraints for their monetary policy to follow the stability standard of the hard currency countries. The formal symmetry of the intervention rules is reversed because the asymmetrical sterilization policy dominates the interventions' preliminary money supply and interest effects. Within the EMS a symmetrical adjustment constraint towards an average stability standard can only occur when the sterilization capacity of the hard currency central bank is exhausted. In literature, the formal symmetry of the intervention obligations within the EMS has often led to the view that the overall design of the EMS is symmetrical and, therefore, the de facto hegemony of the DM is to be attributed mostly to external factors not inherent to the system's institutional settings. The most important reason for this misjudgement was that the system's symmetry characteristics were solely derived from the intervention rules and not, as it is necessary, from their interaction with the sterilization policy and the other components of the EMS's set of rules.

(15) Asymmetrical Financing Mechanism: Since the holding of intervention reserves in member currencies is limited to the level of agreed on 'working balances', for financing their interventions at the lower intervention point the central banks have to rely on the system's financing mechanisms. Core of the intervention financing mechanism of the EMS are the credit facilities of the very short-term financing and the settlement obligations.

■ With the *very short-term facility*, credits unlimited in amount are available to countries participating in the exchange rate mechanism. Hence in principle all member countries are able to comply with their unlimited intervention obligations at any time. The resulting liabilities become due at the latest 2,5 months after the end of the month in which the facility was used. The budget restriction is only temporarily suspended for a maximum of 3,5 months. The mechanisms of the very short-term financing are sufficient to guarantee a temporary unlimited access to member currencies for financing the system's obligatory interventions. Therefore, the unlimited intervention promise of the weak currency countries is only credible for a limited period of time. Afterwards, their budget restriction of limited intervention reserves is re-established by the repayment obligations.

■ Due to the so-called *settlement rules* of the EMS a hard currency central bank's interventions at its upper intervention point are accounted like an intervention of a weak currency central bank at its lower intervention point drawing on its very short-term credit facility. From the weak currency central banks' point of view, it is obviously not important by which central bank the intervention is carried out in the markets. In the end it is always the central bank of the weak currency which has to finance all interventions according to the procedures of the very short-term financing. The budget restriction of the weak currency countries is extended to the interventions of the hard currency countries and, therefore, is considerably *tightened*. In contrast to the formally symmetrical design of the intervention mechanism the finance mechanism is almost entirely asymmetrical. The system's reserve effects, therefore, are also asymmetrical in the end. As a result the credibility of the central banks' intervention promise for the markets is only low. Keeping the promise in case of unlimited interventions is implausible for the markets because, after a short period of time, all interventions have to be (re-) financed by the weak currency countries. Even in times of speculative attacks of the markets against fundamentally justified exchange rates their budget restriction is only temporary suspended; however, it is not revoked in principle.

(16) Restrictive Reserve Rules: The EMS rules do not provide any exactly quantified reserve rules. In practice, however, the procedure is handled less restrictive. Still, the accumulation of intervention reserves denominated in member currencies remains subject to the consent of the issuing central bank concerned. In contrast to the more or less restrictive reserve accumulation rules the central banks are free in deciding on the way they prefer to hold their intervention reserves; they can either invest them directly in market assets or deposit them at the issuing central bank involved. As a result of this, the institutional rules and procedures for the accumulation and investment of intervention reserves in the EMS do not seem to be decisive determinants of its monetary symmetry characteristics.

(17) Political Exchange Rate Competency: The exchange rate competency within the EMS is completely political. It is solely assigned to the European Council and not to the central banks. In practice, realignment decisions are negotiated and prepared by the Monetary Committee of the European Community. In the end, however, mutual political consent of the responsible Council of Ministers is required. Therefore, the realignment procedure's decisive characteristics are that the exchange rate competency within the EMS is political and unanimous mutual consent is required. Together, the two characteristics ensure a political veto for each member country involved. Therefore, the realignment decision remains subject to a politically dominated process of negotiation.



(18) Working Conditions of the Capital and Foreign Exchange Markets: Since the mid-1980s, the international capital and exchange markets are characterized by *liberalization* and *globalization* trends as well as by a *securitization* of international credit relations. In two different aspects, these trends have fundamentally changed the conditions of global exchange markets:

- In international portfolios with currency diversification the exchange rate has become an autonomous component of the return calculation. The spot market price effects of portfolio restructurings as a result of changing exchange expectations are consequently the first channel through which the new conditions of the capital and exchange markets can make the central banks' effort to stabilize the exchange rates more difficult.

- The increasing importance of the exchange rate risk has simultaneously lead to the development of derivative markets where market participants can hedge their uncovered currency positions. Derivative financial instruments, however, are not solely used for hedging currency risks but also for establishing open currency positions without the necessity of using liquid speculation capital. Repercussions from this kind of *currency speculation without capital* on the spot market are the second channel through which the changed market conditions make it more difficult for the central banks to stabilize exchange rates.

(19) Speculative Attacks: With the exchange rate as a part of their currency portfolio's return and the derivative instruments of currency speculation without capital, the markets' incentive for and capability of successful speculative attacks against central banks increases. Return-orientated speculative attacks on the exchange rate promises of institutionalized fixed rate systems can be performed by the capital and exchange markets in two different ways:

- *On-balance-sheet* attacks are capital backed speculations. They are carried out directly via the spot markets. These on-balance-sheet attacks have a twofold effect on the central banks involved. At first, as a result of their intervention obligations they are forced to take the counter position in the speculative spot sales of the attacked currency. The liquidity and reserve effects resulting from the spot interventions automatically lead to the corresponding system-inherent monetary adjustment constraints. Secondly, the weak currency's central bank in its function as 'lender of last resort' is forced to refinance the speculative credit expansions at an interest rate which is acceptable from the perspective of the national economy as a whole in order to maintain orderly conditions in the domestic money markets. This means that the central banks are at first obliged to provide the demanded hard currency and at the same time have to guarantee the speculant's refinancing in the weak currency at conditions which are justifiable from the domestic point of view of the national economy as a whole. In addition, they have to accept the liquidity and reserve effects and the resulting

adjustment constraints as well as corresponding exchange losses from (re-) exchanging the speculative currency positions in case of a devaluation of the attacked currency.

■ *Off-balance-sheet* attacks are currency speculations without underlying liquid capital positions. They are carried out by forward sales of the weak currency in the forward markets. Their transmittance into the spot market takes place indirectly via routinely conducted cover transactions of the banks contracting the speculative forward deal. Again, the central banks have to take the counter position in the spot market and are responsible for refinancing both the spot and the swap part of the cover transaction. The further course is then identical to an on-balance-sheet attack. Since the establishment of uncovered forward positions is technically easier and, therefore, favourable in terms of transaction costs, speculators usually will switch to the spot market only if the forward markets become inflexible in terms of liquidity.

Therefore, independent on whether the speculative attacks are carried out via the spot or the forward markets, the central banks of the attacked currencies are the inherent losers all along the line:

- They provide the speculatively demanded hard currency spot amounts by intervening in the markets and have to face the resulting liquidity and reserve effects;
- as 'lender of last resort', they refinance the weak currency's expansion of the credit volume to finance the speculative positions;
- after a forced realignment according to the speculative market pressures, they have to take the currency losses and thereby finance the speculant's profits.

(20) Overall Symmetry Characteristics of the EMS: The EMS is a market-determined asymmetrical fixed rate system. Under the prevailing conditions its intervention promise is not credible for the markets. The intervention mechanism is neither sufficient to protect the system's exchange rates against speculative attacks nor does it provide for an efficient protection against economic irrational market valuations of certain member currencies. The triggering and direction of the system-inherent macro-economic adjustment constraints is entirely determined by the markets. The degree of the system's adjustment constraints' economic rationality, therefore, only corresponds to that of the capital and exchange markets. Speculative attacks of the markets lead either to economically unjustified exchange rate adjustments, or to macroeconomic costs of inadequate adjustment constraints. The second alternative makes the first one all the more likely and leads to a further loss of credibility of the exchange rate promise.

#### IV. Reasons for the Currency Crisis

(21) In the following, the EMS crisis is analyzed as being mainly inherent to the system's institutional design and, therefore, as a result of its institutional structure under the new conditions of completely liberalized capital and exchange markets. It is described as a systemically determined asymmetry crises following fundamentally irrational market speculations. Thereby the fundamental approach of explaining the crisis as a result of economic convergence deficits can only play a minor part because it only applies to individual member countries but not for all the currencies attacked in the course of the 1992/93 crisis.

(22) Market Failure: The conditions of financial markets largely correspond to the standards of a 'perfect market'. This is especially true for the highly efficient foreign exchange markets. At first, therefore, it seems to be unjustified to speak of a capital and exchange markets' failure. Indeed the market failure in the course of the EMS crises does not consist in micro-economic malfunctions as a result of imperfect markets but in the lacking fundamental rationality of the monetary adjustment constraints within the EMS which are themselves dominated by the markets. One can speak of a lack of fundamental rationality according to the EMS if the market valuations of the individual member currencies are not sufficiently orientated to the monetary stability criterion. If currencies with a high level of stability (= low inflation rate) are subject to fundamentally irrational devaluation speculations of the markets, a deflationary adjustment pressure will automatically occur for those countries. As a consequence the attacked countries have to carry considerable macroeconomic costs of inadequate policy adjustment. In times of speculative attacks, the disciplinary mechanism of sanctioning expansive inflation policies is turned into a mechanism producing inadequate monetary adjustment constraints. The adjustment mechanism then has a deflationary bias. Thereby speculative attacks grow up to asymmetry crises of the overall system. The market failure then consists in its insufficient performance as the 'modus operandi' of the system's indirect mechanism of national monetary policy coordination. A market failure of this kind has been observable both before and during the currency crises and has become one of its most important reasons. Before the crisis, the market failure consisted in the relaxation of the system's disciplinary constraints due to the so-called 'convergence trading' in the markets. At that time the markets did not force any central rate adjustment despite

further accumulating monetary convergence deficits for individual currencies. The exchange rate illusion has led to a predominant orientation of capital investment and exchange trading decisions to the nominal interest rate differences. Thereby it has additionally revalued or at least stabilized the exchange rate of countries with a relatively higher inflation rate and correspondingly higher nominal interest rates. The nominal interest divergences within the EMS were no more interpreted by the markets as representing premiums for inflation-related devaluation risks, but, while ignoring the exchange rate risk, as a real return advantage denominated in domestic currency. The 'convergence trading' was followed by a second type of market failure in the course of the currency crises. The re-discovery of the exchange rate risk led to speculative 'undershooting' phenomena and domino effects within and outside the system. Thereby the market failure of the 'convergence trading' was substituted by the market failure of fundamentally irrational speculative attacks. The actual overvaluation of individual currencies during the phase of the market's 'convergence plays' was followed by an speculative 'undershooting' in the course of the crises. The market failure as the most important reason of the crises, therefore, consists at first in the failure of the market-determined mechanism of indirect monetary policy coordination.

(23) System Failure: On the one hand, in speculative attacks the EMS's exchange rate promise has proved to be implausible for the markets. This is true for the interest as well as the intervention mechanism:

- The use of *interest rates* to defend exchange rates against speculative attacks stands under the priority of the domestic economy. It becomes implausible if the interest rates necessary for defending the exchange rate exceeds a level acceptable for the domestic economy. The experience of the EMS crises has proved the limited credibility of this instrument even in a short-term perspective. In its core, the exchange rate promise of the central banks, therefore, is an intervention promise.

- But also the *intervention promise* obviously is not credible in the market's judgment. The lack of credibility is mainly due to the asymmetrical design of the intervention financing mechanism with the settlement obligations of the weak currency countries as its core element. The settlement obligations lead to a further tightening of the already existing budget restrictions for the weak currency central banks. Concerning the markets' judgement, the settlement obligations turn the intervention mechanism of the EMS into an 'elaborated bluff of the central banks'. An additional reason for the implausibility of the intervention promise are the intervention's direct money base effects for the hard currency countries. When its sterilization capacity is exhausted, the hard currency central bank may face considerable restrictions in its ability to control the domestic central bank money supply and the

short term interest rates in the money markets. In such a situation the scenario of an opting out of the hard currency central bank from the system's exchange rate and intervention mechanism is anticipated by the markets and heavily weakens the intervention promise's credibility in the course of a speculative attack. The lack of protection for weak currency countries against the costs of inadequate monetary policy adjustments as a consequence of speculative attacks is also a result from the unconditional application of the settlement rules. The one-sided monetary adjustment constraints for the weak currency countries triggered by the settlement obligations become effective irrespective of the particular degree of economic rationality underlying the speculative attack. The system's failures described are a specific result of the EMS's set of rules. Consequently, they can be avoided by appropriate modifications of the rules involved.

## V. Reform Options

(24) Preliminary conditions: For being acceptable for all member governments and central banks involved, adequate reform options have to meet certain preliminary conditions. These conditions can directly be derived from the original economic and political objectives of the system, the given institutional settings and strategies of the Maastricht Treaty, and from the systemical reasons of the actual EMS crisis that has led to its de facto suspension in August 1993.

### ■ *Stability Criterion:*

For hard currency countries it has to be ensured that the systemical adjustment constraints are orientated to the standard set by the lowest inflation rate within the system. Concerning the monetary stability policies, the disciplinary effect of the anchor currency mechanism may not be relaxed.

### ■ *Protection against Opportunism I (=protection against 'inflationary infection')*:

For the stability-orientated countries precautions have to be taken protecting them from opportunistic behaviour of less stability-orientated states within the system. An 'inflationary infection' has to be ruled out. At least in case of rational market valuations of the member currencies (= absence of speculative attacks), the asymmetry has to remain effective.

### ■ *Protection against Opportunism II (=protection against speculative attacks)*

Under the prevailing conditions of economical irrational exchange speculations attacked currencies have to be sufficiently protected against inadequate monetary adjustment costs. The protection against 'inflationary infection' for the hard currency countries has to be completed by a complementary protection for the weak currency countries against deflationary adjustment constraints in the consequence of speculative attacks.

(25) Direct Coordination of Monetary Policy: The above analysis has shown that the EMS as a simple fixed rate system has failed under the conditions of speculative attacks. The market mechanism of indirect monetary policy coordination has proved to be inefficient. Supplementing the EMS with a mechanism of direct monetary policy coordination, therefore, is a feasible starting point for reform. It is, therefore, suggested to combine a common policy rule for direct monetary coordination within the EMI with a conditional temporary suspension competency of the EMS's settlement obligations.

- Concerning monetary coordination, the member states should ex ante agree on standards for national money supply or price level targets according to the above mentioned proposal of the Council of Economic Advisors. The national targets should be agreed on by mutual consent within the EMI-council of autonomous central bank governors.

- The monetary coordination mechanism should be supplemented by the council's competency to suspend the settlement obligations. However, this competency remains limited to situations of clearly identifiable fundamentally irrational attacks of the capital and exchange markets. The ex ante agreed on monetary coordination targets serve as appropriate fundamental identification criteria for speculative attacks.

In addition, the proposed combination of an ex ante coordination of national monetary policies with a conditional suspension competency of the settlement obligations meets all of the above required preconditions for a successful EMS reform during stage two. The *stability criterion* is met by the monetary standard agreed on in the voluntary monetary ex ante coordination of national monetary targeting. A sufficient '*protection against inflationary infection*' is ensured by the asymmetric intervention mechanism of the 'old EMS' which remains unmodified.

(26) European Intervention Fund (EIF): The institutional analysis of the EMS has shown that from the hard currency countries' point of view the liquidity effects of interventions make the intervention promise becoming unsustainable in the course of a crisis. When their sterilization capacity is exhausted the interventions lead to an irreversible expansion of the money base and, therefore, to a considerable loss of efficiency in controlling the domestic monetary aggregates. However, the only reason for this is the fact that the central banks carry out their interventions via the existing central bank accounts of the banks involved.

Thereby, the interventions have a direct expansionary effect on the national central bank money circulation. Intervention-caused money base effects could be avoided if the interventions are taken out of the accounts of the central banks by transferring the execution of interventions in the markets to an external fund established exclusively for that purpose. From the accounting point of view, the fund's enforcement of interventions would not affect the domestic central bank money circulation. Shifting the interventions 'out of the central bank's account' is attainable by founding a *European Intervention Fund (EIF)*, for example. As a commonly established and managed fund, the central banks would provide the EIF with sufficient intervention deposits or intervention credit facilities. The EIF then establishes its own accounts with the banks involved in the foreign exchange trading, through which all interventions would be carried out. Such an arrangement is sufficient to guarantee that interventions are separated from the national central bank money circulations. The expensive construction of such an intervention fund exclusively for the transitional phase, however, is an important disadvantage from the perspective of institutional efficiency. A strategy of central bank interventions in the forward market which is developed in the following seems to be much more efficient. A forward intervention strategy allows to retain the avoidance of expansive money base effects without having to accept the disadvantages of institutional inefficiencies during the phase of transition.

(27) Interventions in the Forward Market: Central bank interventions in the spot markets always and automatically involve direct liquidity and reserve effects. That is why unlimited spot intervention promises of the central banks are inherently implausible for the markets. They are perceived as being *self-defeating*. Overall it has become clear, that unlimited spot intervention promises are implausible because in the worst case of speculative tests by the markets they cause monetary policy costs which rationally are unacceptable for any of the central banks involved. Therefore, spot interventions cannot be *credible* because they are not *sustainable*. In order to avoid intervention-caused liquidity and reserve effects and the resulting loss of credibility, an extension of the central banks' intervention policy from the spot to the forward market is suggested. Interventions of central banks in the forward market have the important advantage of avoiding any direct liquidity and reserve effects. Furthermore, forward interventions are not underlying a budget restriction because no liquid spot reserves are necessary. Since they are also neutral in terms of liquidity, forward

interventions compared to spot interventions are the more credible strategy from the speculant's perspective to guarantee an intervention promise. Only the unlimited willingness of the central banks to intervene in the forward market can prove to the markets that the central banks themselves believe as much in their own exchange rate promise as they expect the market participants to do. In principle, two different mechanisms are conceivable for forward interventions in order to ensure the exchange rates in the spot market:

- In the *off-balance-sheet* variant of a speculative attack, the central banks directly take the counter position of speculative forward sales of the attacked currency by intervening in the forward markets. With that, the transmittance of the speculative forward sales into the spot market is interrupted. The central banks avoid the necessity of corresponding spot interventions which would inevitably become necessary in case of a speculative free market forward sale of the attacked currency that afterwards has to be covered by the contracting bank and thereby is transmitted in the spot market.

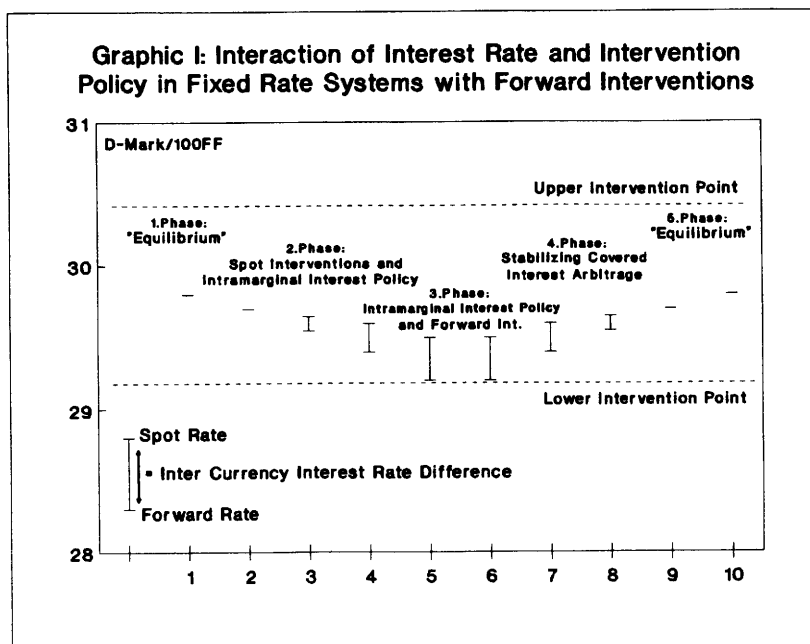
- *On-balance-sheet* attacks are carried out directly by sales of the attacked currency in the spot market; however, they can be kept off just as off-balance-sheet attacks by interventions of the central banks in the forward market. Whenever a currency is under pressure in the spot market, the central banks can stabilize its spot rate by taking a long position in the forward market. As a result of this, the contracting bank is facing a forward risk which routinely has to be offset. Thereby the central bank's forward intervention is transmitted into the spot market.

Forward interventions, therefore, are the suitable strategy for the EMS to protect a de facto monetary union of the core countries which are already today in a position to meet the necessary convergence criteria as agreed preconditions for entering the final stage of EMU. However, to establish a de facto monetary union it would be neither necessary nor useful to abandon the fluctuation margins. It is sufficient to ultimately fix the central rates. Therefore, the old margins of  $\pm 2,25\%$  should be re-established while at the same time the exchange rate adjustment reservations with regard to the central rate and the corresponding intervention limits are irrevocably given up. Maintaining the fluctuation margins around the forever fixed central rates facilitates a sensible installation of a forward intervention promise. In addition, the margins will help to guarantee a sufficiently liquid spot market as well as a certain flexibility for national interest rate policy. The asymmetrical spot intervention mechanism of the 'old EMS' is supplemented by unlimited and symmetrically designed forward intervention obligations of the central banks involved.



In an arrangement like this the credibility of the fluctuation margins is guaranteed by the unlimited forward intervention promises. In principle, the development of the spot rate within the margin remains market-determined; however, it may be influenced by spot interventions and interest rate adjustments of the central banks. The asymmetrically designed spot market intervention mechanism should be kept unchanged because it is domesticated by the forward interventions.

Therefore, it can serve as a suitable mechanism of coordinating and disciplining national interest rate policies. Whenever a currency is under pressure in the spot markets, the central banks concerned are at first obliged to support it by intervening in the spot markets. Only



if the liquidity and reserve effects due to the spot interventions are becoming unsustainable, the central banks will start to support their spot intervention policy by interest rate measures. With credible margins, the establishment of a modest inter currency interest rate difference will prove to be sufficient to arouse interest arbitrage orientated capital movements and thereby assure the desired stabilization of the spot rate. In the course of a speculative attack, with a forward intervention obligation the central banks are able to refrain from an excessive use of the interest instrument by allowing the forward rate falling down to the lower intervention point and then absorbing the speculative attack by unlimited forward interventions. In addition, the central banks may stimulate the spot supply of hard currency necessary for stabilizing the spot rate by so-called *aggressive forward interventions*. The resulting cover and arbitrage reactions of the markets will then transfer the forward supply of the attacked currency into a spot supply. Even in the worst case of a speculative attack, therefore, unsustainable liquidity and reserve effects can be avoided. The liquidity effects remain limited to the broader level of the non-bank liquidity; a direct influence on the monetary base is shut out. In the course of a speculative attack the central banks do not face any

constraints to give in to the markets' pressure by realigning the exchange rate in the end. Forward intervention strategies to guarantee exchange rate margins around ultimately fixed central rates, therefore, prove to be sustainable even in the *worst case scenario* of a speculative attack. Anyway, those attacks become unlikely because, due to the forward intervention mechanism, the markets' arbitrage is stabilizing the central bank's exchange rate promise instead of destabilizing it as it was likely for the spot intervention promise of the 'old EMS'. For speculants to wait and see during a speculative attack is inevitably associated with current financing costs whereas for the central banks - again in contrast to spot interventions - no costs in terms of unsustainable liquidity and reserve effects arise which in the end could force them to opt out. From the speculant's perspective, no rational incentives remains to speculatively test the central bank's exchange rate promise because even unlimited forward interventions are riskless and, therefore, sustainable for the central banks: "*The authorities need only keep their nerves.*"

(28) Suspension of the Settlement Rules: Consequently, the suspension of the settlement obligations seems to be a suitable reform option. Suspending or even revoking the settlement rules while at the same time maintaining the other parts the system's institutional setting including the financing rules, would lead to an unlimited obligation for the hard currency central banks to finance both, the own as well as the weak currency's spot interventions. Such a mechanism of intervention financing would be credible for the markets because the hard currency central bank is the only institution which is able to create the hard currency intervention reserves in an unlimited amount. This credibility gain of the intervention promise, however, is overcompensated by decisive disadvantages of an unconditioned suspension of the settlement rules:

- The precondition of *monetary stability* could be violated because the asymmetrical adjustment constraints for the weak currency which is rational in the case of diverging inflation rates would be dropped. An unconditioned suspension of the settlement rules would, therefore, excuse the weak currency countries from monetary policy adjustments even if they prove to be necessary for preserving the monetary stability of the overall system.
- From the hard currency countries' perspective, an unconditioned revocation of the settlement rules would also violate the criterion of a sufficient *protection against opportunistic behaviour* of currencies with higher inflation rates. Following an expansive monetary policy and financing the resulting

balance of payments deficits by obligatory interventions of the hard currency countries would be an example for opportunistic behaviour of weak currency countries. As a consequence of the intervention financing the hard currency countries have to face the risk of an inflationary adjustment deriving from the interventions' liquidity effects if those exceed their sterilisation capacity.

Who nevertheless seeks to establish a vital protection against fundamentally inadequate adjustment constraints, a *conditioned suspension competency of the settlement obligations* should be considered. To minimize the risks of opportunistic behaviour the suspension competency could be assigned to the EMI and tied to the precondition of a prior autonomization of the national central banks according to the institutional requirements laid down in the Maastricht Treaty. For defining the conditions that have to be fulfilled for activating the suspension competency certain rules for a direct coordination of national monetary policies are necessary. Overall it has been demonstrated that a temporary and conditioned suspension of the settlement obligations is sufficient to make the system's intervention promise credible for the markets. In order to meet all of the above required preconditions for a successful EMS reform, however, the merits of a suspension competency depends on a corresponding efficient mechanism for direct monetary policy coordination. Therefore, this proposal is clearly inferior to the forward intervention strategy. With forward interventions the monetary coordination mechanism would remain market determined, while at the same time inadequate adjustment constraints in case of speculative attacks are eliminated. With forward interventions the establishment of a mechanism for direct monetary policy coordination during the phase of transition as it has proved to be necessary for reforming the system by introducing a suspension competency could be avoided.

(29) Exchange Rate Management Competency of the Central Banks: Transferring the exchange rate management competency within the EMS to the central banks would be an important contribution for objectifying the existing rules of the system. The exchange rate adjustment mechanism could then be used more efficiently as an additional instrument of a direct monetary policy coordination than it was allowed for with the political exchange rate competency of the governments within the 'old EMS'. A credible and consistent use of the interest rate, intervention, and exchange rate adjustment instruments within the EMS would be guaranteed. The protection against opportunistic behaviour of individual governments is considerably improved. From the more political point of view, this should also increase the

central banks' willingness to enhance the cooperation of national monetary policies. Anyway, for the system as a whole a considerable credibility gain is to be expected. To avoid political disadvantages in terms of the Maastricht integration schedule shifting the exchange rate management competency to the central banks has to be limited to the all-day management of central rate adjustments within the system. The basic institutional government competency of modifying the exchange rate regime in general would not be affected. Deciding the if, when and how of the member states' return to the normal fluctuation margins as well as the final decision of entering the third stage remains an exclusive domain of national government's and parliament's involved. The suggested split of the exchange rate competency (*regime competency of the governments and management competency of the central banks*) fulfils both the political integration objective of the governments and the monetary stability objectives of the central banks. The pace of monetary integration would still be determined politically; however, with a divided exchange competency it would not be necessary to give up the advantages of a rate management competency of the central banks.

