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The road to monetary union in Latin America: An EMS-type fixed exchange rate system as an intermediate step

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W. E. P.

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The Road to Monetary Union in Latin America: An EMS-type fixed exchange rate system as an intermediate step

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October 2010

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The Road to Monetary Union in Latin America: An EMS-type fixed exchange rate system as an intermediate step

Daniel Garcia Rocabado*

October 2010

Abstract

In the light of new political initiatives in Latin America, discussions of expanding the monetary cooperation in the region have intensified and the idea of monetary union is gaining popularity. Since literature on the subject widely dismisses the feasibility of Latin America adopting a single currency in the short- to medium-term, several authors have proposed to follow the European example by establishing a regional exchange rate system, similar to the European Monetary System (EMS), as an intermediate step. While these proposals usually describe the general benefits of an EMS-type system for Latin America, they rarely discuss how such a regional arrangement can institutionally be designed or what the main lessons are, that can be derived from the EMS experience, in order for a Latin American exchange rate system to be successful. Thus, it is the central aim of this paper to address these specific issues by providing a detailed look at the design and functioning of regional fixed rate systems as an intermediate step towards monetary union. For this purpose, first, an overview of the current Latin American initiatives in the field of monetary integration is given, followed by a general analysis of fixed rate systems from an institutional perspective. This analysis presents the basic design choices available to policymakers when creating such a system and describes how the decided upon rules (i.e. the institutional framework) determine the overall monetary adjustment constraints for the participating countries. Further, the paper examines the historic, political and economic rationale as well as the overall institutional design and functioning of a specific fixed rate system, namely the EMS. It is shown that the EMS did not only constitute an efficient monetary arrangement by effectively reducing both nominal and real exchange rate variability in the region, but can also be considered a successful intermediate step towards monetary union in Europe. The paper ends with a discussion of the main lessons drawn from the EMS analysis and their implications for the Latin American prospects of possibly establishing a similar regional exchange rate mechanism.

Keywords: Latin American Integration, Monetary Cooperation, fixed exchange rates, European Monetary System

JEL-classification: F31, F33, F55

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1 Introduction

Despite being able to look back at over 50 years of integration history, success regarding monetary cooperation in Latin America has been very modest. Nevertheless, a variety of recent initiatives in the region are providing new integration impulses, and voices advocating the implementation of a single Latin American currency are getting louder. While a full-fledged monetary union in Latin America might still be a long-term goal at best, the time could be ripe for the implementation of an intermediate step towards monetary unification. Many sources endorsing this option propose following the European example and introduce a regional exchange rate mechanism in Latin America similar to the European Monetary System (EMS) that was established in Europe in the late 1970s. While the advocates of an EMS-type system for Latin America usually describe the general benefits of such an arrangement, little discussion on the different ways in which this intermediate step could potentially be designed and also on what lessons can be derived from the EMS experience in order for a Latin American exchange rate system to be successful, is provided. Despite, or maybe precisely because of the recent developments in the EU, that have cast a shadow on European Monetary Union, an in-depth analysis of the European experience on the road to monetary integration and its lessons for Latin America might prove especially relevant. Thus, the aim of this paper is to assess the effectiveness of a regional exchange rate system as an intermediate step towards monetary union by first presenting the available institutional design options for such a system and then analysing how these institutional features interacted in a specific scenario (i.e. the historical experience of the European countries with the EMS). This detailed institutional analysis of regional fixed rate systems in general and the EMS in particular might provide important lessons and implications for the Latin American prospects of monetary union by way of an intermediate step.

In order to address these aspects this paper will be structured as follows. First, chapter 2 will discuss the general integration developments in Latin America by assessing the degree of already achieved monetary cooperation within a few of the main integration projects in the region, and then describe the Latin American plans for monetary unification as well as the proposals for an intermediate step towards this long-term goal.

This will be followed by chapter 3, in which the proposed intermediate step, a regional fixed rate system, will be thoroughly analysed from an institutional perspective in order to describe the basic design choices available to policymakers when creating such a regional exchange

rate arrangement and show how the decided upon rules determine the overall monetary adjustment constraints for the participating countries in the system. In chapter 4, the economic and political rationale, as well as the design and performance of a specific historical fixed rate system, the EMS, will be analyzed, in order to provide an overall assessment on the effectiveness of regional exchange rate arrangements. Finally, chapter 5 will discuss some of the main implications of the analyses given in chapters 3 and 4 for a possible fixed rate system in Latin America and also point to further research necessary for a specific implementation proposal. Chapter 6 concludes this paper by providing a short summary and some final remarks.

2 Developments in Latin American Integration

2.1 Monetary Integration in Latin America

Since the early 1960s, a number of regional economic and political integration processes involving Latin American countries have developed. They include, in historical order, the Latin American Free Trade Association (LAFTA), which became the Latin American Integration Association (LAIA) in 1980, the Central American Common Market (CACM), the Andean Community (CAN), the Caribbean Community (CARICOM), the Common Market of the South (Mercosur) and more recently the South American Union of Nations (UNASUR) and the Bolivarian Alternative for the People of Our America – People’s Trade Agreement (ALBA-TCP).¹ These regional integration blocs and agreements have launched a variety of initiatives in order to promote intra-regional trade and strengthen macroeconomic convergence among their members. Furthermore, there are parallel proposals like the US-led Free Trade Area of the Americas (FTAA), several overlaps regarding member states as well as countries leaving integration projects and joining others. Chile, for instance, which left the CAN in 1977, has signed free trade agreements (FTA) with the North American Free Trade Agreement (NAFTA) countries, but also has an FTA with Mercosur and has in the past expressed interest in full membership. Venezuela left the CAN in 2006 and has signed a membership agreement to enter Mercosur, although the full membership is still pending on the ratification by the Paraguayan parliament. There is also a series of other bilateral FTAs connecting the countries in the continent. In addition, Mexico, Chile, a part of the CAN

¹ Note that several of the abbreviations and acronyms throughout the section follow the Spanish names in order to keep the widely accepted nomenclature of the different integration schemes.

countries and Mercosur have all concluded or are negotiating FTAs with the European Union (EU), and the CACM has expressed interest in negotiating such an agreement with the EU. In sum, there is a complex set of trade agreements involving Latin American countries and a high degree of uncertainty about the future shape of trade and economic integration within the continent.² Attempting to assess the advisability (i.e. effectiveness and problems) or determine the likelihood of all the different roads to economic integration in the American continent proposed by the diverse agreements and initiatives is well beyond the scope of this section (and paper). Rather, this section will focus on the integration developments specifically regarding monetary and financial cooperation in the region by providing a brief overview of such initiatives promoted by a few of the main and comparatively recent economic and/or political integration projects in Latin America. The examples that will be briefly presented are the two main economic integration agreements Mercosur and CAN, as well as the more recently created and more politically oriented UNASUR and ALBA-TCP:

- The Mercosur was created in 1991 through the Treaty of Asunción. Its founding members are Argentina, Brazil, Paraguay and Uruguay. Since then Bolivia, Chile, Colombia, Ecuador and Peru have become Associate members; as well as Venezuela that is awaiting full membership.³ The Treaty of Asunción provided Mercosur with an individual institutional framework and established the main objective of creating a common market with free movement of goods, services and productive factors until the year 1994, as well as adopting a common external trade policy, coordinating common positions in international forums and coordinating sectoral and macroeconomic policies.⁴ Institutionally, Mercosur is comprised by the Council of the Common Market, the Common Market Group, the Mercosur Trade Commission, the Joint Parliamentary Commission (later the Parliament of the Mercosur), the Economic-Social Consultative Forum and the Mercosur Administrative Secretariat (later the Commission of Permanent Representatives of Mercosur).⁵ Monetary cooperation between members of Mercosur was established in an indirect way by the Treaty of Asunción, which in article 5.b stipulates that macroeconomic coordination is

² The complex co-existence of partly overlapping bilateral and regional agreements, creating important administrative costs for the different economic agents has been dubbed the “spaghetti bowl effect” by Bhagwati, 1995. For a more detailed overview of integration initiatives as well as intra-regional and extra-regional trade agreements in Latin America see Vaillant, 2007; Baumann, 2008.

³ Bolivia and Chile became associate members in 1996, and Colombia, Ecuador, Peru and Venezuela were added in 2003.

⁴ See Treaty of Asunción, article 1, March 26, 1991.

⁵ The institutional structure of Mercosur was established in the Protocol of Ouro Preto, December 1994.

to be attained in a gradual manner. Nevertheless, the Treaty does not establish any instruments or provisions to achieve said coordination. In a meeting of the Economics and Finance ministers together with the presidents of the central banks of the Mercosur countries in 2000, it was agreed that a common compromise regarding fiscal solvency and monetary stability was needed, because Mercosur had suffered from recurrent trade tensions among its member countries that were partly caused by divergent macroeconomic developments and sharp fluctuations in their real exchange rates.⁶ The Macroeconomic Monitoring Group (MMG) was set up in order to harmonize the statistical data of the different member countries (as to make it comparable) and to put forward proposals aimed at strengthening macroeconomic coordination like the creation of indicators. The Mercosur countries started publishing harmonized indicators regarding fiscal deficit, public debt and inflation.⁷ In late 2000, the presidents of the member countries made a joined declaration about the approval of common targets for these variables and the mechanisms of macroeconomic convergence that had been previously established.⁸ Since 2004, the MMG has established a variety of monetary and financial harmonized indicators, which do not have a pre-determined goal but were designed to enable comparative analysis between Mercosur countries.⁹ One recent initiative within the Mercosur has been the Local Currency Payment System (Sistema de Pagos en Moneda Local - SML), which was agreed on in January 2007 in a Presidential Summit of Mercosur. Through the SML, Brazil and Argentina agreed on the use of domestic currencies for bilateral trade. This initiative is intended to fulfill a variety of tasks, for instance assist in dealing with the mismatch of bilateral parities with regard to the USD, and also reduce transaction costs and thus foster regional trade between the two countries. Uruguay and Paraguay have decided to continue using the USD for their transactions, so that

⁶ See Temprano, 2003, p. 71.

⁷ Using these macroeconomic indicators to establish common goals was widely inspired by the convergence criteria in the Maastricht Treaty. See Kenen/Meade, 2008, p.133.

⁸ The agreed upon goals were a ceiling for public debt of 40 percent of GDP by 2010 (with defined convergence paths from 2005 onwards), a ceiling for the fiscal deficit of 3.5 percent of GDP (3 percent from 2004 onwards) and a maximum inflation rate of 5 percent for headline inflation (from 2006 onwards 4 percent for headline inflation and 3 percent for core inflation). For further detail see Presidential Declaration of Mercosur on Macroeconomic Convergence, Florianopolis, December 15, 2000.

⁹ Such indicators are for instance the monetary base and monetary aggregates, as well as statistics concerning loans to the private sector. See Termansen, 2010.

the initiative has remained essentially a bilateral agreement between Argentina and Brazil that started operating in October 2008.¹⁰

- The CAN is an association formed in May 1969 by the Cartagena Agreement and its members are Bolivia, Colombia, Ecuador and Peru. Until 1996 it was known as the Andean Pact. Originally both Chile and Venezuela were member countries but as already mentioned, the former left the Community in 1974 and the latter in 2006. Associate members are Argentina, Brazil, Chile (that accepted the invitation to re-join as an associate), Paraguay and Uruguay. Observer members are Mexico and Panama. The main objective of the CAN is to establish a customs union and in the long-run a common market.¹¹ The collective of bodies and institutions of the CAN is the so-called Andean Integration System, which comprises the Andean Presidential Council; the Andean Council of Ministers of Foreign Affairs; the Commission of the Andean Community; the General Secretariat of the Andean Community; the Court of Justice of the Andean Community; the Andean Parliament; the Business Advisory Council; the Labor Advisory Council; the Andean Development Corporation and the Latin American Reserve Fund (FLAR).¹² Regarding explicit monetary cooperation the Cartagena Agreement called for the harmonization of monetary and exchange rate policies¹³, and also established the FLAR as the financial institution of the region in article 45.¹⁴ In 1997, the CAN set up the so-called Advisory Council of Finance Ministers, Central Bank Presidents and Economic Planning Officers that had the task to develop a procedural framework for further coordination of macroeconomic policies in the region.¹⁵ In 2001, this Council defined macroeconomic convergence criteria on inflation, the fiscal deficit and public debt, and also established a permanent technical group to monitor the realisation of these goals.¹⁶ There have been no further relevant attempts at macroeconomic and specifically monetary policy cooperation in

¹⁰ See *Convenio del Sistema de Pagos en Moneda Local entre la República de Argentina y la República Federal del Brasil*, September 2008.

¹¹ See *Cartagena Agreement*, article 1, May 26, 1969.

¹² See *Cartagena Agreement*, article 6, May 26, 1969.

¹³ See *Cartagena Agreement*, article 51 and 54, May 26, 1969.

¹⁴ The FLAR was originally created as the Andean Reserve Fund with the objectives of providing financing support in the case of balance of payments difficulties, assisting in the management of foreign exchange reserves and contributing in the harmonization of monetary, exchange rate and financial policies of the member states. In 1978 the Andean Reserve Fund changed its name to the current FLAR in order to be able to include member countries outside of the CAN. See Chang, 2000; Ponsot, 2009.

¹⁵ This was done at the IX meeting of the Presidential Council in April 1997.

¹⁶ The agreed convergence objectives of the CAN for each member state, which were also inspired by the Maastricht criteria, where a single digit inflation rate, a ceiling for the fiscal deficit of 3 percent of the GDP and a ceiling of 50 percent of GDP for the public debt. See Temprano, 2003, p.70 for further detail.

the CAN, which has recently experienced severe strain in its integration prospects due to the leaving of Venezuela and the political divergence between its remaining member states.¹⁷

- Following the signing of a free trade agreement by the two largest trading blocs of the region, Mercosur and the Andean Community, together with Chile, Guyana and Suriname; the Cusco Declaration created the South American Community of Nations (CASA) in 2004, which became UNASUR in 2007.¹⁸ The Constitutive Treaty of UNASUR was signed in May 2008 and the Union counts as its members Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela.¹⁹ UNASUR represents a new type of regionalism model that is not focused predominantly on trade issues, since the general objective of UNASUR, established by the Constitutive Treaty, is to build a space for integration and union among its people in the cultural, social, economic as well as the political field.²⁰ The institutional bodies of UNASUR are the Council of Heads of State and Government, the Council of Ministers of Foreign Affairs, the Council of Delegates and the General Secretariat.²¹ Regarding monetary and financial cooperation, the Constitutive Treaty of UNASUR establishes the specific objectives of financial integration through the adoption of mechanisms compatible with the economic and fiscal policies of Member States (article 3f), as well as economic and commercial cooperation (article 3l), but does not stipulate any specific measures to promote monetary cooperation between the UNASUR countries. In 2007 Venezuela proposed the creation of the Bank of the South which was conceived as a development bank to provide financing for economic and social projects within the UNASUR region and was officially established in September 2009 with the signing of an agreement for participation by Argentina, Brazil, Paraguay, Uruguay, Ecuador, Bolivia and Venezuela.²² Another recently proposed initiative is the “Ecuadorian Proposal for a New Regional Financial Architecture”, which was a direct response to the global financial crisis and advises

¹⁷ See Espinosa, 2008, p. 50-51.

¹⁸ See Bennett, 2008.

¹⁹ Note that UNASUR, together with LAIA are the two integration processes that comprise all South American countries.

²⁰ See Constitutive Treaty of UNASUR, article 2, May 23, 2008. See also Baumann, 2008.

²¹ See Constitutive Treaty of UNASUR, article 2, May 23, 2008

²² The Bank of the South is established with an initial authorized capital of 20 billion USD and a subscribed capital of 7 billion USD by the participating countries. Venezuela, Argentina and Brazil contribute 2 billion each, Uruguay and Ecuador 400 million each, and Bolivia and Paraguay 100 million each. See SELA, 2009, p. 59-63.

not only the strengthening of the Bank of the South as an alternative development bank, but also the creation of a Common Reserve Fund and a Regional Monetary Agreement linked to the issue of Regional Drawing Rights and an electronic regional currency.²³

- The Bolivarian Alternative for the People of Our America (ALBA) is an initiative that was originally proposed by Venezuela as an alternative integration process to the US-led FTAA and officially created through the signing of a bilateral agreement by Venezuela and Cuba in December 2004.²⁴ Since then there have been various accession rounds and two modifications to the original name of the integration scheme to reflect the institutional development. With the joining of Bolivia in April 2006 the denomination People's Trade Agreement (TCP for the Spanish initials) was added and in June 2009 the initial term "Alternative" was replaced by "Alliance".²⁵ Official members of ALBA-TCP are Venezuela, Cuba, Bolivia, Ecuador, Nicaragua, Antigua & Barbuda, Dominica and St Vincent & Grenadines. Honduras joined ALBA-TCP in October 2008 but withdrew again through a Honduran Congress decision in January 2010, following the political disturbances in that country.²⁶ ALBA-TCP was conceived to promote integration in Latin America in the political, economic, social, cultural and environmental areas and has established institutional bodies for this purpose, like Ministerial Councils to the different subjects, the Council of Social Movements, the Permanent Political Commission and a variety of committees and working groups.²⁷ In regard to monetary and financial cooperation, ALBA-TCP has launched ambitious initiatives in its short existence, like the Bank of ALBA, that was created in January 2008 as a development bank and possible alternative financial institution to the IMF and World Bank²⁸, as well as the ALBA-Caribbean Fund, which is a structural convergence fund aimed to assist in reducing regional asymmetries and finance infrastructure projects.²⁹ Another initiative is the Unitary System of Regional

²³ See Páez, 2008. The "Ecuadorian Proposal for a New Regional Financial Architecture" is an initiative promoted by the Ecuadorian government as well as the Bank of the South, and will be further described in the next section.

²⁴ See Altmann, 2009, p. 2.

²⁵ The VI Declaration of the Summit of ALBA-TCP, Maracay, June 24, 2009 establishes the new official name as "Alianza Bolivariana para los Pueblos de Nuestra America-Tratado de Comercio de los Pueblos". See SELA, 2009, p. 50-51.

²⁶ See El Financiero, "Abandona Honduras el ALBA", January 12, 2010.

²⁷ For further detail on the institutional framework of ALBA-TCP see Altmann, 2009; as well as SELA, 2009.

²⁸ The starting capital for the Bank of ALBA was set at 1 billion USD, and Venezuela has asked its partners to divert their international reserves from the US to the Bank of ALBA. See Baumann, 2008, p. 18.

²⁹ See Romero, 2010, p. 9-13.

Compensation (SUCRE), which was conceived as an element of a regional monetary zone during the III Summit of ALBA-TCP in November 2008 and officially created with the SUCRE Constitutive Treaty signed by Venezuela, Ecuador, Bolivia, Cuba, Nicaragua (and Honduras) in October 2009. Within the SUCRE, the identically named “sucre” is intended to serve as a virtual currency unit for intra-regional trade transactions between participating countries and to be at the center of the regional clearing system (Cámara Central de Compensación de Pagos), which is designed to allow a multilateral offsetting of liabilities and assets generated in the reciprocal trade transactions.³⁰ The SUCRE agreement stipulates that Non-ALBA-TCP countries are invited to join the SUCRE and start a process of “decoupling” from the USD as means of transaction.³¹ The first transactions in sucre units were conducted in early 2010 between Venezuela and Cuba.³² Within the “Proposal for a New Regional Financial Architecture”, Ecuador has also put forward the possibility of adopting the sucre as the currency unit for the Regional Monetary Agreement.³³ While these described initiatives are all significant steps towards deepening monetary cooperation in the region, it remains unclear how they will develop, since ALBA-TCP is the integration model most reliant on the political affinity of the current heads of state of its member countries.

2.2 Plans of Monetary Unification and Alternatives

As described in the last section, there are a variety of initiatives for the development of further monetary and financial cooperation in Latin America. While the relatively older economic integration schemes Mercosur and CAN have to a degree stagnated in this regard, new impulses are being provided by two recently created and more political connoted integration processes, namely UNASUR and ALBA-TCP. Prompted by these developments, the plan for a common currency in the region has again become popular, as various South American presidents have proposed this goal. Alan García, President of Peru, has put forth the idea of a common currency and citizenship in UNASUR³⁴, while the Ecuadorian President, Rafael Correa, has proposed that a common currency for the whole of South America could be

³⁰ See Constitutive Treaty of the Unitary System of Regional Compensation (SUCRE), Cochabamba, October 17, 2009. Also SELA, 2009, p. 52-55.

³¹ See SELA, 2009, p. 55; Macro Agreement of the SUCRE, April 16/17, 2009.

³² See Romero, 2010, p. 9.

³³ See IADE interview with P. Páez, President of the Presidential Technical Commission of Ecuador for the New Financial Architecture, December 17, 2009.

³⁴ See EL Comercio, “García plantea ciudadanía y moneda común en Unasur”, May 23, 2008.

established through the Bank of the South.³⁵ The Presidents of Bolivia and Venezuela, Evo Morales and Hugo Chávez, have also on several occasions confirmed their intention of pursuing the creation of a monetary union for ALBA-TCP and South America based on the sucre. Lula da Silva, President of Brazil, has stated interest in a common currency for UNASUR as well as one for Brazilian-Argentinean bilateral trade, which has been a project within Mercosur since 1997, when it was proposed by the Presidents at that time Enrique Cardoso and Carlos Menem.³⁶

While it is not the aim of this paper to assess the long-term advisability of the politically desired pursuit of full monetary unification in Latin America, but rather to accept this political desire and analyse a possible intermediate (or alternative) step towards its realization, it will nevertheless be useful to briefly describe the main economic benefits a monetary union could provide for Latin America, since several are shared with the exchange rate system later detailed in this paper.³⁷

The main argument for irrevocably fixing the exchange rates of the participating countries in a Latin American Monetary Union (LMU) would be the resulting elimination of the exchange rate risks and exchange-related transaction costs in intra-regional trade. This would reduce the costs for private companies, facilitate cost accounting of intra-regional trade and improve the overall investment climate in the region. Furthermore a single currency would prevent competitive devaluations (i.e. beggar-thy-neighbour strategies) as well as eliminate currency speculation within the region. The introduction of a single currency would also increase price transparency and could therefore encourage competition and growth. Finally, a common currency for the region could serve as a catalyst for financial market integration, thus fostering growth and contributing in the creation of a larger single market that could provide greater scope for absorbing external shocks.

Despite these benefits there is a large body of economic literature that concludes that a common currency for Latin America (or for one of the specific integration arrangements like Mercosur or CAN) is remarkably undesirable for the time being. This literature is mainly based on the theory of Optimum Currency Areas (OCA), pioneered by Mundell (1961), which establishes criteria relevant for a region to effectively adopt a single currency. Mundell establishes the criterion of factor mobility between the countries in a monetary union as

³⁵ See Pagina/12, “Correa quiere moneda común”, December 11, 2007.

³⁶ See Kronberger, 2001, p. 2; La Nacion, “Impulsan una moneda única para Brasil y la Argentina”, January 15, 2003.

³⁷ The briefly described benefits of monetary union are mainly taken from De Grauwe, 2005, which should be consulted for further detail and assessment of these benefits.

necessary in order to offset the inability of these countries to pursue independent adjustment policies in the face of asymmetrically distributed shocks. Other criteria are for instance trade openness and trade interdependence among the countries (Mckinnon, 1963), as well as the degree of product or industry diversification of a country (Kenen 1969). Regarding the analysis for Latin America, De Grauwe (2005) lists three different factors that determine whether a monetary union would be suitable for the region: the degree of economic integration between the prospective members of the union, the degree to which these countries' economies are subject to asymmetric shocks and the degree of flexibility in the labor markets. De Grauwe (2005, p. 110-112) concludes that Latin America is far from being an OCA. Other studies are for instance Hochreiter et al. (2002), who add the precondition of a sound financial sector to the analysis and find that Latin America is currently unsuited for monetary union; or Kronberger (2001), who focuses on Mercosur and determines a low degree of trade openness and integration, as well as a low level of labor mobility that would not sufficiently compensate for asymmetric shocks in the case of a currency union. Similar results are given by Calderon et al. (2003) and Larrain/Tavares (2005), who indicate that the degree of synchronization of output movements is still quite low in the region.³⁸ Furthermore, Edwards (2006) states that the prerequisites for joining a currency union may have increased to include the following (in addition to those mentioned above): different (or diversified) composition of output and trade across countries, price and wage flexibility across members of the union, similar inflation rates across countries, absence of "fiscal dominance" in the individual countries, as well as low – and similar – levels of public-sector debt in the different countries. All these studies state the unsatisfactory degree of economic integration and policy coordination in the region, which leads to a high susceptibility in regard to external financial and economic shocks and, according to the authors, makes full monetary unification unfeasible in the near future.

Nevertheless, the general argument for a stabilization of intra-regional exchange rates remains valid, since a large number of studies attribute the lack of trade and financial integration to the high degree of exchange rate volatility in the region, which is partly caused by the instability

³⁸ Other Studies that find insufficient evidence for monetary union viability are for instance Cardim, 2004, who analyses the possibility of a Brazilian-Argentinean single currency; Espinosa, 2008, who analyses monetary union for both Mercosur and CAN and proposes dollarization as an alternative; Peña/Flores, 2006, for CAN; Foresti, 2007, for whole Latin America; Berg et al., 2002, propose dollarization; Arestis et al., 2002, for Mercosur.

of the USD (see Figure 1).³⁹ The volatility of bilateral exchange rates does not only undermine intra-regional trade, but can also exacerbate political tensions within the specific integration schemes due to abrupt changes in competitiveness.⁴⁰ The proposal of intra-regional exchange rate stabilization through coordination is also in line with the literature on the endogeneity of the OCA criteria which argues that, contrary to the conventional wisdom of OCA theory (i.e. that countries would only consider a common currency if they showed high levels of economic integration), there is reason to believe that exchange rate coordination and a step forward in the direction of monetary union could endogenously encourage economic integration within the region.⁴¹ While it might be too early to viably establish a monetary union in Latin America due to economic (and possibly also political) reasons, a regional exchange rate fluctuation band system could provide the exchange rate stability needed to encourage trade and at the same time allow for the possibility of monetary and exchange rate policy adjustments in accordance with the macroeconomic differences still present between member states.⁴² Thus, setting up such a system could not only provide an effective option for an intermediate step towards monetary integration, but also a possible long-term alternative if sufficient convergence for full monetary unification is not reached. Several authors propose variations of this type regional exchange rate mechanism as a gradual approach towards monetary union or at least further monetary integration, which would be fairly similar to the European Monetary System that was adopted as an intermediate step in the European monetary integration process.⁴³ The already mentioned “Ecuadorian Proposal for a New Regional Financial Architecture” also follows this line of thought and aims at setting up a Regional Exchange Rate Mechanism for Latin America in the medium-term.⁴⁴

While all these sources champion the general possible benefits of establishing a regional exchange rate mechanism for Latin America and recommend its implementation, they do not discuss two important aspects in need of analysis before such steps should be taken. These

³⁹ See Bersch, 2002; Scandizzo, 2003; Medina, 2004; Arize et al., 2005; Moccero/Winograd, 2005; Machinea/Rozenwurcel, 2005; Ugarteche, 2008; Campos, 2009.

⁴⁰ See Machinea/Rozenwurcel, 2005, p. 45-46.

⁴¹ See Frankel/Rose, 1998; Rose, 2000; Rajan, 2002; Fritz/Mühlich, 2006; Agénor/Aizenman, 2008.

⁴² See Ugarteche, 2008, p. 21.

⁴³ Authors that propose a possible regional exchange rate arrangement in line with the type of a exchange rate fluctuation band system analysed in this paper are for example Medina, 2004; Moccero/Winograd, 2005; Machinea/Rozenwurcel, 2005; Ugarteche, 2008; Campos, 2009; Bresser-Pereira/Holland, 2009. Note also the large body of literature discussing similar fixed rate systems for the East Asian integration process. While the macroeconomic conditions of East Asia and Latin America might widely differ, the literature on the subject nevertheless sheds light on the economic rationale behind the implementation of a regional exchange rate mechanism. See for instance Williamson, 2005; Murase, 2007; Chey, 2008; Chai, 2010.

⁴⁴ See Páez, 2008.

are, 1) how the institutional framework (and its constitutive elements) of such an exchange rate arrangement between countries could be designed, i.e. what different basic choices regarding the institutional features of the system would have to be considered and made by policymakers; and 2) how the mechanism might actually function in reality depending on its agreed upon institutional design. Thus, and in accordance with the stated primary aim of this paper to provide a detailed look at an optional intermediate step towards monetary unification in Latin America, the next two chapters of this paper are intended to shed a light on both these issues that are of central relevance for the practical design and implementation of a regional exchange rate arrangement. The third chapter of this paper will provide a detailed analysis of regional exchange rate systems from an institutional perspective and present the different design elements policymakers will have to decide upon before implementation, since these essentially determine the overall functioning of the system. Chapter four will then take an in-depth look at one of the most relevant regional exchange rate arrangements in recent history, the European Monetary System, in order to analyse how such a system with a specific institutional design might actually work, whether or not it was successful and what lessons can be learned from the European experience on the road towards monetary union.

3 Fixed Exchange Rate Systems: An Institutional Analysis

3.1 Overview

The aim of this chapter of the paper is to provide a general analysis of fixed exchange rate arrangements between various sovereign countries from an institutional perspective.⁴⁵ This type of international/regional arrangement, that has the main objective of providing exchange rate stability for its participating countries, will be referred to in broad terms as a fixed rate system and specified by its institutional features.

Since the institutional design of fixed rate systems has, throughout history, essentially remained an issue of practical policy, the available economic literature that is concerned with the theoretical analysis of the basic institutional and systemic aspects of fixed rate systems is very scarce. While there is a large array of theoretical and empirical work that deals with specific historic fixed rate systems (e.g. the Bretton Woods System or the EMS) and analyzes the implications of the agreed upon rules for the member countries, the authors that address

⁴⁵ An institution within the context of this paper is defined in a broad sense as “the rules [...] or devised constraints that shape [...] interaction”, see North, 1991, p. 3.

the general nature of institutionalized fixed rate systems and their constitutive features are very few.⁴⁶ Furthermore, the vast existing literature on exchange rate target zones⁴⁷ (or “currency bands”), which share various institutional elements with the general type of fixed rate system analyzed in this paper, also offers little guide on the institutional choices policymakers have to make in order to implement such a system, but rather assumes the institutional framework (e.g. the existence of the fluctuation band, its width, etc.) as exogenous.⁴⁸

Thus, it is one of the intentions of this paper to contribute in filling this void in economic literature and provide a comprehensive analysis of the institutional design choices available to policymakers when creating an international/regional fixed exchange rate system that can possibly serve as an intermediate step towards eventual full monetary integration. Following this basic premise, section 3.2 will first describe some general aspects regarding symmetry and policy coordination in fixed rate systems, after which section 3.3 will then provide a detailed analysis of possible design options for the institutional framework and also a short typology of different design configurations for the system. In section 3.4 the relevance and effects of the size of a country participating in the system will be detailed. Finally, in section 3.5 a summary of the overall functioning and resulting adjustment constraints of the institutional design of the fixed rate system will be provided.

3.2 General Aspects and Policy Coordination

An institutionalized fixed rate system is established by its inherent economic mechanics and functioning, the so called “rules of the game”.⁴⁹ The “rules of the game” describe the effects and adjustment constraints on the member countries of a fixed rate system, which are a direct result of the system’s institutional design structure interacting with the prevailing conditions of the capital and foreign exchange markets. The institutional framework of the system, established by the basic set of regulatory features and their specific design, therefore

⁴⁶ Because of the scarcity of relevant literature, the basic design choices regarding the institutional framework of fixed rate systems that are described in this paper stem from the works of Miller et al. (1989) and McKinnon (1993), which attempt to provide systemic comparative analysis’ of fixed rate systems, and especially from Bofinger (1991) as well as Vehrkamp (1995), who generally adopts Bofinger’s terminology and basic elements.

⁴⁷ The “target zone” concept is coined and developed by Williamson (1985) and later adopted and theoretically formalized by the standard model of Krugman (1991). For comprehensive surveys of target zone work see Krugman/Miller (1992) and Kempa/Nelles (1999)

⁴⁸ Exceptions, which are also used for the institutional analysis of fixed rate systems attempted in this paper, are for example Williamson (1985), Frenkel/Goldstein (1986) and Williamson/Miller (1987).

⁴⁹ This terminology is originally attributed to J.M. Keynes (1925, p.220), who describes the monetary adjustment measures of the Bank of England as the “rules of the gold standard game”. See also McKinnon, 1993, who uses the term to systematically describe the economic mechanics of historical fixed rate systems.

determines the system's symmetry characteristics (i.e. the allocation of monetary adjustment pressures among the participating countries resulting from the commitment to create exchange rate stability). A fixed rate system can be designed to asymmetrically burden either the strong currency countries (i.e. the countries whose currencies revalue beyond the allowed scope of the system's rules) or the weak currency countries (i.e. the countries whose currencies devalue beyond the allowed scope of the system's rules) or to be symmetrical in the distribution of adjustment constraints.⁵⁰ While the symmetry criterion is used throughout the following analysis of the institutional framework of fixed rate systems to describe the distribution of macroeconomic effects generated by the individual institutional features, it is only through the interaction of all the specific symmetry characteristics of these individual rule components that the overall symmetry characteristics of the system are determined.

While the basic function of a fixed exchange rate system is the stabilization of exchange rates, it also serves as a mechanism that provides a coordination structure for the national monetary policies of member states.⁵¹ This coordination can occur indirectly, through the policy adjustment constraints established by the basic institutional rules and framework of the system, and/or also through a direct coordination of policy measures by the system's participating countries intended to achieve the monetary convergence necessary for the stabilization of the exchange rate relations.⁵² Although this paper focuses mainly on the basic institutionally established rules that constitute fixed rate systems in general and which lead to a primarily indirect coordination of policy through the adjustment constraints of the system, it cannot be denied, that a certain amount of direct coordination between member countries might prove indispensable in order to successfully manage a regional fixed rate system. This necessity is shown in chapter 4 of this paper, which details the functioning of a specific fixed rate system, the EMS.

3.3 Basic Institutional Features

A fixed exchange rate system is constituted by a set of rules, intended to stabilize the exchange rate fluctuations of the system's member currencies within a predetermined band. For each of these basic regulatory features, which together constitute the institutional framework of the fixed exchange rate system, there are several possible design options.

⁵⁰ See Vehrkamp, 1995, p. 11.

⁵¹ See Bofinger, 1988, p. 317.

⁵² See Bofinger, 1991, who differentiates between "simple fixed rate systems" that trigger merely indirect monetary policy coordination, and "complex fixed rate systems" that establish mechanisms for direct monetary policy coordination.

Therefore an assessment of the mechanics and working of the system as a whole can only be made once the specific rules of the system are established, since certain types of intervention rules can have varying effects on the macroeconomic adjustment constraints and their symmetry when combined with different types of financing rules for said interventions. In the following subsections, the general institutional features and the alternatives for their respective design will be described. Subsection 2.3.5 will then present a short overview of different types of fixed exchange systems that are constituted by a specific combination of feature arrangements.⁵³

3.3.1 Intervention Rules

The intervention rules of the fixed exchange rate system establish the mechanism and the circumstances under which the participating central banks commit to intervene in the foreign exchange market in order to stabilize exchange rates. Before the different institutional features, which together establish the intervention rules, are described, some basic aspects regarding foreign market interventions that are relevant in the scope of this paper must be noted. A central element in this analysis is the assumption that foreign market interventions can effectively influence the exchange rate.⁵⁴ Given this premise, once a country performs an intervention in the foreign exchange market in order to influence the market exchange rate, two different effects result:

- Liquidity effects that are determined by the changes in the countries' monetary bases, which result from selling/buying currencies in the foreign exchange market. For instance, if a country intervenes by selling its own currency A on the foreign exchange market against currency B assets, this transaction has an expansionary effect on its own monetary base and at the same time reduces the monetary base of the country issuing currency B.⁵⁵ Identical liquidity effects result if country B purchases its own currency by providing its currency A reserves to the market.
- Reserve effects, defined as changes in the foreign exchange reserves of a country due to intervention. By acquiring currency B assets against its own currency, country A increases its foreign exchange reserves. The reserves of country B on the other hand

⁵³ The described features of fixed exchange rate system as well as the terminology are mainly borrowed from Bofinger, 1991.