## VI. A Strategy for Stage Two

(30) The following suggests a reform strategy for the European Monetary System (EMS) in the course of the second stage of the European Economic and Monetary Union (EEMU). Based on the integration schedule and procedure of the Maastricht Treaty, the proposals facilitate a criteria-orientated transition to the third and final stage by 1999 at the latest. First, the establishment of a *monetary autonomy standard* for Europe is suggested by improving and strengthening the institutional framework of the European Monetary Institute (EMI). The autonomy standard of the EMI should be orientated to the criterion of institutional convergence of the central banks involved according to the Maastricht Treaty. The monetary autonomy standard will be supplemented by a *two-track EMS*. For the core countries a *de facto monetary union* can be established by ultimately fixing the fluctuation margins. The core countries of the de facto monetary union remain tied to the countries of the periphery through a *modified exchange rate mechanism* which is considerably strengthe-

ned compared to the 'old EMS'. As an institutional link between the monetary autonomy standard and the two-tier European Monetary System the exchange rate management competency of the central banks is also transferred to the EMI.

(31) European Autonomy Standard: For our purposes it is suggested that the monetary autonomization of the national central banks according to the institutional standard of the ESCB is realized already at the beginning of stage two. As a 'Club of Autonomous Central Bank Governors', the EMI would be a credible forerunner of the ESCB. A *European autonomy standard* would be established. Concerning the exchange rate policy, the autonomy standard is supplemented by the exchange rate management competency within the 'new EMS' transferred to the EMI. Defending the exchange rates in the markets, the EMI then could autonomously decide on a suitable combination of the interest rate, intervention, and exchange rate adjustment instruments. In order to create sufficient incentives for the national governments to give up the exchange rate management competency within the 'new EMS', its transference to the EMI, as the prior autonomization of the central banks, should become a precondition for the participation in one of the two institutional arrangements of the new two-track EMS.

(32) A Two-Track European Monetary System for the Transitional Stage Towards Monetary Union: The integration strategy laid down in the Maastricht Treaty already implies a multi-track Europe for the further monetary integration on its way to monetary union. The strategy of a criteria-orientated transition to the third stage inevitably determines a multi-speed transition for the individual countries. In this respect the following proposal of a two-track EMS for the course of stage two is in accordance with the scheduled multi-track strategy for the transition to the third stage. The necessity of a two-track EMS is mainly a consequence from the still existing economic convergence deficits in terms of monetary stability policy for some of the member states. Besides the precondition of institutional convergence with regard to the autonomy standard, the actually realized level of monetary stability should serve as the criterion for joining the *de facto monetary union* of the core countries. For participating in the *modified exchange rate mechanism* of the peripheral countries the institutional precondition of the European autonomy standard would be sufficient.

**(33) De Facto Monetary Union of the Core Countries:** In order to create a de facto monetary union of the core countries it is not necessary that the states involved abolish the fluctuation margins around the fixed central rates. It is sufficient to return to the narrow margins of the 'old EMS'. These margins and the corresponding central rates, however, have to be ultimately fixed. For a credible and sustainable intervention promise to protect the de facto monetary union's exchange rates in the markets the otherwise unchanged rule system of the old EMS has to be supplemented by a symmetrical, unconditioned, and unlimited intervention obligation of the central banks in the forward market. The spot intervention obligations of the 'old EMS' are not to be abolished but only completed by obligatory forward interventions. While maintaining the existing spot intervention rules, the intervention obligation in the forward markets has two different effects. It provides for an efficient mechanism for monetary policy coordination within the de facto monetary union as for a credible intervention mechanism to protect the exchange rates against speculative attacks:

- The latter is ensured because a forward intervention promise is sustainable for the central banks and, therefore, is credible for the markets. The unlimited interventions of the central banks necessary to discourage a speculative attack are defused in terms of direct expansive liquidity effects. In the course of an attack, however, the speculators inevitably suffer exchange losses of an amount equal to the intramarginal inter currency interest rate differences as indicated in the swap rates.
- The necessary interest rate coordination within the de facto monetary union is ensured by the certain combination of spot and forward interventions. The remaining asymmetry for financing spot interventions, forces the weak currency countries to activate the symmetrically designed forward intervention mechanism by establishing an intramarginal inter currency interest rate difference in favour of the weak currency. The interest rate coordination mechanism, therefore, would essentially remain market-determined. However, the risk of inadequate monetary adjustment constraints as a consequence of fundamentally irrational attacks is reduced to the establishment of intramarginal interest rate differences to activate the forward intervention mechanism.

The here suggested reform meets all criteria and preconditions required in this paper for the implementation of a stability-orientated fixed rate system. The transition from the de facto monetary union as a 'core EMS' to the third stage of monetary union could take place according to the procedure and timetable laid down in the Maastricht Treaty by 1999 at the latest.

(34) Modified Exchange Rate Mechanism with the Periphery: Those countries not yet able to meet the preconditions of monetary stability according to the ex ante agreed inflation standard should be tied to the core countries' de facto union by reestablishing the exchange rate mechanism of the 'old EMS' in an improved and strengthened version. The institutional convergence of the monetary autonomy standard, including the exchange rate management competency of the central banks within the rate mechanism, is the only precondition for participating in this modified exchange rate mechanism of the periphery. For countries which meet the criterion of institutional convergence, the exchange rate mechanism of the EMS should be re-established within the normal fluctuation margins of  $\pm 2,25\%$ . In order to find a convincing response to the far-reaching loss of credibility which the 'old EMS' suffered from the 1992/93 crisis, it is suggested to strengthen the intervention rules by introducing a case-by-case suspension competency of the settlement obligations. For reasons of institutional efficiency, the suspension competency should also be assigned to the EMI and should be decided by mutual consent of the central banks involved.

(35) Final Remarks: With the extended fluctuation margins of  $\pm 15\%$  the convergence criteria of the Maastricht Treaty have proved to be prohibitive for further progress towards the European Monetary Union. Therefore, in order to establish a monetary union by 1999 at the latest an additional reform strategy outside the EEC-Treaty is necessary to re-establish the EMS. A 'new EMS' proves to be a precondition for the transition to the third stage. The above suggested reform has the advantage to facilitate such a reform outside the EEC-Treaty without contravening its principles or requiring any modifications. It meets each of the required preconditions for a stability-orientated fixed rate system. In terms of a successful european integration policy, the rationality of realizing the European Monetary Union before the turn of the century is met, as is the central bank's rationality of preserving and even strengthen monetary stability. The proposal, therefore, proves to be the result of a rationality mix which is suitable to bring back the process of european monetary integration on the track of the Maastricht Treaty.

## Introduction

Fixed rate systems are institutions with economic benefits (or damages) determined by their inherent economic mechanics, the so-called "*rules of the game*"<sup>1</sup>.

In a fixed rate system, the 'rules of the game' are the result of the system's institutional design interacting with the prevailing conditions of the capital and foreign exchange markets. The market conditions can be described as the relevant environment of a fixed rate system. According to Mundell's terminology, a fixed rate system's set of rules is to its market conditions "like a constitution (...) to a political or electoral system"<sup>2</sup>. The market conditions prove to be the '*modus operandi*' of the rule system.

Currency crises as specific malfunctions of a fixed rate system are, like the systems' functioning, the result of its institutional design under given market conditions. Therefore, analysing currency crises and reform considerations to avoid them, also has to be orientated to the system's set of rules and its market conditions.

The European Monetary System (EMS) is an institutionalized fixed rate system. Its rule system was established in 1978/79 by contractual agreements between the governments and central banks involved. Except for a few modifications by the Basle/Nyborg-Agreement in 1987, the initial set of rules has remained unchanged. The extension of the bilateral exchange rate bands to +/- 15% as a consequence of the currency crisis of July 1993, however, comes close to a de facto suspension of the systems' rules. It also fundamentally questions the way towards European Monetary Union scheduled in the Maastricht Treaty.

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<sup>1</sup>) The term is originally attributed to J.M. Keynes. In his "Economic Consequences of Mr. Churchill" (1925, p.220) Keynes describes the monetary adjustment measures of the Bank of England as "rules of the gold standard game"; see for corresponding references Bloomfield (1959, p.47) and Eichengreen (1985,p.14) and for systematically using the term to describe the economic mechanics of historic fixed rate systems McKinnon (1993).

<sup>2</sup>) Mudell (1972, p.92). Similarly, he distinguishes between currency system and currency order: "An order, as distinct from a system, represents the framework and setting in which the system operates"; *ibid*,p.92.



This report, therefore, is to develop reform strategies for the EMS in order to re-establish its functioning during stage two of the European Economic and Monetary Union (EEMU), which - on the basis of the Maastricht Treaty - is a prerequisite for the transition to the third stage by 1999 at the latest.

The current state of European monetary integration described in *chapter I* of the report is used as starting point and given condition for reforming the EMS. The second stage's institutional settings are considered, as are the regulations about liberalizing capital and exchange markets and other constituent principles of the Maastricht Treaty. It is assumed that the objectives and strategies of integration agreed on in Maastricht are given. All examined reform options, therefore, refer to additional measures not concerning the Union Treaty. These options can be passed and implemented by the governments and central banks involved without the necessity of modifying the treaty.

*Chapter II* works out the theoretical background for deducting various reform options. A general institutional setting for fixed rate systems is introduced and the various institutional design options are developed in detail. The functioning of a fixed rate system is explained by the interaction of its rule system with the conditions of the capital and exchange markets. Currency crises as specific malfunctions of a fixed rate system are also interpreted as a necessary result of the system's rules and market conditions. Thereby, the theoretical patterns developed also become available for the analysis of reasons for those crises (*chapter IV*) and for corresponding reform considerations to avoid them (*chapters V and VI*).

However, *chapter III* first describes the institutional arrangement of the EMS as a specification of the general framework. Its functioning is explained by the interaction of the systems' rules which asymmetrically burden weak-currency countries and the conditions of initially still regulated, but since the late 1980s more and more liberalized capital and exchange markets. First, the systemically determined liquidity and reserve effects of the EMS's intervention and credit mechanism are derived to find out the systems' relevant symmetry characteristics. The formally symmetrical constructed intervention rules are dominated by one-sided asymmetrical reserve effects for the weak currency countries as a result of the intervention financing and settlement mechanism. The part of Mundell's

'electoral system' has been assigned to the markets. The markets alone determine whether a participating currency is regarded as being weak or strong according to the rules. The monetary adjustment constraints, which asymmetrically burden weak currency countries, then result from the liquidity and reserve effects of the intervention. These effects are triggered by the markets but the general structure setting out the burden sharing between hard and weak currencies is systemically determined by the specific construction of the relevant rules.

On the basis of a systematic understanding of the EMS, *chapter IV* analyzes also its malfunctions. The reasons for the currency crises of 1992/93 are analyzed as being mainly system-inherent consequences of the EMS's 'rules of the game'. With the liberalization of capital and exchange markets the system's functioning and stability became even more dependent on the market conditions than it used to be during the eighties. With the liberalization the rules' credibility for the markets became an indispensable condition for the EMS to exist. The political failure to make the EMS fit for the fundamentally changing market conditions by adequately adjusting its rules is recognized as a principal reason for the increasing system-inherent instability of the EMS, as well as the changed political handling of existing rules. Fundamentally irrational capital and exchange market speculations initially led to a 'false' stabilization of fundamentally more and more inadequate exchange rates until mid-1992 (= 'convergence trading'). Then, during the currency crises since fall 1992, the speculators forced the de facto suspension of the EMS. In its essence the crisis can be described as a speculative asymmetry crisis of the specific fixed rate institution EMS.

With reference to the general institutional framework *chapter V* develops and evaluates different reform options to re-establish the EMS during the phase of transition to European Monetary Union. A high degree of monetary stability within the system, the protection from inflationary influences from other member states, and a sufficient protection from inadequate monetary adjustment constraints are derived as indispensable criteria for feasible reform strategies and are used as strict preconditions for the following considerations. Then, appropriate modifications of the EMS's set of rules are developed and analyzed with regard to the objective of restoring credible rules for the markets.

Out of this pool of feasible reform options a detailed reform strategy is formulated in *chapter VI*. Besides re-establishing a 'new EMS' that might work even under the conditions of fully liberalized capital and exchange markets, the proposed reform strategy proves to be suitable for the transition to the third stage of the European Economic and Monetary Union. In its core it proposes the implementation of a *European Autonomy Standard* for monetary policy with the beginning of the second stage. The autonomy standard is supplemented by a *two-track European Monetary System* with a de facto Monetary Union of the core countries and a modified exchange rate mechanism for the periphery. Thereby, the obstruction of the Maastricht Treaty within the extended exchange rate margins is removed and the scheduled transition mechanism is re-established without modifying the convergence-orientated monetary stability criteria stipulated in the Treaty.

## I. Current State of European Monetary Integration

The European Community has entered the second stage of the Economic and Monetary Union. This stage, which has started January 1, 1994, is a preparatory phase for the transition to the third. With the establishment of a European Central Bank and the introduction of a common European currency the third is the final stage of European monetary integration process.

With the beginning of the second stage the European Monetary Institute (EMI) has been founded. The EMI in an institutionalized form replaces the Committee of Central Bank Presidents which is disbanded with the beginning of stage two. The main responsibilities of the EMI are the coordination of the member states' monetary policies, the control and management of the European Monetary System, and the necessary technical and organizational preparations for entering the final stage. The decisive characteristic of the second stage as being a preparatory instead of a training phase results from the contractual requirement that during the phase of transition the monetary policy competency remains completely on the national level of the individual member countries:

"The EMI shall carry out the tasks and functions conferred upon it by this Treaty and this Statute without prejudice to the responsibility of the competent authorities for the conduct of the monetary policy within respective Member States ." (Art. 3.1; Protocol on the Statute of the European Monetary Institute; Treaty on European Union)

The Maastricht Treaty, therefore, has abstained from an institutionalized learning process in the course of a training phase for the future European Central Bank (ECB).

Besides the preparatory works for the third stage, the institutional upgrading of the Committee of Governors<sup>3</sup> nevertheless explicitly schedules a "strengthening (of; R.V.) the coordination of monetary policies with a view to ensuring price stability" (Art. 2) already

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<sup>3</sup>) The main institutional innovations compared to the status quo of the Committee of Governors are that the Council of the EMI is headed by a "full-time" president who is not at the same time a governor of one of the national central banks involved (art.9). The members of the Council act on their own responsibility and are not allowed to obtain or accept any directions from agencies or institutions of the Community or from the member states' governments (art.8).

for the course of the transitional phase. Concerning the EMS it is stipulated that, besides its control and management through the takeover of the European Monetary Cooperation Fund (EMCF), the EMI may present the governments council statements or recommendations concerning measures "which might affect the internal or external monetary situation in the Community and, in particular, the functioning of the EMS." (Art. 5.1).

Provided that measures of direct monetary policy coordination or modifications of the EMS's rule system prove to be necessary for a successful transition to the third stage, the Union Treaty predetermines and entitles the EMI for its conceptual preparation and implementation.

The beginning of the final stage is supposed to be determined in the course of stage two. If it is not agreed by the end of 1997, the third and final stage will start January 1, 1999. The European Council in the composition of the heads of state or government has to decide by a qualified majority which countries fulfil the necessary conditions for entering the third stage. The qualifying standard for participating is whether the individual member states meet the convergence criteria specified in the treaty. For the design of the national monetary policies during the second stage it is of exceptional (but normally understated) importance, that, besides the four macroeconomic convergence criteria, the treaty requires as an additional *institutional convergence criterion* the adjustment of the national central bank legislation to the statutes of the European System of Central Banks (ESCB) in the course of stage two:

"Each Member State shall ensure, at the latest at the date of the establishment of the ESCB, that its national legislation including the statutes of its national central bank is compatible with this Treaty and the Statute of the ESCB." (Art. 108, Treaty on European Union)

" During the second stage, each Member State shall, as appropriate, start the process leading to the independence of its central bank, in accordance with Art. 108." (Art. 109e.5, Treaty on European Union)

Since this criterion essentially demands the timely establishment of the national central bank's institutional convergence with the future ESCB's autonomy standard specified in the treaty, it will subsequently be called '*autonomy criterion*'.

In order to enter the final stage, the third macroeconomic convergence criterion requires a country to keep its currency within the normal band in the EMS's exchange rate mechanism for at least the last two years before without a devaluation against another member currency:

"The criterion on participation in the exchange-rate mechanism of the European Monetary System (...) shall mean that a Member State has respected the normal fluctuation margins provided for by the exchange-rate mechanism of the European Monetary System without severe tensions for at least the last two years before the examination. In particular, the Member State shall not have devalued its currency's bilateral central rate against any other Member State's currency on its own initiative for the same period." (Art. 3; Protocol on the Convergence Criteria Referred to in Article 109j of the Treaty Establishing the European Community) ✓

By respective EMS agreements the normal band is defined as a bilateral fluctuation margin of  $\pm 2,25\%$ <sup>4</sup>. The transition to the extended bands of  $\pm 15\%$  on August 1, 1993, therefore, is clearly contrary to the exchange rate criterion of the Maastricht Treaty. As long as a member state does not at least return to the normal band, it will be barred from entering the third stage<sup>5</sup>.

The de facto suspension of the EMS proves to a criteria- and, therefore, a contract inherent obstruction for the transition to the third stage. Returning to the normal band of the EMS becomes a necessary precondition for further progress of the Maastricht integration strategy. Hence it follows that the second stage's main focus should be to re-establish the EMS's exchange rate mechanism.

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<sup>4</sup>) See the Agreement of March 13, 1979 between the Central Banks of the Member States of the European Economic Community stipulating the operating procedures for the European Monetary System; printed in: Texts concerning the European Monetary System (1985, p. 25-40). The introduction of the agreement says: "Whereas under the terms of the said Resolution (of the European Council of December 5, 1978 on the establishment of a European Monetary System; R. V.) (...) fluctuation margins of 2.25% will be fixed around these bilateral central rates, although Member States not at present participating in the narrower margins mechanism may in the initial stage of the European Monetary System opt for wider margins of up to 6 per cent"; ibid p. 24.

<sup>5</sup>) The argument not only derives from the legal position cited above but also from the economical and political dimension of the 'de facto floating' within the extended bands. Sooner or later necessarily occurring exchange rate fluctuations within the 30% margin will politically be interpreted as a proof for still insufficient convergence; the transition to stage three then becomes dependent on the exchange rate stability in the markets and is entirely subject to the 'dictate' of fundamentally irrational capital and exchange speculation. A direct transition from the 'de facto floating' to the final stage will prove to be impossible. Therefore, the return to a reformed and for market participants credible EMS becomes a necessary economic and political precondition for further progress toward European Monetary Union. ✓

To avoid further modifications of the Union Treaty, which would need to be ratified by the national parliaments, the EMS reform should be implemented by using the EMI procedures and competencies without modifying the Treaty. The way of reforming the EMS by means of agreements between the governments and central banks involved is in accordance with the foundation as well as the further institutional adjustments the EMS since it was implemented in 1978/79. Its institutional core is based on agreements between the participating central banks which are not part of the EEC Treaty. Thereby a transfer of monetary competencies of the individual member states to community institutions can be avoided without endangering the reform essentials. The second stage is merely extended and efficiently used. However, its character as a preparatory phase with furthermore national monetary policy competencies remains unchanged. Thereby, from the central banks' point of view, an essential policy condition for supporting an EMS reform initiative is already fulfilled.

## II. Fixed Rate Systems: A General Institutional Framework

"The choice in economic policy is a choice of institutions".  
(Coase 1984, p. 230)

The design of institutionalized fixed rate systems has essentially remained an exclusive issue of practical policy. Only recently it has become a subject of systematic theoretical analysis<sup>6</sup>.

Likewise the EMS is an exclusive result of policy initiatives without any worth mentioning theoretical assistance<sup>7</sup>. Only in recent years some theoretic work in institutional analysis of fixed rate systems has been done. With an improved understanding of the gold standard and the historic experience with the Bretton Woods System and the EMS, the essentials for a systematic analysis of institutionalized exchange rate systems can be derived<sup>8</sup>. Chapter II works out these essentials in a general framework for institutional analysis of fixed rate systems. The following chapters then apply the general framework to the EMS and deduct a systematic and theoretically sound analysis of various reform options.

### 2.1 Definitions

Rules and rule structures are important elements of economic institutions. Fixed rate systems are institutions which - as a politically intended and established rule system in interaction with its relevant environment - produces certain economic results. The relevant

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<sup>6</sup>) An exception is of course J.M. Keynes who fundamentally contributed to the design of the world monetary order of the post war era with his theoretically motivated preparatory work during the Bretton Woods Conference in 1943/44; see Keynes (1943/69;1980,Bd.XXV + XXVI).

<sup>7</sup>) "To tell the truth we have to admit, that the politicians alone deserve the merits of the (EMS-; R.V.) success-story. None of the academic economists has guarded the cradle of the EMS and when it was christened most of them have been critics. Today they lead the procession against the European Monetary Union." Sievert, Olaf; Money that can not be self-created, in: Frankfurter Allgemeine Zeitung of September 26,1992,p.13 (translated by R.V.). For the foundation and history of the EMS see Ludlow (1982) and from the perspective of the German Bundesbank Emminger (1986,p.356-372).

<sup>8</sup>) See Bofinger (1987; 1989; 1991), Bofinger/Gerberding (1988) and McKinnon (1993) which contains a comprehensive and current survey of the relevant literature. For similar attempts see Hasse (1984) and Miller/Eichengreen/Portes (1989). The terminology used in this study essentially follows Bofinger (1991).



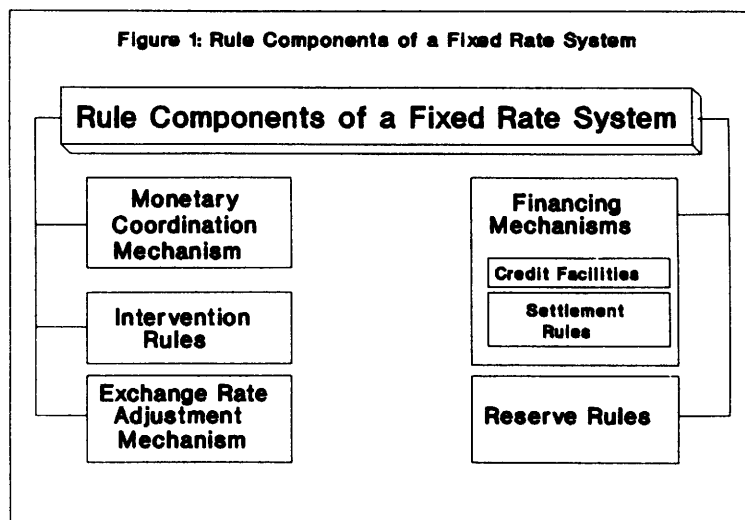
environment of fixed rate systems is mainly determined by the conditions of the capital and exchange markets. Markets are also part of the economic institutional system. A fixed rate system's rule structure and its market conditions thus prove to be a suitable object of institutional analysis:

"If rules influence outcomes and if some outcomes are better than others it follows that to that extent that rules can be chosen the study and analysis of comparative rules and institutions become proper objects of our attention" (Brennan/Buchanan (1987), p.XI)

According to this basic ideas, chapter II develops a general institutional framework for fixed rate systems and their market conditions. In chapters III and IV this framework is applied to the EMS's problems in question. From the resulting pool of reform options (chapter V) a suitable institutional reform strategy for the EMS is proposed in chapter VI.

## 2.2. Basic Institutional Structure

The set of rules of a fixed rate system is essentially a mechanism for allocating its inherent monetary adjustment constraints. These adjustment constraints are triggered by market transactions. However, the intensity and direction of the market transactions' impact is essentially determined by the specific design of the rules. The rule structure can be classified and described in five different categories of rules. Besides the monetary coordination mechanism, these categories contain the intervention rules, the financing mechanism (consisting of settlement rules and credit facilities), the reserve rules, and the exchange rate adjustment mechanism (s.fig.1)



Together with the financing mechanisms and the reserve rules, the intervention rules constitute the core of a fixed rate system. It determines the allocation and intensity of liquidity and reserve effects caused by interventions. The system's inherent monetary adjustment constraints are essentially resulting from these effects. Another constituent

element is the exchange rate adjustment mechanism. In contrast to a de facto monetary union, fixed rate systems explicitly preserve the option of regular central rate adjustments. Thereby member states can evade policy adjustment constraints by case to case adjustments of their exchange rates.

The allocation of monetary adjustment burdens among the participating member currencies is described by the system's symmetry characteristics. A fixed rate system of uncovered paper currencies can either be designed asymmetrically burdening hard currency countries (= '*weak currency standard*') or asymmetrically burdening weak currency countries (= '*hard currency standard*') or symmetrical (= '*compromise standard*'). The symmetry characteristics determine the system's internal monetary stability standard<sup>9</sup>. In the following, the symmetry term is used on different system levels; however, the symmetry characteristics of the overall system result only from the interaction of the specific symmetry characteristics of its individual rule components. The *dominant rule* determines the overall result.

The symmetry characteristics of the inherent liquidity and reserve effects are resulting from the interaction of the several individual rule components. These rule-determined effects can be modified by the relative size of the member states concerning their foreign exchange reserves and monetary sterilization capacity. Activated by free market transactions evaluating the various member currencies, the resulting systemic liquidity and reserve effects then determine the actually effective monetary adjustment constraints and thereby define the symmetry characteristics of the overall system. Following this basic structure, the individual rule components and their interaction is analyzed in section 2.3.. Modified by the determinants of relative size of the participating states (section 2.4), the systemically determined liquidity and reserve effects can be described (section 2.5). Triggered by capital and exchange market transactions (section 2.6), these effects determine the actually effective monetary adjustment constraints of a fixed rate system (section 2.7).

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<sup>9</sup>) Uncovered paper currency systems are ex definitionem lacking an external stability standard. The internal one is essentially a monetary policy standard. According to the distinction between external and internal standards we can speak of real (goods or gold standards) and nominal (paper standard) anchorage of a monetary system. Fixed rate systems of uncovered paper currencies only provide a nominal anchorage: the overall system is tied to the (nominal) monetary policy standard of individual member currencies. The structure of this "tying" is described by the system's symmetry characteristics.

## 2.3. Rule Components

Each rule component within the institutional structure of a fixed rate system contains a number of different design alternatives. Deducting the system's rules of the game we at first have to analyse the specific composition and interaction of the different rules and thereby taking into account their specific design details. An intervention rule A and a credit mechanism B in combination with a settlement rule C may cause different adjustment constraints and overall symmetry characteristics than the same combination of intervention rules and credit facilities with a settlement rule D. The different combinations of design alternatives can be summarized by defining various types of fixed rate systems characterized by different monetary stability and symmetry characteristics<sup>10</sup>.