⁵⁴ While this premise is not uncontested in economic literature, see for instance Schwartz, 2000; it is still consistent with recent empirical studies, see Fatum/Hutchison, 2002; Fatum/Hutchison, 2003; as well as the literature on managed floating, see for instance Bofinger/Wollmershäuser, 2001.

⁵⁵ Note that the liquidity effects may vary depending on how the purchased or sold assets were previously invested. See section 3.3.3.

decrease if it intervenes by buying its own currency against its previously accumulated currency A reserves.

The distribution of the liquidity and reserve effects resulting from institutionally established intervention obligations, as well as the adjustment constraints for the member countries resulting from these effects, is a main aspect in the analysis of the functioning of the exchange rate mechanism stipulated by the institutional framework of the fixed rate system. Thus, the intervention rules are, together with the institutional features designed to finance interventions, the core of the exchange rate mechanism of the fixed rate system. These rules are configured by the design choices concerning the exchange rate standard, the central parities, the width of the fluctuation band and the intervention points.

3.3.1.1 Exchange Rate Standard

The choice regarding the type of exchange rate standard under which the system's intervention rules operate, has crucial implications regarding which of the participating central banks is obliged to intervene. While the resulting distribution of intervention obligations between the member countries influences the general symmetry of the fixed rate system, an opposing composition of the fluctuation band width and/or the intervention points can still (over-) compensate this influence, and therefore change the overall adjustment constraints for the system's participants. Nevertheless, the choice of the standard implies an important initial indication of the intended symmetry characteristics for the system.⁵⁶ There are three possible design options for the exchange rate standard:

- The first option is the so-called *key currency standard*, which is characterized by each of the $n-1$ participating countries establishing a bilateral rate of their currency towards the (n -th) key currency and having to defend this parity (with an allowed degree of fluctuation within pre-established intervention margins) through foreign exchange market interventions. It is evident that under this institutional premise only the non-key currencies can reach the intervention points and be subject to compulsory interventions, since the key-currency cannot, by definition, deviate from its own (implicit) parity.⁵⁷ Due to this passive role, the key currency country is not affected by any monetary adjustment constraints that could result from the liquidity and reserve effects due to being forced to intervene in the foreign exchange market. The key currency standard is therefore by design inherently asymmetrical, because the ($n-1$)

⁵⁶ See Vehrkamp, 1995, p. 15.

⁵⁷ See Bofinger, 1991, p. 93-94.

non-key currencies are burdened with the entirety of the intervention obligations, while the (n-th) key currency is institutionally guaranteed by rule the remaining monetary degree of freedom.⁵⁸ Furthermore, in a key currency standard the implicit fluctuation bands between fellow non-key currencies are twice as wide as the fluctuation band institutionally established for a non-key-currency around the key currency parity.⁵⁹

- In the second type of exchange rate standard, each member country establishes fixed parities for its currency toward every other currency of the system, thus creating a so-called *bilateral parity grid*. With n currencies participating, this results in $n(n-1)/2$ bilaterally established central rates that have to be defended through mandatory interventions, due to the fact that every currency commits to stabilize its bilateral rates vis-à-vis all other member currencies, not just one key currency.⁶⁰ Thus, in contrast to the key currency standard, in a parity grid standard all participant currencies formally possess an equal status in the fixed rate system. A system using a bilateral parity grid is, at least in a formal sense, expected to be characterized by a symmetric distribution of intervention obligations between countries with strong and countries with weak currencies, since the construction of bilateral central rates entails that a weak currency reaching its lower fluctuation margin automatically means the strong currency is at its upper margin.⁶¹ Nevertheless, as mentioned above, the de facto characteristics of the system regarding the symmetry of adjustment constraints also depend on the design of the remaining institutional features.
- A third possible option is using a *currency basket* as the standard for the central parities in the fixed rate system.⁶² A currency basket is composed by fixed absolute amounts of all participating currencies⁶³, therefore assigning each currency a certain weight in the basket, which can for example be based on the relative economic size of

⁵⁸ See Vehrkamp, 1995, p. 15.

⁵⁹ For formal prove see Bofinger, 1991, p. 200-202.

⁶⁰ See Vehrkamp, 1995, p. 16.

⁶¹ See Bofinger, 1991, p. 96.

⁶² In order to better describe the basic mechanics and symmetry effects of the currency basket standard it is hereafter assumed, that the basket is solely composed of currencies participating in the fixed rate system, although different types of compositions are obviously conceivable. For instance a basket composition that also includes the currencies of major trading partners that do not participate in the fixed rate system might be a possibility.

⁶³ This type of basket value construction follows the “standard basket technique”, used for example in the conception of the European Monetary Unit or the SDR of the IMF. Other methods like the “adjustable basket technique” or the “asymmetrical basket technique” are also conceivable, for further detail see Sommer-Herberich, 1983, 325-329.

the currency's country in the system. Since a currency's exchange rate vis-à-vis the basket currency is the weighted average of its bilateral exchange rate vis-à-vis the individual currencies participating in the basket, it follows that whenever a bilateral exchange of two currencies in the basket change, their relative weight changes and the exchange rate of the basket currency against all participating currencies changes as well.⁶⁴ This makes the implications for the symmetry characteristics of a currency basket standard, regarding the intervention obligations, a lot more complex than those of the other standards, since it is possible that contradictory exchange rate fluctuations of an individual currency towards other currencies in the system compensate each other and consequently are not reflected in its basket rate. In general, the distribution of the intervention obligations in a currency basket standard primarily burdens those currencies which deviate the most from the average (of all participating currencies), defined by the basket composition, because these reach their compulsory intervention points earlier than currencies that follow an "average exchange rate trend".⁶⁵ Also, currencies with a relatively small weight in the basket can fluctuate more before reaching their intervention rate, since their impact on the basket parity is smaller.⁶⁶ Another particularity of a currency basket standard lies in the fact that, assuming identical exchange rate fluctuations and band widths, the intervention margins are reached at a much later point in time compared to the key currency and parity grid standards. This is due to the fact that a depreciation (or appreciation) of a member currency vis-à-vis all other basket currencies is only partially mirrored in its basket rate, the degree of which is dependent upon the weight the currency counts for in the basket. Thus, the implicit fluctuation bands around the bilateral cross-rates between member currencies are wider than the established band of the individual currencies around the central parity towards the basket currency.⁶⁷

3.3.1.2 Central Parities

The second necessary design detail of the intervention rules concerns the establishing of the central parities. Regardless of which type of exchange rate standard is chosen, it is imperative for the design of the fixed rate system to explicitly establish the level at which the bilateral central parities will be set. The central parities can be decided upon by using a variety of

⁶⁴ See Fuchs, 1989, p. 41-42.

⁶⁵ For further detail, as well as a numerical example, see Bofinger, 1991, p. 97-102.

⁶⁶ See Sommer-Herberich, 1983, p. 338-339.

⁶⁷ For further detail see Bofinger, 1991, p. 99-100, 201-2002.

possible normative models to define the “correct” equilibrium exchange rates⁶⁸, although none is completely unproblematic, or by referring to a “consensus forecast”, consisting of the average of the results obtained from different estimation procedures.⁶⁹ Alternatively the central rates can be established by simply adopting the given bilateral market rates at the time of the fixed rate system’s inception.

A fixed rate system can also establish rules that allow and stipulate adjustments of the central parities in order to avoid misaligned central rates due to changes in the real macroeconomic conditions of member countries; section 2.3.4 describes how such a central rate adjustment mechanism can be designed.

Furthermore, it is assumed that in order to create transparency and to stabilize market expectations, the central parities (as well as the entire institutional framework of the system) of the fixed rate system are announced to the public.⁷⁰

3.3.1.3 Width of the Fluctuation Band

Another important institutional aspect of the intervention rules that has to be defined, is the width of the fluctuation band of the fixed rate system. The band width establishes the margins around the central parity within which the exchange rates of the participating currencies can fluctuate freely. Therefore, the choice regarding the width of the fluctuation band equals the choice about how much the exchange rate flexibility should be restricted by the fixed rate system.⁷¹ The band should be wide enough to accommodate short-run disturbances that do not alter long-run equilibrium real exchange rates.⁷² A too narrow fluctuation band would lack an adequate “buffer” that “not only guards against costly shifts in resources due to excessively frequent changes in central rates but also provides the authorities with breathing space to sort out permanent from transitory shocks” (Frenkel/Goldstein, 1986, p. 40-41). Generally, there are several reasons as to why accommodating these transitory shocks within the band margins is preferable to central rate realignment: to avoid giving the market misleading signals for resource allocation, to avoid lessening the market confidence in the probability of an impending rebound of the exchange rate, and to allow for an instantaneous initial adjustment

⁶⁸ For an overview of exchange rate theories, as well as models and assessments to define equilibrium exchange rates, see Isard, 2007.

⁶⁹ See Frenkel/Goldstein, 1986, p. 36.

⁷⁰ For a discussion on the merits of policy announcement regarding exchange rate bands see Williamson, 2000, p. 49-50. Theoretically conceivable alternatives to an announced system, like for instance the “quiet band” advocated by Goldstein (1995), will not be discussed in the scope of this institutional analysis.

⁷¹ See Pohl, 1985, p. 91.

⁷² See Frenkel/Goldstein, 1986, p. 40.

to a shock.⁷³ How wide the band is required to be to fulfill this purpose, “depends on how large the interest rate differentials likely to be needed to provide autonomy of domestic action [are]” (See Williamson, 1985, p. 66). Furthermore, the band should be wide enough to account for the uncertainties that arise, as mentioned above, in calculating and establishing the “correct” central parities.⁷⁴ Another factor that requires consideration is speculation, since a very narrow band is much more vulnerable to exchange rate crises and can make speculation regarding the future spot rate a “one-way bet” if the need for a central rate adjustment has become evident.⁷⁵ In order to avoid the bankable promise of self-fulfilling “one-way” speculation, the margins should be wide enough to allow for the newly adjusted central rate to fall within the original band or to provide an overlap of the new and old fluctuation band in the case of central rate realignments. Overlapping bands reduce the predictability of the future spot rate for speculators, because the new spot rate (within the new band) does not necessarily have to lie outside the margins of the old band.⁷⁶ While all of these criteria focus on the necessity of choosing a “wide-enough” fluctuation band, it is also obvious that the band is still required to be sufficiently narrow, so that the aim of stabilizing exchange rates through the fixed rate system remains credible. As noted earlier while discussing the basket currency standard, it is worth considering, that the established fluctuation band width around the central parity can be very different from the implicit widths of the bands between the member currencies, depending on which exchange rate standard is chosen.⁷⁷ Finally, when establishing the fluctuation margins, choices can be made about whether or not the band should be symmetrical (i.e. equal margins around the central parity), the band width should be constant over time (i.e. not adjust depending on the nature and frequency of the disturbances) and if the band width should be the same for all participating currencies.⁷⁸

3.3.1.4 Intervention Points

A crucial design element, which is tightly related to the construction of the fluctuation margins for the participating currencies, is the definition of the actual intervention obligations (i.e. the specific intervention points) to keep the currencies within the established band. If a currency reaches its intervention point, the fixed rate system’s intervention rules are triggered, so it has to be specified if the compulsory intervention point will lie at the upper or lower

⁷³ See Williamson, 1985, p. 66

⁷⁴ See Frenkel/Goldstein, 1986, p. 41.

⁷⁵ See Bofinger/Gerberding, 1988, p. 217.

⁷⁶ For further detail see Vehrkamp, 1995, p. 16.

⁷⁷ For an analysis of implicit fluctuation margins for different standards, see Sommer-Herberich, 1983.

⁷⁸ See Frenkel/Goldstein, 1986, p. 41-42.

margin of the band, or possibly at both margins. Provided that the commitment to action lies at the lower intervention point, which describes the minimum exchange rate of a currency within the system, then the country whose currency has devaluated until it has reached its lower limit is obliged to intervene in the foreign exchange market by purchasing its own weak currency (using its reserves of strong currency), in order to prevent further depreciation. On the other hand, if the commitment to action lies at the upper intervention point, which in turn describes the maximum rate of a currency within the system, then the strong currency country must intervene to prevent further revaluation of its currency by selling it against the weak currency.⁷⁹ The choice regarding the construction of the intervention points can therefore also be seen as the choice regarding whether the strong or the weak (or both) currency's central bank has to intervene in order to keep the system's currencies within the fluctuation band.

As noted, the intervention points can be constructed in a symmetrical or asymmetrical way. Symmetry regarding the intervention points is given, if the obligation to intervene is established for both the upper and lower point of intervention, and if these are set in the same distance from the bilaterally defined central parity (i.e. a symmetrical fluctuation band). The intervention points can also be constructed in an asymmetrical fashion if the compulsion to intervene exist exclusively at either the upper ("soft currency version") or at the lower ("strong currency version") band margin, or if the band is build in an inherently asymmetrical way, through differently distanced upper and lower margins from the central rate.⁸⁰ Another possible asymmetric construction of the intervention points is by establishing different margins (i.e. different band widths) for participating currencies. Finally, it is also theoretically conceivable to establish a fluctuation band without creating compulsory intervention points, but this type of "monitoring band"- system will not be a part of further analysis within the scope of this work.⁸¹

When considering the construction of a system based on intervention points set at the upper margin, lower margin or both margins, it is necessary to determine if such a framework is possible/recommendable for the given currency standard of the system.

For instance, in a system based on a key currency standard, symmetrical intervention points should be constructed, since a "one-sided" intervention commitment for the non-key currency

⁷⁹ This definition of the "upper" ("lower") intervention point as the maximum (minimum) exchange rate a strong (weak) currency is allowed to appreciate (depreciate) to within a fixed rate system is used throughout this paper regardless of the actual used exchange rate quotation. This distinction applies also in reference to "upper" ("lower") fluctuation band margin.

⁸⁰ See Vehrkamp, 1995, p. 17.

⁸¹ For an analysis of "monitoring bands" and "soft buffer"-systems, see Williamson, 1998; Williamson, 2000; and Corrado et al., 2003.

country at only the lower (or upper) margin would mean that a revaluation (devaluation) vis-à-vis the key currency would not be met by any intervention obligation to keep the currency within the fluctuation band. Thus, the characteristics of a fixed rate system would merely be given in one direction from the central parity.⁸²

In the basket standard system, the currencies reach their fluctuation margins at different times depending on their weight in the basket and how much they deviate from the “basket average”. A “one-sided” intervention obligation could therefore lead to a participating currency crossing its established upper (or lower) margin long before another currency reaches its lower (upper) compulsory intervention point. As a result, in a basket currency standard, the intervention points should be established for both the upper and lower fluctuation margin, in order to avoid the possibility of a currency (with a small weight in the basket) deviating widely from its central parity before an intervention obligation arises for a fellow member currency.⁸³ But even with “two-sided” intervention obligations, a currency basket standard has an inherently asymmetrical nature, because, as noted above, currencies have different implicit fluctuation margins, depending on their weight in the basket.⁸⁴

Because of the symmetric structure of the bilateral parity grid standard, in which two currencies reach their bilateral margins simultaneously, a construction of both asymmetric (upper or lower margin) or symmetric (both margins) intervention obligations is possible in order to keep the member currencies’ fluctuation within the pre-established band.

3.3.1.5 Intramarginal Interventions

As a final component of the intervention rules of a fixed rate system it has to be established whether or not (or under what conditions) the participating countries are allowed to intervene in the foreign exchange market while their currencies are still within the fluctuation band and have not reached their mandatory intervention points. These so-called intramarginal interventions allow member countries to stabilize their exchange rate even before they are institutionally compelled to do so and can therefore be used to strengthen the stabilization process of the system, especially if the fluctuation band of the system is very wide.⁸⁵ In addition to this, intramarginal interventions allow weak currency countries, which were obliged to intervene due to transitory shocks, to replenish their foreign exchange reserves

⁸² Although such a mixture of a fixed and flexible exchange rate system is certainly theoretically possible it shall not be considered in this analysis. See Bofinger, 1991, p. 104-105.

⁸³ See Bofinger, 1991, p. 105-106.

⁸⁴ See Sommer-Herberich, 1983, p. 337-341.

⁸⁵ See Bofinger, 2004, p. 11.

once their currencies move within the band again.⁸⁶ While these are clear advantages, problems from intramarginal interventions could arise if these are allowed to be performed in a discretionary way by member countries, since this would increase the risk that individual countries may try to improve their competitiveness by devaluating their currencies through interventions or that several countries perform directly opposing intramarginal interventions. Also, if country A performs non-coordinated intramarginal interventions in the currency of fellow member country B, it could lead to the latter being forced to compulsory intervention vis-à-vis a third party's currency, therefore affecting the systemic adjustment pressure for country B. Due to these problems, if intramarginal interventions are allowed within the institutionalized fixed rate system, it may be recommendable to stipulate a framework for the coordination of intramarginal interventions.⁸⁷ Finally, since intramarginal interventions have the same liquidity and reserve effects as mandatory interventions, the fixed rate system's framework could also stipulate financing rules (credit facilities and asset settlement obligations) for intramarginal interventions.

3.3.2 Intervention Financing Mechanism

After defining the intervention rules of the fixed exchange rate system, it is required to establish the corresponding mechanism of intervention financing. While the intervention rules dictate the distribution of the intervention obligations and the technical process of intervening in the foreign exchange market, the financing rules provide an institutional framework that stipulates how the intervention commitments can be upheld through credit and settlement rules. Due to the possible random nature of currency crises, it is also necessary to establish intervention financing mechanisms in order to avoid a completely accidental and conceivably unsustainable distribution of adjustment constraints resulting from the liquidity and reserve effects of compulsory foreign market intervention.⁸⁸ The design of the financing mechanisms can have a decisive impact on the overall symmetry characteristics of the fixed rate system's adjustment obligations. Even if the intervention rules are formally conceived in a symmetrical fashion, these can be offset by an asymmetrical design of the corresponding financing rules. When analyzing the intervention financing mechanism of a fixed rate system, it has to be distinguished between two elements, the credit facilities and the settlement obligations. Even

⁸⁶ This is a very important aspect since a country's lower margin intervention capability is limited by the size of its reserves.

⁸⁷ See Bofinger, 1991, p. 147-148.