### 2.3.1. Monetary Coordination Mechanism

Fixed rate systems can be described as mechanisms providing a coordination structure for national monetary policies. Nevertheless, monetary policy coordination in fixed rate systems seems to be means and end at the same time. Obviously the first objective of a fixed rate system is the stabilization of exchange rates. Coordinating the monetary policies of the member states is only necessary to the extent that is needed to maintain exchange rate stability. For our purpose, the monetary coordination mechanism is described in the following as an integrated component of a fixed rate system and not as the system itself.

The monetary policy coordination of a fixed rate system can either be effected ex post through the resulting adjustment constraints of the system. Coordination is then the result of the system's adjustment mechanics triggered by the markets. It can be described as a *market coordination* or indirect coordination of monetary policy. On the other hand, monetary coordination can also be effected ex ante as a direct monetary coordination of the responsible currency authorities. Analogous to market coordination, the direct coordination can be described as *authority coordination*. As an additional terminological distinction, the term

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<sup>10</sup>) For such a typology of different systems see Bofinger (1991; p.153-179) and McKinnon (1993).

simple fixed rate system is used in the following in distinction to complex fixed rate systems when no mechanism for a direct coordination of monetary policy is provided.

Monetary coordination in *simple fixed rate systems*, therefore, is solely triggered by the markets, whereas complex fixed rate systems provide rules and/or procedures for a direct coordination of monetary policies. The institutional design alternatives of monetary coordination in simple fixed rate systems are accordingly limited to regulations of the capital and exchange markets to influence and ensure their proper functioning as an instrument for indirect monetary policy coordination. With fully liberalized capital and exchange movements the indirect coordination is completely dominated by free market transactions and speculation. The rationality of the monetary coordination mechanism then exactly corresponds to the fundamental rationality of the markets.

In *complex fixed rate systems* the central banks try to coordinate their monetary policies directly in order to realize the monetary convergence necessary for the stabilization of the exchange rate relations. With the ex ante coordination process they try to convince the markets of this convergence to thereby avoid market-determined ex post adjustment constraints. Designing a direct coordination process we have to choose among several alternatives in substance and organizational detail. In its substance a direct monetary coordination can either be conducted along certain ex ante agreed rules or follow a discretionary case to case strategy<sup>11</sup>. Institutionally, it can be organized either without or within a defined 'governance structure'. Ultimately any direct authority coordination remains subject to a certain degree of indirect control since it is constantly tested by the markets. If it appears to be insufficient or implausible in the judgement of the markets, it will not provide ultimate protection against the systemic consequences of fundamentally irrational market speculations. Mechanisms for a direct monetary policy coordination may prove to be necessary for a successful stabilization of exchange rates but definitely they are not sufficient. As long as the monetary policy sovereignty remains on the national level, any kind of monetary coordination for stabilizing exchange rates remains dependent on the judgement and acceptance of the markets.

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<sup>11</sup>) For details see the standard texts of McKinnon (1984; 1988) and Williamson/Miller (1987).

### 2.3.2. Intervention Rules

The intervention rules of a fixed rate system should unambiguously stipulate the circumstances and extent the member states are obliged to intervene in order to keep the system's exchange rate promise. Besides the choice of an exchange rate standard it is necessary to define and establish the bilateral central rates, fluctuation margins and intervention points.

When choosing an *exchange rate standard* it is important to take into account the consequences of the various standards for the distribution of intervention obligations among the member currencies. The distribution of intervention obligations is an initial formal determinant of the system's symmetry characteristics. Besides the effect that a contradictory design of the fluctuation margins and/or the intervention points can (over-) compensate the symmetry implications of the formal intervention rules, the choice of an exchange rate standard nevertheless can be an important signal of the intended overall symmetry characteristics. Three different types of exchange rate standards can be distinguished:

- The first option is the *key currency standard*. Here, all participating nations are obliged to establish a bilateral exchange rate of their currency towards the key currency. They have to defend this rate in the exchange markets by means of intervention. As an exception of this rule the role of the key currency is characterized by its passivity in defending the exchange rates in the markets. The key currency is not subject to any intervention obligations. Therefore, its monetary authorities are not forced to accept any monetary adjustment constraints caused by liquidity and reserve effects due to interventions<sup>12</sup>. The remaining monetary degree of freedom is in-

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<sup>12</sup>) This clearly shows, that in the Bretton Woods System the dollar has become the de jure key currency of the system only with the suspension of the dollar's convertibility into gold in August 1971 ('closing the gold window'). Until then the dollar had been subject to a gold intervention obligation like the other countries had been subject to a foreign exchange intervention obligation. Prior to 1971 the dollar's de facto key currency position was based on the irregular passivity of the USA in the foreign exchange markets. This passivity, however, was accepted by the other member states. In addition, most of the (n-1) participating countries generally renounced from redeeming their gold convertibility rights from the dollar reserves accumulated by intervening in support of the dollar. This conduct was an additional guarantee of the dollar's de facto key currency position.

stitutionally guaranteed by rule to the key currency as the n-th currency of the system<sup>13</sup>. Consequently, a key currency standard is designed entirely asymmetrically burdening the (n-1)-countries of the system.

- The *bilateral parity grid* is the second type of exchange rate standard. In a bilateral parity grid the central rates of the member currencies are established bilaterally, with n participating countries resulting in  $n(n-1)/2$  bilateral central rates. For a bilateral parity grid symmetrical intervention obligations can be expected at least in a formal sense.
  
- As a third option, the central rates can be defined with respect to a *currency basket* in which each participating currency counts for a certain weight. The symmetry characteristics of a currency basket are more complicated since a currency's exchange rate towards the basket currency is the weighted average of its bilateral exchange rates towards the individual currencies participating in the basket. It, therefore, is conceivable that contradictory exchange rate fluctuations of individual currencies within the system offset each other and consequently are not reflected in its basket rate. In a currency basket standard, therefore, one can assume symmetry characteristics unilaterally burdening the currencies counting for the highest weights in the basket and whose exchange rate deviates the most from the basket average<sup>14</sup>.

Each of the various currency standards including the basket standard demands the explicit definition of bilateral central rates. Establishing bilateral central rates one can refer to normative models of defining the 'correct' exchange rate or simply follow the given market rates. An important aspect for defining the fluctuation margins is the criterion of *overlapping bands* in case of central rate adjustments. Overlapping bands can help to reduce the probability of 'one-way bets' in the markets. They reduce the predictability of the future

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<sup>13</sup>) In accordance with the distinction between de jure and de facto key currencies, Matthes (1988; p.31) distinguishes "born" and "elected" key currencies. For the following we always use the term key currency according to a de jure key currency, whereas a market determined key currency is described as an anchor currency.

<sup>14</sup>) See Kleinheyer (1987; pp.48) for more detail.

spot rate within the new band because the spot rate does not necessarily have to fall below the lower limit of the former margin.

A fourth design detail of intervention rules is the specific construction of intervention points. If a currency reaches its intervention point, the system's intervention rules are automatically activated. The upper intervention point describes the maximum exchange rate, the lower intervention point describes the minimum rate of a currency within the system. At the upper intervention point a country is obliged to prevent a further revaluation of its currency by intervening in support of the weak currency. At the lower point of intervention, weak currency countries are obliged to support their own currency by purchasing it against the strong currency. We speak of symmetrical intervention points if the upper and lower point of intervention are in the same distance from the bilaterally defined central rate. With asymmetrically constructed intervention points, obligations to intervene exist either at the upper (= *'soft currency version'*) or at the lower (= *'hard currency version'*) intervention points. As an alternative design detail the intervention points' distance from the bilateral central rate can be defined differently for the two currencies involved. An example for asymmetrical intervention points is a currency basket standard in which individual currencies count for different weights. If such a basket standard is 'translated' into a bilateral parity grid, it results in asymmetrical bilateral fluctuation margins and intervention points.

Analyzing the intervention rules of fixed rate systems it is important to examine if and to what extent the symmetry characteristics of the intervention rules are concealed by the corresponding financing mechanism of the system. Even formally symmetrically designed intervention rules may result in asymmetrical systemic adjustment constraints due to the corresponding settlement rules. The intervention rule's formal symmetry characteristics by themselves only decide on the technical implementation of the interventions in the markets and may prove to be insignificant for the system's adjustment mechanics. Resulting already from the at first accidental distribution of intervention obligations among the central banks in the course of a currency crisis, it is not sufficient to stipulate only the technical aspect of carrying out the interventions in the markets. To prevent an accidental distribution of adjustment constraints resulting from the liquidity and reserve effects of interventions a corresponding intervention finance mechanism is required.

### 2.3.3. Mechanisms of Intervention Financing

The finance mechanism of a fixed rate system consists of credit facilities and settlement obligations. Although we will find identical design details for these two elements, they refer to very different aspects of the intervention financing and, therefore, are analyzed separately.

#### 2.3.3.1. Credit Facilities

In order to relax the existing budget restriction for weak currency countries intervening at their lower intervention point, a fixed rate system with intervention obligations needs corresponding intervention credit facilities. The budget restriction of weak currency countries result from the limited funds of hard currency reserves as freely available intervention assets for defending the exchange rate at its lower intervention point. Intervention promises at the lower intervention point can only be kept and, therefore, be credible from the markets' point of view as long as the affected countries have access to appropriate hard currency intervention reserves. Only the central bank of the hard currency itself can guarantee these reserves unlimitedly. The certain extent of loosening the budget restriction through credit facilities depends on the facilities' particular conditions. Besides the overall amount of the credit facility the most important conditions are the maturity, interest rate, and the denomination of repayment obligations:

- From the markets' point of view, the amount and maturity of credit facilities are the most important determinants for the credibility of a weak currency country's intervention promise. Any limitations - concerning both the amount and maturity - lead to the re-establish the budget restriction in the course of a currency crisis. Thereby the intervention promise of the weak currency country becomes untrustworthy and an exchange rate adjustment corresponding to the market pressure will prove to be inevitable<sup>15</sup>.

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<sup>15</sup>) However, this does not result in the simple rule that an intervention promise to be credible for the markets only requires unlimited mutual credit facilities. Intervention facilities of this kind do not take into account the monetary consequences of the liquidity effects associated with credit-financed interventions for the hard currency creditor countries. If the expansionary money base effects due to interventions exceeds their sterilization capacities the consequences of an unlimited intervention facility will become *unsustainable* from



- The interest rate and currency denomination of the repayment obligations determine both the credit facility's costs and the allocation of the exchange rate risk connected with the credit.

Besides the credit mechanisms' importance in terms of intervention policy, it implies an additional financing aspect concerning the balance of payments. When intervention financing is demanded over a longer term it may become a credit for permanently financing fundamental balance of payments deficits. Longer maturities for international credit facilities, therefore, are normally 'conditional', i.e. they are bound to economic policy measures which are supposed to re-establish the conditions for a market-financed balance of payments.

### 2.3.3.2. Settlement Rules

In contrast to credit facilities, settlement obligations do not help to finance interventions of weak currency countries at their lower intervention limit but stipulate the financing of interventions carried out by a hard currency country reaching its upper intervention point. Interventions at the upper intervention limit are purchases in support of the weak currency against the own hard currency. As a consequence, the domestic money base of the hard currency increases in the amount of the intervention. At the same time, the central bank accumulates currency reserves denominated in the weak currency. In the context of settlement rules weak currency reserves of hard currency central banks accumulated by obligatory interventions establish a claim towards the central bank of the weak currency to re-exchange the reserves into hard currency. The weak currency central bank, therefore, is obliged to redeem the hard currency central bank's weak currency reserves purchased in support interventions at its upper intervention point and to convert them into hard currency. *With settlement obligations the weak currency central bank is obliged to finance the hard*

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a monetary policy perspective. The markets then will anticipate an *opting out* of the hard currency central bank. Intervention promises, therefore, have to be credible for the markets from the weak currency countries' perspective but at the same time they have to be sustainable from the monetary policy perspective of the hard currency countries (see appendix I).

*currency central bank's interventions*<sup>16</sup>. Since the central bank with the weak currency needs hard currency assets to meet its settlement obligations, settlement transactions are subject to the budget restriction of limited intervention reserves. They cause similar reserve effects as the central bank's own interventions. In the end, each support intervention, therefore, has to be financed by the weak currency country itself, regardless of which central bank involved has carried out the interventions in the market. As much as credit facilities contribute to the relief of the budget restriction, settlement obligations lead to its further tightening.

Similar to credit facilities, for designing a settlement obligation it is especially important to fix its amount, maturity, and the denomination of the settlement transactions.

- Amount and maturity both determine the course of the budget restriction and the degree to which it is tightened. Besides the quantitative dimension of limited or unlimited settlement obligations, their qualitative dimension is of importance, i.e. the question whether they are independent of or conditioned to certain reasons and circumstances of the interventions.
- Besides the allocation of the exchange rate risk, the denomination of the settlement transactions determines whether other reserve assets in addition to the hard currency can also be used to meet the settlement obligations. The use of additional reserve assets is a certain relief for weak currency countries since they can use the whole of their currency reserves (including gold and other reserve assets) for settling the balance and not only the part of its reserves denominated in the hard currency.

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<sup>16</sup>) From the accounting point of view, interventions of hard currency central banks in fixed rate systems with settlement obligations are treated similar to a credit granted to the weak currency country. The exchange obligations deriving from the settlement process correspond to the repayment obligation of financing interventions by using the system's very short term credit facilities.

#### **2.3.4. Reserve Rules**

The purchase, holding, investment, and employment of intervention reserves can produce liquidity and other monetary policy effects for the reserve currency's central bank. Therefore, certain reserve rules should be agreed upon. Reserve rules determine in what form central banks are allowed to hold their intervention reserves in member currencies (= '*reserve investment rules*') and to what extent they are allowed to accumulate those currencies (= '*reserve limitation rules*')

- Reserve investment rules are an important determinant of the liquidity effects resulting from interventions. Expansionary money base effects always occur when the currency reserves of the intervening central bank were previously invested at the central bank issuing the intervention currency. In comparison, intervention assets from market investments do not affect the central bank money circulation of the intervention currency and remain limited to liquidity effects to the broader non-bank liquidity aggregates of money supply.
- For the individual central banks, the amount of reserves denominated in intervention currencies is a decisive determinant of the remaining monetary degree of freedom within a fixed rate system. By using its intervention reserves a country can at least temporarily evade the system's monetary adjustment constraints or it can gain time for the implementation of suitable adjustment policies.

Obviously any central bank can purchase and invest unlimited currency reserves in the market by organizing their domestic money supply in the way of purchasing intervention currencies and hold them in liquid and always available market investments. They can practice their monopoly of issuing central bank money by purchasing foreign exchange. Nevertheless, the accumulation of those intervention reserves is limited by the instrumental and institutional conditions of domestic money supply policies. In principle, however, the individual central banks' scope of accumulating foreign exchange reserves is considerable. For an explicit limitation of this scope an agreement on reserve rules is necessary.

### 2.3.5. Exchange Rate Adjustment Mechanism

For each fixed rate system, the possibility of an exchange rate adjustment is a sort of loophole to evade the system's adjustment constraints or to forestall the markets' pressure towards such adjustment constraints. The institutional design and operation of the exchange rate adjustment mechanism, therefore, is an important determinant for the degree of system inherent economic adjustment pressure and the credibility of the exchange rate promise from the markets' point of view. Rule-determined or discretionary exchange adjustment mechanisms are the basic design alternatives:

- Rule-determined adjustment mechanisms can also be described as *formula flexibility*. The changes in the exchange rates follow a specified rule or formula and are 'objectively' given for all countries involved. In technical detail, those adjustment automatisms are conceivable as either *ex ante* or *ex post* rules. *Ex ante* rules determine the course and extent of the exchange rate development already in advance, whereas in *ex post* rules, they follow a certain formula in the course of time. *Ex post* rules, therefore, facilitate the agreement on economically efficient adjustment rules in substance and not - like the *ex ante* rules - in an exclusively formal sense. Provided that the economic rationality of an adjustment formula is accepted by the markets, it substantially contributes to the credibility of the exchange rate promise and, therefore, to the stability of the overall system.

- As an alternative to the rule-determined formula flexibility exchange rate adjustment mechanisms can follow a discretionary case by case strategy. In principle, *discretionary adjustments* of the exchange rate can be carried out within a 'governance structure' or without being tied to specific procedural rules. Without procedural rules, each member state can autonomously and without being forced to reach a formal agreement with the other member countries involved adjust its central rate. Within a 'governance structure' exchange rate adjustments follow certain *ex ante* determined procedural rules and competencies. Thereby the most important institutional choice alternatives are whether the governments (= *political exchange rate competency*) or the central banks (= *monetary exchange rate competency*) have the exchange rate competency and in which way the institutionalized discussion and decision process within the 'governance structure' is organized.

## 2.4. Size of a Country

Besides the rule-determined symmetry characteristics, the relative size of the member states is important for the internal allocation of a fixed rate system's monetary adjustment constraints. A country's relative size within a fixed rate system is essentially determined by its monetary sterilization capacity and the amount of its freely available hard currency intervention reserves<sup>17</sup>:

- The *sterilization capacity* depends on the amount of a member country's domestic money base and the national monetary authority's capacity to control it. The more and flexible controllable the national money base proves to be the more easy a country can sterilize intervention-caused liquidity effects and avoid expansive monetary base effects resulting from unsterilized interventions at the upper intervention point.
- *Intervention reserves* provide a temporary buffer against the reserve effects of exchange interventions. If this buffer is exhausted, further pressure on the exchange rate will directly cause a tightening of the restrictive adjustment constraints or alternatively an adequate exchange rate adjustment according to the speculative market pressure.

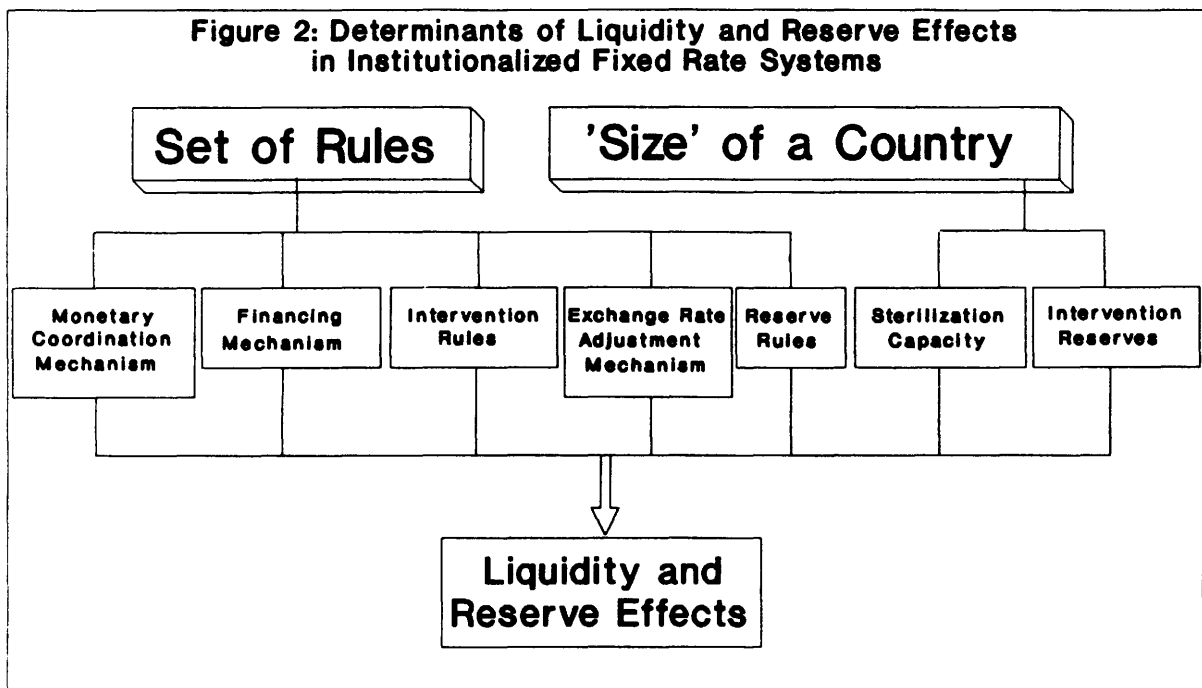
Consequently, the bigger a country in terms of its sterilization capacity and its currency reserves, the more likely it can - at least temporarily - evade rule-determined liquidity and reserve effects and the resulting adjustment constraints. Intensity and direction of rule-determined symmetry characteristics, therefore, can be (over-)compensated by the relative size of the countries involved.

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<sup>17</sup>) Such a limitation to exclusively 'nominal' determinants of a country's relative size referring to the intervention and sterilization capacities and the associated neglect of 'real' economic fundamentals is all the more justified the stronger the goods markets are dominated by the financial markets. Speculative attacks in fixed rate systems are essentially financial markets phenomena and, therefore, have to be analyzed more or less separately from the developments in the goods markets as documented in the trade balances and national income statistics.

## 2.5. Interim Summary of Liquidity and Reserve Effects

Institutional rules of a fixed rate system play an important, but not all-decisive part in determining the 'rules of the game'. At least in a formal sense, their part mainly consists in controlling the liquidity and reserve effects' direction and intensity, which, as determinants of the economic adjustment constraints are of great importance for the functioning and monetary stability of the overall system. The adjustment constraints that become effective in the end, however, are not determined by the formal symmetry of the individual rule components but only by the actually effective liquidity and reserve effects of the system in action. Their formal (= rule-determined) symmetry characteristics can be (over-)compensated by sterilizing the intervention-caused money base effects or by a country's capacity of financing interventions from its own reserves. For identifying the *dominant rule*, we have to find out whether the liquidity effects resulting from the intervention and reserve rules or the reserve effects as a result of the financing mechanism dominate the allocation of adjustment constraints, and for that, a country's size can be of significant relevance. Figure II summarizes the systemic determinants of liquidity and reserve effects in an institutionalized fixed rate system as analyzed above:



## **2.6. The Part of Capital and Foreign Exchange Markets**

The above analysis has indicated that the symmetry characteristics of systemical liquidity and reserve effects determine the allocation of economic adjustment constraints among hard and weak currency countries. The question of whether a currency is 'hard' or 'weak' according to the rules, however, remains open. The identification of hard and weak currencies within the system is dominated by the markets. The markets, therefore, take the part of a 'judge' who has to decide which of the member currencies are weak or strong according to the rules. The system's institutional settings are blind to this kind of identification problem. A currency, therefore, is by definition a hard currency when its exchange rate is subject to a revaluation pressure in the foreign exchange market. A currency is called weak when it is subject to a devaluation pressure. In case a currency is subject to revaluation or devaluation pressures, the intervention mechanism and with it the systemically determined liquidity and reserve effects are virtually automatically activated. For that a revaluation or devaluation pressure of the market is the necessary and sufficient condition at the same time, regardless of its underlying degree of fundamental rationality. Activating the adjustment constraints is entirely the job of the markets<sup>18</sup>.

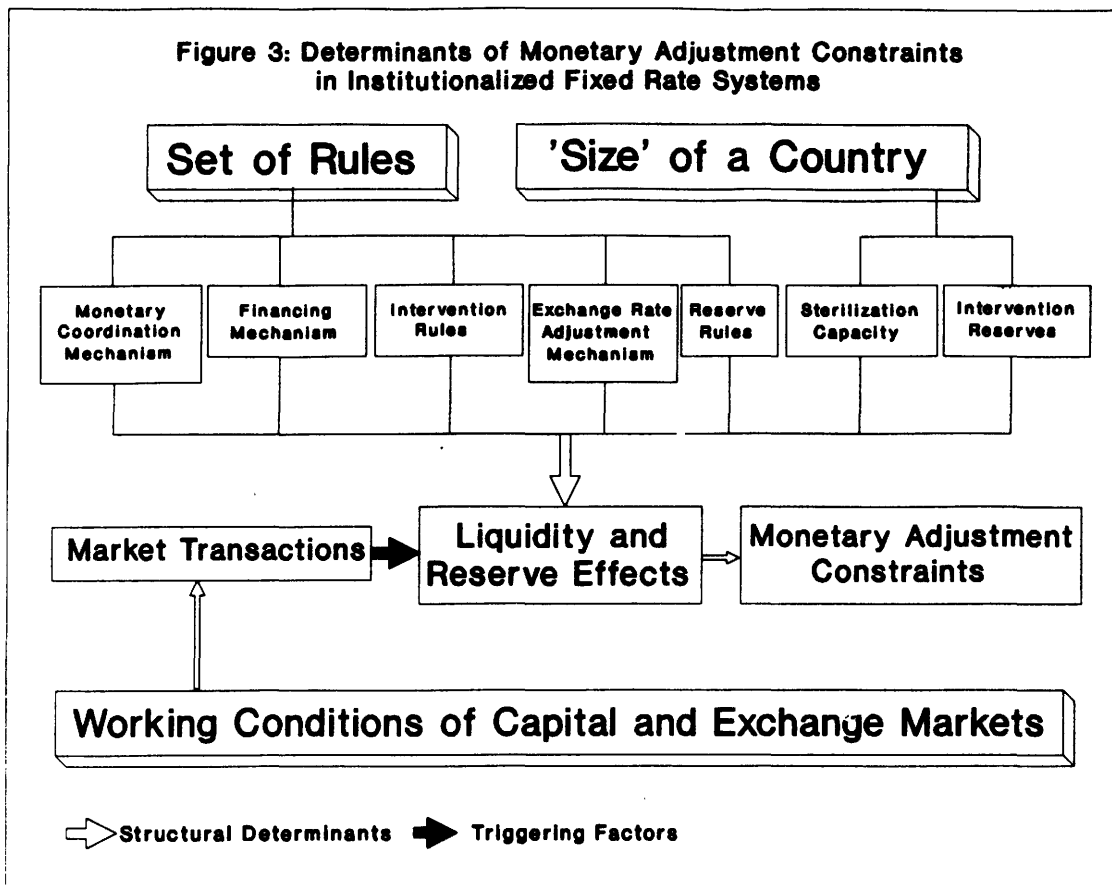
## **2.7. The System's Overall Monetary Adjustment Constraints**

It has been shown that the internal allocation of actually effective monetary adjustment constraints can only be identified by the interaction of a fixed rate system's institutional rules with the relative size of the countries involved and the conditions of the capital and exchange

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<sup>18</sup>) Even if its rule system provides mechanisms for a direct coordination of national monetary policies a fixed rate system remains subject to the 'market's dictate'. Although ex ante coordinations of the monetary and interest rate policies may contribute to the stabilization of the market's expectations, they cannot provide a sufficient protection against speculative attacks. For example, a coordinated interest rate policy will only provide suitable protection against speculative attacks if it guarantees that at any point of time during the crisis the exchange expectations of the speculators are (over-) compensated by the inter currency interest rate differences. However, the necessary excessive volatility of short-term money market interest rates is unsustainable for the central banks and, therefore, implausible for the markets. Direct coordination mechanisms will only prove to be sufficient if they are credible for the markets and ex ante prevent the development of speculative attacks by stabilizing the market's exchange expectations. Therefore, even the effectiveness of direct monetary policy coordination for stabilizing exchange rates remains dependent on the market's judgement (see appendix I).

markets. From that, figure III can be derived which contains an overall description of the 'rules of the game'. The figure shows the structural determinants of the system's economic mechanics as well as the way they are released by market transactions:



The set of rules and the relative size of the countries involved can be described as a fixed rate system's structural determinants. They determine the system-inherent liquidity and reserve effects which in turn trigger the monetary adjustment constraints. However, the system structures are activated solely by corresponding market transactions. The market transactions' fundamental rationality, therefore, determines at the same time the economic rationality of the overall adjustment constraints effectively resulting from the system's structures in action. *A fixed rate system's constitution can only be as good as its 'modus operandi' in the shape of the markets.*



### III. The European Monetary System (EMS): Functioning, Symmetry Characteristics, Market Conditions

"To understand the crisis, it is first necessary to understand the European Monetary System."  
(Eichengreen 1993)

The EMS is an asymmetrically designed simple fixed rate system burdening weak currency countries, in which the part of the key currency is not determined by rules but is awarded by the capital and exchange markets. It, therefore, can be called a *market-determined anchor currency system*. Which member currency functions as the system's nominal anchor is exclusively market-determined and is decided according to the criteria used by the capital and exchange markets in evaluating the individual member currencies. The market forces alone decide which member currency is charged with adjustment constraints. The economic rationality of the monetary coordination mechanism within the EMS, therefore, corresponds to the degree of fundamental rationality of the capital and exchange markets. In the recent literature on the EMS, the systemic reasons of its inherent asymmetric adjustment constraints have remained largely unrecognized<sup>19</sup>. In its essence they are resulting from the specific composition of various rule components within the EMS's overall institutional arrangement. As an institutionalized fixed rate system, the EMS was founded in March 1979 by an agreement between the central banks involved, which followed earlier political guidelines of the European Council<sup>20</sup>. Except for a few modifications by the Basle/Nyborg-Agreement of 1987 the initial set of rules has remained unchanged. The system's originally scheduled transition to its second, so-called institutional phase has not been realized. For the following the terms 'old' and 'new EMS'

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<sup>19</sup>) Whereas the asymmetry of the EMS as empirically proved by the D-Mark hegemony has been broadly accepted, its explanation often remains unsatisfactory. It's not at first the size of Germany's real economy or the role of the D-Mark as an international transaction and reserve currency but its market-determined position as a leading investment currency and its relative size in terms of its intervention and sterilization capacity in interaction with the institutional structure of the EMS that provides the most relevant explanation for the D-Mark hegemony within the EMS.

<sup>20</sup>) See the Resolution of the European Council of December 5, 1978 on the establishment of the European Monetary System (EMS) and the Agreement of March 13, 1979 between the central banks of the Member States of the European Economic Community stipulating the operating procedures for the EMS, in: Texts concerning the European Monetary System (1985, p.13-25 and p.23-42).

are nevertheless used; however, they exclusively refer to the modification of the system's market conditions as an important reason for the actual crisis and suitable reform options to make the system fit for the new market conditions of fully liberalized capital and exchange markets<sup>21</sup>.

### **3.1. The Set of Rules**

Following the general framework of chapter II, the elements of the institutional arrangement determining the system's adjustment constraints are analyzed at first<sup>22</sup>. From that the systemically determined liquidity and reserve effects are derived. The concluding chapter then describes the monetary adjustment constraints triggered by market transactions under the new conditions of fully liberalized capital and exchange markets.

#### **3.1.1. Indirect Coordination of Monetary Policy**

The EMS is a simple fixed rate system. Mechanisms for a direct coordination of national monetary policies are not assigned. Consequently, the EMS's institutional arrangement does not contain any rules or provisions for a 'governance structure' to coordinate monetary policies. Still, the EMS in its core is a mechanism for monetary policy coordination in Europe<sup>23</sup>. The coordination of monetary policy is managed indirectly by means of the system's inherent adjustment and coordination constraints. As the following will show, these constraints are designed almost entirely asymmetrically for the weak currency countries and are activated by market transactions. The monetary adjustment constraints within the EMS, therefore, are essentially market-determined. The currencies' hierarchy in the capital and exchange markets determine the allocation of the remaining degree of freedom. The market's

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<sup>21</sup>) Compared to the 'old EMS', the 'new EMS' is characterized by a complete liberalization of the capital and exchange markets within the European Community and a simultaneous renunciation of periodic exchange rate adjustments according to the accumulated inflation divergences as it used to be common practice until 1987. For introducing the term of the 'new EMS' see Giavazzi/Spaventa (1990) and Portes (1993).

<sup>22</sup>) See for a general survey Commission (1979); Deutsche Bundesbank (1979; 1989), Bofinger (1991), Kleinheyer (1989), and Ypersele (1985). For the relevant resolutions and agreements see the Texts concerning the European Monetary System (1985).

<sup>23</sup>) See Bofinger (1989; 1992).

investment and/or speculation decisions earmark which of the member currencies they consider to be strong or to be weak. The resulting revaluation and devaluation pressure leads, via activating the intervention mechanism through which then the system-determined asymmetrical liquidity and reserve effects are triggered, to unilateral adjustment constraints for the weak currency countries. The strongest currency is awarded for the key currency role and, thereby, determines the monetary stability standard of the overall system.

As long as the markets award the most stable currency of the system, a desirable convergence pressure towards the stability standard of the anchor currency country develops for the weak currencies. The EMS's success story during the 1980s was based on this convergence pressure, when the D-Mark functioned as stability standard and credibility anchor for the monetary policy of the traditional weak currencies. However, if the markets continue to devalue traditionally weak currencies with no regard to already succeeding adjustment policies, an inherent *deflationary bias* for the 'supposed to be weak-currencies' may occur. They are then forced to compensate the markets' devaluation speculations by interest rate differences in favour of its irrationally attacked currency. In an economic downward trend with low inflation and growth rates, such a policy may lead to considerable inadequate macroeconomic adjustment costs<sup>24</sup>. These market-determined inadequate adjustment constraints make the system intolerable (from the point of view of the governments and central banks involved) and implausible (from the markets' point of view).

### 3.1.2. Symmetrical Intervention Rules

De jure the EMS has two different intervention mechanisms related to different currency standards:

- The first intervention mechanism follows the basic structure of a currency basket standard. It commits the interventions to divergences of the member currencies' daily ECU exchange rates in an amount of 75% of the maximum permissible fluctuation

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<sup>24</sup>) See for the virtually arithmetic interrelation between exchange rate expectations and their compensation in terms of interest rate differences Wyplosz/Eichengreen (1993; p.100).

around their central rates defined against the ECU (= 'indicator of divergence')<sup>25</sup>.

- The second intervention mechanism refers to the EMS's bilateral parity grid. It commits the intervention obligations to the maximum permissible fluctuation margin of  $\pm 2,25\%$  from the bilateral central rates.

As a consequence of the divergence indicator, especially those currencies that diverge the most from the system's average would be obliged to intervene. The adjustment constraints of such a currency standard are not sufficient to establish a standard for monetary stability within the system in the sense of an absolute level of stability. Always those countries are forced to adjust which deviate most from the average, regardless if the divergence is in the direction of more or of less stability. The monetary stability of a basket standard is determined only by the average inflation rate within the system and, therefore, only guarantees a relative instead of an absolute level of stability. However, the divergence indicator was irrelevant for the actual development of the EMS. This irrelevance can mainly be contributed to the lack of rule-determined consequences once a currency touches its ECU intervention points. Article 3.6 of the Resolution of the European Council of December 5, 1978 only says in a non-committal manner:

"When a currency crosses its 'threshold of divergence', this results in a presumption that the authorities concerned will correct this situation by adequate measure, namely (a) diversified intervention; (b) measures of domestic monetary policy; (c) changes in central rates; (d) other measures of economic policy.(...)" (Texts concerning the European Monetary System, p.15)

The intervention mechanism referring to the divergence indicator, therefore, has not influenced the actual intervention policy within the EMS. The indicator has only played a minor role as an informal "trigger for policy coordination"<sup>26</sup>. This development could have been expected since the ECU currency basket standard of the EMS entered the agreement

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<sup>25</sup>) For details concerning the divergence indicator see Commission (1979, annex 3, p.88-94) and the discussion in Kleinheyer (1987, pp.63). The normal fluctuation margin of the individual currencies around their ECU central rate are calculated in a way that their individual weights within the ECU basket do not influence their intervention obligations. The intervention points denominated in ECU are reached when an individual currency reaches its maximum divergence of  $\pm 2,25\%$  with respect to all the other currencies. The size of the divergence margin, therefore, decreases and increases respectively with the individual weight of a currency in the ECU basket.

<sup>26</sup>) Rieke (1982, p.5).

only as a political compromise indicating symmetry and equality within the system in an at least informal and non-committal way. In practice, the intervention rules of a currency basket standard, which in principle cause symmetrical adjustment constraints towards an average stability standard, are not acceptable for the more stability-orientated hard currency countries<sup>27</sup>.

By the so-called 'Belgium Compromise' the in practice relevant intervention obligations have been tied to the bilateral parity grid instead of the ECU indicator. The intervention obligations are committed to the upper and lower intervention points, which result from the agreed fluctuation margins of  $\pm 2,25\%$  around the bilateral central rates, and they are unlimited in amount:

"(...) These interventions shall be unlimited at the compulsory intervention rates. (...)"  
(Article 2.2 EMS-Agreement)

In a parity grid of this kind, two currencies reach their upper respectively lower intervention points simultaneously. The hard currency's bilateral exchange rate at the upper intervention limit exactly corresponds to the lower intervention limit of the weak currency. In this respect, at least the formal design of the EMS's intervention rules is entirely symmetrical.

As a result of this, the preliminary liquidity effects of the interventions become effective in both countries. The domestic money base of the hard currency country expands, whereas in the weak currency country it decreases<sup>28</sup>. The adjustment constraints deriving from the preliminary liquidity effects, therefore, are at first symmetrical as it is indicated by the formal symmetry of the bilateral intervention obligations. However, the long-term liquidity effects are determined by the sterilization policy of the intervening central banks. Naturally, the weak currency countries' technical capacity for sterilizing money base effects due to interventions are unlimited in amount. For hard currency

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<sup>27)</sup> See for the backgrounds Ludlow (1982), Bofinger (1992), and Emminger (1985).

<sup>28)</sup> This holds for both obligatory and intramarginal interventions as long as they are not financed out of reserves which were held in market investments prior to the intervention and as long as the reserves accumulated by interventions are not re-invested in the markets. Only if one of these criteria is disregarded no direct money base effects will occur. Obligatory interventions are the unlimited intervention obligations at the intervention points. Intramarginal interventions are voluntary measures of the central banks within the fluctuation margins which are supposed to prevent a currency from touching its intervention points.

countries the sterilization policy is limited by their domestic sterilization capacities. As a result of this, the freedom to implement a restrictive monetary policy is for a hard currency central bank mainly determined by its monetary sterilization capacity and -policy but not by the intervention's preliminary liquidity effects as a direct consequence of the intervention transactions in the markets.

In contrast to the EMS's formal intervention obligations the adjustment impact of the individual member country's sterilization policy is asymmetrical. Whereas hard currency countries sterilize the primary liquidity effects of their interventions almost entirely, weak currency countries have only little inclination to sterilize<sup>29</sup>. As a consequence of the asymmetrical sterilization behaviour the monetary policy of hard currency central banks is not weakened by any expanding money supply and interest rate effects while the restrictive effects for the weak currencies lead to adjustment constraints for their monetary policy to follow the stability standard of the hard currency countries. The formal symmetry of the intervention rules is reversed because the asymmetrical sterilization policy dominates the interventions' preliminary money supply and interest effects<sup>30</sup>.

Within the EMS a symmetrical adjustment constraint towards an average stability standard can only occur when the sterilization capacity of the hard currency central bank is exhausted<sup>31</sup>. In literature, the formal symmetry of the intervention obligations within the EMS has often lead to the view that the overall design of the EMS is symmetrical and, therefore, the de facto hegemony of the DM is to be attributed mostly to external factors

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<sup>29</sup>) See the similar empirical results of Mastropasqua (1988) and Bofinger (1992). For the sterilization policy of the Bundesbank see Deutsche Bundesbank (1993).

<sup>30</sup>) We can speak of dominance when the weak currency countries' non-sterilization policy is not voluntary but inherently necessary to protect their own intervention reserves. With the reserve losses due to interventions the weak currency countries are facing the alternatives of devaluation or monetary adjustment to the hard currency country. The restrictive money supply and interest rate effects of the interventions then become a vital part of their monetary adjustment strategies.

<sup>31</sup>) This inability of sterilizing the money base effects of its support interventions corresponds to the scenario of the explicit opting out reservation of the Bundesbank in its role as the dominant hard currency central bank of the EMS; see Wyplosz/Eichengreen (1993a, pp.57). The sterilization capacity of the Bundesbank is approximately about 150 billion D-Mark even in the very short-term. According to its own statements this has proved to be sufficient to defuse the money base effects of even the worst of the EMS crisis including the 1992/93 crisis; see Deutsche Bundesbank (1993, pp.19).

not inherent to the system's institutional settings. The most important reason for this misjudgement was that the system's symmetry characteristics were solely derived from the intervention rules and not, as it is necessary, from their interaction with the sterilization policy and the other components of the EMS's set of rules<sup>32</sup>.

Another important EMS characteristic concerning the functioning of its intervention mechanism is the fact that most exchange rate adjustments exceeded the unilateral fluctuation margins of 2,25%. Thus, the exchange rate adjustments have fulfilled the criterion of 'overlapping bands' and, therefore, have increased the probability of successful speculative 'one-way bets' against existing margins.

### **3.1.3. Asymmetrical Financing Mechanism**

Since the holding of intervention reserves in member currencies is limited to the level of agreed on 'working balances' and is supposed not to exceed the reserves necessary for payment transactions, for financing their interventions at the lower intervention point the central banks have to rely on the system's financing mechanisms. Core of the intervention financing mechanism of the EMS are the credit facilities of the very short-term financing and the settlement obligations.

#### **3.1.3.1. Unlimited Credit Facilities**

Besides the very short-term financing two additional facilities are available to the central banks of the EMS for financing their obligatory interventions:

- In the *short-term monetary support* the EC central banks grant each other short-term foreign exchange credits for financing balance of payments deficits. These credits

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<sup>32</sup> See Mayer (1988), Giavazzi/Giovannini (1987) as well as Herz/Röger (1992) and McKinnon (1993). For the opposite position of systemic-intentional asymmetry see Wyplosz (1989) as well as Bofinger (1989, 1991) and Matthes (1988, 1993).

have a maturity of three months and can be extended twice for three months each. The amount of the credit limits is restricted to exactly defined debtor and creditor quotas.

- In the *medium-term financial support* the EC member states' mutual balance of payments credit facility have a limited maturity of three to five years. However, these credits are conditioned to economic adjustment policies in order to re-establish a market financed fundamental balance of payments equilibrium.

Neither facility has been used by the central banks for financing interventions since the EMS became effective. They, therefore, can be ignored in the further analysis.

In practice the intervention financing is limited to the mechanism of the very short-term financing. There, credits unlimited in amount are available to countries participating in the exchange rate mechanism. Hence in principle all member countries are able to comply with their unlimited intervention obligations at any time:

"To enable intervention to be made in Community currencies, the participating central banks shall open for each other very short-term credit facilities, unlimited in amount, (...)." (Article 6.1. EMS-Agreement)

The resulting liabilities become due at the latest 2,5 months after the end of the month in which the facility was used. The budget restriction is only temporarily suspended for a maximum of 3,5 months. At the request of the debtor central bank, the credit limit can be extended up to an amount of twice the debtor's quota for another three months. Further extensions of the amount as well as a second extension of the maturity for another three months are dependent on the approval of the creditor central bank involved. All transactions of the very short-term financing are denominated in ECU and are entered in accounts with the European Monetary Cooperation Fund (EMCF)<sup>33</sup>. The interest paid corresponds to a weighted average of representative interest rates of the ECU-basket currencies. Repayments can be denominated in the creditor's currency, in 'official' ECU, or in other reserve components; however, repayments cannot be made in the debtor's currency.

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<sup>33</sup>) For details see the Decision of the Board of Governors of the European Monetary Cooperation Fund (EMCF); in: Texts concerning the European Monetary System (1985, pp.49).



The mechanisms of the very short-term financing are sufficient to guarantee a temporary unlimited access to member currencies for financing the system's obligatory interventions. Therefore, the unlimited intervention promise of the weak currency countries is only credible for a limited period of time. Afterwards, their budget restriction of limited intervention reserves is re-established by the repayment obligations.

### **3.1.3.2. Unilateral Settlement Obligations**

Due to the so-called settlement rules of the EMS a hard currency central bank's interventions at its upper intervention point are accounted like an intervention of a weak currency central bank at its lower intervention point drawing on its very short-term credit facility. When a hard currency central bank intervenes at its upper intervention point, the acquired weak currency assets are routinely transferred to the EMCF. There, they establish corresponding ECU-assets for the hard currency central bank and ECU-liabilities for the weak currency central bank. This arrangement, which is decisive for the symmetry characteristics of the overall system, is mainly based on the regulations of article 6.2 of the EMS-Agreement:

"The financing operations concluded in this connection shall take the form of spot sales and purchases of Community currencies against the crediting or debiting of accounts denominated in ECUs with the European Monetary Co-operation Fund (...)." (Texts concerning the European Monetary System, p.27)

The settlement of the resulting balances follows the same mechanisms as the repayment of drawings on the very short-term credit facility. Interventions of hard currency central banks are treated like credit-financed interventions of the central bank with the weak currency.

From the weak currency central banks' point of view, it is obviously not important by which central bank the intervention is carried out in the markets. In the end it is always the central bank of the weak currency which has to finance all interventions according to the procedures of the very short-term financing. The budget restriction of the weak currency countries is extended to the interventions of the hard currency countries and, therefore, is considerably tightened. In contrast to the formally symmetrical design of the intervention mechanism the finance mechanism is almost entirely asymmetrical. The system's reserve

effects, therefore, are also asymmetrical in the end. The mechanism of the very short-term credit facility merely leads to a temporary suspension of the asymmetric financing obligations. From the markets' point of view, however, this suspension stands under the reservation of a limited maturity of at most 3,5 months.

As a result the credibility of the central banks' intervention promise for the markets is only low. Keeping the promise in case of unlimited interventions is implausible for the markets because, after a short period of time, all interventions have to be (re-) financed by the weak currency countries. Even in times of speculative attacks of the markets against fundamentally justified exchange rates their budget restriction is only temporarily suspended; however, it is not revoked in principle.

#### **3.1.4. Restrictive Reserve Rules**

The EMS rules do not provide any exactly quantified reserve rules. While it is lacking any reserve investment rules, at least a certain procedure has been agreed, how to fix reserve limitation rules as upper limits for the holding of intervention reserves in member currencies:

"The central banks may hold working balances in Community currencies within the limits laid down by the Committee of Governors. These limits may be exceeded only with the consent of the central bank concerned." (Article 15, EMS-Agreement)

A strict limitation of reserve holdings in member currencies to working balances would have meant a considerable tightening of the budget restriction of limited intervention reserves. Thereby the intervention promise of the weak currency countries would have been subject to an additional loss of credibility. In practice, however, the procedure is handled less restrictive as one may expect from article 15. Still, the accumulation of intervention reserves denominated in member currencies remains subject to the consent of the issuing central bank concerned.

In contrast to the more or less restrictive reserve accumulation rules the central banks are free in deciding on the way they prefer to hold their intervention reserves; they can either invest them directly in market assets or deposit them at the issuing central bank

involved. The investment decision is an important determinant of the money base effects deriving from interventions financed out of existing reserve holdings. Only in case of intervention reserves previously deposited at the hard currency central bank the interventions of the weak currency country at its lower intervention point bring about expansive money base effects for the hard currency. With intervention reserves directly invested in market assets the interventions do not affect the hard currency's central bank money circulation at all<sup>34</sup>. Therefore, in the extreme case of an exhausted sterilization potential of a hard currency central bank the weak currency countries may have the ability of increasing the symmetry of the system's adjustment constraints by financing interventions out of reserves previously deposited at the central bank of the hard currency<sup>35</sup>. Analogously, the intervention of a hard currency central bank at its upper intervention point will influence the money base of the weak currency only if it invests the thereby accumulated weak currency reserves at the central bank issuing the weak currency. The resulting restrictive money base effects, however, can be sterilized routinely and unlimited in amount. Therefore, they are irrelevant for the system's monetary adjustment constraints.

As a result of this, the institutional rules and procedures for the accumulation and investment of intervention reserves in the EMS do not seem to be decisive determinants of its monetary symmetry characteristics. However, by tying the accumulation of reserves denominated in member currencies to the consent of the issuing central bank concerned, article 15 has the effect of tightening the asymmetrically designed financing mechanisms and the resulting asymmetrical reserve effects of the system.

### **3.1.5. Political Exchange Rate Competency**

The relevant resolution of the European Council explicitly provides for discretionary adjustments of the bilateral central rates. Nevertheless, the agreement between the central

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<sup>34</sup>) See chapter 3.1.2.

<sup>35</sup>) It is assumed that the sterilization capacity of the hard currency country is exhausted before the weak currency country reaches its budget restriction of limited intervention reserves. This assumption is extremely unrealistic for the EMS because the sterilization capacity of the traditional anchor currency D-Mark by far exceeds the intervention capacity of the weak countries.

banks does not contain any further arrangements on the rules and procedures for deciding such central rate adjustments in practice. Thereby it is already indicated that the exchange rate competency within the EMS is completely political. It is solely assigned to the European Council and not to the central banks. For details of the political exchange rate competency, the Council's resolution merely states:

"Adjustments of central rates will be subject to mutual agreement by a common procedure which will comprise all countries participating in the exchange rate mechanism and the Commission." (Article 3.2. of the Resolution of the European Council of December 5, 1978)

The EMS rules, therefore, do provide neither definite economic criteria nor binding procedural regulations for a decision on discretionary exchange rate adjustments. In practice, realignment decisions are negotiated and prepared by the Monetary Committee of the European Community. In the end, however, mutual political consent of the responsible Council of Ministers is required<sup>36</sup>.

Therefore, the realignment procedure's decisive characteristics are that the exchange rate competency within the EMS is political and unanimous mutual consent is required. Together, the two characteristics ensure a political veto for each member country involved. Therefore, the realignment decision remains subject to a politically dominated process of negotiation.

### **Appendix on the Basle/Nyborg Agreement 1987**

On September 8, 1987, the Committee of Governors of EC Central Banks decided on certain modifications of the intervention rules and financing procedures within the EMS. The general intention was to increase the cooperation among central banks. The agreement's main objective was to enhance the EMS's resistance against disturbing influences of short term money movements by improving the coordination of interest and intervention policies. It can be described as an attempt to adjust the EMS's rule system according to the rapidly changing market conditions of more liberalized capital and exchange markets within the EC and toward the US-Dollar. Therefore, the focus was on providing improved protection

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<sup>36</sup>) See for a detailed description of the realignment decisions Kees (1987).

against speculative attacks of the markets. Therefore, the following three aspects of the EMS's intervention and financing rules were adjusted<sup>37</sup>:

- To improve the finance mechanism it was agreed to extend the settlement maturity from 2,5 to 3,5 months. In addition, the amount for an automatic extension of repayment maturities in the settlement procedure was doubled to twice the level of the respective debtor quota.
- As another measure to facilitate settlement procedures, it was agreed that debtor central banks can repay up to 100% of their intervention liabilities in 'official' ECU. The original rules obliged the creditor central banks to accept only a maximum of 50% of the settlement payments in ECU.
- For a more efficient design of the intervention rules, access to the the very short-term facility was extended to the financing of intramarginal interventions, as long as the creditor central banks concerned do not explicitly object and the drawings do not exceed twice the debtor quota of the intervening country. Intramarginal interventions are carried out for preventive purposes before the central rates have reached an intervention point at which the central banks would be obliged to intervene.

To summarize the results, the Basle/Nyborg Agreement has contributed to a more efficient design of the intervention procedure within the EMS. Especially the preventive intramarginal interventions were strengthened. The system's basic symmetry characteristics, however, remained unchanged<sup>38</sup>.

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<sup>37</sup>) See for the corresponding adjustments of article 6.1 of the EMS-Agreement the press statement of the EC central bank governors and the EMCF in: Texts concerning the European Monetary System (1985, supplement). For a detailed description and comment see Deutsche Bundesbank (1987, p.66-72).

<sup>38</sup>) The same holds for the money base effects of intramarginal interventions. As far as they are financed by drawing on the very short term facility the resulting liquidity effects are at first symmetric. In the end however, intramarginal interventions remain dependent on the consent of the creditor central bank involved and, therefore, can be denied if the creditor's sterilization capacity is exhausted.

### 3.1.6. Interim Summary of Liquidity and Reserve Effects

As long as the analysis is limited to the intervention's preliminary liquidity effects directly deriving from the central bank's intervention transactions in the markets, the systemically determined money base effects seem to be asymmetrically burdening the hard currency countries. This view however, considers neither the compensating liquidity effects of credit repayments and settlement obligations nor the reserve investment and sterilization policy of the central banks involved. Limiting the analysis to the formal rules, therefore, is insufficient and leads to the misjudgement of asymmetrical or at least symmetrical liquidity effects of EMS interventions for the hard currency countries. In contrast to that, an adequate analysis of the overall liquidity effects shows that the formal symmetry is dominated by the hard currency countries' sterilization capacities, as well as by the - at least partial - reversal of the preliminary money base effects in the settlement process. As a result, interventions in the EMS will only cause expansive monetary adjustment constraints for the hard currency country if the intervention volume financed through drawings on the very short-term facility exceeds its sterilization capacity<sup>39</sup>.

With a short delay, the reserve effects asymmetrically burdening the weak currency countries become effective. Those reserve losses are not only resulting from the repayments of their own credit-financed interventions but also from the settlement obligations deriving from the hard currency country's interventions. As long as the hard currency countries' sterilization capacity exceeds the intervention reserves of the weak currency countries, the adjustment constraints are dominated by the reserve effects. Because of this dominance of the reserve effects, the EMS is a systemically asymmetrical fixed rate system. The adjustment constraints are asymmetrically burdening the currencies valued in the markets as being weak.

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<sup>39</sup>) For a detailed analysis of the intervention-related liquidity effects within the EMS see Bofinger (1991).