⁸⁸ See Vehrkamp, 1995, p. 17.

though both features share similar design details, they refer to very different facets of intervention financing and will therefore be described separately.

3.3.2.1 Credit Facilities

For a fixed rate system that establishes compulsory interventions at the lower fluctuation margin, appropriate credit facilities have to be defined in order to relax the budget constraint the weak currency country faces when fulfilling its intervention commitment. The budget constraint results from the fact that a country, whose currency has reached its lower intervention point and that is therefore obliged to intervene in the foreign exchange market by purchasing its own weak currency and supplying the strong currency to the market, can only do this according to the funds of strong currency reserves at its disposal. Because of this limited amount of freely available intervention assets, the fixed rate system's commitment to defend a currency's exchange rate at its lower intervention point can only be perceived as credible (from the markets perspective) if the country obliged to intervene is provided with an adequate access to intervention assets beyond its strong currency reserves.⁸⁹ While the weak currency countries can attempt to secure extra intervention assets through the private capital markets, the fixed rate system can also create institutionally established credit facilities that are able to guarantee an unlimited short-term strong currency intervention potential, which can only be provided by the strong currency's central bank itself through granting credit facilities to the weak currency's central bank for lower margin interventions. As an alternative to a direct credit facility from the strong currency country to the weak currency country, the credit mechanism of the system can also be run through a separate institution created by the system's participants for this purpose and endowed with the necessary funds.⁹⁰ To which extent the budgetary constraint of limited intervention assets is loosened, depends on the way that the conditions of the credit facilities of the system are structured. The conditions that have to be established are the overall amount and maturity of the credit facility, as well as the interest rate and the denomination of the assets used for repayment:

- The agreed upon conditions concerning the amount and the maturity of the credit facilities granted to the weak currency country have a determining effect on the overall credibility of the intervention commitment at the lower intervention point. From the markets' perspective, strong restrictions regarding the amount and maturity of the credits would essentially re-establish the budgetary limitations of the weak currency

⁸⁹ See Vehrkamp, 1995, p. 18.

⁹⁰ See Bofinger, 1991, p. 90.

country and therefore drastically reduce the credibility of the exchange rate defense in case of a currency crisis. This would inevitably lead to speculation and an eventually necessary exchange rate adjustment corresponding to the market pressure. However, a guarantee of unlimited mutual credit facilities between participating countries might also appear implausible from the markets' point of view, due to the expansionary liquidity effects that the creditor central bank would have to face as a result from credit-financed interventions of the debtor central bank.⁹¹ If the expansionary effects on the monetary base of the strong currency country caused by the interventions exceed its sterilization potential, an unlimited credit facility may become unsustainable from a monetary policy standpoint (especially if the strong currency country is committed to maintaining price level stability).⁹² This would lead the markets to assume an eventual "opting-out" of the strong currency country from the intervention mechanism and thus create credibility problems for the fixed rate system as a whole. Altogether, credit facilities should be designed to provide credibility for the intervention promise (of the weak currency country) at the lower intervention point while also being sustainable for the strong currency country from a monetary policy perspective.

- The agreed upon interest rate, as well as the denomination of the assets used for the repayment obligation, also play an important role when defining the design elements of the credit facilities, since they determine the cost of the granted credits for the weak currency country and the allocation of the exchange rate risk connected with the credit.

Overall favourable credit conditions, like long settlement periods and low interest rates, allow the weak currency country to not having to immediately adjust its domestic policy when accumulating liabilities towards creditor countries, since it has ampler scope to replenish its foreign exchange reserves, which are needed for repayment, through other sources before the credits mature.⁹³ Problems may arise from the fact that advantageously-designed credit facilities could be used as an additional financing element regarding the balance of payments. Countries demanding intervention financing over a long period of time could use it as a facility to permanently finance fundamental balance of payments deficits. The facility would

⁹¹ See Vehrkamp, 1995, p. 19.

⁹² Note that a strong currency central bank can theoretically also sterilize interventions that exceed its national monetary base if it establishes an interest bearing "deposit facility" (such a facility has been established by the ECB for instance), for further detail see Bofinger, 2001, p. 24.

⁹³ See Bofinger, 1991, p. 132-133.

essentially assist countries pursuing non-stabilizing monetary and fiscal policies. Credit facilities with favourable conditions (long maturity, high amounts, low interest rates, etc.) should therefore be designed in a “conditional” manner, e.g. longer maturities are granted only when the debtor country commits to economic policy measures that re-establish the requisites for market-financed balance of payments.

Another important aspect is that although the possibility of being granted intervention credits does not necessarily alter the actual level of a country’s foreign exchange reserves it obviously reduces the “minimum reserve level” (i.e. the level of foreign exchange reserves a weak currency central bank does not intend to fall below due to intervention obligations, since doing so would lead to either an unavoidable exchange rate realignment or a complete quitting of the fixed rate system) due to the implicitly larger intervention potential. Moreover, through an institutionalized credit mechanism a weak currency country would not be compelled to hold a large number of different member currencies in its foreign exchange reserve as means of intervention, since the required strong currency would be provided by the strong currency country itself in case of mandatory intervention.⁹⁴

3.3.2.2 Asset Settlement Rules

While the credit facility applies to interventions on the lower margin of the fluctuation band by the weak currency central bank, the asset settlement rules establish the guidelines for mandatory interventions on the upper margin carried out by the strong currency country. When the strong currency reaches its upper intervention point, the strong currency country is obliged to intervene in order to support the weak currency by purchasing weak currency assets and supplying its own strong currency to the foreign exchange market. As a result, the domestic monetary base and the foreign exchange reserves (in weak currency assets) of the strong currency country increase by the size of the intervention volume.⁹⁵ The asset settlement rules of a fixed rate system stipulate a claim for the strong currency country towards the weak currency country, in which the strong currency country can transfer the weak currency assets, that it has acquired through obligatory intervention at the upper intervention point, to the weak currency country in exchange for strong currency or other assets the weak currency country cannot create itself. Since the weak currency central bank has to redeem the weak currency reserves that the strong currency central bank has accumulated through mandatory interventions, the asset settlement facility essentially stipulates an obligation for the weak

⁹⁴ See Bofinger, 1991, p. 132-133

⁹⁵ Ibid., p. 119.

currency country to finance the strong currency country's interventions.⁹⁶ Thus, the weak currency central bank faces a budget constraint to fulfill the asset settlement obligations, which is very similar to the constraint it encounters when having to finance its own interventions, because the assets it requires to meet said obligations are limited by its foreign exchange reserves.

Altogether, in a fixed rate system with asset settlement obligation, the weak currency country can be forced to carry the burden of financing all interventions (and be subject to the resulting reserve effects), regardless of which central bank is obliged to intervene because of the stipulated intervention rules. As much as the established credit facilities provide a loosening of the budget constraint for intervention financing, the asset settlement obligations lead to its further tightening.

Similar to the credit facilities, the design elements of the asset settlement rules that have to be defined are the amount, the maturity and the denomination of the compulsory settlement transactions:

- Both the amount and the maturity of the asset settlement obligation determine the degree to which the budget constraint for the weak currency country is tightened. It has to be established whether the settlement obligations of the weak currency country (or at least the amount/maturity thereof) are independent of or conditioned by specific reasons or circumstances regarding the upper margin interventions by the strong currency central bank.⁹⁷
- The agreed upon denomination of the settlement transactions is another important aspect when designing the asset settlement rules. Not only does it determine the allocation of the exchange rate risk, but it also establishes what assets the weak currency country can use to fulfill its settlement obligations. If the weak currency country is allowed to use additional reserve assets (beyond the reserves held in currency issued by the country intervening at the upper margin) to meet its settlement commitment, it would provide a relief of the budget constraint, since the weak currency country could use the entirety of its reserves (including gold and other reserve currencies).⁹⁸

⁹⁶ In a fixed rate system with asset settlement facilities, the credit repayment obligation and the asset exchange obligations from the settlement process are similar from an accounting point of view. See Vehrkamp, 1995, p. 20

⁹⁷ See Vehrkamp, 1995, p. 20.

⁹⁸ See Bofinger, 1991, p. 133.

3.3.3 Reserve Rules

Whenever reserve assets denominated in a currency participating in the fixed rate system are purchased, held, invested or generally used for intervention purposes, these transactions can generate liquidity and other monetary policy effects for the member country that issues that reserve currency.⁹⁹ Therefore, an institutionalized fixed rate system should establish certain reserve rules, which stipulate in what form central banks participating in the system are allowed to use and acquire their intervention reserves denominated in member currencies (“reserve investment rules”) and to which amount those currencies are permitted to be accumulated (“reserve limitation rules”)¹⁰⁰:

- When a central bank intervenes in the foreign exchange market by either selling (intervention at lower margin) or purchasing (intervention at upper margin) reserve assets, it can cause liquidity effects for the intervention currency involved, depending on the form of reserve investment. In case of a lower margin intervention, selling currency reserves that were previously deposited at the strong currency central bank (which issues the intervention currency), will lead to an expansionary effect of the intervention currency money base. In comparison, if the weak currency country intervenes by using strong currency reserve assets from market investments (e.g. funds deposited at commercial banks), then the intervention will not have liquidity effects on the strong currency, since the money circulation will remain unchanged.¹⁰¹ Regarding interventions at the upper margin, the monetary base effects for the intervention currency (in this case the weak currency) also vary depending on how the acquired weak currency reserve assets are invested by the strong currency central bank. If the purchased intervention assets are directly deposited at the weak currency central bank (i.e. the central bank issuing the intervention currency), then the monetary base of the weak currency country is reduced. Alternatively, investing the acquired intervention assets in the private market has no liquidity effects, since the weak currency monetary base is not affected by this transaction.¹⁰² Due to the described varying liquidity effects of intervention asset investment, it may be recommendable to stipulate rules regarding reserve investment within a fixed rate system.

⁹⁹ The reserve rules of a fixed rate system are tightly related to the stipulations regarding the possibility to perform intramarginal interventions described in section 3.3.1.5.

¹⁰⁰ See Vehrkamp, 1995, p. 21.

¹⁰¹ For further detail see Bofinger, 1991, p. 112-116

¹⁰² For a detailed analysis of the different effects of reserve asset investment, see Bofinger, 1991, p. 126-129.

- As noted in the description of the credit facility, the amount of reserves denominated in intervention currencies an individual central bank in the fixed rate system has at its disposal, is a decisive factor in determining the remaining monetary degree of freedom. This is due to the fact that by drawing on its intervention reserves a member country can at least temporarily elude the monetary adjustment constraints established by the rules of the system or at the least gain time in order to implement adequate adjustment policies.¹⁰³ An individual central bank has an ample scope to acquire (and subsequently invest) currency reserves in the foreign exchange market by simply exercising their issuing monopoly through a domestic money supply based on foreign exchange purchases. This practice might only be limited by the effects of the manipulated exchange rates or by the instrumental and institutional boundaries of domestic money supply policy. In order to restrict the wide capacity of member central banks to accumulate reserve currency (and thus, controlling the aforementioned liquidity effects for the country issuing the reserve currency) a specific agreement on reserve limitation rules for the fixed rate system might be necessary.

3.3.4 Central Rate Adjustment Mechanism

As noted in section 3.3.1.2, defining the central parities is one of the most important elements when creating the institutional framework for a fixed rate system. Since the system is based on defending these pre-established parities, it appears necessary for the participating countries to agree on a mechanism that stipulates the periodicity and criteria for revision and possibly realignment of the central rates.¹⁰⁴ While it is clear that the possibility of central rate adjustment should be given in order to reflect divergence in real macroeconomic conditions and therefore prevent a systemic defence of a misaligned parity¹⁰⁵, this can also become an eventual “exit-strategy” that loosens the system’s adjustment constraints and allows member countries to evade the means of coercion resulting from market pressure or unsound policy. Thus, the institutional design and functioning of the central rate adjustment mechanism is a main determinant of the fixed rate system’s inherent economic adjustment pressure as well as

¹⁰³ See Vehrkamp, 1995, p. 21.

¹⁰⁴ This is one of the main differences between the fixed rate systems discussed in this paper and the final integration stage of a monetary union, where the central parities between member countries are irrevocably fixed.

¹⁰⁵ Changes in real macroeconomic conditions for example include permanent changes in the terms of trade, continuing differences between countries regarding productivity as well as inter-country shifts in savings and investment propensities. See Frenkel/Goldstein, 1986, p. 42.

the level of its credibility from the perspective of the markets. This is because frequent revisions of the central parities would reduce the credibility of the commitment to exchange rate stability and thereby also reduce the system's value as an anchor for expectations. Determining the frequency of central parity adjustment can essentially be seen as a choice between credibility (of the exchange rate promise) and flexibility (to avoid misaligned central rates through adjustment).¹⁰⁶ Regarding the flexibility to avoid misalignments it is clear that this can also be provided through policy adjustment, since a change in real economic conditions can be reconciled either by a change in macroeconomic policy with an unchanged central rate or by a change in the rate with unchanged policies.¹⁰⁷ Because of this the flexibility of macroeconomic policy instruments is an important factor governing the choice of realignment frequency, since inflexible policies would call for more frequent revisions of central rates, and vice-versa.

The basic decision regarding the design of the adjustment mechanism is whether the realignments of central parities should be made in a rule-determined or discretionary fashion.¹⁰⁸

- Rule-determined adjustments to the central parities, as the name implies, follow a specific rule or formula that is adopted by the system's member countries. The adjustment automatism of the ex ante agreed upon rules for the adjustment mechanism can either also be determined from the outset (i.e. the course and extent of the exchange rate development is established in advanced) or follow a certain formula over the course of time (i.e. the binding formula establishes a "contingent contract" under which parity adjustments are to be carried out ex post).¹⁰⁹ Possible alternatives of rule-determined adjustment mechanisms of central rates that can be found in the literature regarding exchange rate systems are for instance "crawling bands" (which are characterized by a rule that determines parity adjustments according to inflation differentials between participating countries and are proposed by Williamson, 1996; and in the BBC-variant in Williamson, 2000), or exchange rate target paths that are based on an "uncovered interest parity" formula and thus interest rate differentials (as described by Bofinger, 2000a; and Bofinger, 2009). An advantage of rule-determined

¹⁰⁶ Relevant to this trade-off is also the pre-established width of the fluctuation band around the central parity, since narrow margins drastically reduce the scope of flexibility before an adjustment due to misalignment might be necessary. See Cukierman et al., 2004, p. 381.

¹⁰⁷ See Frenkel/Goldstein, 1986, p. 42-43.

¹⁰⁸ See Bofinger, 1991, p. 179.

¹⁰⁹ See Vehrkamp, 1995, p. 22; Bofinger, 1991, p. 179-180.

automatic adjustments compared to discretionary realignments is the fact that they can considerably add to the credibility of the exchange rate promise and the overall stability of the system if the economic rationality of the adjustment formula is accepted by the markets. In contrast, a discretionary adjustment mechanism is more susceptible to speculative attacks if impending realignments are large and expected by the markets, therefore allowing one-way bets.¹¹⁰ Another advantage of a rule-determined adjustment mechanism could be that through automatic rule-induced realignment it can overcome political obstacles that stem from the fact that political authorities might be poorly informed or unwilling to perform needed adjustments if given discretionary scope of action.¹¹¹ But it is also clear that the advantages of rule-determined realignments depend heavily on the effectiveness of the agreed upon formula to identify the need for adjustment (i.e. being able to take into account all relevant factors). Assuming that this is not the case and ex post discretionary corrective adjustments are ruled out, then countries might find themselves defending misaligned central rates, especially if the relevant parameters not taken into account can be manipulated by individual member country policy. It can be assumed that a simple ex ante rule that can effectively anticipate all types of macroeconomic disturbances relevant to ex post equilibrium rates is difficult to determine. Furthermore, if the parameters that are encompassed in the formula can be manipulated unilaterally by individual member countries, this could lead to opportunistic behaviour (e.g. a country might pursue an inflationary policy because the automatic realignment rule weakens the constraints of the fixed rate system) and endanger the stability of the system as a whole.¹¹²

- The alternative to the ex ante established rule-determined adjustment mechanism of central rates is to follow a discretionary case by case ex post strategy regarding realignments. The discretionary adjustments to the central parities can be carried out within an ex ante agreed upon procedural framework for ex post realignments (“governance structure”) or without a commitment to a specific procedural regulations.¹¹³ If no procedural rules for the discretionary realignments are established, then either each country participating in the system can autonomously adjust its

¹¹⁰ See Williamson, 1998, p. 66-68.

¹¹¹ See Bofinger, 1991, p. 182-183; Williamson, 1987, p. 17.

¹¹² See Bofinger, 1991, p. 184-185.

¹¹³ See Vehrkamp, 1995, p. 23.

central rate as it sees fit or an agreement between all involved member states has to be reached without a formal ex post procedural framework, which would most certainly lead to long and costly negotiations.¹¹⁴ Within a “governance structure”, the discretionary decisions of member states regarding central parity adjustments follow ex ante determined procedural rules and competencies that allow avoiding or at least reducing the costs and conflicts that may result from complex ex post negotiations. Institutional design choices for the procedural framework can be made regarding the decision-making competencies (i.e. whether the member countries’ governments or central banks have the final competency regarding the decision of central rate adjustment) and the organisation of the discussion and decision process within the “governance structure”.¹¹⁵ An international organisation could be created to serve as forum for informal communication between member states and as a platform for the formal common discussion and decision process; this international organisation could be bestowed with a mediator role in case conflicts arise in the decision process or even be conceived as an international decision-making entity.¹¹⁶ If the decision-making authority is to remain with the member states, then an important element of the ex ante agreed upon procedural framework is the “decision rule” that is used for the discretionary ex post parity adjustments, which can be established as a “rule of consensus” (i.e. unanimity between member states is needed for a parity realignment), a “majority rule” (i.e. more than half of participating parties must agree) or a “individual initiative rule” in which a single member can unilaterally demand a parity adjustment.¹¹⁷ Generally a majority rule would provide the widest protection from opportunistic behaviour because it prevents unilaterally forced adjustments (in case of an individual initiative rule) as well as unilateral veto chances (in case of a consensus rule). Such a rule would therefore effectively counter the above mentioned risks of unilateral political unwillingness to realignment in a discretionary central rate adjustment mechanism.¹¹⁸ The protection from opportunistic behaviour can even be increased if the majority rule is also combined with ex ante established “exception-rules” that protect single countries from forced realignments that may be induced due

¹¹⁴ See Bofinger, 1991, p. 179.