## 3.2. Working Conditions of the Capital and Foreign Exchange Markets

### 3.2.1. Recent Developments

Since the mid-1980s, the international capital and exchange markets are characterized by *liberalization* and *globalization* trends as well as by a *securitization* of international credit relations. These trends have considerable consequences for the problem of stabilizing exchange rates within an institutionalized fixed rate system. In two different aspects, they have fundamentally changed the conditions of global exchange markets:

- In international portfolios with currency diversification the exchange rate has become an autonomous component of the return calculation. Already marginal fluctuations of the exchange rates can decisively change the return of a foreign currency portfolio calculated in the domestic currency and can (over-)compensate existing interest rate divergences. Besides interest rates and prices (= bond rates), exchange rate gains are a profit component of their own in international portfolio investments. Portfolio restructurings as a result of changing currency preferences, therefore, can at the same time become both a reason for and a result of exchange rate fluctuations. The spot market price effects of portfolio restructurings as a result of changing exchange expectations are consequently the first channel through which the new conditions of the capital and exchange markets can make the central banks' effort to stabilize the exchange rates more difficult.
- The increasing importance of the exchange rate risk has simultaneously lead to the development of derivative markets where market participants can hedge their uncovered currency positions. Derivative financial instruments, however, are not solely used for hedging currency risks but also for establishing open currency positions without the necessity of using liquid speculation capital. Repercussions from this kind of currency speculation without capital on the spot market are the second channel through which the changed market conditions make it more difficult for the central banks to stabilize exchange rates.

With the exchange rate as a part of their currency portfolio's return and the derivative instruments of currency speculation without capital, the markets' incentive for and capability of successful speculative attacks against central banks increases.

### 3.2.2. Speculative Attacks

Return-orientated speculative attacks on the exchange rate promises of institutionalized fixed rate systems can be performed by the capital and exchange markets in two different ways:

- *On-balance-sheet* attacks are capital backed speculations. They are carried out directly via the spot markets. The speculators hold their uncovered currency positions as hard currency deposits or investments. The hard currency is directly purchased in the spot market. For financing the spot purchases, weak currency assets are sold or additional weak currency credit facilities are used. These on-balance-sheet attacks have a twofold effect on the central banks involved. At first, as a result of their intervention obligations they are forced to take the counter position in the speculative spot sales of the attacked currency. The liquidity and reserve effects resulting from the spot interventions automatically lead to the corresponding system-inherent monetary adjustment constraints. Secondly, the weak currency's central bank in its function as 'lender of last resort' is forced to refinance the speculative credit expansions at an interest rate which is acceptable from the perspective of the national economy as a whole in order to maintain orderly conditions in the domestic money markets. This means that the central banks are at first obliged to provide the demanded hard currency and at the same time have to guarantee the speculant's refinancing in the weak currency at conditions which are justifiable from the domestic point of view of the national economy as a whole. In addition, they have to accept the liquidity and reserve effects and the resulting adjustment constraints as well as corresponding exchange losses from (re-) exchanging the speculative currency positions in case of a devaluation of the attacked currency<sup>40</sup>.

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<sup>40</sup>) See for a detailed description of speculative on-balance-sheet attacks appendix I of this study.



- *Off-balance-sheet* attacks are currency speculations without underlying liquid capital positions. They are carried out by forward sales of the weak currency in the forward markets. Their transmittance into the spot market takes place indirectly via routinely conducted cover transactions of the banks contracting the speculative forward deal. Again, the central banks have to take the counter position in the spot market and are responsible for refinancing both the spot and the swap part of the cover transaction. The further course is then identical to an on-balance-sheet attack. The single difference between the two is that in an off-balance-sheet attack, the speculative position is not established in the spot market but in the forward market. Since the establishment of uncovered forward positions is technically easier and, therefore, favourable in terms of transaction costs, speculators usually will switch to the spot market only if the forward markets become inflexible in terms of liquidity<sup>41</sup>.

Therefore, independent on whether the speculative attacks are carried out via the spot or the forward markets, the central banks of the attacked currencies are the inherent losers all along the line:

- They provide the speculatively demanded hard currency spot amounts by intervening in the markets and have to face the resulting liquidity and reserve effects;
- as lender of last resort, they refinance the weak currency's expansion of the credit volume to finance the speculative positions;
- after a forced realignment according to the speculative market pressures, they have to take the currency losses and thereby finance the speculant's profits.

### **3.3. Overall Symmetry Characteristics of the EMS**

The EMS is a market-determined asymmetrical fixed rate system. Under the prevailing conditions its intervention promise is not credible for the markets. The intervention mechanism is neither sufficient to protect the system's exchange rates against speculative attacks nor does it provide for an efficient protection against economic irrational market valuations

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<sup>41</sup>) For details, see *ibid.*

of certain member currencies. The triggering and direction of the system-inherent macro-economic adjustment constraints is entirely determined by the markets. The degree of the system's adjustment constraints' economic rationality, therefore, only corresponds to that of the capital and exchange markets. Speculative attacks of the markets lead either to economically unjustified exchange rate adjustments, or to macroeconomic costs of inadequate adjustment constraints. The second alternative makes the first one all the more likely and leads to a further loss of credibility of the exchange rate promise.

The general analysis of the 'rules of the game' in the EMS has revealed systemic and, therefore fundamental shortcomings of the EMS' institutional setting. This directly leads to an adequate analysis of reasons for the currency crises which is more closer to reality than the previous convergence discussions (section IV) and at the same time reveals appropriate ideas for reform (section V + VI).

## IV. Reasons for the Currency Crisis

For deducting adequate reform options, it is indispensable to conduct an analysis of reasons for the crisis of the 'old EMS' which is in touch with the markets' reality; a successful therapy always requires a correct diagnosis. In the following, the EMS crisis is analyzed as being mainly inherent to the system's institutional design and, therefore, as a result of its institutional structure under the new conditions of completely liberalized capital and exchange markets. It is described as a *systemically determined asymmetry crises following fundamentally irrational market speculations*. Thereby the fundamental approach of explaining the crisis as a result of economic convergence deficits can only play a minor part because it only applies to individual member countries but not for all the currencies attacked in the course of the 1992/93 crisis.

### 4.1. Convergence Crisis

Assuming fundamental rationality of the markets, currency crises are by definition convergence crises. They then would be a welcome result of fundamental economic divergences revealed by the markets and obviously 'no reason to mourn'<sup>42</sup>.

The European currency crisis of 1992/93 has also been described as a convergence crisis<sup>43</sup>. It was said that the capital and exchange markets' speculation had merely revealed existing fundamental divergences among the member states and thereby had forced governments and central banks to actually face the necessary adjustment policies. The fundamental convergence necessary for giving up exchange rate adjustments within the EMS, it was said, has been realized only insufficiently. Existing differences of national inflation rates and mentalities in the individual member states were still too large<sup>44</sup>. In the following, it will be demonstrated that the fundamental approach is at best of secondary importance for the EMS crisis of 1992/93. The convergence hypothesis lacks both theoretical backing and

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<sup>42</sup>) Blanchard et al (1993).

<sup>43</sup>) For such an interpretation see Tietmeyer (1992), Krüger (1992), and Scharrer (1992).

<sup>44</sup>) See Krüger (1992) as well as an early opposite position Vehrkamp (1992).

empirical evidence. The EMS crisis was mainly the result of speculative attacks of the markets. According to the economic rationality inherent to the EMS of orientating necessary exchange rate adjustments to the state and development of existing national inflation divergences the economic rationality of the market's speculative attack remains at least questionable for most of the member currencies<sup>45</sup>.

The basic difficulty of the convergence approach is the lack of an unambiguous definition of the underlying criteria for economic convergence. For the analysis of currency crises it usually refers to certain fundamental economic data as for example growth, inflation and the balance of payments. It is said that a divergent development of certain fundamentals lead to corresponding exchange rate fluctuations and within fixed rate systems to either discretionary official central rate adjustments or to currency crises. Usually, however, neither an obvious and conclusive interaction of certain fundamentals with the exchange rate is described nor an explanation of the actual transmittance of fundamental convergence divergences in the exchange markets is provided.

In exchange rate theory, the macro-economic pluralism of different models is sufficient to give ex post explanations for almost any exchange rate fluctuation. Therefore, fundamental exchange analysis usually misses the point because it neglects referring to the reality of the markets. Often, they are only used to add to the microeconomic rationality of speculative capital and exchange markets the same degree of macroeconomic rationality. However, the microeconomic rationality of profit maximizing speculation does not automatically follow a macroeconomic rationality of the same degree (see chapter 4.2.).

In this context it has to be pointed out that the economic rationality of the Maastricht convergence criteria is also based on the assumption of fundamentally rational capital and exchange markets. The first two criteria of inflation convergence and the deficit quotas are normative standards in the sense of fundamental economic convergence. Its fulfillment is required as a prerequisite for the transition to the third stage. In contrast to the fundamental criteria, the other criteria of interest and exchange rate convergence are market-determined. The four criteria as a whole will only be consistent if the markets are rational according to the fundamental criteria. This means, that the markets have to orientate their interest and exchange rate determination to the development of inflation divergences and budget targets:

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<sup>45</sup>) See Vehrkamp (1992) as well as Wyplosz/Eichengreen (1993).

Provided that these conditions are met the four convergence criteria prove to be consistent; however, they obviously prove to be redundant. The fulfillment of the market criteria is a derivative of the fundamental criteria.

On the other hand, in case of fundamentally irrational speculations the criteria prove to be inconsistent and, therefore, prohibitive for the transition to the third stage. The market judgement alone decides independently of an explicitly defined fundamental rationality standard on the beginning of stage three.

Only if irrational speculative attacks as a determinant of interest and exchange rates can be ruled out for the EMS by an ex ante credible exchange rate and intervention mechanism, the criteria inconsistency could be dissolved. The market criteria would still be redundant; however, they would not be able to prevent as a fundamentally irrational barrier for the transition to the third stage. In the 'old EMS', this condition of a credible ex ante protection against speculative attacks by a credible exchange rate and intervention mechanism is not met. A direct consequence of this is the formal blockade of the Maastricht integration strategy by the extended fluctuation margins. Again, returning to the narrow margins in a 'new EMS' with a credibly designed intervention mechanism proves to be a necessary prerequisite for a further progress towards European Monetary Union<sup>52</sup>.

Despite the macro-theoretical ambiguity in identifying suitable fundamental convergence indicators for exchange rate fluctuations, the economic exchange rate criterion is unambiguously determined within the EMS. The market-determined coordination mechanism of the national monetary policies requires the markets to refer to the inflation criterion. For the EMS, the criterion of inflation divergences as a suitable standard for the exchange rates does not only result from the relative purchasing power parity as a normative standard for exchange rate adjustments but directly from the system's market mechanism of the indirect monetary policy coordination. Compared to inflation divergences, however, it turns out that the fundamental approach of explaining the EMS crises is limited to only a few individual currencies involved<sup>53</sup>.

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<sup>52</sup>) See the analysis of the criteria-orientated integration strategy of the Maastricht Treaty in Bofinger (1993b) and Petschnigg (1993).

<sup>53</sup>) For more empirical details see Vehrkamp (1992). This analysis has been confirmed by the ministers and central bank governors of the European Community. In their joint communique on the extension of the fluctuation margins to +/-15% of August 2, 1992 it is said: "This limited measure is a reaction to the speculations which are exceptional in both their amount and their type. Considering the economic situation in the Member States of the European Monetary System, the current parity grid is absolutely justified. The ministers and central bank governors, therefore, confirm that they support the current parities and trust in the market rates coming closer to these parities. Communique of the European Community of August 2, 1993; in: Deutsche Bundesbank (1993a, p.20).

It follows that, at least compared with the criterion of fundamental rationality deriving from the indirect monetary coordination mechanism within the EMS, the currency crisis was the result of market failure.

## 4.2. Market Failure

The conditions of financial markets largely correspond to the standards of a 'perfect market'. This is especially true for the highly efficient foreign exchange markets. At first, therefore, it seems to be unjustified to speak of a capital and exchange markets' failure.

Indeed the market failure in the course of the EMS crises does not consist in micro-economic malfunctions as a result of imperfect markets but in the lacking fundamental rationality of the monetary adjustment constraints within the EMS which are themselves dominated by the markets. One can speak of a lack of fundamental rationality according to the EMS if the market valuations of the individual member currencies are not sufficiently orientated to the monetary stability criterion. If currencies with a high level of stability (= low inflation rate) are subject to fundamentally irrational devaluation speculations of the markets, a deflationary adjustment pressure will automatically occur for those countries. As a consequence the attacked countries have to carry considerable macroeconomic costs of inadequate policy adjustment. In times of speculative attacks, the disciplinary mechanism of sanctioning expansive inflation policies is turned into a mechanism producing inadequate monetary adjustment constraints. The adjustment mechanism then has a deflationary bias<sup>48</sup>. Thereby speculative attacks grow up to asymmetry crises of the overall system<sup>49</sup>. The market failure then consists in its insufficient performance as the 'modus operandi' of the system's indirect mechanism of national monetary policy coordination.

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<sup>48</sup>) Inadequate adjustment constraints within the EMS are as a direct consequence of the system's asymmetry are always deflationary. The system, therefore, grants sufficient protection against inflationary infection but not against deflationary adjustment constraints as a consequence of speculative attacks. For a further discussion of this see chapter 5.1..

<sup>49</sup>) For the term 'asymmetry crisis' see Matthes (1992).

A market failure of this kind has been observable both before and during the currency crises and has become one of its most important reasons. Before the crisis, the market failure consisted in the relaxation of the system's disciplinary constraints due to the so-called '*convergence trading*' in the markets. At that time the markets did not force any central rate adjustment despite further accumulating monetary convergence deficits for individual currencies<sup>50</sup>. The exchange rate illusion has led to a predominant orientation of capital investment and exchange trading decisions to the nominal interest rate differences. Thereby it has additionally revalued or at least stabilized the exchange rate of countries with a relatively higher inflation rate and correspondingly higher nominal interest rates<sup>51</sup>. The nominal interest divergences within the EMS were no more interpreted by the markets as representing premiums for inflation-related devaluation risks, but, while ignoring the exchange rate risk, as a real return advantage denominated in domestic currency. The '*convergence trading*' was followed by a second type of market failure in the course of the currency crises. The re-discovery of the exchange rate risk led to speculative '*undershooting*' phenomena and domino effects within and outside the system. Thereby the market failure of the '*convergence trading*' was substituted by the market failure of fundamentally irrational speculative attacks. The actual overvaluation of individual currencies during the phase of the market's '*convergence plays*' was followed by an speculative '*undershooting*' in the course of the crises.

The market failure as the most important reason of the crises, therefore, consists at first in the failure of the market-determined mechanism of indirect monetary policy coordination. The systemically determined consequences of this for the working of the overall system are described in the following section.

### **4.3. System Failure**

On the one hand, in speculative attacks the EMS's exchange rate promise has proved to be implausible for the markets and, on the other hand, the rules did not provide sufficient

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<sup>50</sup>) See International Monetary Fund (1992, p.8-11) and Group of Ten (1992, pp.11).

<sup>51</sup>) For an early analysis of this problem see Deutsche Bundesbank (1989).

protection against *inadequate monetary adjustment constraints* as a consequence of market speculations. Both deficiencies are described as failures of the specific fixed rate institution EMS. The credibility deficits of the exchange rate promises result from the fact that the various instruments to defend the exchange rates in the markets are not credible. This is true for the interest as well as the intervention mechanism:

The use of interest rates to defend exchange rates against speculative attacks stands under the priority of the domestic economy. It becomes implausible if the interest rates necessary for defending the exchange rate exceeds a level acceptable for the domestic economy. The experience of the EMS crises has proved the limited credibility of this instrument even in a short-term perspective<sup>52</sup>. In its core, the exchange rate promise of the central banks, therefore, is an intervention promise.

But also the intervention promise obviously is not credible in the market's judgment. The lack of credibility is mainly due to the asymmetrical design of the intervention financing mechanism with the settlement obligations of the weak currency countries as its core element. All interventions have to be financed solely by the attacked weak currency central bank 3,5 months after the end of the intervention month at the latest; the same goes for interventions which at first were carried out by a hard currency central bank. The settlement obligations lead to a further tightening of the already existing budget restrictions for the weak currency central banks. Concerning the markets' judgement, the settlement obligations turn the intervention mechanism of the EMS into an "elaborated bluff of the central banks"<sup>53</sup>. An additional reason for the implausibility of the intervention promise are the intervention's direct money base effects for the hard currency countries. When its sterilization capacity is exhausted, the hard currency central bank may face considerable restrictions in its ability to control the domestic central bank money supply and the short term interest rates in the money markets. In such a situation the scenario of an opting out of the hard currency central bank from the system's exchange rate and intervention mechanism is

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<sup>52</sup>) For the Swedish experience with an excessive use of the interest rate instrument to fight speculative attacks see Sveriges Riksbank (1993).

<sup>53</sup>) A market participant as quoted by the Neue Zürcher Zeitung of September 29/30, 1992.



anticipated by the markets and heavily weakens the intervention promise's credibility in the course of a speculative attack<sup>54</sup>.

The lack of protection for weak currency countries against the costs of inadequate monetary policy adjustments as a consequence of speculative attacks is also a result from the unconditional application of the settlement rules. The one-sided monetary adjustment constraints for the weak currency countries triggered by the settlement obligations become effective irrespective of the particular degree of economic rationality underlying the speculative attack. It is not feasible nor desirable for any of the participating currencies to submit to economical inadequate adjustment constraints for a longer period of time. Thereby the exchange rate promise becomes more and more implausible in the course of a crisis and leads to a self-aggravating loss of credibility for the system.

The system's failures described are a specific result of the EMS's set of rules. Consequently, they can be avoided by appropriate modifications of the rules involved. The same is true for the policy failure that is analysed as the fourth important reason for the EMS crisis in 1992/93. Policy failure is of importance because in a core element of its institutional structure, the system has remained subject to political negotiation processes.

#### **4.4. Policy Failure**

Although the rules of the EMS as agreed between the national central banks guarantee a considerable objectivity of the system's functioning, the political exchange rate competency remains in the sphere of direct influence of the national governments. In addition to the management failures of the central banks involved, the political exchange rate competency has proved as an additional source of political mismanagement of the system's rules especially in the course of the most recent EMS crisis.

Obviously, the individual governments' power to veto a realignment negotiation has contributed to the development that fundamentally justified adjustments of individual central

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<sup>54</sup>) See Wyplosz/Eichengreen (1993) and Emminger (1986).

rates did not occur. Appropriate adjustment requests of the central banks involved have been declined by the governments of both the potential devaluation and the potential revaluation countries. The governments' obstruction of exchange adjustments in time has been determined by a mixture of countable economic rent seeking and psychological prestige considerations concerning the own currency's image. In connection with the Maastricht exchange rate criterion as a prerequisite for the third stage of European Monetary Union, prestige considerations concerning the own currency's standing in the markets have played an important part especially in several weak currency countries. For the potential revaluation currencies, the occurring exchange rate adjustments were postponed by the governments involved largely because of elections for the national parliament taking place at the same time. Some governments of weak currency countries were also interested in maintaining convergence trade related capital imports to facilitate the external financing of the growing internal budget deficits. The thereby accumulating need of adjustment for some currencies then spilled over to other member currencies solely due to crisis-inherent domino effects that finally brought about a situation in which the de facto suspension of the exchange rate and intervention rules had become unavoidable.

By leading to an inconsistent distribution of the adjustment instruments between the governments and central banks, the political exchange rate competency leads to an additional loss of credibility. Whereas the exchange rate adjustment mechanism is subject to political negotiation procedures, the interest rate and intervention instruments are controlled by the central banks. More credible according to a consistent distribution of the adjustment pressure between the three available instruments would be to concentrate them in one hand.

The main management failure of the central banks was the repeatedly occurring stimulation of the market's speculative phantasy by uncoordinated and sometimes even adverse public statements of central bank officials. The German/English discords directly associated with the crisis of the British pound are only the most distinct example for this. Inadequate policy coordination in the course of a crisis is encouraged by the lack of a sufficient mechanism of direct coordination among the central banks; they could have been avoided much more easily within a more explicit 'governance structure' as it is now provided by the EMI.

## **Summary**

The crisis of the EMS in 1992/93 can in its essence be described as a *speculation-caused asymmetry crisis*. It was the necessary result of fundamentally irrational market speculation in interaction with the systemically determined asymmetrical monetary adjustment constraints for the weak currency countries and - from the markets' point of view - the system's exchange rate and intervention promise being not credible nor sustainable in the course of a speculative attack.

As a minimum requirement for suitable reform options, the system's institutional structure has to be extended for certain precautions against deflationary effects of inadequate adjustment constraints as well as for an intervention mechanism which is credible for the markets.

## V. Reform Options

### 5.1. Preliminary conditions

For being acceptable for all member governments and central banks involved, adequate reform options have to meet certain preliminary conditions. These conditions can directly be derived from the original economic and political objectives of the system, the given institutional settings and strategies of the Maastricht Treaty, and from the systemical reasons of the actual EMS crisis that has led to its de facto suspension in August 1993.

The main objective of establishing the system in 1979 was a zone of monetary stability in Europe. The EMS was supposed to contribute both to the stability of the national price levels in the countries involved and to the exchange rate stabilization among them. Achieving exchange rate stability on the expense of the stability of national price levels, therefore, has been explicitly ruled out from the start. This obvious priority for the objective of monetary stability also corresponds to the monetary policy standard agreed on in the Maastricht Treaty as a precondition for the transition to the third stage of the European Monetary Union. Furthermore, the necessity to protect weak currency countries from inadequate macroeconomic adjustment costs as a consequence of systemically determined speculative asymmetry crisis is an additional precondition for successfully reforming the 'old EMS'.

The following three preliminary conditions can be summarized:

■ *Stability Criterion:*

For hard currency countries it has to be ensured that the systemical adjustment constraints are orientated to the standard set by the lowest inflation rate within the system. Concerning the monetary stability policies, the disciplinary effect of the anchor currency mechanism may not be relaxed. Since the EMS as an exchange rate regime of uncovered national paper currencies does not provide a real anchorage, the 'nominal anchor' of the most stable currency has to dominate the stability standard of the system as a whole.

■ *Protection against Opportunism I (=protection against 'inflationary infection'):*

For the stability-orientated countries precautions have to be taken protecting them from opportunistic behaviour of less stability-orientated states within the system. An 'inflationary infection' has to be ruled out. At least in case of rational market valuations of the member currencies (= absence of speculative attacks), the asymmetry has to remain effective.

■ *Protection against Opportunism II (=protection against speculative attacks)*

Under the prevailing conditions of economical irrational exchange speculations attacked currencies have to be sufficiently protected against inadequate monetary adjustment costs. The protection against 'inflationary infection' for the hard currency countries has to be completed by a complementary protection for the weak currency countries against deflationary adjustment constraints in the consequence of speculative attacks.

Besides the stability criterion, the protection from 'inflationary infection', and the protection from speculative attacks, an EMS reform has to consider the transition to the third stage by 1999 at the latest as scheduled by the Maastricht Treaty. Following the additional *criterion of institutional efficiency*, the required EMS-reform in the phase of transition should use the given institutional structure of stage two. The core institutional innovation of the second stage is the EMI as the nucleus of the future ECB.

Corresponding to the above analyzed market and system failure, the *market conditions* and the *EMS's set of rules* may serve as appropriate starting points for reform options. The analysis so far has shown that the market and system failures are not only interdependent but prove to be even self-aggravating in the course of a crisis. This interaction has to be taken into account for reviewing the various reform options. The fact that the market conditions of speculative attacks have proved to be one of the reasons for and at the same time a consequence of the system failure may justify the focus on institutional reform options in the following. Re-establishing credible system rules, therefore, is an important contribution to improve the market conditions. For reforming the EMS, the adjustment of its rule system to the market conditions of fully liberalized capital and exchange markets proves to be necessary and sufficient at the same time. With a credible and sustainable system a re-regulation of the markets will become superfluous.

## 5.2. Direct Coordination of Monetary Policy

The above analysis has shown that the EMS as a simple fixed rate system has failed under the conditions of speculative attacks. The market mechanism of indirect monetary policy coordination has proved to be inefficient. From the point of view of the attacked currencies, a sufficient protection against fundamentally irrational monetary adjustment constraints as a systemic consequence of market speculations is not guaranteed.

Supplementing the EMS with a mechanism of direct monetary policy coordination, therefore, is a feasible starting point for reform. The market coordination could be supplemented or even being replaced by a direct coordination of the authorities.

Proposals on a direct coordination of monetary policies within the EMS have to provide solutions for at least two different problems:

- A suitable *institutional arrangement* has to be implemented;
- Efficient *policy rules* for conducting the direct coordination in every day practice have to be agreed.

Both the institutional as well as the policy aspect of a direct coordination should follow the criterion of efficient institution and rule formation. Establishing new institutions or monetary policy concepts exclusively for the limited duration of stage two, therefore, would prove to be inefficient. Any direct coordination of the national monetary policies within a 'new EMS' consequently should evolve from the given institutional arrangement of the EMI agreed on in the Maastricht Treaty and already established at the beginning of stage two.

In defining the institutional framework for a direct monetary policy coordination one has to decide whether a certain institutionalized 'governance structure' proves to be helpful and whether the all day conduct of policy coordination should follow a certain policy rule or should be handled discretionary.

A discretionary coordination without governance structure is almost identical to the conditions of the indirect market coordination within the 'old EMS'. Without explicit rules and procedures, the monetary coordination will only be accepted by the markets if the (n-1) member states are unconditionally accepting the resulting hegemonic coordination structure dominated by the de facto key currency of the system. In a structure of this kind, the (n-1)-member states would have to give up their monetary policy autonomy in favour of the remaining degree of freedom for the key currency country. In contrast to an asymmetrically designed fixed rate system like the EMS, a hegemonic structure is not market-determined but based on voluntary coordination obligations of the individual countries. The hegemonic coordination is likely to increase a system's credibility although a common 'governance structure' does not exist<sup>55</sup>.

However, tying one's hands by submitting to a hegemonic coordination structure implies certain risks concerning the hegemonic policy standard set by the key currency. If for example the key currency is for domestic reasons performing an expansionary monetary policy and thereby dragging the system's anchor or, in the opposite case, is performing an excessively restrictive policy the (n-1) countries are forced to follow irrespective of their own domestic situation. A hegemonic coordination structure, therefore, is completely dependent on the key currency's performance and policy decisions. Besides this, neither the absolute stability standard of the system nor the credibility of the voluntary adjustment for the markets is guaranteed. Like any other procedure of direct coordination, the hegemonic coordination structure remains subject to the markets' judgment. As long as different national monetary policies exist, no direct coordination procedure can guarantee a complete protection for the exchange rates against the market's dictate.

Still, a direct coordination of the monetary policy in the EMS is desirable for other reasons concerning the intervention policy. A direct coordination of exchange interventions, interest rates, and liquidity management by the central banks would increase the probability

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<sup>55</sup>) Successful examples of a hegemonic coordination structure without a corresponding 'governance structure' are the monetary policy concepts of Austria outside the EMS and of the Netherlands within the EMS. Both countries have achieved an almost perfect stabilization of their exchange rates through unconditionally tying their interest rate and liquidity policy to the policy of the anchor currency central bank.

and credibility of a consistent use of these instruments to discourage speculative attacks. However, for reasons of institutional efficiency one should abstain from a gradual transfer of national monetary competencies. A monetary training period for the ECB is neither necessary nor desirable. To assure an in time transition to the third stage, one should refrain from complicating and extending the second. An early monetary autonomization of national central banks would serve as a significant credibility gain for a direct monetary coordination procedure within the given 'governance structure' of the EMI. Through its increased credibility, the EMI as a '*Council of Autonomous Central Bank Governors*' could significantly reduce the monetary adjustment costs of a discretionary coordination. The loss of reputation for individual central banks unwilling to cooperate would serve as an indirect sanctioning mechanism for a direct monitoring and coordination of national monetary policies within the EMI. Additionally equipped with the exchange rate management competency within the EMS, the EMI will evolve towards a '*European Autonomy Standard*' in which the credibility of exchange rate promises can be restored, too<sup>56</sup>.