¹¹⁵ See Vehrkamp, 1995, p. 23.

¹¹⁶ See Bofinger, 1991, p. 192-193, 196-197.

¹¹⁷ This follows the taxonomy described in Rae, 1969; and adopted in Bofinger, 1991, p. 193-195.

¹¹⁸ See Bofinger, 1991, p. 194-196.

to the majority of member countries pursuing a destabilizing monetary policy.¹¹⁹ Next to opportunism, the major risk of a discretionary approach to the realignment procedure lies in the danger of speculative attacks, due to the “one-way bet” problem. Although the general problem of speculative capital movements cannot be entirely eliminated in a fixed rate system with a parity adjustment mechanism, it can effectively be reduced through an adequately established width of the fluctuation bands that satisfies the criterion of “overlapping bands” in case of parity adjustments, as described in section 3.3.1.3.

3.3.5 Short Typology of Different Configuration Alternatives

The preceding sections have detailed the design alternatives regarding the basic institutional features of fixed rate systems. The different combinations of these alternatives define various particular types of fixed rate systems. Bofinger (1991) differentiates seven basic types of systems that are characterized by different traits concerning stability and symmetry. Symmetry refers to the distribution of adjustment constraints caused by the reserve and liquidity effects in the system, while the stability criterion in this context describes the system’s inherent capability to limit opportunistic behaviour (i.e. the possibility of member states to individually pursue destabilizing inflationary or deflationary policies within the system) through its adjustment constraints. The seven basic types of systems proposed by Bofinger encompass three forms of systems with a parity grid standard, as well as two using a currency basket standard and two using a key currency standard. In this section these basic types will be described briefly in order to present possible configuration alternatives as well as to illustrate the effects on stability and symmetry of different design elements working together¹²⁰:

- The “inflationary parity grid standard” is a system that is characterized by intervention obligations at the upper intervention point exclusively. Moreover, the participating weak currency countries are not obliged to fulfill any asset settlement commitments within this type of system. As a result, member countries that pursue an inflationary monetary policy (leading to devaluation pressure on their currency) experience only limited adjustment constraints, since the exchange rate shocks and subsequent interventions of the strong currency country have no effects on their budgetary constraint of limited reserves. The weak currency country might be affected by

¹¹⁹ Ibid.

¹²⁰ This section draws heavily on Bofinger, 1991, p. 153-178.

restrictive liquidity effects, if the strong currency country intervenes by purchasing assets deposited at the weak currency central bank. Obviously, both the weak and the strong currency countries can sterilize the eventual liquidity effects of the upper margin intervention on their monetary bases. In an inflationary parity grid standard the distribution of adjustment impulses is therefore essentially determined by the liquidity effects and the countries' sterilization potentials. Assuming that an expansion of the domestic monetary base for the weak currency country, in order to counter the restrictive liquidity effects, is less problematic than creating an additional demand for monetary base necessary to sterilize the liquidity effects for the strong currency country, then the country pursuing an inflationary monetary policy (i.e. the weak currency country) would prevail in a "sterilization duel" regarding the distribution of liquidity effects.¹²¹ Altogether, a system designed as an inflationary parity grid standard can be seen as problematic regarding internal stability (i.e. price stability) and symmetry, because it could favour inflationary policy by member states at the expense of the stability oriented states. Merely under the assumption that the danger of a deflationary policy (or an overambitious stability policy following a price shock) exceeds that of an inflationary policy within the system, could the inflationary parity grid standard provide a stabilizing effect.

- The rules of an "anti-inflationary parity grid standard" establish intervention obligations only at the lower band margin and do not provide any credit facilities for the weak currency country's interventions. Thus, the weak currency country capability to finance its lower margin interventions is limited to its foreign exchange reserves and eventual credits from the private financial markets. The functioning of an anti-inflationary parity grid standard is essentially the diametric opposite to the inflationary parity grid standard, since the distribution of adjustment constraints resulting from the restrictive reserve and liquidity effects of mandatory interventions primarily burden the weak currency country. Although the strong currency country may be subject to an expansionary liquidity effect, if the weak currency country intervenes by selling reserve assets previously invested in the strong currency's central bank, it can be assumed that the strong currency country has an advantage regarding

¹²¹ Another problem for the intervening strong currency central bank would rise from the fact that excessive growth of its foreign exchange reserves due to mandatory intervention would eventually meet domestic political opposition.

the capability to sterilize liquidity effects.¹²² Due to the asymmetric adjustment burden on countries with weak currencies, a system based on an anti-inflationary parity grid standard can, to a large extent, provide protection against de-stabilizing inflationary policies by individual member states within the system. Problems for this type of system could emerge from the fact that it allows for a wider scope of deflationary policy (or overambitious stabilisation after shocks) by individual member central banks.

- A third alternative is the “compromise parity grid standard”, which combines intervention obligations at both the upper and lower fluctuation margin, as well as stipulates credit facilities and asset settlement obligations. Through the credit facilities, member countries obligated to intervene at the lower intervention point are granted an unlimited amount of strong currency intervention assets.¹²³ The credits have fixed maturities and must be repaid, just like the settlement payments resulting from the strong currency country’s intervention, in assets the weak currency cannot create itself. The distribution of reserve effects resulting from a de-stabilizing (inflationary or deflationary) monetary policy of a member country in a compromise parity grid standard is very similar to the distribution in an anti-inflationary parity grid standard, asymmetrically burdening the weak currency countries.¹²⁴ The main difference is, that by being granted a credit facility, the weak currency’s budgetary constraint of limited reserves is at least temporarily loosened. Depending on how favourable the credit facility conditions (amount, maturity and interest rate) are, the weak currency country can avoid immediate adjustments regarding its inflationary policy, which might in turn lead to similar liquidity effects as described for the inflationary parity grid standard. Another difference to the anti-inflationary parity grid standard is that in a compromise parity grid standard, the expansionary liquidity effects for the strong currency country will be wider, because both the upper margin

¹²² The assumption is that the potential of the strong currency country to sterilize liquidity effects, which is determined by the size of its domestic monetary base, is bigger than the sterilization capacity of the weak currency central bank, which is determined by its limited reserves. See Bofinger, 1991, p. 81. Note also that similar as in regard to the effectiveness of foreign market interventions in general, there is mixed literature on the effective impact of sterilized interventions. For analysis advocating the effectiveness of sterilized interventions see Bofinger/Wollmershäuser, 2001.

¹²³ Since the strong currency country is also obliged to intervene in the foreign currency market and can do this essentially without limitation, it makes sense that the credit facility for the weak currency country is established as unlimited, at least in the short run.

¹²⁴ The reason for this asymmetry can be found in the stipulation of asset settlement obligations, which basically force the weak currency country to pay for the strong currency country’s upper margin interventions. See section 3.3.2.2.

intervention obligations as well as the credit facility financed lower margin interventions affect its monetary base. In sum, whether the adjustment pressures of a compromise parity grid standard have a larger resemblance to those of an anti-inflationary parity grid standard or those of an inflationary parity grid standard is ultimately determined by the design of the conditions for the credit facility and asset settlement obligations. A prominent example of this type of fixed rate system is the EMS, which will be analysed in detail in chapter 4 of this paper.

- The fourth system discussed by Bofinger (1991) is the so-called “extreme key currency standard”, which is characterized by intervention obligations for the non-key currency countries at both their upper and lower fluctuation margin towards the key currency. This “extreme” type of system does not stipulate any asset settlement obligations for the key currency country or any credit facilities for non-key currency countries, which leads to a very asymmetrical distribution of adjustment pressures. For the non-key currency, the adjustment pressure effects of an extreme key currency standard are comparable to those of an anti-inflationary parity grid standard when it reaches its lower margin and to those of an inflationary parity grid standard when it fluctuates to its upper margin. The key currency country on the other hand is not obliged to intervene at any moment and its national monetary policy is not subject to any direct adjustment constraints, since both an inflationary or deflationary policy have no effects on the key currency country’s limited foreign exchange reserves. The system as a whole provides a strong protection from possible de-stabilizing policies of non-key currency member states on the one hand, but also allows for wide policy discretion for the key currency state on the other. This asymmetry might even be enhanced under the assumption that the key currency role is only awarded to countries that possess vast political and economic relevance¹²⁵, since a reflection of this economic superiority would most likely be a large capacity for sterilization, that could allow the key currency country to counter any liquidity effects on its monetary base resulting from interventions by the non-key currency country. Altogether, the extreme key currency standard supplies a wide protection against inflationary or deflationary policy by any of the non-key currency countries participating in the system, but is vulnerable to opportunistic behaviour by the key currency country. If the key currency country can be expected to pursue a stability oriented monetary policy, then the

¹²⁵ This assumption follows the “Hegemonic Stability Theory“, described for example in Eichengreen, 1987.

extreme key currency standard system can provide stability to a degree neither of the parity grid based systems are able to. Due to its institutional features, the Bretton Woods System (after the suspension of the gold convertibility) had a certain resemblance to an extreme key currency standard, with the USD as the key currency.

- The “moderate key currency standard” has identical intervention rules as the extreme key currency standard (i.e. upper and lower margin intervention obligations), but also establishes a credit facility for the non-key currency countries, as well as an asset settlement obligation for the key currency country. Due to these stipulations, the dominance of the key currency country in this type of system is drastically reduced, since it has to essentially finance upper margin interventions of non-key currency countries through the settlement mechanism and also grant them credit facilities for lower margin interventions. As a result, reserve and liquidity effects, and therefore also the adjustment constraints on the participating countries, of a moderate key currency standard are the same as those in a compromise parity grid standard.¹²⁶
- Another possible type of system is the so-called “extreme currency basket standard”, which establishes intervention obligations for participating countries at both the upper and lower fluctuation band margins vis-à-vis a currency basket. The institutional framework of an extreme currency basket standard does not establish any credit facilities or asset settlement obligations, and therefore asymmetrically burdens the countries whose currencies deviate the most from the average of all member currencies (defined by the basket composition) with the stabilizing adjustment obligations.¹²⁷ For a country whose currency is deviating from the basket average, the resulting adjustment constraints are very similar to those a non-key currency country faces in an extreme key currency standard. Thus, an extreme currency basket standard can be a viable option to prevent opportunistic inflationary or deflationary policy by member states, especially if the risk of such de-stabilizing policies being pursued stems from large countries participating in the system.¹²⁸
- A less asymmetrical version of a currency basket based system is the “moderate currency basket standard” which is characterized by identical intervention rules as the

¹²⁶ Operational differences to the moderate key currency standard result merely from the fact that the fluctuation bands between non-key currencies are twice as wide as those between the key currency and the non-key currencies (see section 3.3.1.1.) and that the key currency country is obviously never obliged to intervene in the foreign exchange market, since the key currency by definition can’t deviate from its own parity.

¹²⁷ See section 3.3.1.1.

¹²⁸ Under this aspect the extreme currency basket standard is superior to any system based on a key currency or parity grid standard. See Bofinger, 1991, p.162-163.

extreme basket version, but also stipulates institutional features like credit facilities and an asset settlement mechanism that favour the countries obliged to intervene. The macroeconomic adjustment constraints of a moderate currency basket standard are very similar to those in a compromise parity grid standard for countries whose currency reaches an intervention point. Operational differences result from the fact that in compromise parity grid standard both the weak and strong currency countries have to intervene simultaneously when their currencies reach their margins vis-à-vis each other, while in a basket based system only the country whose currency deviates most from the basket average is obliged to intervene. Another difference stems from the distribution of asset settlement obligations, because in a moderate currency basket standard all member countries have to fulfill settlement obligations towards a strong currency country that intervenes at its currency's upper fluctuation margin.¹²⁹ Thus, the adjustment constraints resulting from the settlement rules do not burden only one weak currency country (as is the case in the parity grid system with settlement obligations), but are distributed among all non-intervening countries of the system. Altogether, in what degree the effects on stability and symmetry of a moderate currency basket standard differ from those of the extreme version depends mainly on how restrictive the conditions for the credit and settlement mechanisms are. Obviously for all types of currency basket systems it is only possible to achieve overall stability (i.e. price stability) for the system's currency area, if the majority of the participating countries pursue a stability oriented monetary policy. This is because otherwise the countries whose currencies deviate the most from the average and that are subsequently forced to intervene and asymmetrically adjust are the ones actually practicing stability oriented policy.

3.4 Size of Member Countries

In addition to the institutionally established rules and framework of the fixed rate system, another aspect that is a relevant determinant of the overall adjustment constraints distribution of the system is the relative size of the participating countries. Within the system the relative size of a member country is essentially defined by its capacity for monetary sterilization and the amount of freely available intervention asset reserves it holds:¹³⁰

¹²⁹ The size of the settlement obligation for the individual member countries is defined by their currencies' weight in the currency basket. See Bofinger, 1991, p.164-165.

¹³⁰ See Vehrkamp, 1995, p. 23.

- As noted earlier, interventions at the upper fluctuation band margin have expansionary liquidity effects for the intervening strong currency country, because it has to support the weak currency by supplying its own currency to the market. The country's capacity to sterilize the impact of these interventions on its domestic liquidity situation is determined by the size of its national monetary base (i.e. the credits to the domestic banking system), as well as the capability of the country's monetary authorities to control it.¹³¹ The larger the overall size and controllability of a member country's national monetary base is, the wider is its potential to sterilize the expansionary liquidity effects of foreign market intervention at the upper margin and therefore its ability to elude policy adjustment pressure resulting from these effects.¹³² On the other hand, the weak currency country's ability to sterilize its lower margin interventions (i.e. counter the restrictive liquidity effects resulting from purchasing its own currency against strong currency assets from its foreign exchange reserves) is technically unlimited by simply pursuing an expansionary monetary policy. But the expansionary impulses necessary to sterilize the interventions may lead to a further weakening of its currency, therefore requiring additional lower margin interventions and continued reserve losses.¹³³ As result, the capacity for intervention for a weak currency country is determined by the size of its reserves. The size of a country might also matter under the assumption that a "large" country as opposed to a "small" country can affect international interest rates with its monetary policy (i.e. its sterilization policy), therefore reducing the cost of sterilization since the resulting capital flows might tend to be smaller.¹³⁴
- The second relevant aspect regarding the size of a country in the system is the amount of intervention reserves the country holds, since this does not only establish the sterilization capacity of lower margin interventions, as detailed above, but also impacts the overall distribution of adjustment pressures. As described in section 3.3.3, if a currency reaches its lower intervention point, the country issuing the weak currency can temporarily avoid policy adjustment pressures of the system by drawing on its foreign exchange reserves to finance interventions. Thus, the size of its

¹³¹ Again, a strong currency central bank can theoretically sterilize interventions that exceed its national monetary base if it establishes a "deposit facility", see Bofinger, 2001, p. 24. This possibility will not be considered in this general analysis.

¹³² See Vehrkamp, 1995, p. 23-24.

¹³³ See Bofinger, 1991, p. 80-82.

¹³⁴ Ibid., p. 78.

intervention reserves establishes the amount to which a country can accommodate the draining reserve effects of lower margin interventions. If the weak currency country's intervention reserves are depleted due to compulsory interventions, further pressure on the weak currency will lead to a tightening of the adjustment constraints for the weak currency country or eventually to central parity realignment in order to accommodate for the speculative market pressure.

Altogether, the size of a country participating in the fixed rate system, as defined by its sterilization capacity and extent of foreign exchange reserves, has an important impact on the overall adjustment constraint distribution of the system, since a bigger country in terms of the two aforementioned characteristics, has a larger capacity to at least temporarily avoid the adjustment pressure of the system's liquidity and reserve effects. The symmetry characteristics regarding the adjustment constraints that are established by the system's "rules" can therefore potentially be offset by the relative size of the countries involved in the system.

3.5 Overall Adjustment Constraints of the Fixed Exchange Rate System

The institutional framework of the fixed rate system, constituted by the individual institutional rules and features which are described throughout section 3.3., formally establishes the direction and intensity of the liquidity and reserve effects within the system that result from mandatory interventions; and therefore plays an integral part in determining the overall economic adjustment constraints of the system. The "size" of the participating countries is the other main determinant of the system's inherent symmetry characteristics regarding the distribution of liquidity and reserve effects, because the formal (i.e. rule-determined) symmetry established by the institutional framework can be (over-)compensated by a country's ability to deflect the liquidity and reserve effects' adjustment pressure through its sterilization capacity and the size of its reserves (see section 3.4.). The set of rules and the relative size of the countries participating in the system can therefore be described as the structural determinants of the fixed rate system's internal functioning.¹³⁵ Together they determine the symmetry characteristics of the liquidity and reserve effects that are effective in the system and which in turn trigger and decide the overall allocation of economic adjustment constraints among the system's strong and weak currency countries. However, the identification of a member country's currency as "strong" or "weak" is not determined by the

¹³⁵ See Vehrkamp, 1995, p. 27.

institutional framework of the fixed rate system, but rather by the markets and the fundamental economic conditions. Regardless of the underlying degree of fundamental rationality, the pressure of the foreign exchange and capital markets can determine if a currency is subject to revaluation (then becoming a strong currency within the system) or devaluation (leading to a weak currency status). Then, through the market's revaluation or devaluation pressure, the institutionalized intervention mechanism and with it the systemically determined liquidity and reserve effects are activated and unfold. Even if the system is provided with mechanisms for a direct coordination of monetary and macroeconomic policies between member states, it still remains dependent on the market's "judgement", because speculative attacks can only be avoided if the system can effectively stabilize market expectations and remain credible.¹³⁶ Thus, the overall monetary adjustment constraints of a fixed rate system are determined by the interaction of the institutional structure of the system with the relative size of the participating countries and the conditions of the capital and foreign exchange markets. Figure 2 summarizes the inherent economic mechanics of a institutionalized fixed rate system (i.e. the "rules of the game") that are described by the aforementioned interaction between the structural determinants of the system's internal functioning (i.e. the institutional rules and the size of the country) and the market transactions that influence them, resulting in the system's distribution of economic adjustment constraints for the participating countries.