As well as the 'governance structure' the definition of a suitable policy rule for the direct policy coordination is subject to the criterion of institutional efficiency. Introducing new monetary policy procedures for the phase of transition has to be ruled out for being inefficient<sup>57</sup>. The policy rule of monetary coordination within the EMS should, therefore, refer to a likely monetary concept of the future ECB. Common money supply and price level standards as well as corresponding procedures of the interest rate and liquidity management would be conceivable<sup>58</sup>:

- The *McKinnon rule (1984)* suggests a common monetary targeting for the entire currency area. The central banks involved should follow national targets which in their aggregate are compatible with the common target. In order to ensure the

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<sup>56</sup>) For more details see chapter 6.1.

<sup>57</sup>) For such proposals on a european minimum reserve conception for the transitional phase see Ciampi (1989) and Gros (1990) as well as the discussion of the proposals in Bofinger (1993a).

<sup>58</sup>) See for the basics McKinnon (1984) and the Council of Economic Advisers (1976). For a detailed discussion of the proposals see Bofinger (1991, p.203-267; 1993, pp.167)



compatibility of the common monetary target with national intervention obligations, McKinnon suggests a sterilization ban and corresponding reserve investment rules. Thereby entirely asymmetrical and, with regard to the aggregate, self-compensating liquidity effects of the interventions are guaranteed. The common meta monetary targeting is not disturbed by liquidity effects of exchange interventions.

- The *German Council of Economic Advisors (1976)* has proposed a coordination procedure in which the national central banks have to manage an identically defined money supply (e.g., monetary base) according to ex ante agreed targets. In contrast to the McKinnon rule, the determination of the national targets does not result from disaggregating a meta rule but with respect to different national industrial production capacities, different growth rates and so-called unavoidable national inflation rates. The intervention obligations are supposed to be designed in a way assuring that liquidity effects do not endanger the achievement of the national targets, otherwise, the intervention obligations are to be suspended.

With regard to the integration of direct monetary policy coordination mechanisms in the EMS during stage two, however, both of the above mentioned coordination rules have serious shortcomings. Whereas the McKinnon rule assumes a common monetary target and is thereby violating the national monetary policy autonomy explicitly guaranteed in the Maastricht Treaty, the coordination procedure of the Council of Economic Advisors does not provide for a credible intervention mechanism to curb speculative attacks.

In order to establish a credible intervention mechanism while simultaneously maintaining national monetary autonomy it is therefore suggested to combine a common policy rule for direct monetary coordination within the EMI with a conditional temporary suspension competency of the EMS's settlement obligations<sup>59</sup>:

Concerning monetary coordination, the member states should ex ante agree on standards for national money supply or price level targets according to the above mentioned proposal of

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<sup>59</sup>) For a more detailed discussion of this proposal see chapter 6.1.

the Council of Economic Advisors. Thereby neither the agreement of a common monetary policy conception is required nor is the autonomy of national monetary management being restricted. It is only necessary to mutually accept the specific national targets on a common level as providing a suitable guarantee for the monetary stability within the system as a whole. The national targets should be agreed on by mutual consent within the EMI-council of autonomous central bank governors<sup>60</sup>.

The monetary coordination mechanism should be supplemented by the council's competency to suspend the settlement obligations. However, this competency remains limited to situations of clearly identifiable fundamentally irrational attacks of the capital and exchange markets. The ex ante agreed on monetary coordination targets serve as appropriate fundamental identification criteria for speculative attacks. If a country meets its ex ante targets and nonetheless becomes subject of a speculative attack, the EMI may decide the suspension of the settlement obligations for support interventions in favour of the attacked currency. The resulting unlimited intervention obligation of the hard currency countries without corresponding settlement mechanisms burdening the attacked currencies provides for a credible intervention mechanism to curb speculative attacks once they occur or even prevent their emergence from the start. The suspension competency may be combined with a sterilization ban and corresponding reserve investment rules following the McKinnon concept<sup>61</sup>.

In addition, the proposed combination of an ex ante coordination of national monetary policies with a conditional suspension competency of the settlement obligations meets all of the above required preconditions for a successful EMS reform during stage two. The *stability criterion* is met by the monetary standard agreed on in the voluntary monetary ex ante coordination of national monetary targeting. A sufficient '*protection against inflationary infection*' is ensured by the asymmetric intervention mechanism of the 'old EMS' which remains unmodified. As an additional reform innovation the conditional suspension competency of the settlement obligations provides sufficient protection against speculative attacks

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<sup>60</sup>) The rule of mutual consent corresponds to the rule of unanimity, in which all members have to agree; see Bofinger (1991, pp.192).

<sup>61</sup>) For an application of such a reform strategy see chapter 6.2.2..

and their systematic consequences of inadequate adjustment constraints. In such a scenario additional institutions are not necessary for the transitional phase, whereby the criterion of *institutional efficiency* is also satisfied. The already existing institutions are merely supplemented and more efficiently used.

### **5.3. European Intervention Fund (EIF)**

Together with the foundation of the EMS in 1978/79, a European Monetary Fund (EMF) was scheduled to be found as the core element of the so-called institutional phase two already two years after the system's implementation. In its concluding notes the European Council conference of July 6 and 7, 1978 says in point 4 of the annex:

"Not later than two years after the start of the scheme, the existing arrangements and institutions will be consolidated in a European Monetary Fund."

The European Council's resolution of December 5, 1978 laid down that the second phase as the final stage of the system should entail besides the establishment of the European Monetary Fund the unlimited utilization of the ECU as a reserve asset and as a means of settlement. The fund's most important objective was the institutional integration and consolidation of the existing credit mechanisms within the system. For years there has been a broad discussion based on these statements of intention about the design of the final institutional stage of the EMS. Despite the clear allowances, the discussion came to nothing for political reasons. It failed mainly because the governments were not ready to admit a supra-national institution with monetary competencies within the EC besides the national central banks. In accordance to that, neither the Maastricht Treaty provides for any transference of national monetary sovereignty to a supra-national institution. Our criterion of institutional efficiency has confirmed this strategy as being rational. Still, the idea of a European Monetary Fund should be reconsidered with regards to a more credible design and performance of intervention policies within the EMS.

The institutional analysis of the EMS has shown that from the hard currency countries' point of view the liquidity effects of interventions make the intervention promise becoming unsustainable in the course of a crisis. When their sterilization capacity is exhausted the interventions lead to an irreversible expansion of the money base and, therefore, to a

considerable loss of efficiency in controlling the domestic monetary aggregates. However, the only reason for this is the fact that the central banks carry out their interventions via the existing central bank accounts of the banks involved. Thereby, the interventions have a direct expansionary effect on the national central bank money circulation<sup>62</sup>.

Intervention-caused money base effects could be avoided if the interventions are taken out of the accounts of the central banks by transferring the execution of interventions in the markets to an external fund established exclusively for that purpose. From the accounting point of view, the fund's enforcement of interventions would not affect the domestic central bank money circulation.

Shifting the interventions 'out of the central bank's account'<sup>63</sup> is attainable by founding a *European Intervention Fund (EIF)*, for example. As a commonly established and managed fund, the central banks would provide the EIF with sufficient intervention deposits or intervention credit facilities. The EIF then establishes its own accounts with the banks involved in the foreign exchange trading, through which all interventions would be carried out. Such an arrangement is sufficient to guarantee that interventions are separated from the national central bank money circulations.

Of course, such an intervention fund would also involve liquidity effects for the banking system as a whole. The important difference to conventional central bank interventions is that the fund's liquidity effects become effective not on the basic level of the central bank money supply (= money base) but only on the broader level of the non bank liquidity. Interventions by the EIF would be completely neutral for the central bank money supply and,

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<sup>62)</sup> In our context, central bank money is the equivalent of the commercial bank's deposits at the central bank. Central bank money circulations are institutionally self-contained deposit circulations which are entirely subject to the central bank's control. The overall amount of central bank money is adjustable only through direct transactions with the central bank. The commercial banks can trade central bank money among themselves (= money market transactions), but they cannot extend its volume. The demand of the commercial banks for central bank money is controlled by the central bank's reserve rules. The central banks, therefore, dominate both the supply and demand of central bank money. This power to control the central bank money markets is in fiat money systems the basis of the central bank's ability to conduct a monetary targeting. To the degree a central bank is obliged to intervene in the exchange markets its control over the money markets is loosened because the interventions are accounted via the banking system's central bank money deposits.

<sup>63)</sup> See Deutsche Bundesbank (1993, p.23).

therefore, do not restrict the efficiency of domestic money supply control.

The expensive construction of such an intervention fund exclusively for the transitional phase, however, is an important disadvantage from the perspective of institutional efficiency. A strategy of central bank interventions in the forward market which is developed in the following seems to be much more efficient. A forward intervention strategy allows to retain the avoidance of expansive money base effects without having to accept the disadvantages of institutional inefficiencies during the phase of transition.

#### 5.4. Interventions in the Forward Market

"...there is much to the argument that pure speculation, completely unjustified by any adverse fundamentals in trade and normal capital movements, could not defeat a bold, resolute, and if necessary unlimited forward support policy." (Yeager; 1976, p.281)

"Alle Beteuerungen der Währungsbehörden eines Landes, daß die Parität seiner Währung unter keinen Umständen verändert werde, klingen kaum sehr glaubhaft, wenn man sich gleichzeitig weigert, die Terminkurse durch offizielle Interventionen zu stützen." (Sohmen; 1971, p.131)

Central bank interventions in the spot markets always and automatically involve direct liquidity and reserve effects. That is why unlimited spot intervention promises of the central banks are inherently implausible for the markets. They are perceived as being *self-defeating*. Within the EMS this mainly results from the expansive liquidity effects of spot interventions for the hard currency countries and from the budget restrictions of financing the interventions for the weak currency countries:

- Unlimited spot intervention promises of a hard currency central bank are only credible as long as the expansive money base effects of the interventions do not exceed its sterilization capacity and thereby dominate its central bank money supply. With its sterilization capacity being exhausted, further exchange interventions would lead to an ultimate loss of the central bank's control over domestic money market conditions. For the entire system the nominal stability anchor is dragging and, due to speculation, the monetary adjustment constraints become more symmetrical or even asymmetrical for the intervening hard currency country. In such a situation,

market participants realistically anticipate an opting-out of the hard currency central bank<sup>64</sup>. The attacked currency will unavoidably be devalued in the markets. The speculators then will have the possibility to re-exchange their speculative currency positions with the central banks and thereby take considerable exchange profits. Therefore, unlimited spot intervention promises of the hard currency countries tend to be self-defeating by even aggravating the market's speculations instead of depressing them.

- At the same time unlimited spot interventions of weak currency countries become fishy when their budget restriction of limited hard currency intervention reserves is reached or anticipated by the markets for the near future as a consequence of the mounting settlement and repayment obligations. The shorter the repayment and settlement maturities, the faster the credibility loss will occur. In addition, interventions of weak currency countries do also cause expansive liquidity effects for the hard currencies provided they are financed out of reserves which had previously been deposited at the hard currency central bank or by drawings on the hard currency country's credit facility.

Overall it has become clear, that unlimited spot intervention promises are implausible because in the worst case of speculative tests by the markets they cause monetary policy costs which rationally are unacceptable for any of the central banks involved<sup>65</sup>. Therefore, spot interventions cannot be *credible* because they are not *sustainable*.

In order to avoid intervention-caused liquidity and reserve effects and the resulting loss of credibility, an extension of the central banks' intervention policy from the spot to the

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<sup>64</sup>) This is called to be realistic, because the opting-out behaviour of the Bundesbank as the traditional hard currency central bank of the EMS is following such a pattern. Already the final suspension of the dollar intervention obligation of the Bretton Woods System in March 1973 has been justified by the Bundesbank with its unacceptable expansive liquidity effects. The transition to flexible exchange rates, therefore, is also a direct result of an opting-out of the Bundesbank forced by speculations. For this and the explicit opting-out reserveation of the Bundesbank within the EMS see Emminger (1986, pp.361). For the empirical relevance of this during the EMS's 1992/93 crisis see Wyplosz/Eichengreen (1993, pp.57).

<sup>65</sup>) This is confirmed by the already cited market judgement describing the EMS's intervention mechanism as an "elaborated bluff of the central banks". See Neue Zürcher Zeitung September 29/30, 1992, p.14.

forward market is suggested<sup>66</sup>. Interventions of central banks in the forward market have the important advantage of avoiding any direct liquidity and reserve effects. Furthermore, forward interventions are not underlying a budget restriction because no liquid spot reserves are necessary. Since they are also neutral in terms of liquidity, forward interventions compared to spot interventions are the more credible strategy from the speculant's perspective to guarantee an intervention promise. Only the unlimited willingness of the central banks to intervene in the forward market can prove to the markets that the central banks themselves believe as much in their own exchange rate promise as they expect the market participants to do.

In principle, two different mechanisms are conceivable for forward interventions in order to ensure the exchange rates in the spot market:

- In the *off-balance-sheet* variant of a speculative attack, the central banks directly take the counter position of speculative forward sales of the attacked currency by intervening in the forward markets. With that, the transmittance of the speculative forward sales into the spot market is interrupted. The central banks avoid the necessity of corresponding spot interventions which would inevitably become necessary in case of a speculative free market forward sale of the attacked currency that afterwards has to be covered by the contracting bank and thereby is transmitted in the spot market<sup>67</sup>.
- *On-balance-sheet* attacks are carried out directly by sales of the attacked currency in the spot market; however, they can be kept off just as off-balance-sheet attacks by interventions of the central banks in the forward market. Whenever a currency is under pressure in the spot market, the central banks can stabilize its spot rate by taking a long position in the forward market. As a result of this, the contracting bank is facing a forward risk which routinely has to be offset. Thereby the central bank's

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<sup>66</sup>) For the theory of forward interventions see the discussion of the relevant literature in Yeager (1976, p.279-285) and Sohmen (1973, p.83-131).

<sup>67</sup>) This is confirmed by the IMF's analysis of the mechanics of speculative attacks within the EMS: "If a central bank's forward purchase matches a forward sale of some other customer in the banking system, all the swap and spot transactions of the banking system will cancel; specifically, spot exchange sales will be matched with purchases at the parity exchange." International Monetary Fund (1993, p.41).

forward intervention is transmitted into the spot market<sup>68</sup>.

Crucial objections against forward interventions are the possibly greater intervention volumes compared to a strategy of direct interventions in the spot market and the argument that the liquidity and reserve effects of spot interventions are not really avoided but only delayed to the maturity date of the forward contract<sup>69</sup>. Both objections, however, are flawed because they continue to assume the possibility of an exchange rate adjustment. Their relevance is, therefore, limited to the case of forward interventions in flexible exchange rate systems respectively fixed rate systems with explicit central rate adjustment reservations. Here, however, it is proposed to use forward interventions as an instrument to guarantee a de facto core currency union in which the fluctuation margins for the spot rates continue to exist but the bilateral central rates are irrevocably fixed. Forward speculation against central banks is only rational from the speculators' point of view in so far they can expect the future spot rate to be lower than the central bank's forward intervention rate. If fluctuation margins and central rates remain unchanged, however, the delivery of speculative forward contracts will always and automatically involve speculative losses of an amount equal to the inter currency interest rate difference as it is represented in the swap rate. The speculators themselves have to take these losses. Since forward interventions - unlike interventions in the spot market - do not force central banks to give up their exchange rate guarantee as a consequence of excessive liquidity and reserve effects, the central banks' promise to keep central rates and fluctuation margins unchanged remains credible even in times of speculative attacks, because the speculators are punished with unavoidable occurring losses and are thereby discouraged from the start.

Forward interventions, therefore, are the suitable strategy for the EMS to protect a de facto monetary union of the core countries which are already today in a position to meet the necessary convergence criteria as agreed preconditions for entering the final stage of EMU. However, to establish a de facto monetary union it would be neither necessary nor useful to abandon the fluctuation margins. It is sufficient to ultimately fix the central rates. Therefore,

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<sup>68</sup>) For a detailed description see appendix I.

<sup>69</sup>) For a discussion of this argument see Fischer-Erlach (1991, p.82-88).



the old margins of  $\pm 2,25\%$  should be re-established while at the same time the exchange rate adjustment reservations with regard to the central rate and the corresponding intervention limits are irrevocably given up. Maintaining the fluctuation margins around the for ever fixed central rates facilitates a sensible installation of a forward intervention promise. In addition, the margins will help to guarantee a sufficiently liquid spot market as well as a certain flexibility for national interest rate policy<sup>70</sup>. The asymmetrical spot intervention mechanism of the 'old EMS' is supplemented by unlimited and symmetrically designed forward intervention obligations of the central banks involved.

In an arrangement like this the credibility of the fluctuation margins is guaranteed by the unlimited forward intervention promises. In principle, the development of the spot rate within the margin remains market-determined; however, it may be influenced by spot interventions and interest rate adjustments of the central banks. The asymmetrically designed spot market intervention mechanism should be kept unchanged because it is domesticated by the forward interventions. Therefore, it can serve as a suitable mechanism of coordinating and disciplining national interest rate policies. Whenever a currency is under pressure in the spot markets, the central banks concerned are at first obliged to support it by intervening in the spot markets. Only if the liquidity and reserve effects due to the spot interventions are becoming unsustainable, the central banks will start to support their spot intervention policy by interest rate measures. With credible margins, the establishment of a modest inter currency interest rate difference will prove to be sufficient to arouse interest arbitrage orientated capital movements and thereby assure the desired stabilization of the spot rate (for further details see box I).

In the course of a speculative attack, with a forward intervention obligation the central banks are able to refrain from an excessive use of the interest instrument by allowing the forward rate falling down to the lower intervention point and then absorbing the speculative attack by unlimited forward interventions. In addition, the central banks may stimulate the

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<sup>70</sup>) This argument was already mentioned by J.M. Keynes who, as the founder of the forward theory, proposed in his Tract interventions in the forward market in order to extend the marginal leeway for a national monetary and interest rate policy even in a gold standard with fully liberalized capital and exchange transactions. See Keynes (1923, p.94-115).

## Interaction of Interest Rate and Intervention Policies in Fixed Rate Systems with Forward Interventions

In a 'new EMS' following the suggested reform strategy, the spot intervention mechanism of the 'old EMS' serves as an efficient instrument to coordinate the intramarginal interest rate policies within the system, while the additionally introduced unlimited and symmetrically designed forward intervention obligations will credibly guarantee the fluctuation margins. The interaction of interest rate and intervention policies in the course of a speculative attack can be described as follows:

**1. Phase:** In the beginning a stable equilibrium is assumed in which the spot rates more or less correspond to the bilateral central rates. Slight deviations of the spot rates around the central rates are purely caused by 'normal' transactions, a speculative pressure of the markets does not exist. Because of the stability of expectations concerning the future exchange rates the spot rates are equal to the forward rates: the inter currency interest rate difference tends to be zero; a uniform interest rate prevails for all currencies involved.

**2. Phase:** As result of an exogenous destabilization of the exchange expectations speculative pressure occurs in the spot market. At first, the central banks concerned will try to damp down the pressure by spot interventions. If those intramarginal spot interventions prove to be insufficient to stabilize the spot rates, the strategy will be supplemented by establishing an intramarginal inter currency interest rate difference in favour of the weak currency. The attacked currencies are even forced to do so because the spot intervention mechanism of the 'old EMS' asymmetrically burdens the weak currency countries. Already the unavoidable reserve effects as a consequence of spot interventions are sufficient to force the weak currency countries to use the intramarginal interest rate policy as a defence mechanism against the speculative market pressure.

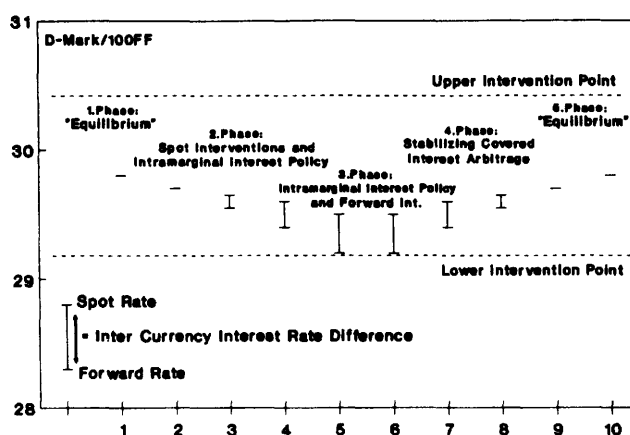
**3. Phase:** If the intramarginal inter currency interest rate difference does prove to be insufficient to stimulate interest arbitrage motivated capital movements in favour of the weak currency, forward interventions will become necessary for ultimately combating the attack. With the forward rate dropped to the lower intervention point, the unlimited and symmetrically designed forward intervention obligation is activated. A further falling of both, the spot and the forward rate is thereby stopped. The intervention strategy does not incur any costs for the central banks because

with forward interventions no liquidity and reserve effects are connected. Maturing forward contracts, however, inevitably lead to exchange losses for the speculators in an amount equal to the swap rate. Besides that, the central bank can stimulate the spot supply in hard currency necessary for sterilizing the liquidity effects in the consequence of maturing forward interventions by simply prolongating their forward positions in the market. By aggressive forward interventions slightly above the lower intervention point the central banks can even activate covered interest arbitrage already before the interventions become obligatory at the intervention point.

**4. Phase:** With the increasing losses of the speculators the market pressure diminishes: ... 'the central banks need only keep their nerves'. Their intervention strategy is not associated with any 'costs' in terms of unsustainable liquidity and reserve effects and, therefore, is credible for the markets. With the restabilization of market expectations covered interest arbitrage is strengthened and leads toward a new equilibrium.

**5. Phase:** When the stabilization process is finished, the initial equilibrium is restored. The successful fight of the attack prevents its reemergence because the system is self-stabilized by the 'learning' of rational speculators.

**Graphic 1: Interaction of Interest Rate and Intervention Policy in Fixed Rate Systems with Forward Interventions**



spot supply of hard currency necessary for stabilizing the spot rate by so-called *aggressive forward interventions*<sup>71</sup>. The resulting cover and arbitrage reactions of the markets will then transfer the forward supply of the attacked currency into a spot supply. Even in the worst case of a speculative attack, therefore, unsustainable liquidity and reserve effects can be avoided. The liquidity effects remain limited to the broader level of the non-bank liquidity; a direct influence on the monetary base is shut out<sup>72</sup>. In the course of a speculative attack the central banks do not face any constraints to give in to the markets' pressure by realigning the exchange rate in the end.

Forward intervention strategies to guarantee exchange rate margins around ultimately fixed central rates, therefore, prove to be sustainable even in the worst case scenario of a speculative attack. Anyway, those attacks become unlikely because, due to the forward intervention mechanism, the markets' arbitrage is stabilizing the central bank's exchange rate promise instead of destabilizing it as it was likely for the spot intervention promise of the 'old EMS'. For speculators to wait and see during a speculative attack is inevitably associated with current financing costs whereas for the central banks - again in contrast to spot interventions - no costs in terms of unsustainable liquidity and reserve effects arise which in the end could force them to opt out.

Consequently, an EMS forward intervention promise would be credible and sustainable at the same time. It is, therefore, the suitable strategy to protect and guarantee ultimately fixed exchange rate margins. For the hard currency countries forward intervention promises have the advantage of minimizing the monetary policy risks in terms of liquidity effects of spot interventions. For weak currency countries the budget restriction of limited intervention reserves is eliminated and the maximum use of the interest rate instrument is limited to the

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<sup>71</sup>) Aggressive forward interventions can also be described as being intramarginal because the central banks are intervening at a rate slightly above the lower forward intervention point. This kind of forward interventions offer riskless profits to the interest arbitrage. It also ensures the transmittance of the forward intervention into the spot market even for the unlikely case of forward interventions at the lower intervention point alone are proving to be insufficient to stabilize the spot rates.

<sup>72</sup>) For the mechanics of speculative attacks within an EMS supplemented by unlimited forward interventions see the discussion in appendix II.

establishment of minimal inter currency interest rate differences within the margins. Excessive risk premiums due to economic irrational market speculations are cut down to intramarginal interest rate differences for motivating arbitrage capital flows. From the speculant's perspective, no rational incentives remains to speculatively test the central bank's exchange rate promise because even unlimited forward interventions are riskless and, therefore, sustainable for the central banks: "The authorities need only keep their nerves."<sup>73</sup>

### **5.5 Suspension of the Settlement Rules**

The above analysis of the EMS's rule system (see chapter III) has demonstrated that the systematic asymmetry for the weak currency countries is mainly resulting from the system's settlement obligations. Under the conditions of speculative attacks the settlement produces costs in terms of inadequate policy adjustment constraints and massive reserve losses only for the attacked currencies. The criterion of sufficient protection against inadequate monetary policy adjustments as a consequence of irrational market speculations ('protection against opportunism II') is not fulfilled for the attacked countries.

In the course of a crisis a loss of credibility for the entire system automatically occurs because its core of keeping the exchange rate promise by unlimited interventions in the spot markets becomes implausible. The implausibility of the intervention promise mainly results from the settlement obligations anticipated by the markets. For the markets, the unlimited intervention promise of an attacked central bank which has to finance not only its own reserve- and credit-financed interventions but also the interventions carried out by the hard currency central bank is implausible from the start.

Consequently, the suspension of the settlement obligations seems to be a suitable reform option. Suspending or even revoking the settlement rules while at the same time maintaining

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<sup>73</sup>) Yeager (1976, p.280). Further it reads: "Honoring a massive volume of contracts made under the forward support policy would prove costly to the authorities if they lose their nerve and finally devalue. In effect, then, they lose their freedom to devalue; but, on an optimistic view, this nearly ironclad guarantee against devaluation and itself further deters speculation." Ibid, pp.280. This optimistic view is the only realistic for the case of ultimately fixed rates in a de facto monetary union.

the other parts the system's institutional setting including the financing rules, would lead to an unlimited obligation for the hard currency central banks to finance both, the own as well as the weak currency's spot interventions<sup>74</sup>.