4 The European Monetary System

4.1 Overview

After chapter 3 provided a detailed institutional analysis of fixed rate systems in general, this chapter will focus on the examination of a specific regional exchange rate system, namely the EMS, in order to assess its overall efficiency and its success in providing an intermediated step towards monetary union. An in-depth analysis of the historic, political and economic rationale behind the EMS as well as its overall design and functioning will be necessary to draw lessons from the EMS experience that might prove crucial for the Latin American prospects of introducing a similar system. In line with this premise, section 4.2 will provide a historic background to the introduction of the system, followed by section 4.3 that will detail the main

¹³⁶ See Bofinger, 1991, p. 270-274. Note also that capital controls could be used to defend the fixed rate system against speculative attacks; this possibility will be discussed in section 4.5.2.2 that analyses the use of capital controls in the EMS.

political and economic reasons that led to the EMS. Section 4.4 will describe the institutional design of the EMS, while section 4.5 will detail its overall performance. The chapter will close with an assessment of the EMS as an effective regional exchange rate arrangement in section 4.6.

4.2 Short Historic Background to the European Monetary System

This section presents a selective overview of some of the most relevant events in the history and evolution of the monetary integration process in Europe leading up to the introduction of the European Monetary System in March 1979 in order to show the difficulties and compromises needed before the EMS fixed rate system could effectively be set up in the region.¹³⁷ Monetary policy coordination within the larger project of economic and political integration in Europe dates back to the Treaty of Rome in 1957, which created the European Economic Community (EEC; the name was later abbreviated to European Communities (EC) after the merger of the Euratom, the European Coal and Steel Community Council and the EEC Council of Ministers in 1967) and established a customs union as well as a common market for cereals, which was later extended to all agricultural products (Common Agricultural Policy- CAP), for the participant member states.¹³⁸ The Treaty of Rome laid down a set of principles for macroeconomic policy conduct (Articles 103 to 108)¹³⁹ that called for short-term macro policies to be subject of mutual consultation; furthermore it raised the possibility of assistance for balance of payments disequilibria between members and encouraged coordination to achieve high employment and price stability in the Community. Article 105 established a permanent advisory body, the Monetary Committee, to serve as an institutional forum for discussion and exchange of information concerning monetary coordination.¹⁴⁰ But although short-term macroeconomic policy and the exchange rate were to be considered a matter of common interest within the EEC, national monetary policy remained in the hands of the respective governments and was not subject to any binding constraints. Due to the relative stability provided by the Bretton Woods System and the domain of the IMF in matters of exchange rate policy and balance of payments assistance, the provisions laid down in the Treaty of Rome did not play a de facto relevant role in European

¹³⁷ For a detailed history of European monetary integration see Gros/Thygesen, 1998.

¹³⁸ Member states were Belgium, France, Italy, Luxembourg, the Netherlands and West Germany

¹³⁹ See Giavazzi/Giovannini, 1989, p. 8.

¹⁴⁰ The committee comprised one representative appointed by the central bank and one by the finance ministry of each country, as well as two representatives of the ECC.

monetary policy at the time.¹⁴¹ The Bretton Wood agreement (1944) had established a system of fixed exchange rates that linked all participant currencies to the US dollar (USD) and the USD to the price of gold, in order to provide exchange rate stability on a global scale.¹⁴² The rules of the system were enforced by the IMF and restricted the fluctuations to a one percent band around the central parities against the USD, which meant that two European currencies could fluctuate by as much as 4 percent vis-à-vis each other if they changed their relative position against the USD to the margins of the band. European countries considered this margin too wide and agreed to limit the band to ± 0.75 percent against the UDS, allowing for a maximum of 3 percent fluctuation for intra-European exchange rates.¹⁴³

Over the course of the 1960s the development of the common market, especially regarding agricultural products, increased the interest in exchange rate stability between community members. At the Hague Summit in 1969, shortly after a devaluation of the French franc and a revaluation of the German D-mark threatened the durability of the customs union and CAP, the EEC Heads of the State agreed to move forward along the road to a full Economic and Monetary Union (EMU). However, there was not a consensus on a general strategy to implement the transition to monetary unification and two different integration approaches were advocated. France, Belgium and Luxembourg subscribed to so-called “monetarist view” (or “corner-stone theory”), which argued for an immediate fixation of exchange rates that would in turn force states towards policy convergence. Germany and the Netherlands favored the “economist view” (or “coronation theory”) that member states should first achieve a high level of convergence, through policy coordination and supranational decision making, to finally – in the last phase of integration – fix the exchange rates irrevocably.¹⁴⁴ In order to find a middle ground between these two schools of thought¹⁴⁵, a mayor study by a group of high-ranking EEC and member state officials, led by the Prime Minister of Luxembourg Pierre Werner, was commissioned. The second and definitive version of the study, known as

¹⁴¹ See Gros/Thygesen, 1998, p. 9.

¹⁴² The original Bretton Woods System (before 1967) can be seen as a system very similar to a “moderate” key currency standard, as described in section 3.3.5, in which the gold convertibility served as the asset settlement mechanism. Afterwards, although the system still stipulated intervention obligations for the USD towards the price of gold, the Bretton Woods system essentially became a de facto “extreme” key currency standard fixed rate system with the USD as key currency (again, see section 3.3.5). The reason for this is the irregular passivity of the USA regarding intervention and the resulting loose commitment to the gold parity, which was accepted by other member countries who renounced the convertibility option. For a detailed description of the Bretton Wood System from a historic and institutional perspective, see McKinnon, 1993, p. 1-44; Bofinger, 1991, p. 297-336.

¹⁴³ For further detail see Gros/Thygesen, 1998, p. 9.

¹⁴⁴ See Tsoukalis, 1977, p. 91-97; Ypersele/Koeune, 1984, p. 41-42.

¹⁴⁵ For a more detailed summary of the dispute between “Economists” and “Monetarists”, as well as the proposals which best encompass their respective views, the Schiller Plan and the Second Barre Plan, see Coffey, 1987, p. 7-12.

the Werner Report and published in October 1970, was able to achieve a compromise acceptable to all parties by emphasizing the need of a parallel progress in monetary and non-monetary policy convergence. It stressed the main objective of full EMU and presented a three stage plan to achieve this goal in the span of ten years (1971-1980).¹⁴⁶ The first stage, starting on 1.1.1971, envisioned a number of measures to increase coordination and consultation in medium and short-term economic policy, budgetary policy and monetary policy, as well as a reduction in the margins of exchange rate fluctuation between currencies of member states. The aim of the second stage, which was not thoroughly specified, was to further deepen the achieved integration level and again reduce the fluctuation-bands until the final stage, to complete economic and monetary unification, would be reached by 1980. Monetary Union was to consist of “the total and irreversible convertibility of currencies, the elimination of fluctuation in exchange rates, the irrevocable fixing of parity rates and the complete liberation of movements of capital” (Werner et al., 1970).

On March 22, 1971, the Council of Ministers of Economics and Finance (ECOFIN) endorsed the Werner Report by adopting a resolution that called for the attainment of EMU in stages, with the first stage to be completed by the end of 1973. Despite this political support, the Werner Plan was never fully implemented due to the turbulences in the global monetary system during the early 1970s, which happened exactly as the first stages of the Werner Plan were supposed to be carried out.¹⁴⁷ Following the major USD crisis of 1971 and subsequent suspension of the USD convertibility to gold¹⁴⁸, the Smithsonian Agreement (December 1971) intended to fight the immanent collapse of the Bretton Woods System by not only devaluating the USD vis-à-vis the price of gold, but also widening the exchange rate band around the key currency from two percent to 4.5 percent. The new margins implied an increase in the maximum possible excursion of bilateral intra-European exchange rates to nine percent, which the EC considered to be excessive and not compatible with the developing of the common market.¹⁴⁹ As a result, the EC countries decided to restrict the margin of bilateral exchange rates to ± 2.25 in the Basle Agreement (April 10, 1972), effectively halving the exchange rate band established by the Smithsonian Agreement. This initiative was known as “the snake in the (dollar) tunnel” (Gros/Thygesen, 1998, p.15) and participation was

¹⁴⁶ See Werner et al., 1970.

¹⁴⁷ For further detail of these global economic turbulences see Gros/Thygesen, 1998, p. 14.

¹⁴⁸ After the suspension of the gold convertibility, the Bretton Woods system changed from merely a de facto to also a de jure “extreme” key currency standard fixed rate system. See Bofinger, 1991, p. 311.

¹⁴⁹ See Giavazzi/Giovannini, 1989, p. 25-26.

expanded to non-EC countries¹⁵⁰, as the UK, with Ireland as part of the UK currency area, Denmark and Norway joined the system shortly after it was created.¹⁵¹ Only one year later, with the definitive collapse of the Bretton Woods System in March 1973, the “snake” became a joint float as European central banks stopped defending the peg vis-à-vis the USD, essentially eliminating the “tunnel”. But this “floating snake” proved to be just as difficult to sustain, with several currencies leaving and in some cases rejoining, as well as a large number of exchange rate realignments necessary.¹⁵² By 1979 the “snake” had become more of a de facto DM-zone instead of any real EC currency stabilization arrangement, with the DM being the only major currency in the system, “surrounded by three EEC “satellites” – the Benelux currencies and the Danish kroner – and two non-EEC currencies, the Norwegian and the Swedish kroner” (Giavazzi/Giovannini, 1990, p.26). The reason for the relative failure of the “snake”, especially regarding the ability to keep major currencies together, can be seen in the lack of formal rules for joint interventions and negotiated realignments, which led to an overall strong asymmetry in the exchange rate mechanism and denied the system credibility without the backing of a global exchange rate system like Bretton Woods.¹⁵³

Despite strong macroeconomic disturbances like the oil crisis in 1973 and the rather unstable course of the “snake”, there were several initiatives intended to further deepen monetary integration during the 1970s. Examples are the creation of the European Monetary Cooperation Fund (EMCF) in April 1973, assigned to monitor and administer the intra-European exchange rate system, and the EC Council adopting a European unit of account (EUA) based on a composite basket of EC currencies as a measuring unit within the Community in March 1975. A number of approaches to strengthen cooperation in exchange rate policy were discussed: the Fourcade Plan of 1974, the Tindeman Report of 1975, the Duisenberg Plan of 1976 and the Commission initiative of 1977, led by Roy Jenkins.¹⁵⁴ These early proposals all supported further monetary integration and the goal of a full EMU, and were therefore instrumental in not only creating a favourable environment for the Schmidt-Giscard initiative, which became the EMS, but also ultimately shaping the system. The German-French proposal for a new European exchange rate system, a conjoint effort by

¹⁵⁰ The UK, Ireland, Denmark and Norway all had already applied for membership and in January 1973, the UK, Ireland and Denmark joined the EC.

¹⁵¹ In June 1972, only 2 months after joining, the UK (with Ireland) left the “snake in the tunnel”. In February 1973 Italy also withdrew.

¹⁵² For a chronological history of the “snake” see Table 1.1.1 in Gros/Thygesen, 1998, p. 17.

¹⁵³ See Coffey, 1987, p. 14; Giavazzi/Giovannini, 1989, p. 26.

¹⁵⁴ For a detailed analysis of each of these proposals see Gros/Thygesen, 1998, p.39-43; Ypersele/Koeune, 1984, p.46-47; Fuchs, 1989, p. 21-26.

German Chancellor Helmut Schmidt and French President Valéry Giscard d'Estaing, was first presented at the meeting of the European Council in Copenhagen in April, 1978 and three months later (July, 1978), in the meeting held in Bremen, the Council agreed to launch the EMS, a monetary system based on a European Currency Unit (ECU) with an Exchange Rate Mechanism (ERM), much like the “snake”.¹⁵⁵ The details for the system were formally decided in the Brussels meeting in December, 1978 and on March 13, 1979 the European Monetary System officially came into force.

Initially, the EMS counted eight participating countries. These were Belgium, Denmark, France, Ireland, Italy, Luxembourg, the Netherlands and West Germany. The other two EC countries, the United Kingdom and Greece¹⁵⁶, were also officially members, but strictly on a formal basis, since they did not participate in the ERM. Despite a relatively high heterogeneity between the participants regarding population, per capita income, rate of employment, openness and inflation, they all had a similar interest in deepening integration and creating stability for the EC area.¹⁵⁷ These particular motives behind the EMS scheme are further detailed in the next section.

4.3 Reasons for the European Monetary System

Before a detailed analysis of the specific rules and mechanics of the EMS is given, it is important to illustrate the motivations and pursued goals behind the Schmidt-Giscard EMS-initiative and the decision of the EC states to adopt it as the next step in European monetary integration, especially since these actions were accompanied by much public, as well as academic debate and criticism.¹⁵⁸ Analysing these motivations will also allow for a better assessment of the performance and results of the system as a whole. The reasons that led to the EMS can be divided into political and economic motives, although these often overlap. The political reasons will mainly be described by the political interests on a national level that originated the EMS proposal by France and Germany, while the analysis of the economic reasons will deal with the general macroeconomic objectives, such as exchange rate stability and inflation convergence, which prompted the European countries to adopt the ERM of the EMS.

¹⁵⁵ See Ypersele/Koeune, 1984, p.47-48. The institutional framework of the EMS is detailed in section 4.4.

¹⁵⁶ Greece joined the EC in 1981.

¹⁵⁷ For a comparison of the founding member states at the time of the EMS launching, see Table 3.

¹⁵⁸ See Bofinger, 2000b, p. 1.

4.3.1 Political Reasons

The origin of the EMS, the Schmidt-Giscard initiative in 1978, was mostly a product of political, rather than of economic considerations by its initiators Germany and France.¹⁵⁹ The German Chancellor Schmidt and the French President Giscard d'Estaing both enjoyed wide domestic support at the time, which gave them the political strength to pursue more ambitious, long-term actions on the national as well as the European level. In the French elections in 1978 Giscard d'Estaing cemented his position in the government, allowing him to follow up on the long-term plan to stabilize the French economy, specifically by re-joining an exchange rate system with Germany.¹⁶⁰ The German government also counted with strong national acceptance, not least because of the way it had handled the terrorist threat of the "Rote Armee Fraktion" (RAF), and the results of the French election reassured Germany that France would aim for a policy of stabilization, therefore facilitating a joined initiative.

Another political reason was the growing interest of both countries to lessen the dependence on the United States and the USD, prompting them to seek a stronger and wider alliance within the EC.¹⁶¹ While independence had been a traditionally relevant matter for France, it was particularly important to Germany because of the persistent weakening of the USD. The German government feared that the growing loss of confidence in the American currency, partly due to an active US-policy to "talk the dollar down" (Gros/ Thygesen, 1998, p.37), would lead to large shifts in demand towards the DM. The resulting strong appreciation of the DM vis-à-vis the USD and the other European currencies, that were not part of the "snake"-system, would in turn have negative effects on the international competitiveness of the German industry, reducing profits and employment. To counter this development, Schmidt decided to push for closer monetary integration in Europe (an initiative that would become the EMS) by linking as many willing, free floating EC currencies to the DM as possible. Spreading the pressure from the weakening USD over a wider monetary area would stabilize Germany's trading environment, protect Germany against being in the forefront of the critique by international organizations regarding economic policy and increase the influence of Europe in the global economy.¹⁶² This strategy also appealed to France and the other EC countries, since it appeared to guarantee a better cohesion within Europe as well as a joint

¹⁵⁹ See Gros/Thygesen, 1998, p. 35-38, for a detailed analysis of the political motivations behind the Schmidt-Giscard initiative.

¹⁶⁰ France had left the "snake" on two occasions because of political opposition to the implications of such a commitment. See Gros/Thygesen, 1998, p. 63.

¹⁶¹ See Fratianni/Hagen, 1992, p. 17.

¹⁶² See Gros/Thygesen, 1998, p. 37-38.

response to the pressure exercised by the US and international organizations. Closer monetary cooperation would serve as an instrument for pushing forward political integration, since it was expected that by joining the EMS, countries would tighten their commitment and create a favorable starting point for the transition to full EMU.¹⁶³

Finally, a third political motivation that led Germany and France to pursue further European integration, was the growing concern regarding the political developments in Italy at the time. The growing influence of the Italian Socialist Party as well as the impending political alliance of the Christian Democrats with the Communist Party (*compromesso storico*) were seen as threats in the geopolitical order of the Cold War by Italy's West European community partners.¹⁶⁴ The Schmidt-Giscard initiative was to provide an option for a clear incorporation of Italy into a stable European framework¹⁶⁵ and secure Italian participation in the long term goal of European integration.

4.3.2 Economic Reasons

Apart from the specific long-term goal of European integration, the reason that prompted the EC member states to embrace the Schmidt-Giscard initiative and launch the EMS was the desire to establish a “zone of monetary stability in Europe”.¹⁶⁶

The stability objective encompassed both an external (i.e. stable exchange rates among participating countries) as well as an internal (i.e. inflation reduction/convergence through a policy of disinflation) dimension.¹⁶⁷

4.3.2.1 Interest in External Stability

The interest of the EC member states in joining the ERM of the EMS, which was similar to the motive that led to the creation of the “snake”, stemmed from a general aversion to intra-Community exchange rate instability, both in its short-term (“volatility”) and its medium-term (“misalignments”) form.¹⁶⁸

Short-term volatility of intra-EC exchange rates would have strong negative effects due to the degree of “openness” of the EC countries.¹⁶⁹ While the “openness” (measured as the imports as a share of GDP in Table 1) of the EC as whole was relatively low (10.4% in 1960, 12.3%

¹⁶³ See Ledesma et al., 2008, p. 8.

¹⁶⁴ See Raveggi, 2000, p. 4.

¹⁶⁵ Italy had left the “snake” within the first year of its existence.

¹⁶⁶ See Conclusions of the Presidency of the European Council of 6 and 7 July in Bremen, extract printed in Gros/Thygesen, 1998, p. 56-57.

¹⁶⁷ See Gros/Thygesen, 1998, p.112.

¹⁶⁸ See Bofinger, 2000b, p.2.

¹⁶⁹ See Giavazzi/Giovannini, 1990, p.249.

in 1987) and comparable with the numbers for the USA and Japan at the time, the individual EC countries were a lot more open. Because of the regulations set by the Treaty of Rome, which called for the reduction (and eventual elimination) of taxes and other trade barriers between member states in order to establish “free movement of goods” and the “common market”, as well as the relatively low transportation costs due to the regional proximity of most EC countries, intra-EC trade had grown significantly. Table 2 shows that for every member state, except Denmark, trade within the EC (as a share of total trade) had grown since 1958 (the Treaty of Rome was signed in 1957) and that by 1970 over half of the Community’s trade was intraregional. Because of this high degree of trade integration, volatile exchange rates were seen as very problematic.