Such a mechanism of intervention financing would be credible for the markets because the hard currency central bank is the only institution which is able to create the hard currency intervention reserves in an unlimited amount. This credibility gain of the intervention promise, however, is overcompensated by decisive disadvantages of an unconditioned suspension of the settlement rules:

- The precondition of monetary stability could be violated because the asymmetrical adjustment constraints for the weak currency which is rational in the case of diverging inflation rates would be dropped. An unconditioned suspension of the settlement rules would, therefore, excuse the weak currency countries from monetary policy adjustments even if they prove to be necessary for preserving the monetary stability of the overall system. During the 1980s, the settlement obligations have been the crucial mechanism forcing the countries with high inflation rates to ward a nominal convergence with the anchor currency. For that reason, one should not in principle refrain from the potentially disciplining settlement obligations.
- From the hard currency countries' perspective, an unconditioned revocation of the settlement rules would also violate the criterion of a sufficient protection against opportunistic behaviour of currencies with higher inflation rates. Following an expansive monetary policy and financing the resulting balance of payments deficits by obligatory interventions of the hard currency countries would be an example for opportunistic behaviour of weak currency countries<sup>75</sup>. As a consequence of the

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<sup>74</sup>) For a discussion of case by case suspensions of the settlement obligations see Bofinger (1991, p.373-376; 1993b) and Collignon (1993, p.170-173). The proposals of a mutual holding of EMS currencies made by Balladur (1987) and the French Commisariat General du Plan (1993) as well as the strategy of broadening the anchor through additional and unlimited long-term credit facilities suggested by Collignon (1993) de facto also imply the suspension of the settlement rules. For a discussion see *ibid* (1993, p.167-169; p.170-173; pp.174).

<sup>75</sup>) This problem also arises with a de facto suspension through introducing an additional and unlimited long-term intervention facility as suggested by Collignon. The proposal explicitly leads to unlimited bilateral credit facilities for financing interventions. Thereby a country could finance its balance of payments deficits.

intervention financing the hard currency countries have to face the risk of an inflationary adjustment deriving from the interventions' liquidity effects if those exceed their sterilisation capacity. The danger of opportunistic behaviour in the absence of settlement obligations, therefore, is a result of at the same time remaining unrestricted autonomy of the national monetary policies.

Who nevertheless seeks to establish a vital protection against fundamentally inadequate adjustment constraints, a conditioned suspension competency of the settlement obligations should be considered<sup>76</sup>. To minimize the risks of opportunistic behaviour the suspension competency could be assigned to the EMI and tied to the precondition of a prior autonomization of the national central banks according to the institutional requirements laid down in the Maastricht Treaty. For defining the conditions that have to be fulfilled for activating the suspension competency certain rules for a direct coordination of national monetary policies are necessary<sup>77</sup>. Furthermore it is obvious, that if the hard currency central bank can veto or even revoke a suspension decision, the probability of opportunistic behaviour among the central banks involved will be minimized. In detail the suspension competency should be organized as follows:

- a) The temporary and conditioned suspension competency is assigned to the EMI. Within the EMI it is tied to the precondition of the institutional autonomy standard for monetary policy laid down in the Maastricht Treaty. The suspension competency can be activated only in mutual consent of the central banks involved and can unilaterally be revoked at any time.
- b) In terms of monetary stability the suspension competency remains limited to situations of clearly identifiable speculative attacks. The degree of meeting the money

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A monetary adjustment constraint to assure interest rate conditions sufficient to finance the deficits in the markets without suffering market pressures on the exchange rate would no longer exist; see Collignon (1993, pp.174).

<sup>76</sup>) See Vehrkamp (1992, pp.645).

<sup>77</sup>) For a discussion of the interrelation between a suspension of the settlement obligations and a direct monetary coordination see chapter 5.2.

supply and price level targets mutually agreed as part of the ex ante direct monetary policy coordination within the EMI serves as a suitable identification criterion for the speculative character of market pressures on exchange rates within the given margins.

Overall it has been demonstrated that a temporary and conditioned suspension of the settlement obligations is sufficient to make the system's intervention promise credible for the markets. In order to meet all of the above required preconditions for a successful EMS reform, however, the merits of a suspension competency depends on a corresponding efficient mechanism for direct monetary policy coordination. Therefore, this proposal is clearly inferior to the forward intervention strategy discussed in chapter 5.4. With forward interventions the monetary coordination mechanism would remain market determined, while at the same time inadequate adjustment constraints in case of speculative attacks are eliminated. With forward interventions the establishment of a mechanism for direct monetary policy coordination during the phase of transition as it has proved to be necessary for reforming the system by introducing a suspension competency could be avoided.

## **5.6. Exchange Rate Management Competency of the Central Banks**

Transferring the exchange rate management competency within the EMS to the central banks would be an important contribution for objectifying the existing rules of the system. The exchange rate adjustment mechanism could then be used more efficiently as an additional instrument of a direct monetary policy coordination than it was allowed for with the political exchange rate competency of the governments within the 'old EMS'. The exchange rate management competency could become an integrated part of the governance structure for direct monetary policy coordination. As a result of that, a credible and consistent use of the interest rate, intervention, and exchange rate adjustment instruments within the EMS would be guaranteed. The protection against opportunistic behaviour of individual governments is considerably improved. From the more political point of view, this should also increase the central banks' willingness to enhance the cooperation of national monetary policies. Anyway, for the system as a whole a considerable credibility gain is to be expected.

To avoid political disadvantages in terms of the Maastricht integration schedule shifting the exchange rate management competency to the central banks has to be limited to the all-day management of central rate adjustments within the system. The basic institutional government competency of modifying the exchange rate regime in general would not be affected. Deciding the if, when and how of the member states' return to the normal fluctuation margins as well as the final decision of entering the third stage remains an exclusive domain of national government's and parliament's involved. The suggested split of the exchange rate competency (*regime competency of the governments and management competency of the central banks*) fulfils both the political integration objective of the governments and the monetary stability objectives of the central banks. The pace of monetary integration would still be determined politically; however, with a divided exchange competency it would not be necessary to give up the advantages of a rate management competency of the central banks<sup>78</sup>.

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<sup>78</sup>) For the integration strategy presented in chapter VI such a splitting the exchange rate competency means that the decision of entering the third stage remains political, whereas the central rate management for the course of stage two is transferred to the central banks.



## VI. A Strategy for Stage Two

The following suggests a reform strategy for the European Monetary System (EMS) in the course of the second stage of the European Economic and Monetary Union (EEMU). Based on the integration schedule and procedure of the Maastricht Treaty, the proposals facilitate a criteria-orientated transition to the third and final stage by 1999 at the latest.

First, the establishment of a *monetary autonomy standard* for Europe is suggested by improving and strengthening the institutional framework of the European Monetary Institute (EMI). The autonomy standard of the EMI should be orientated to the criterion of institutional convergence of the central banks involved according to the Maastricht Treaty. The monetary autonomy standard will be supplemented by a *two-track EMS*. For the core countries a *de facto monetary union* can be established by ultimately fixing the fluctuation margins. The core countries of the de facto monetary union remain tied to the countries of the periphery through a *modified exchange rate mechanism* which is considerably strengthened compared to the 'old EMS'. As an institutional link between the monetary autonomy standard and the two-tier European Monetary System the exchange rate management competency of the central banks is also transferred to the EMI.

### 6.1. European Autonomy Standard

As laid down in the Maastricht Treaty, the monetary policy autonomy of the national central banks is a prerequisite for entering the third stage. Its implementation, therefore, is scheduled for the course of the second stage. In addition to the four macroeconomic convergence criteria, we can speak of a fifth criterion of institutional convergence. Even the standards of the required autonomization are already given by the statute of the ESCB and are, therefore, also a vital part of the Treaty.

For our purposes it is suggested that the monetary autonomization of the national central banks according to the institutional standard of the ESCB is realized already at the beginning

of stage two. As a 'Club of Autonomous Central Bank Governors', the EMI would be a credible forerunner of the ESCB. A *European autonomy standard* would be established.

The proposal is based on the considerable advantages of an early institutional convergence for each individual country. The credibility gain of a stability orientated monetary policy associated with the institutional convergence would considerably reduce the economic costs of its realization especially for the former weak currency countries. Furthermore, the European autonomy standard would provide for an efficient 'governance structure' for a more credible direct coordination of national monetary policy within the 'new EMS' and, thereby, could also serve as a conceptual preparation of the third stage of the monetary union.

Concerning the exchange rate policy, the autonomy standard is supplemented by the exchange rate management competency within the 'new EMS' transferred to the EMI. Thereby, the three available instruments for keeping the exchange rate promise would be concentrated within the EMI. Defending the exchange rates in the markets, the EMI then could autonomously decide on a suitable combination of the interest rate, intervention, and exchange rate adjustment instruments. The probability of a consistent and, therefore, credible use of these instruments would be maximized and problems of political coordination could be avoided. In order to create sufficient incentives for the national governments to give up the exchange rate management competency within the 'new EMS', its transference to the EMI, as the prior autonomization of the central banks, should become a precondition for the participation in one of the two institutional arrangements of the new two-track EMS.

## **6.2. A Two-Track European Monetary System for the Transitional Stage Towards Monetary Union**

The integration strategy laid down in the Maastricht Treaty already implies a multi-track Europe for the further monetary integration on its way to monetary union. The strategy of a criteria-orientated transition to the third stage inevitably determines a multi-speed transition for the individual countries. In this respect the following proposal of a two-track EMS for the course of stage two is in accordance with the scheduled multi-track strategy for the transition to the third stage.

The necessity of a two-track EMS is mainly a consequence from the still existing economic convergence deficits in terms of monetary stability policy for some of the member states. Besides the precondition of institutional convergence with regard to the autonomy standard, the actually realized level of monetary stability should serve as the criterion for joining the *de facto monetary union* of the core countries. A price level rule in terms of an absolute inflation target has proved to be an economic rational precondition for joining the de facto union. Such a rule would require that each individual state has not exceeded the absolute inflation standard (e.g. 3%) for the average of an agreed period of time (e.g. 3 years) before joining the de facto union. For participating in the *modified exchange rate mechanism of the peripheral countries* the institutional precondition of the European autonomy standard would be sufficient because continuing inflation divergences can furthermore be balanced by occasional exchange rate adjustments.

### **6.2.1. De Facto Monetary Union of the Core Countries**

In order to create a de facto monetary union of the core countries it is not necessary that the states involved abolish the fluctuation margins around the fixed central rates. It is sufficient to return to the narrow margins of the 'old EMS'. These margins and the corresponding central rates, however, have to be ultimately fixed. For a credible and sustainable intervention promise to protect the de facto monetary union's exchange rates in the markets the otherwise unchanged rule system of the old EMS has to be supplemented by a symmetrical, unconditioned, and unlimited intervention obligation of the central banks in the forward market. The spot intervention obligations of the 'old EMS' are not to be abolished but only completed by obligatory forward interventions.

While maintaining the existing spot intervention rules, the intervention obligation in the forward markets has two different effects. It provides for an efficient mechanism for monetary policy coordination within the de facto monetary union as for a credible intervention mechanism to protect the exchange rates against speculative attacks:

The latter is ensured because a forward intervention promise is sustainable for the central banks and, therefore, is credible for the markets. The unlimited interventions of the central

banks necessary to discourage a speculative attack are defused in terms of direct expansive liquidity effects. In the course of an attack, however, the speculants inevitably suffer exchange losses of an amount equal to the intramarginal inter currency interest rate differences as indicated in the swap rates.

The necessary interest rate coordination within the de facto monetary union is ensured by the certain combination of spot and forward interventions. The remaining asymmetry for financing spot interventions, forces the weak currency countries to activate the symmetrically designed forward intervention mechanism by establishing an intramarginal inter currency interest rate difference in favour of the weak currency. The interest rate coordination mechanism, therefore, would essentially remain market-determined. However, the risk of inadequate monetary adjustment constraints as a consequence of fundamentally irrational attacks is reduced to the establishment of intramarginal interest rate differences to activate the forward intervention mechanism.

Therefore the suggested reform meets all criteria and preconditions required in this paper for the implementation of a stability-orientated fixed rate system (see chapter 5.1.). It is sustainable and, therefore, credible at the same time. It guarantees for an exchange rate stabilization around the level of the ultimately fixed central rates. The system's interest rate standard is set by the market-determined anchor currency of the system. Although fluctuation margins continue to exist, this part of the 'new EMS' can be described as a de facto monetary union.

The transition from the de facto monetary union as a 'core EMS' to the third stage of monetary union could take place according to the procedure and timetable laid down in the Maastricht Treaty by 1999 at the latest.

### **6.2.2. Modified Exchange Rate Mechanism with the Periphery**

Those countries not yet able to meet the preconditions of monetary stability according to the ex ante agreed inflation standard should be tied to the core countries' de facto union by reestablishing the exchange rate mechanism of the 'old EMS' in an improved and

strengthened version. The institutional convergence of the monetary autonomy standard, including the exchange rate management competency of the central banks within the rate mechanism, is the only precondition for participating in this modified exchange rate mechanism of the periphery.

For countries which meet the criterion of institutional convergence, the exchange rate mechanism of the EMS should be re-established within the normal fluctuation margins of  $\pm 2,25\%$ . In order to find a convincing response to the far-reaching loss of credibility which the 'old EMS' suffered from the 1992/93 crisis, it is suggested to strengthen the intervention rules by introducing a case-by-case suspension competency of the settlement obligations. The extended EMS should not in principle refrain from the settlement rules as an efficient coordination mechanism of monetary policies in case of furthermore diverging inflation standards. During the 1980s, it has proved to be the decisive mechanism to discipline national policies in line with the monetary standard of the anchor currency. Still, the criterion of protection against the costs of inadequate monetary policy adjustment caused by speculative attacks requires the introduction of a suspension competency of the settlement obligations at least in cases of clearly identified speculative attacks. For reasons of institutional efficiency, the suspension competency should also be assigned to the EMI and should be decided by mutual consent of the central banks involved.

In interaction with the exchange rate management competency of the EMI a consistent and, therefore, credible use of the interest rate, intervention, and exchange rate adjustment instruments would be ensured for the protection of the in principle furthermore adjustable fluctuation margins. The modified exchange rate mechanism would already be more credible than in the 'old EMS' because it is institutionally strengthened by the autonomy standard for national monetary policies. The transition from the modified exchange rate mechanism to the de facto monetary union should depend on a sufficient fulfillment of the monetary stability criterion and can be decided individually.

## Final Remarks

With the extended fluctuation margins of +/-15% the convergence criteria of the Maastricht Treaty have proved to be prohibitive for further progress towards the European Monetary Union. Therefore, in order to establish a monetary union by 1999 at the latest an additional reform strategy outside the EEC-Treaty is necessary to re-establish the EMS. A 'new EMS' proves to be a precondition for the transition to the third stage.

The above suggested reform has the advantage to facilitate such a reform outside the EEC-Treaty without contravening its principles or requiring any modifications. It meets each of the required preconditions for a stability-orientated fixed rate system from the hard currency countries' perspective (*'stability criterion'* and *'protection against 'inflationary infection'*) as well as from the weak currency countries' perspective (*'protection against speculative attacks'*). In its essence, merely an earlier implementation of certain measures which are anyway scheduled for the course of the second stage is proposed. In terms of a successful european integration policy, the rationality of realizing the European Monetary Union before the turn of the century is met, as is the central bank's rationality of preserving and even strengthen monetary stability. The proposal, therefore, proves to be the result of a rationality mix which is suitable to bring back the process of european monetary integration on the track of the Maastricht Treaty.

**Appendix I:**  
**The Anatomy of Speculative Attacks**

## The Anatomy of Speculative Attacks

The EMS is a fixed rate system with symmetrical fluctuation margins of  $\pm 2,25\%$  around the bilateral central rates and a politically determined central rate adjustment mechanism. In such a system speculative one-way bets tend to occur when the market participants anticipate central rate adjustments in an extent which ensures, that the upper intervention point of the new margin will be fixed below the lower intervention point of the former margin, and that the financing costs of the speculation do not overcompensate the expected devaluation profits. To perform a speculative attack, the speculants predominantly use the traditional exchange trading instruments in the spot and swap markets<sup>1</sup>. Two alternative ways of performing a speculative attack can be distinguished<sup>2</sup>:

### 1. Off-Balance-Sheet Attacks

Off-balance-sheet attacks are *forward speculations*. The market participants sell the attacked currency against a hard currency in the forward markets. If the currency has been devalued before the maturity date of the forward deal, the speculants can expect to be able to purchase the spot amount of the weak currency necessary to meet the forward obligation at a rate which is cheaper than the agreed forward price.

### 2. On-Balance-Sheet Attacks

On-balance-sheet attacks are *spot speculations*. Market participants sell the attacked currency in the spot market against hard currency. When the currency has been devalued, they might expect to purchase it at a rate which is far enough below the former rate to overcompensate the financing costs of the speculative spot position.

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<sup>1</sup>) This is confirmed for the 1992/93 EMS crisis by a G-10 report based on interviews with market participants: "Options and other derivatives do not appear to have played a special role in the episode. (...) Most of the action was in traditional spot, swap, and outright forward instruments, and was the direct result of conscious decisions to alter exposures in currencies viewed as devaluation risks." G-10 (1993, p.17).

<sup>2</sup>) See International Monetary Fund (1993), especially the appendices IV and V on the mechanics and economics of speculative attacks during the EMS-crisis 1992/93, p.40-43 and p.44-48.



In both variants, the central banks, according to their spot intervention obligations, are forced to take the counter position of both the speculative spot and/or forward sales by intervening in the spot markets. Furthermore, they have to refinance the non-bank credit expansion necessary to finance the speculative investments. In order to demonstrate that it is insignificant for the central banks in which variant the markets are performing a speculative attack the following will give a detailed description of both. The description is illustrated by corresponding accounting charts.

### A) The Dynamics of an Off-Balance-Sheet Attack<sup>3</sup>

**Step 1:** The speculant sells the attacked currency (100 FF) forward to bank A for hard currency (30 DM):

<i>Tab. 1A-1</i>	Speculant		Bank A	
	Receipt	Payment	Receipt	Payment
<b>1.Step:</b> <i>Speculative forward deal</i> one month forward sale of 100 FF against 30 DM to bank A	30 DM (in one month)	100 FF (in one month)	100 FF (in one month)	30 DM (in one month)

Without using any liquid capital, the speculant has established his uncovered foreign currency position denominated in the currency which he suspects to be revalued. For him, no direct financing costs in terms of interest payments arise. In order to realize a speculative exchange profit it is sufficient that the future spot rate, at which the speculant will cover his forward position prior to the maturity date, is cheaper than the agreed forward rate<sup>4</sup>. Profit and risk of the speculant, therefore, are based on the expected difference of the future spot

<sup>3</sup>) See the summary of the following individual accounting charts in table 1A of this appendix.

<sup>4</sup>) For the forward speculant indirect financing costs arise because his forward rate deviates from the effective spot rate in an amount that equals the inter currency interest rate difference, because the so-called covered interest rate arbitrage always guarantees the exact equalization of the swap rate, as the difference between the spot and the forward rate, with the inter currency interest rate difference. The indirect financing costs of the forward speculant, therefore, are equal to the direct financing costs of a spot speculant who first raises a credit in the attacked currency and then invests the amount of the credit in hard currency. Concerning the overall profits, spot and forward speculations, therefore, lead to exactly the same results. Selecting the instruments during a speculative attack mainly depends on the criteria of availability and liquidity, and not on return calculations.

rate to today's forward rate. By contracting the speculative forward deal a corresponding currency risk inevitably arises for bank A.

**Step 2:** Unintentional arising uncovered currency positions in the banking system are routinely covered by the individual bank involved. Covering a forward position can be reached by combining a contrary spot- with a swap transaction:

Tab. 1A-2	Bank A		Bank B		Central Bank	
	Receipt	Payment	Receipt	Payment	Receipt	Payment
<b>2.Step:</b>						
<u>Covering bank A</u>						
a) spot purchase of 30 DM against 100 FF from the central bank	30 DM (in two days)	100 FF (in two days)			100 FF (in two days)	30 DM (in two days)
b) swap with bank B:	100 FF (in two days)	30 DM (in two days)	30 DM (in two days)	100 FF (in two days)		
spot sale of 30 DM against 100 FF in two days and re-purchase in one month	30 DM (in one month)	100 FF (in one month)	100 FF (in one month)	30 DM (in one month)		

First, the short spot position is offset in terms of the currency risk involved by a spot purchase of the hard currency (30 DM) against the currency which is suspected to be devalued (100 FF). The remaining maturity inconsistency is balanced by an additional swap transaction. The purchased spot amount in hard currency is exchanged against a corresponding forward position. In that way, bank A is balanced in terms of both, uncovered currencies in amount and maturity. According to the spot intervention obligations, the central banks have to match the spot transaction whereas the swap is routinely contracted with another bank B. As a consequence of the spot intervention the central banks are facing the systemically determined liquidity and reserve effects<sup>5</sup>. They at first activate the corresponding asymmetrical monetary policy adjustment constraints and finally, if the liquidity and reserve effects become unsustainable from the central banks' perspective, unavoidably lead to a devaluation of the attacked currency.

<sup>5</sup>) Within the EMS interventions usually imply symmetrical liquidity effects (=expansive money base effects in the hard currency versus restrictive money base effects in the weak currency) and asymmetrical reserve effects for the weak currency central bank (=direct loss of hard currency intervention reserves respectively repayment or settlement obligations deriving from drawings on the system's credit facilities or interventions carried out by the hard currency country). In our example, the expansive DM- and restrictive FF-money base effects due to the spot interventions arise simultaneously at bank A because, for reasons of simplification, one can refrain from both, distinguishing between the DM- and FF-banking system and between the DM- and FF-central banks. The simplification seems to be suitable because otherwise the analysis is considerably complicated, however, it would not alter its results.

**Step 3:** As a consequence of its swap transaction bank B needs to earn interest on the hard currency spot amount received in the spot leg of the transaction. The bank, therefore, invests the spot amount for the duration of the forward:

<i>Tab. 1A-3</i>	<b>Bank B</b>		<b>Bank C</b>	
	Receipt	Payment	Receipt	Payment
<b>3.Step:</b> <u>Investment bank B</u> a) investment of 30 DM for one month	30 DM (in one month)	30 DM (in two days)	30 DM (in two days)	30 DM (in one month)

Bank B, therefore, is also balanced in terms of maturity.

**Step 4:** With the liquidity effects of the central banks' spot interventions, the central banks are faced to sterilize the intervention-related expansive DM- and restrictive FF-money base effects. Besides they have to refinance the central bank money demand of the banking system resulting from the speculative DM-investments. Therefore, the hard currency central bank has to contract a restrictive open market transaction equal to the spot intervention (30 DM) with bank A. With that, the expansive money base effect of the spot intervention is completely sterilized. For the FF-central bank an expansive open market transaction in the same amount as the intervention with bank B is necessary in order to sterilize the restrictive FF-money base effect of the intervention. For the purpose of satisfying the additional demand for DM-central bank money arising from the additional DM-investment of bank B (see footnote 6), the DM-central bank has to contract an expansive open market transaction with bank C in an amount equal to  $r(30 \text{ DM})$ :

<i>Tab. 1A-4</i>	<b>Bank A/C</b>		<b>Central Bank</b>	
	Receipt	Payment	Receipt	Payment
<b>4.Step:</b> <u>Sterilization and refinancing</u> a) ster. of the expansive DM m.b. effect (**) b) ster. of the restrictive FF m.b. effect (***) c) ref. of the DM investment (****)	30 DM (ref. assets)	30 DM (c.b. money)	30 DM (c.b. money)	30 DM (ref. assets)
	100 FF (c.b. money)	100 FF (ref. assets)	100 FF (ref. assets)	100 FF (c.b. money)
	$r(30 \text{ DM})$ (c.b. money)	$r(30 \text{ DM})$ (ref. assets)	$r(30 \text{ DM})$ (ref. assets)	$r(30 \text{ DM})$ (c.b. money)

(\*\*) Intervention-caused expansive DM money base effects automatically arise when the interventions are directly carried out by the DM central bank or the FF central bank's intervention reserves have previously been deposited at the DM central bank. (\*\*\*) Intervention-caused restrictive FF money base effects automatically arise when the interventions are directly carried out by the FF central bank or the DM central bank's intervention reserves have previously been deposited at the FF central bank. (\*\*\*\*) An additional demand for DM central bank money arises from the DM investment only in case of the DM central bank has failed to sterilize the expansive DM money base effects.

If the sterilization of the intervention-related expansive DM-money base effect is cleared with the additional central bank money demand of the banking system from the DM-investment, a net amount of  $(30-r)DM$  remains for the DM-central bank to be sterilized<sup>6</sup>. Therefore, additional to the expansion of the non-bank liquidity equal to the speculative investments, the currency attack leads to an expansion of the bank liquidity (= money base) equal to  $r(30DM)$  for the DM-central bank even after the sterilization and refinancing transactions are finished<sup>7</sup>. While the expansion of the non-bank liquidity has to be accepted as inevitable from the central bank's perspective, it could refrain from refinancing the speculative investments. However, if the hard currency central bank refuses to refinance the speculative investments, the resulting increases of the domestic money market interest rates will automatically lead to an aggravation of the speculative attack. The thereby reduced inter currency interest rate in favour of the attacked currency decreases the financing costs of the speculators and, therefore, further increases the incentive to speculate. For that reason, the DM-central bank is realistically forced to refinance the non-bank liquidity expansion. A corresponding de facto obligation to sterilize can be derived for the liquidity effects of the interventions. In case of unsterilized spot interventions, the hard currency central bank would, in terms of interest rate and liquidity policy, completely lose its control over domestic money markets<sup>8</sup>. However, its ability to fulfil the de facto obligation to sterilize is limited to the amount of its sterilization capacity.

Corresponding to the above analysis the weak currency central banks are liable to a de facto obligation to sterilize the intervention's restrictive money base effects. If a central bank would refuse to do so, at first the interest rates in the weak currency's domestic money market are likely to increase. Thereby the financing costs of the speculators are increased

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<sup>6</sup>) A uniform reserve quota for all bank liabilities is assumed; due to the short-term view, multiplier effects are not considered.

<sup>7</sup>) For this distinction between the effects on the bank liquidity (= money base) and the non-bank liquidity see Deutsche Bundesbank (1993, p.19-34).

<sup>8</sup>) For a further discussion see chapter 5.4.. The actual sterilization obligation can already be derived from the fact that otherwise an unlimited intervention promise of the hard currency central bank is not credible for the markets because the central bank would give up its monetary policy autonomy. A complete renunciation of sterilization policy, therefore, is extremely implausible from a perspective following the theory of bureaucratic behaviour. Central banks are not likely to voluntarily commit political suicide.

which might help to lessen the attack because the devaluation expectations of the speculators are over-compensated by their interest costs. However, the extremely high interest rates necessary for that become implausible even in the short- and medium-term because no central bank can passively accept the deasastrous consequences of speculative excessive interest rates for the economy as a whole. In the end, the central bank as the lender of last resort has to guarantee economically acceptable interest rates, and this is what the market participants anticipate<sup>9</sup>.

**Summary:** The result of intervening in the spot markets to fight a speculative off-balance-sheet attack is unsatisfying for the central banks in every respect:

For the hard currency country, the speculative increase of the non-bank liquidity and the expansive money base effects of the interventions lead to a gradual loss of policy control over the domestic money markets. Historical experiences with speculative currency crisis clearly show that the hard currency central bank will opt out and permit a devaluation of the attacked currency at the latest when its sterilization capacity is exhausted. The speculative attack has then been successful for the speculators.