This is because, for a highly integrated area like the EC, that had very few trade restrictions and low transportation costs, the “law of one price” would be rather stable.¹⁷⁰ Consequently, frequent short-term exchange rate fluctuations and the subsequent short-term deviations from the “law of one price” can cause arbitrage transactions with negative effects on local suppliers or on exporting firms if these are forced to frequently adjust their local prizes to counter the arbitrage effects, resulting in high “menu costs” and very erratic local pricing policies.¹⁷¹ So because of the “openness” of a “common market” area (like the EC and now the EU) firms have a lot more difficulties to apply the commonly used strategy of “pricing-to-the-market” to cover for exchange rate volatility.

Another reason for the aversion of the EC countries to short-term exchange rate instability was that apart from causing problems for the “common market” in general, it posed a serious threat to the European agricultural sector in particular, specifically the “Common Agricultural Policy”, which was institutionalized in the Treaty of Rome.¹⁷² Under the CAP, the EC agricultural market was organized through a common price policy which set EC-wide intervention prices for agricultural goods in a common currency unit, which was then translated in local currencies at the ongoing exchange rate.¹⁷³ So essentially, the “law of one price” was dictated *by law* in the CAP and was also especially rigid, because the intervention prices for many products were established on an annual basis. Because of the rigid prices, short-term exchange rate volatility could lead to strong and arbitrary shifts in profitability for

¹⁷⁰ See Bofinger, 2000b, p.4.

¹⁷¹ Ibid.

¹⁷² See Giavazzi/Giovannini, 1990, p.249.

¹⁷³ The prices were fixed in a common unit, the EUA, which at the time of its creation was defined as the gold content of one USD. Later the EUA became the ECU and eventually the Euro (see Gros/Thygesen, 1998, p.10-11).

producers in the agricultural sector across Europe, as well as induce swings in agricultural trade in the EC region. In order to deal with these difficulties, the CAP had to introduce a complicated system of so-called “green exchange rates” and compensating payments.¹⁷⁴

Exchange rate stability was not only a desired goal in the short-term, but also in the medium-term. Being that the EC was a highly integrated area, exchange rate misalignments, defined as significant deviations of the mid-term (i.e. actual) real exchange rate from its long-run equilibrium level¹⁷⁵, could cause significant problems, since shifts in real exchange rates are identical with shifts in competitiveness. Because changes in real exchange rates can be seen as equal to relative changes in domestic costs, the effects on competitiveness can only be neutralized through adjustments in domestic price and wage levels.¹⁷⁶ For countries with an appreciating currency, these types of adjustments are difficult because they would demand an absolute decrease of nominal wages, which tend to be rigid in the downward direction. This relation between appreciation and competitiveness explains the German involvement in the creation of the EMS, since the DM was subjected to strong appreciation pressure at the time, as mentioned in section 3.2.1. But real exchange rate stability was also of interest for the EC as a whole, in order to prevent against “beggar-thy-neighbour” strategies that countries could use to unilaterally improve their competitiveness by depreciating their currency. This argument was of special importance, since many viewed the competitive exchange rate depreciations of the 1920s and 30s as the reason for the disruption of international trade, massive unemployment and protectionism that contributed to the ensuing rise of fascism in Europe.¹⁷⁷ After the collapse of the Bretton Woods System and the unsatisfactory performance of the “snake”, the ERM of the EMS was intended to be a new scheme that provided stability and in case of major exchange rate changes, at least subject these to a common decision process.

4.3.2.2 Interest in Internal Stability

In addition to external stability (stable exchange rates), the EMS was also intended to provide internal stability for the EC area by advancing the convergence in macroeconomic performance across Europe. This intention was mainly directed at the reduction and convergence of inflation rates, since over the course of the 1970s big differences between EC

¹⁷⁴ For a more detailed description of the “green parities” and the “Monetary Compensatory Amounts”, see Gros/Thygesen, 1998, p.11; Giavazzi/Giovannini, 1989, p.14-18.

¹⁷⁵ See Williamson, 1985, p. 13-17.

¹⁷⁶ See Bofinger, 2000b, p.5.

¹⁷⁷ See Giavazzi/Giovannini, 1989, p.6-7.

member states regarding inflation had developed, causing serious problems for many European countries.¹⁷⁸ In 1979, the year the EMS came into force, the inflation rates for “snake” countries like Germany and the BENELUX-states were around 4 percent while EC countries with free floating exchange rates like France (10.8 percent), Ireland (13.3 percent) and Italy (14.8 percent) had relatively high inflation rates.¹⁷⁹ In joining the EMS, the high-inflation countries hoped to fight inflationary effects by pegging their currencies to the low-inflation countries and reducing the cost of disinflation policy by importing credibility, specifically from the German Bundesbank, which enjoyed an excellent reputation regarding monetary policy and fighting inflation.¹⁸⁰ Credibility is very important for a policy of disinflation because in countries with a weak anti-inflationary reputation, the public would expect the government to deviate from the announced inflation aim by engineering some surprise inflation to increase output and employment (“time inconsistency problem”). The public would adjust its expectations and anticipate this, so inflation would therefore be higher, but without positive effects on output and employment.¹⁸¹ Thus, countries with little inflation-fighting credibility were “caught in a trap of high inflationary expectations” (Gros/Thygesen, 1998, p.143), which they were forced to ratify in order to avoid a strong increase in unemployment that would occur if they reduced inflation below the level expected by the public. In this context, the EMS could theoretically work as a “disciplinary device” for high-inflation countries, that would provide a credible framework (by pegging the exchange rate to the stable DM) to stabilize prices and convince the public of an anti-inflationary commitment, therefore reducing inflation expectations and lowering the unemployment costs of a disinflation policy. Whether this strategy of “tying one’s hands”¹⁸² and the general approach of using the DM as an anchor¹⁸³ within the ERM of EMS were successful, is discussed further in the following sections regarding the performance of the EMS.

¹⁷⁸ See Bofinger, 2000b, p.3.

¹⁷⁹ See Table 3.

¹⁸⁰ See Bofinger, 2000b, p.3.

¹⁸¹ For further detail on the “time inconsistency problem” see Gros/Thygesen, 1998, p.143, 180-183.

¹⁸² See Giavazzi/ Pagano, 1988.

¹⁸³ Note that within the analysis of this paper an “anchor” currency, in contrast to a “key” currency, is not institutionally established as the central currency of the fixed rate system but rather is given this role by the economic agents.

4.4 The Features and Mechanisms of the European Monetary System

After having briefly described the historic background as well as the political and economic rationale of the European Monetary System, this section will focus on detailing the institutional structure of the EMS. The analysis of the individual institutional elements will widely follow the general framework regarding the institutional design of fixed rate systems described in chapter 3 of this paper.

4.4.1 The European Currency Unit and the Central Parities

The creation of a new monetary unit, the European Currency Unit (ECU),¹⁸⁴ was one of the first steps taken in designing the EMS. The ECU was essentially a currency basket as described in section 3.3.1.1, and because it was intended to have a variety of functions in the EMS it will briefly be described separate from the actual institutionalized intervention rules and financing mechanisms of the system. The ECU was to “be at the centre of the EMS” (Resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System, Paragraph 2.1, extract printed in Gros/Thygesen, 1998, p.58) and fulfill a number of tasks in the system (Paragraph 2.2):

- “as a denominator (numéraire) for the exchange rate mechanism;
- as the basis for a divergence indicator;
- as the denominator for the operations in both the intervention and the credit mechanisms;
- as a means of settlement between monetary authorities of the European Community.”

The ECU currency basket was defined by specified amounts of all Community currencies. The amount or weight of each component currency in the basket was to reflect the relative economic size of the country. The economic criteria that determined the weight of a country's currency in the ECU were: the share of the country in the GDP of the Community, its share in intra-Community trade and its share in the financial support system of the EMS. Table 4 shows the composition of the ECU in amounts of national currencies. The ECU was a fixed-amounts basket, which meant that intra-European exchange rate fluctuations would lead to changes in the relative weights of the various currencies as well as the exchange rate of the ECU vis-à-vis all currencies.¹⁸⁵ This was particularly a concern regarding currencies like the

¹⁸⁴ The acronym ECU was also reminiscent of a medieval coin used in France and England, the *écu*. See Ypersele/Koeune, 1984, p. 49.

¹⁸⁵ For a formal analysis of the effects of bilateral exchange rate fluctuations on the ECU weight, see Gros/Thygesen, 1998, p.239-240.

British pound (later also the Greek drachma, the Portuguese escudo and the Spanish peseta) that were part of the ECU but did not initially participate in the ERM of the EMS. Since exchange rate fluctuations could move the relative weights in the ECU far away from the initial representative composition, the unit amounts of each currency in the ECU basket was to be reviewed after the first six months of the EMS and after that periodically every five years, or also on request, if the weight of any participant currency changed by 25 percent or more.¹⁸⁶ In order to serve as a means of settlements, the participating central banks were given an initial supply of ECUs against the deposit of 20 percent of their gold and dollar reserves with the EMCF (on a revolving basis).¹⁸⁷ In practice, the actual role of the ECU (in contrast with its “official” role) in the intervention mechanism of the EMS was relatively limited (as will be shown in the following sections). Nevertheless, it has to be noted that during the existence of the EMS the ECU was increasingly adopted for private use on the international financial markets.¹⁸⁸

4.4.2 The Intervention Rules and the Exchange Rate Mechanism

As with any fixed rate system, the intervention rules (i.e. the exchange rate standard, the central parities and their respective adjustment mechanisms, the band width and the intervention obligations) established the core element of the EMS, the so-called Exchange Rate Mechanism (ERM). The central parities of the system were established by each participant currency being assigned an ECU central rate, which was agreed on by the ECOFIN and the country in question and defined the price of one ECU in terms of that currency.¹⁸⁹ On the basis of the ECU central rates, the EMS established de jure two different intervention mechanisms in order to provide exchange rate stability:

- The divergence indicator, which established an intervention mechanism that follows the basic structure of a currency basket standard based on the ECU
- A bilateral intervention mechanism based on a parity grid standard

Although the initial premise of placing the ECU at “the center of the EMS” would have signified that the ERM was to use the ECU as the pivot in the intervention rules, essentially reforming the previous exchange rate system (i.e. “the snake-system”) and creating a currency

¹⁸⁶ See Resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System, Paragraph 2.3, extract printed in Gros/Thygesen, 1998, p.59.

¹⁸⁷ See Resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System, Paragraph 3.8, extract printed in Gros/Thygesen, 1998, p.60.

¹⁸⁸ See Fuchs, 1989.

¹⁸⁹ For “snake” members the rates were based on the “snake” rates. For France, Italy and Ireland the rates were taken from the market.

basket standard system, several member states (Denmark, Germany and the Benelux countries) opposed this development by stating that the “snake” was not under discussion and would remain completely intact.¹⁹⁰ This strong resistance of most of the “snake” participant EC countries to an ECU-centered system (especially Germany¹⁹¹), as well as the technical complications attached to a basket-pegged intervention mechanism¹⁹², led to the retaining of the bilateral parity grid standard and obligatory intervention rules very similar to the “snake” as the basis for the ERM of the EMS. As a compromise to the participant countries advocating an ECU-pivoted currency basket standard system, the parity grid would use the ECU as a denominator (see section 4.4.1.); and a supplementary intervention mechanism based on the divergence of the participant currencies from the ECU central rate was created, the divergence indicator.¹⁹³ But interventions based on the divergence indicator were not stipulated as mandatory, thereby maintaining the fluctuation margins of the bilateral rates in the parity grid as the sole trigger of compulsory interventions. As a result, the obligatory intervention mechanism based on the parity grid standard was the de facto core of the ERM of the EMS.¹⁹⁴ The EMS can therefore be essentially defined as a parity grid standard system.¹⁹⁵ Any further mention to the system’s ERM in the scope of this paper will thus refer exclusively to the intervention rules stipulated for the parity grid intervention mechanism. Nevertheless, in order to provide a complete description of the institutional framework of the EMS, the following two sections will briefly describe both intervention mechanisms: the divergence indicator and the more relevant parity grid.

4.4.2.1 The Divergence Indicator

The intervention mechanism based on the divergence indicator follows the basic structure of a currency basket standard. This mechanism was a main innovation in the EMS compared to the “snake”, since it used the ECU as a pivot and did not rely on a bilateral but rather a unilateral intervention rule. The indicator (D_i) signalled the divergence of each EMS currency from its pre-assigned ECU central rate and was defined as:

¹⁹⁰ See Gros/Thygesen, 1998, p.45.

¹⁹¹ Because of the upwards tendency of the DM at the time, the German Bundesbank strongly resisted joining a ECU-centered system that would single out the divergent currency and force unilateral intervention, since this would have compromised national monetary policy. See Giavazzi/Giovannini, 1989, p. 41-42.

¹⁹² These complications might have resulted from currencies being represented in the basket but whose issuing countries were not part of the ERM (e.g. Great Britain); from the issues regarding which currencies to use for intervention; and the concerns regarding the different fluctuation scopes in a currency basket standard depending on a currency’s weight in the basket, as described in section 3.3.1.1.

¹⁹³ This was the so-called “Belgian compromise”

¹⁹⁴ See Bofinger, 2000b, p. 6.

¹⁹⁵ See Bofinger, 1991, p. 344.

$$D_i = ((s_i - c_i)/c_i) (1/(1 - w_i)) (100/m) ,$$

where s_i and c_i are the market and central rates for currency i , w_i the weight of the currency in the ECU basket and m the deviation percentage for the bilateral margins in the parity grid (i.e. 2.25 percent).¹⁹⁶ In Paragraph 3.5, the European Council Resolution of 1978 defined the “threshold of divergence” as $D_i = 0.75$ for each currency, which meant 75 percent of the maximum possible divergence, that would be observed if currency i deviated by the full 2.25 percent margin from all other EMS currencies.¹⁹⁷ When a currency crossed this threshold, it was expected that the concerning country would “correct this situation by adequate measures namely: a) diversified intervention, b) measures of domestic monetary policy, c) changes in central rates, d) other measures of economic policy” (Paragraph 3.6). If such intervention measures were not taken, “on account of special circumstances”, the involved country would have to justify this inaction to the other countries, first in the concertation between central banks and later possibly in the ECOFIN Council.

Although the divergence indicator was seen as an important innovation at the time of its creation, being the sole example of a specific and multilateral objective indicator as a trigger for policy coordination, it did not play a significant role in the intervention policies of the EMS.¹⁹⁸ This was due to the rather informal and, as mentioned, non-obligatory nature of the policy prescriptions, which merely “presumed” an intervention; but also because in many cases the participant countries used intra-marginal interventions well before the divergence indicator reached the 75 percent threshold.

4.4.2.2 The Parity Grid of Exchange Rates

The parity grid is the core of the ERM of the EMS. As mentioned above, for each currency participating in the EMS a central rate in ECU was agreed on. Through the fixed central rates, bilateral central rates between any two of the participating currencies were determined and linking all of these together formed the parity grid of the system as a whole. Thus, in the parity grid the ECU ended serving merely as a numéraire for the relevant bilateral rates. The intervention rules of the ERM demanded that a participating currency’s bilateral market exchange rate vis-à-vis any other EMS currency stayed within a pre-assigned margin, in either direction, from the bilateral central parity. At the start of the EMS in 1979, the bilateral margins were set at 2.25 percent on each side of the central parity, therefore creating a 4.5

¹⁹⁶ This formal definition is taken from Gros/Thygesen, 1998, p.66.

¹⁹⁷ See Gros/Thygesen, 1998, p. 47-48, and Giavazzi/Giovannini, 1989, p. 35-37 for further formal analysis of the divergence indicator.

¹⁹⁸ See Gros/Thygesen, 1998, p. 48.

percent wide fluctuation band. For Italy the margins were set at ± 6 percent, mainly because of the high Italian inflation rates compared to the other EMS countries. By allowing the lira to fluctuate in a wider band of 12 percent, the Italian central bank was given more space to maneuver without having to resort to realignment.

Obligatory intervention points were established at both the upper and lower margin of the fluctuation band. Because the “symmetry of the bilateral parities implied that whenever a currency A reached its *upper* intervention point vis-à-vis currency B [...], currency B simultaneously reached its *lower* intervention point vis-à-vis currency A” (Bofinger, 2000b, p.6), it follows that any two EMS currencies reaching their bilateral margins against each other, would lead to both countries’ central banks being obligated to simultaneously intervene in the foreign exchange market. Thus, the parity grid of bilateral exchange rates established a formal symmetry regarding the distribution of intervention obligations. To fulfill the marginal intervention commitment in the EMS, the issuing central bank of the stronger currency (i.e. the appreciating currency that has reached its upper intervention point vis-à-vis the depreciating currency) had to purchase the weaker currency and the “relatively weaker” issuing central bank was to sell the stronger currency.¹⁹⁹ The defence of the intervention points through compulsory marginal intervention was stipulated to be unlimited in amount.²⁰⁰ While there were technically no limits for the strong central bank to the amount of the weaker currency that could be bought by supplying its own currency to the market, the EMS also provided an unlimited short-term credit line (the “very short-term facility”) to allow the weak central bank to intervene (i.e. buy its own currency by selling the stronger one) limitless beyond its reserves. How this credit facility worked will be further detailed in the section regarding the financing mechanism of the system.

Note also, that interventions in the ERM were not only carried out when the outer limits of the exchange rate band were reached, but also before (within the intervention points), since the EMS agreements allowed central banks to intervene intramarginally by buying and selling each other’s as well as non-EMS currencies in the foreign exchange market.²⁰¹ The intra-marginal interventions were carried out at the discretion of the individual central bank and used often, since a currency reaching its ERM margin was seen by the markets as a negative

¹⁹⁹ “In principle, the interventions will be made in participating currencies.” See Resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System, Paragraph 3.3, extract printed in Gros/Thygesen, 1998, p.59.

²⁰⁰ See Agreement between the Member States of the EEC setting terms of operation for the European Monetary System of 13 March 1979 in Basle, article 2.2, extract printed in Gold, 1990, p. 58-59.