Besides the reserve losses the weak currency country is facing severe economic costs in terms of increasing interest rates in the domestic money market. These interest rate increases directly result from the restrictive monetary base effects of the spot interventions, at least as long as they are not sterilized. On the horns of a dilemma, the central bank either aggravates the speculative attack through the sterilization policy by keeping the interest costs of the speculators low, or it passively accepts the economic costs of excessive interest rates. Both alternatives improve the prospects of a successful attack for the speculators and, therefore, lead to an aggravation of the speculators' market pressure. The historical experience proves that with the accumulating reserve losses even the weak currency central banks are forced to opt out. From this perspective, again, the speculative attack is in the end successful for the speculators.

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<sup>9</sup>) See the basic and still valid explanations of Bagehot (1873).

After the forced devaluation of the attacked currency the speculative currency positions are re-exchanged with the central banks. Again, from the perspective of the central banks involved, one can speak of a de facto obligation to re-exchange the speculative positions. This obligation results from the policy objective of re-establishing normal conditions for the domestic money markets, from the necessity of replenishing the intervention reserves and, last but not least, from the intervention obligations at the devalued currency's upper intervention point of the new margin. All this leads us to the perverse consequence that in the end the central banks have to finance the speculators' exchange profits<sup>10</sup>. Therefore, in speculative attacks the central banks become the exploitable resource of the system<sup>11</sup>.

### B) The Dynamics of an On-Balance-Sheet Attack<sup>12</sup>

**Step 1:** The speculant sells the attacked currency against hard currency in the spot market. The counter position of the speculative spot transaction is directly taken by the central banks following their intervention obligations:

<i>Tab. 1B-1</i>	Speculant		Central Bank	
	Receipt	Payment	Receipt	Payment
<b>1.Step:</b> <u>Speculative spot deal</u> spot sale of 100 FF against 30 DM to the central bank	30 DM (in two days)	100 FF (in two days)	100 FF (in two days)	30 DM (in two days)

The speculant intends to hold his uncovered spot position in hard currency until he is able to profitably sell it after a devaluation of the attacked currency for the new spot rate (e.g. 30 DM against 110 FF). As long as the thereby realized exchange profit exceeds the interest costs from financing the speculative currency position, the speculation has been profitable. For the central banks, the spot interventions cause corresponding liquidity and reserve

<sup>10)</sup> The distribution of the overall loss among the member central banks mainly derives from the denomination rules of the settlement procedure; for details see Committee of Governors (1993, p.6).

<sup>11)</sup> This already results from the foreign exchange trading as a closed system being a zero-sum game; the profit of the one is the loss of another. In speculative one-way bets the central banks inherently have to take the loss position. See Grabbe (1991, p.287).

<sup>12)</sup> See the summary of the accounting charts in table 1B) of this appendix.

effects. The overall result exactly corresponds to the first and second steps of an off-balance-sheet attack. The only difference is, that the transmittance of the speculative forward transaction into the spot market is not necessary because in an on-balance-sheet attack the central bank is directly contracting the spot position with the speculant.

**Step 2:** The speculant invests his speculative hard currency spot amount in order to earn interest:

<i>Tab. 1B-2</i>	Speculant		Bank B	
	Receipt	Payment	Receipt	Payment
<b>2.Step:</b> <i>Investment by the speculant</i> a) investment of 30 DM for one month	30 DM <small>(in one month)</small>	30 DM <small>(in two days)</small>	30 DM <small>(in two days)</small>	30 DM <small>(in one month)</small>

The thereby realized interest returns help to reduce his direct financing costs from borrowing in the attacked currency to the inter currency interest rate difference<sup>13</sup>. They, therefore, are exactly equal to the indirect financing costs of a forward speculant as being represented by the swap rate.

**Step 3:** For the central banks, the sterilization and refinancing requirements resulting from a spot intervention are the same as in case of a forward speculation:

<i>Tab. 1B-3</i>	Bank A/B		Central Bank	
	Receipt	Payment	Receipt	Payment
<b>3.Step:</b> <i>Sterilization and refinancing</i> a) ster. of the expansive DM m.b. effects (*) b) ster. of the restrictive FF m.b. effects (**) c) ref. of the DM investment (***)	30 DM <small>(ref. assets)</small>	30 DM <small>(c.b. money)</small>	30 DM <small>(c.b. money)</small>	30 DM <small>(ref. assets)</small>
	100 FF <small>(c.b. money)</small>	100 FF <small>(ref. assets)</small>	100 FF <small>(ref. assets)</small>	100 FF <small>(c.b. money)</small>
	r(30 DM) <small>(c.b. money)</small>	r(30 DM) <small>(ref. assets)</small>	r(30 DM) <small>(ref. assets)</small>	r(30 DM) <small>(c.b. money)</small>

(\*) Intervention-caused expansive DM money base effects automatically arise when the interventions are directly carried out by the DM central bank or the FF central bank's intervention reserves have previously been deposited at the DM central bank. (\*\*) Intervention-caused restrictive FF money base effects automatically arise when the interventions are directly carried out by the FF central bank or the DM central bank's intervention reserves have previously been deposited at the FF central bank. (\*\*\*) An additional demand for DM central bank money arises from the DM investment only in case of the DM central bank has failed to sterilize the expansive DM money base effects of the interventions.

<sup>13)</sup> See footnote 4 of this appendix.

The only difference is that with spot speculations the speculative expansion of the hard currency's non-bank liquidity is a direct consequence of the speculant's transactions, whereas in case of an off-balance-sheet attack it follows from the swap contracting bank's investment of the swap's spot amount.

For the central banks the implications of a spot intervention obligation are identical for on-balance-sheet and off-balance-sheet attacks. In both cases the central banks take the counter position of the speculants by intervening in the spot market. The corresponding liquidity and reserve effects at first trigger the almost entirely asymmetrical monetary adjustment constraints for the weak currency countries. Due to the accumulating reserve losses the budget restriction of limited intervention reserves forces the weak currency countries to shift their efforts in fighting the attack from the intervention to the interest rate instrument. An opting-out of the weak currency countries becomes unavoidable when a further use of the interest rate instrument becomes unsustainable for the economy as a whole. In case that both, intervention and interest rate instruments have become implausible, the only way out is a devaluation according to the speculative market pressures. For the weak currency countries, the inherent implausibility of the unlimited spot intervention promise directly result from their budget restriction of limited hard currency intervention reserves. The very short-term financing in the EMS does only temporarily suspend this budget restriction and with the asymmetric settlement obligation for the weak currencies it is even extended to the interventions carried out by the hard currency countries.

The intervention promise of a hard currency country becomes implausible for the markets when its sterilization capacity is exhausted and the hard currency central bank, therefore, loses its monetary policy control over domestic money market conditions. With the sterilization capacity exhausted, the symmetry characteristics of the entire system are changing. The monetary adjustment constraints become more symmetrical or even asymmetrical for the hard currency countries which are then forced to adjust to the interest rates and monetary policy of the weak currency country. The market participants, therefore, will anticipate an opting-out of the hard currency central bank at the latest when its sterilization potential is exhausted.



**Final remarks:** The mechanics of speculative attacks show that exchange rate promises within the 'old EMS' are inherently implausible because the instruments for keeping the promises are lacking credibility. The markets anticipate that both, the intervention and interest rate instruments are not sustainable. Consequently, the one-way bets of speculative attacks seem to be promising even when the exchange rates are in accordance with economic fundamentals. The inherent implausibility of the system alone has proved to be sufficient to provoke speculative attacks of the markets. Following their profit-maximizing rationality the markets sooner or later realize the potential profit of a speculative attack. *Anybody who gives exchange rate promises has to guarantee them by means and instruments being credible for the markets.* This condition is not fulfilled for the 'old EMS'.

**Table 1A: Off-Balance-Sheet Attacks (Forward Speculations)**

	Speculant		Bank A		Bank B		Central Bank	
	Receipt	Payment	Receipt	Payment	Receipt	Payment	Receipt	Payment
<p><b>1.Step:</b>  <u>Speculative forward deal:</u>                      one month forward sale of 100 FF against 30 DM to bank A</p>	30 DM (in one month)	100 FF (in one month)	100 FF (in one month)	30 DM (in one month)				
<p><b>2.Step:</b>  <u>Covering bank A</u>                      a) spot purchase of 30 DM against 100 FF from the central bank                      b) swap with bank B:                      spot sale of 30 DM against 100 FF in two days and re-purchase in one month</p>			30 DM (in two days) 100 FF (in two days) 30 DM (in one month)	100 FF (in two days) 30 DM (in two days) 100 FF (in one month)	30 DM (in two days) 100 FF (in one month)	100 FF (in two days)	30 DM (in two days)	
<p><b>3.Step:</b>  <u>Investment bank B</u>                      a) investment: of 30 DM for one month (*)</p>					30 DM (in one month)	30 DM (in two days)		
<p><b>4.Step:</b>  <u>Sterilization and refinancing</u>                      a) ster. of the expansive DM m.b. effect (**)                      b) ster. of the restrictive FF m.b. effect(***)                      c) ref. of the DM investment (****)</p>			30 DM (ref. assets) 100 FF (c.b. money)	30 DM (c.b. money) 100 FF (ref. assets)	30 DM (c.b. money) 100 FF (ref. assets) r(30 DM) (c.b. money)	30 DM (c.b. money) 100 FF (ref. assets) r(30 DM) (ref. assets)	30 DM (ref. assets) 100 FF (c.b. money) r(30 DM) (c.b. money)	
<p>(*) For example at a bank C. (**) Intervention-caused expansive DM money base effects automatically arise when the interventions are directly carried out by the DM central bank or the FF central bank's intervention reserves have previously been deposited at the DM central bank. (***) Intervention-caused restrictive FF money base effects automatically arise when the interventions are directly carried out by the FF central bank or the DM central bank's intervention reserves have previously been deposited at the FF central bank. (****) An additional demand for DM central bank money arises from the DM investment only in case of the DM central bank has failed to sterilize the expansive DM money base effects of the interventions. C.b. = central bank; r = minimum reserve quota for DM investments; m.b. = money base; ref. = refinancing; ster. = sterilization.</p>								

**Table 1B: On-balance-sheet Attacks (Spot Speculations)**

	Speculant		Bank A		Bank B		Central Bank	
	Receipt	Payment	Receipt	Payment	Receipt	Payment	Receipt	Payment
<b>1.Step:</b> <u>Speculative spot deal</u> spot sale of 100 FF against 30 DM to the central bank	30 DM (in two days)	100 FF (in two days)					100 FF (in two days)	30 DM (in two days)
<b>2.Step:</b> <u>Investment by the speculant</u> a) investment of 30 DM for one month	30 DM (in one month)	30 DM (in two days)			30 DM (in two days)	30 DM (in one month)		
<b>3.Step:</b> <u>Sterilization and refinancing</u> a) ster. of the expansive DM m.b. effects (*) b) ster. of the restrictive FF m.b. effects(**) c) ref. of the DM investment (***)			30 DM (ref. assets)	30 DM (c.b. money)			30 DM (c.b. money)	30 DM (ref. assets)
			100 FF (c.b. money)	100 FF (ref. assets)			100 FF (ref. assets)	100 FF (c.b. money)
					r(30 DM) (c.b. money)	r(30 DM) (ref. assets)	r(30 DM) (ref. assets)	r(30 DM) (c.b. money)

(\*) Bank A as the speculant's bank. Intervention-caused expansive DM money base effects automatically arise when the interventions are directly carried out by the DM central bank or the FF central bank's intervention reserves have previously been deposited at the DM central bank. (\*\*) Intervention-caused restrictive FF money base effects automatically arise when the interventions are directly carried out by the FF central bank or the DM central bank's intervention reserves have previously been deposited at the FF central bank. (\*\*\*) An additional demand for DM central bank money arises from the DM investment only in case of the DM central bank has failed to sterilize the expansive DM money base effects of the interventions. C.b. = central bank; r = minimum reserve quota for DM investments; m.b. = money base; ref. = refinancing; ster. = sterilization.

**Appendix II:**  
**Forward Interventions in Speculative Attacks**

## Forward Interventions in Speculative Attacks

Compared to interventions in the spot markets, forward interventions have the decisive advantage not to involve any direct liquidity and reserve effects for the intervening central bank. The following will show that those effects can be avoided even if the central bank's forward transactions actually have to be delivered. Besides that, it will be demonstrated that it is irrelevant for the effectiveness of forward interventions if the speculative attack is performed as an on-balance-sheet attack or as an off-balance-sheet attack. Forward interventions prove to be an efficient defence mechanism against both of them<sup>2</sup>. In both cases the credibility problems inherent to spot intervention strategies can be avoided.

### A) The Dynamics of Forward Interventions in Off-Balance-Sheet Attacks

**Variante 1:** In the first variant of a forward intervention strategy, the intervening central bank directly takes on the counter position of the speculant's forward sale of the attacked currency:

<i>Tab. 2A-1</i>	<b>Speculant</b>		<b>Central Banks</b>	
	Receipt	Payment	Receipt	Payment
<p><b><u>1. Variante</u></b>  <b>1. Step:</b>  <u>Speculative forward deal</u>                      one month forward sale of 100 FF                      against 30 DM to the central bank</p>	30 DM <small>(in one month)</small>	100 FF <small>(in one month)</small>	100 FF <small>(in one month)</small>	30 DM <small>(in one month)</small>

If the central bank has managed to contract its forward intervention directly with the speculant, the currency position of the commercial bank system is not affected by the speculative attack. Thereby the transmittance of the speculative forward deal into the spot market is already interrupted at the speculant's initial transaction. For the central banks, therefore, no liquidity or reserve effects arise from interventions in the course of the attack. Those effects are only conceivable - analogous to a spot intervention - when the forward transaction is effectively delivered at the maturity date. An effective delivery of speculative forward

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<sup>2)</sup> In the following a forward intervention strategy similar to the one suggested in chapter 5.4. is assumed. The proposal provides for simultaneous intervention obligations in the spot and forward markets. For the interaction of spot and forward interventions see box I in chapter 5.4.

transactions with the central banks, however, can be regarded as being extremely unlikely because it always automatically involves a loss for the speculant of an amount equal to the inter currency interest rate difference as represented in the swap rate. The proposed intervention strategy obliges the central banks to unlimited forward interventions only when the forward rate has reached the lower intervention point of a currency. With a remaining asymmetrical spot intervention obligation for the weak currency country, to activate the symmetrical forward intervention mechanism the attacked central bank is forced to establish a positive interest rate difference in favour of its own currency, because otherwise it would be the spot rate that first touches the lower intervention point and thereby release only the asymmetrical spot intervention obligation. Within the 'new EMS' the furthermore co-existing spot intervention mechanism of the 'old EMS' proves to serve as an efficient mechanism of coordination for the national interest rate policies. It guarantees for a positive interest rate difference in favour of the attacked currency as a first line of defence against a speculative attack, because such a difference is a precondition to activate the symmetric forward intervention mechanism. Thereby, for the central banks and speculants the tables are turned in the course of a speculative attack:

- For central banks, the liquidity and reserve effects arise from the beginning. They are forced to face the 'costs' of their spot interventions during the entire course of the attack. Spot interventions, therefore, are viewed to be self-defeating from the market's perspective. In contrast to the central bank's dilemma with self-defeating spot interventions, the indirect financing costs of the speculants arise only at the end of a speculative attack. This temporal non-congruence of cost-taking between the central banks and the speculants is a major reason for the inherent unsustainability of spot intervention strategies as a defence mechanism against speculative attacks.
- With forward interventions this temporal non-congruence of cost-taking is reversed in favour of the central banks. No 'costs' in terms of excessive liquidity and reserve effects arise in the course of an attack. A spot transaction of the central banks can only become necessary to deliver a forward contract and would be inevitably connected with a corresponding loss-taking by the speculants. An actual delivery of forward interventions is, therefore, unlikely to happen in reality. The central banks

are no longer forced to opt out as a consequence of unavoidably arising liquidity and reserve effects. The vicious circle of inherently implausible spot interventions is broken; with forward intervention strategies the speculants have to defray the inevitable losses instead of the central banks.

This mechanism alone should prove to be sufficient to stimulate arbitrage transactions to stabilize the exchange rates already before the lower forward intervention point is touched. Even if the central banks have to deliver the forward intervention at the maturity date, they can sterilize the associated liquidity and reserve effects in the spot markets without being restricted by limited sterilization capacities. The central banks can ensure the supply of spot amounts in hard currency to deliver its initial forward intervention by so-called *agressive forward interventions*. The aggressive forward intervention is then transmitted into the spot market by the contracting banks covering their unintentional arising forward positions. The intervening central banks are thereby prolongating their initial forward positions. At the same time, the money base and reserve effects of the forward intervention's delivery - by which the speculants are unavoidably taking a loss - is neutralized.

**Variant 2:** Instead of contracting his speculative forward transactions with the central bank, the speculant is contracting it with bank A:

<i>Tab. 2A-2/1</i>	<b>Speculant</b>		<b>Bank A</b>	
	Receipt	Payment	Receipt	Payment
<b><u>2. Variant</u></b> <b>1.Step:</b> <i>Speculative foward deal</i> one month foward sale of 100 FF against 30 DM to bank A	30 DM (in one month)	100 FF (in one month)	100 FF (in one month)	30 DM (in one month)

Thereby an unintentional uncovered forward position arises for Bank A. The bank will routinely offset the currency risks involved by contracting a contrary spot deal in combination with a swap. If the central bank has not been able to take on the forward position directly from the speculant, it can obtain the same result by contracting both, the spot and the swap transaction with bank B:

<i>Tab. 2A-2/2</i>	<b>Bank A</b>		<b>Central Banks</b>	
	Receipt	Payment	Receipt	Payment
<b>2.Step:</b> <i>Covering bank A</i>				
a) spot purchase of 30 DM against 100 FF to bank A	30 DM (in two days)	100 FF (in two days)	100 FF (in two days)	30 DM (in two days)
b) swap: spot sale of 30 DM against 100 FF to the central bank and re-purchase in one month	100 FF (in two days) ----- 30 DM (in one month)	30 DM (in two days) ----- 100 FF (in one month)	30 DM (in two days) ----- 100 FF (in one month)	100 FF (in two days) ----- 30 DM (in one month)

Bank A, therefore, has balanced its position in terms of currencies and maturities. The bank's function was only the neutral transmittance of the uncovered forward position from the speculant to the central bank. Again, the central bank has succeeded in taking on the counter position of the speculant not in the spot market but in the forward market. The further course of the speculative attack then exactly corresponds to variant 1. However, if the central bank does not succeed in taking on the swap part of the bank's covering transactions, it will have to face the consequence of an isolated spot intervention. In order to nevertheless escape the self defeating dynamics of spot interventions, the central bank can fall back on the above described instrument of aggressive forward interventions. Its use will be required anyway if the attack is performed as an on-balance-sheet attack from the beginning.

## **B) The Dynamics of Forward Interventions in On-Balance-Sheet Attacks**

When speculative attacks are performed in the spot markets, the central banks do not have the opportunity of directly contracting the speculative position in the forward market. In order to nevertheless avoid spot interventions, they are forced to intervene preventively in the forward markets. As in case of the above mentioned aggressive forward interventions, the central banks thereby ensure the necessary spot supply in hard currency to meet the speculants' demand by the spot and swap transaction of the banking system covering the forward intervention and thereby transmitting it into the spot market. By that, the central banks avoid the dilemma of self-defeating spot interventions. In contrast to forward interventions in off-balance-sheet attacks, however, they are forced to refinance the speculative hard currency investments.



**Step 1:** The central bank 'aggressively' intervenes in the forward markets by purchasing the attacked currency forward against hard currency from bank B:

<i>Tab. 2B-1</i>	Central Bank		Bank A	
	Receipt	Payment	Receipt	Payment
<b>1.Step:</b> <u>Aggressive forward intervention</u> one month forward sale against 30 DM to bank A	100 FF (in one month)	30 DM (in one month)	30 DM (in one month)	100 FF (in one month)

Thereby the central bank has established its forward position while at the same time an unintentional uncovered currency position arises for the contracting bank A. Of course the bank will routinely offset its uncovered position by combining a contrary spot with a swap transaction.

**Step 2:** With bank A covering its open forward position, the speculant matches the spot transaction while the swap part is contracted with bank B:

<i>Tab. 2B-2</i>	Bank A		Bank B		Speculant	
	Receipt	Payment	Receipt	Payment	Receipt	Payment
<b>2.Step:</b> <u>Covering bank A</u> a) spot sale of 30 DM against 100 FF to the speculant b) swap: spot purchase of 30 DM against 100 FF from bank B and re-purchase in one month	100 FF (in two days) <hr/> 30 DM (in two days) 100 FF (in one month)	30 DM (in two days) <hr/> 100 FF (in two days) 30 DM (in one month)	<hr/> 100 FF (in two days) 30 DM (in one month)	<hr/> 30 DM (in two days) 100 FF (in one month)	30 DM (in zwei Tagen)	100 FF (in zwei Tagen)

Thereby the speculant has established his desired long spot position in hard currency. Bank A has transmitted the central bank's intervention from the forward into the spot market. It has, therefore, made available the spot supply in hard currency required by the speculant without the necessity of spot interventions by the central bank.

**Step 3:** Both, the speculant and bank B, invest their spot amounts to earn interest:

<i>Tab. 2B-3</i>	Bank A		Bank B		Speculant	
	Receipt	Payment	Receipt	Payment	Receipt	Payment
<b>3.Step:</b> a) <u>Investment by the speculant</u> one month investment of 30 DM at bank B b) <u>Investment by bank B</u> one month investment of 100 FF at bank A	<hr/> 100 FF (in two days)	<hr/> 100 FF (in one month)	30 DM (in two days) <hr/> 100 FF (in one month)	30 DM (in one month) <hr/> 100 FF (in two days)	30 DM (in one month)	30 DM (in two days)

By that, the speculant reduces his financing costs to a level equal to the inter currency interest rate difference. His speculative return calculation then corresponds to one of an off-balance-sheet forward speculation. For bank B the investment of its spot FF amount is necessary in order to balance the maturity inconsistency between the spot and the forward leg of its swap position.

**Step 4:** The resulting expansion of the non-bank liquidity aggregates have to be refinanced by the central banks:

<i>Tab. 2B-4</i>	Central Bank		Bank A		Bank B	
	Receipt	Payment	Receipt	Payment	Receipt	Payment
<b>4.Step:</b> <b>Refinancing</b> a) refinancing of the DM investment b) refinancing of the FF investment	r(30 DM) <small>(ref. assets)</small>	r(30 DM) <small>(c.b. money)</small>			r(30 DM) <small>(c.b. money)</small>	r(30 DM) <small>(ref. assets)</small>
	r(100 FF) <small>(ref. assets)</small>	r(100 FF) <small>(c.b. money)</small>	r(100 FF) <small>(c.b. money)</small>	r(100 FF) <small>(ref. assets)</small>		

Those refinancing transactions become necessary only in case of investments in assets underlying a reserve duty. The additionally arising demand for central bank money to meet the required additional reserve holdings has to be financed by the central banks. The central banks are even facing a de facto obligation to refinance the speculative investments because of the otherwise automatically occurring excessive interest rate increases in the domestic money markets.

An on-balance-sheet attack, therefore, can successfully be combated by aggressive forward interventions of the central banks. The only difference between the dynamics of forward interventions in speculative off-balance-sheet attacks and forward interventions in on-balance-sheet attacks is the minor expansion of the non-bank liquidity which has to be refinanced by the central banks. Still, the direct money base and reserve effects can be avoided and the cost-taking in the course of an attack is passed on to the speculants. Thereby the inherent self defeating dynamics of speculative attacks is turned against the speculants and not - as with spot intervention strategies - against the intervening central banks.

**Final remarks:** Unlimited forward intervention obligations have proved to be a credible defence mechanism against speculative attacks. For the central banks no costs arise which could finally force them to give up their exchange rate and intervention promise. This credibility itself should be sufficient to prevent the development of speculative attacks. If nevertheless attacks of the markets occur, the central banks with forward interventions will have the power to outplay the speculators. Forward interventions, therefore, prove to be a necessary instrument for the EMS in order to establish a sustainable and credible exchange rate and intervention promise.

**Table 2A: Forward Interventions in Off-Balance-Sheet Attacks (Forward Speculations)**

	Speculant		Bank A		Bank B		Central Banks	
	Receipt	Payment	Receipt	Payment	Receipt	Payment	Receipt	Payment
<p><b>1. Variant</b>  <b>1.Step:</b>  <i>Speculative forward deal</i>                      one month forward sale of 100 FF                      against 30 DM to the central bank</p>	30 DM (in one month)	100 FF (in one month)					100 FF (in one month)	30 DM (in one month)
<p><b>2. Variant</b>  <b>1.Step:</b>  <i>Speculative forward deal</i>                      one month forward sale of 100 FF                      against 30 DM to bank A</p>	30 DM (in one month)	100 FF (in one month)	100 FF (in one month)	30 DM (in one month)				
<p><b>2.Step:</b>  <i>Covering bank A</i>                      a) spot purchase of 30 DM                      against 100 FF from the central bank                      b) swap: spot sale of 30 DM                      against 100 FF to the central bank                      and re-purchase in one month</p>			30 DM (in two days) ----- 100 FF (in two days) 30 DM (in one month)	100 FF (in two days) ----- 30 DM (in two days) 100 FF (in one month)			100 FF (in two days) ----- 30 DM (in two days) 100 FF (in one month)	30 DM (in two days) ----- 100 FF (in two days) 30 DM (in one month)

**Table 2B: Aggressive Forward Interventions in On-Balance-Sheet Attacks (Spot Speculations)**

	Central Bank		Bank A		Bank B		Speculant	
	Receipt	Payment	Receipt	Payment	Receipt	Payment	Receipt	Payment
<p><b>1.Step:</b>  <u>Aggressive forward intervention</u>                      one month forward sale of 100 FF                      against 30 DM to bank A</p>	100 FF (in one month)	30 DM (in one month)	30 DM (in one month)	100 FF (in one month)				
<p><b>2.Step:</b>  <u>Covering bank A</u>                      a) spot sale of 30 DM                      against 100 FF to the speculant                      b) swap: spot purchase of 30 DM                      against 100 FF from bank B                      and re-purchase in one month</p>			100 FF (in two days) 30 DM (in two days) 100 FF (in one month)	30 DM (in two days) 100 FF (in two days) 30 DM (in one month)			30 DM (in two days) 100 FF (in two days)	100 FF (in two days)
<p><b>3.Step:</b>  <u>a) Investment by the speculant</u>                      one month investment of 30 DM at bank B  <u>b) Investment by bank B</u>                      one month investment of 100 FF at bank A</p>			100 FF (in two days)	30 DM (in two days) 100 FF (in one month)			30 DM (in one month) 100 FF (in two days)	30 DM (in two days)
<p><b>4.Step:</b>  <u>Refinancing</u>                      a) refinancing of the DM investment                      b) refinancing of the FF investment</p>	r(30 DM) (ref. assets) r(100 FF) (ref. assets)	r(30 DM) (c.b. money) r(100 FF) (c.b. money)	r(30 DM) (c.b. money) r(100 FF) (c.b. money)	r(100 FF) (ref. assets)	r(30 DM) (c.b. money)	r(30 DM) (ref. assets)		

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