²⁰¹ See Bofinger, 2000b, p. 11-12.

sign. When an intervention was done in a Community currency, it was subject to the consent of the central bank whose currency was being sold or bought, whereas interventions in non-Community currencies (e.g. USD) did not require mutual authorization and were always allowed. The original EMS framework did not establish financing provisions for intra-marginal intervention.²⁰²

Since the rules of the parity grid established the relevant intervention mechanism of the EMS, it has to be analysed how this intervention mechanism distributed the monetary adjustment constraints among the countries participating in the System. Due to the symmetrical intervention obligations in the parity grid, the preliminary liquidity and reserve effects of interventions become effective in both the weak and strong currency countries. The strong currency country is subject to an expansionary monetary base effect and increasing reserves, whereas the weak currency country's monetary base and reserves decrease.²⁰³ How this preliminary distribution of effects resulting from the intervention rules, and coupled with the possibly altering effects of the other institutional features, determine the overall functioning and adjustment constraints of the system, is described in section 4.4.6.

4.4.3 The Financing Mechanism

4.4.3.1 The Credit Facilities

The institutional framework of the EMS established three different types of credit mechanisms. Before the most important one, the Very-Short-Term Facility (VSTF) created to provide credit facilities for the financing of mandatory foreign exchange market interventions, is detailed, the other two facilities that were established to aid member countries in balance of payments difficulties will be described briefly:

- The Short-Term Monetary Support (STMS) was aimed to provide short-term financial support for balance of payments problems. In this facility, the EC central banks grant each other short-term credits that have a maturity of three months and can be extended twice for three months each. The amount of the credit lines is limited to exactly defined debtor and creditor quotas.

²⁰² This was changed with the Basle-Nyborg agreement in 1987, which will be described in a later section.

²⁰³ Note that these liquidity effects hold for both mandatory and intramarginal interventions, provided they are not financed out of reserve assets previously held in market investments and as long as the accumulated reserves through the interventions are not re-invested in the private markets. If one of these criteria is not fulfilled then the corresponding intervention will have no monetary base effect. Note that further analysis of the distribution of liquidity effects in the intervention mechanism will assume liquidity effective interventions. See Bofinger, 1991, p. 125- 133.

- Medium-Term Financial Assistance (MTFA), which in contrast to the VSFT and the STMS was not administered by the central banks but by the EEC Council of Ministers, granted member countries medium-term (maturity of two to five years) aid for balance of payments difficulties. These credits however were conditioned to economic adjustment policies in order to re-establish a market financed balance of payments equilibrium.²⁰⁴

Since both the STMS and the MTFA did not play a relevant role for the ERM of the EMS, further analysis of the credit facilities of the system will exclusively focus on the intervention credits provided by the VSTF.

The VSTF consisted of mutual credit lines among the central banks participating in the EMS. The credit lines were unlimited²⁰⁵ and automatic, and were meant to provide an unrestricted amount of financial assistance to central banks, in order to fulfill eventual compulsory intervention commitments. Because central banks only had limited reserves of each other's currencies, it was crucial that they could draw on the partner central bank issuing the currency necessary for intervention if their currencies had reached the bilateral margins. Thus, the unlimited nature of the facility was intended to provide credibility to the bilateral parities of the EMS by securing the financing of marginal interventions.²⁰⁶ All transactions of the VSTF were denominated in ECU and recorded on the accounts of the central banks with the EMCF. The settlements for the VSTF credit lines were to be made at least 45 days after the end of the month in which the intervention had taken place.²⁰⁷ At the request of the debtor central bank the credit lines could be automatically renewed for a period of three months and with the consent of the creditor central bank a second extension of three months was also possible. But beyond the first deadline of 45 days, financing of marginal interventions was no longer unlimited, since the extended credit lines were limited to a ceiling equal to the debtor country's quota in the STMS facility. The interests of the VSTF credits were established by a weighted average of representative interest rates of the ECU-basket currencies. Repayments of the VSTF credits could be denominated in the creditor's currency, in "official" ECU, or in

²⁰⁴ For further detail on the SMTS and the MTFA see Ungerer, 1997, p.90-91.

²⁰⁵ See Resolution of the European Council of 5 December 1978 on the establishment of the European Monetary System, Paragraph 3.7, extract printed in Gros/Thygesen, 1998, p.60.

²⁰⁶ See Giavazzi/Giovannini, 1989, p.38.

²⁰⁷ In the "snake" system the credit period had only been 30 days.

other reserve assets that could not be created by the debtor country (i.e. the debtor country's own currency).²⁰⁸

The credit mechanism of the VSTF provided an unlimited short-term access to intervention assets for the weak currency countries, but due to the short maturity of the credits the unlimited intervention promise was only credible for a limited period of time. Afterwards, the strict budget constraint of limited available reserves, which were needed to finance the interventions, was re-established by the credit repayment obligations.²⁰⁹

4.4.3.2 Settlement Rules

The settlement rules of the EMS established that interventions carried out by a strong currency country at its upper intervention point were essentially accounted like an intervention of a weak currency country at its lower intervention point drawing on its intervention credit facility (VSTF).²¹⁰ The weak currency assets accumulated by the strong currency central bank, when it was forced to intervene at the upper margin, were routinely transferred to the EMCF. In the central banks' VSTF accounts with the EMCF, the transferred weak currency assets then established corresponding ECU-assets for the strong currency central bank and ECU-liabilities for the weak currency central bank. The settlement obligations of these resulting balances for the weak currency country followed the same mechanics as the repayments of the credit lines drawn on the VSTF. Thus, interventions at both the upper and lower margin created an increasing VSTF indebtedness and had to be financed by the weak currency countries.²¹¹ This arrangement was mainly based on article 6.2 of the Agreement between the Member States of the EEC setting terms of operation for the European Monetary System (Basle, 1979): "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 Cooperation Fund (...)"

The settlement obligations imposed on the weak currency countries through this arrangement had decisive impact on the overall symmetry characteristics of the EMS, because interventions by the strong currency country essentially established the same adjustment constraints for the weak currency country as their own credit-financed interventions. Due to

²⁰⁸ For further detail see the Agreement between the Member States of the EEC setting terms of operation for the European Monetary System of 13 March 1979 in Basle, article 8.

²⁰⁹ See Vehrkamp, 1995, p. 36.

²¹⁰ See Bofinger, 1991, p. 351.

²¹¹ See, Bofinger, 2000b, p.7.

the fact that both upper and lower margin intervention had to be financed by the weak currency countries, their budget constraint of available reserve assets was significantly tightened. This fact might also explain why weak currency countries in the EMS intervened a lot intramarginally, since then they could avoid the “double burden” of marginal interventions.²¹²

4.4.4 Reserve Rules

As described in section 3.3.3, a fixed rate system can establish institutionalized rules regarding the amount (reserve limitation rules) and form (reserve investment rules) participating central banks are allowed to hold reserves denominated in other member countries’ currencies in order to control the liquidity effects of reserve accumulation. The reserve rules established by the institutional framework of the EMS were rather loose and therefore not specifically quantifiable. Regarding the “reserve limitation rules”, article 15 of the Agreement between the Member States of the EEC setting terms of operation for the European Monetary System (Basle, 1979) established the central banks’ 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 the Governors. These limits may be exceeded only with the consent of the central bank concerned.” While a rigid limitation of the holding of intervention reserves to “working balances” would have meant a significant tightening of the budget constraint for lower margin interventions (since the budget is precisely defined by the limited reserve assets available for intervention or credit repayment), in practice the procedure was not handled as strictly as stipulated.²¹³ Nevertheless, the reserve limitation rule stipulated by article 15 restricted the accumulation of reserve assets denominated in member currencies and also made it subject to the consent of the central bank issuing the currency in question.

The institutional framework of the EMS did not stipulate reserve investment rules for its participating countries. The central banks of the EMS were therefore free, regarding the decision on how they preferred to hold their intervention reserves; they could either directly deposit them at the fellow central bank issuing the concerned currency or invest them in the private market.

In sum, the reserve rules did not play a significant role in the overall functioning of the EMS. However, the restriction of the accumulation of reserve assets denominated in member

²¹² See Bofinger, 1991, p. 358.

²¹³ See Vehrkamp, 1995, p. 35.

currencies to “working balances” and being subjected to consent of the issuing central bank, contributed in tightening the budget constraint of intervention reserves of the weak currency countries, therefore increasing the need for intervention financing through the credit facility of the system in case of lower margin intervention obligations.²¹⁴

4.4.5 Central Rate Adjustment Mechanism

The final institutional feature of the EMS that has to be analysed is the adjustment mechanism of the central rates of the system. The ECU central rates did not follow any pre-established adjustment rule, but were fixed and could only be changed when a realignment of the central rates was decided. Paragraph 3.2 of the European Council Resolution of 1978 established the adjustment procedure, but remained unspecific regarding the reasons that would lead to realignments: “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. There will be reciprocal consultation in the Community framework about important decisions concerning exchange-rate policy between countries participating and any country not participating in the system.” These regulations established a common procedure for the central parity adjustment mechanism that established a mutual consent rule for the realignment decision. Nevertheless, by not providing any more concrete rules for the realignments, the EMS allowed a very discretionary approach regarding the adjustment of ECU central rates.²¹⁵ Since the decision of discretionary central rate realignments was solely assigned to the European Council and not the central banks, the exchange rate adjustment competency within the EMS was essentially of political nature.²¹⁶ Because the realignment competency required unanimous mutual consent, therefore ensuring each involved member state a political veto, the discretionary central rate adjustments were subject to a politically dominated process of negotiation.²¹⁷ Finally, it has to be noted that due to the rather limited role the ECU de facto played in the ERM, realignments were in practice negotiated in bilateral member currency rates which would then lead to changes in the ECU central rates.²¹⁸ How the discretionary approach to realignments was de facto used in the EMS will be discussed in the section regarding the overall performance of the system.

²¹⁴ See, Bofinger, 1991, p. 351.

²¹⁵ See Bofinger, 2000b, p. 9-10.

²¹⁶ In practice the realignment decisions were negotiated and prepared by the Monetary Committee of the European Community but required the mutual political consent of the European Council of Ministers.

²¹⁷ See Vehrkamp, 1995, p. 39-40.

²¹⁸ See Bofinger, 1991, p. 345.

4.4.6 Overall Adjustment Constraints in the EMS

As established in section 3.2, the crucial aspect for the assessment of a fixed rate system concerns the distribution of the adjustment constraints (i.e. whether the weak currency country or the strong currency country (or possibly both) has to bear the adjustment in case of shocks forcing foreign market intervention) within the institutional framework of the system. The formally symmetrical distribution of intervention obligations in EMS's exchange rate mechanism (established by the parity grid and described in section 4.4.2.2.) led several authors at that time to assume an overall symmetry of adjustment pressures in the EMS.²¹⁹ To determine whether or not this was actually the case, the concrete intervention procedures and resulting effects have to be analyzed. In order to do this, assume a situation in which the French franc came under attack and depreciated vis-à-vis the DM until it reached its lower intervention point, at the same time the DM reached its upper intervention point vis-à-vis the franc due to the symmetry of the bilateral parity grid.²²⁰ Because of the symmetrical intervention obligations both the Bundesbank and the Banque de France (BdF) were obliged to intervene in the foreign exchange market.

The interventions of the BdF (i.e. purchasing its own currency by supplying DM to the market) led to expansionary liquidity effects for Germany and restrictive effects on its own monetary base, as well as a reduction of the French foreign exchange reserves. In order for the BdF to be able to fulfill its intervention promise beyond its limited reserves (that were restricted to "working balances", see section 4.4.4.), it was granted the unlimited short-term credit lines of the VSTF. But because of the relatively tight conditions of the VSTF (short maturity, extension limited to small quotas; see section 4.4.3.1.), the ability of the BdF to cope with persistent speculative attacks simply by the means of (sterilized) intervention was still subject to a strict budget constraint of limited reserves. As a result, in order to staunch the outflow of reserves, the Bdf eventually had either the option of raising interest rates and pursuing a more restrictive monetary policy or to devalue through central rate adjustment.²²¹

The Bundesbank simultaneously fulfilled its intervention obligations by providing its own currency to the market and purchasing franc assets. The liquidity effects resulting from the Bundesbank's foreign exchange market intervention were identically symmetrical as the

²¹⁹ See for instance Eggerstedt/Sinn (1987, p. 8): "Nevertheless, the EMS was originally designed as a symmetrical intervention system. The burden of adjustment was to be shared among the member countries." See also, Begg/Wyplosz, 1987; or Melitz, 1985.

²²⁰ This situation occurred quite frequently in the EMS during the 1980s.

²²¹ Following a more restrictive policy would have implied an adjustment towards the Bundesbanks's policy stand, since the Bundesbank was the central bank with the most stability-oriented policy approach in the EMS during the 1980s, see Bofinger, 2000b, p. 7.

liquidity effects of the BdF interventions (i.e. expansionary effect on the German monetary base, restrictive effect on the French monetary base). Regarding the reserve effects, the intervention by the Bundesbank increased its foreign exchange reserves. Because the increasing accumulation of reserve assets was not restricted by any real limitations, the Bundesbank (in contrast with the draining reserve effects for the BdF) was not subjected to any policy adjustment constraint through this channel.²²² Furthermore, because of the settlement rules of the EMS, interventions by the strong currency central bank were essentially treated the same as VSTF credit financed interventions by the weak currency country (see section 4.4.3.2.). The Bundesbank transferred the purchased franc deposits to the EMCF and was subsequently credited on its VSTF account, while the BdF VSTF account with the EMCF was correspondingly debited. As a result, the Bundesbank interventions had the same effect for the BdF as its own interventions, creating an increasing VSTF indebtedness that tightened the BdF's budget constraint and lead to policy adjustment pressure (devaluation or interest rate increase) in order to avoid eventual insolvency.

All in all, the ERM of the EMS established symmetrical preliminary liquidity-effect-based adjustment constraints for the participating countries and asymmetrical reserve effects that unilaterally burdened the weak currency countries with adjustment pressure (in this example France).²²³ The liquidity effects are described as preliminary because the involved central banks could counter these effects by sterilizing their interventions. The Bundesbank was always able to fully sterilize the liquidity effects of its interventions and therefore never lost the control over the domestic short-term interest rate, which it used as its operating target.²²⁴ Thus, speculative attacks were never a reason for the Bundesbank to relax its monetary policy stance. Because the sterilization capacity of the weak currency central banks of the EMS was again limited by their reserves (see section 3.4.), the liquidity effects resulting from interventions often led to policy adjustment pressures for the weak currency countries displayed by substantial increases of real short-term interest rates, as shown by Figure 3.²²⁵ As a result, the EMS was not only asymmetrical regarding the adjustment constraints resulting from the reserve effects, but also in terms of the liquidity effect determined adjustment

²²² See Bofinger, 1988, p. 321-322.

²²³ See Bofinger, 1991, p. 354.

²²⁴ For empirical results regarding sterilized interventions of the Bundesbank in the EMS see Mastropasqua et al., 1988; Weber, 1996; as well as Gros/Thygesen, 1998, p.170-172. For the general sterilization policy of the Bundesbank, see Deutsche Bundesbank, 1993.

²²⁵ See also Gros/Thygesen, 1998, p. 174-177; Bofinger, 2000b, p. 8.

constraints due to the asymmetrical sterilization behavior of the member countries.²²⁶ In spite of the formal symmetry of the ERM, the overall functioning of the institutional framework of the EMS, which intended to stabilize bilateral exchange rates, established a strong asymmetry in favor of the strong currency countries. The main beneficiary was the Bundesbank, which was through this asymmetry protected from being infected with the relatively high inflation rates that abounded in some of the other member states at the beginning of the EMS (see Figure 4). While the credit facilities of the EMS could have been designed to counter this asymmetry by significantly loosening the budget constraint of the weak currency countries, they were in fact conceived in a rather restrictive way in order to only provide unlimited credits in the very short-term as means to fight transitory speculative attacks, but to discourage the support of unsustainable exchange rate levels in the medium and long-term. The overall asymmetry of adjustment constraints had a decisive impact on the credibility of the system as a whole, because the exchange rate promise could only be credible from the market's perspective if the weak currency countries that were asymmetrically burdened with the adjustment constraints were able (and willing) to perform said policy adjustments (changes in monetary policy) in the case of crisis, or else the need for an exchange rate adjustment in form of a realignment became evident.

Despite the aforementioned literature, the rather asymmetric nature of the EMS, especially in its initial years prior to the Basle-Nyborg agreement that somewhat relaxed the strict conditions of the credit facilities, is today generally accepted.²²⁷

4.5 The Performance of the European Monetary System

4.5.1 Brief Chronology of the EMS Experience

This section is intended to give an assessment of the overall development and performance of the EMS from a chronological and factual approach, while section 4.5.2 will detail the “lessons” that can be drawn from the system's functioning from a more analytical perspective. The EMS experience for the participating European countries can essentially be divided in four phases, that will be briefly described under the criteria of internal and external stability,

²²⁶ See Bofinger, 1991, p. 357.

²²⁷ See for instance Gros/Thygesen, 1998, p. 167-180; Bofinger, 2000b, p. 6-8; Bajo-Rubio et al., 2000. Regarding empirical studies that still come to a less clear-cut result (see for instance von Hagen, 1989), this may be mainly be due to the technical difficulties of testing this “asymmetry”, for a description of these difficulties see Bofinger, 2000b, p. 8.

as well as whether or not the system contributed in enhancing policy coordination and common decision making in Europe, leading to a deepening of integration.²²⁸

4.5.1.1 The uneasy initial phase from 1979 to 1983

The initial four-year phase until March 1983 can be described as rather uneasy due to frequent realignments and wide policy divergence between the member states.²²⁹ There were a total of seven realignments during this phase, which essentially followed tendencies similar to those of the “snake”-system, in which the currencies of Belgium/Luxembourg, Denmark, France, Italy and Ireland experienced constant devaluation pressure vis-à-vis the German DM and the Dutch guilder.²³⁰ An exception to this trend was the brief bout of downward pressure the DM suffered around the turn of the year 1980/1981 that, however, did not result in adjustment action.²³¹ The degree of the exchange rate adjustments was in some cases substantial as Table 5 (that compiles all realignments during the EMS experience) shows, e.g. in June 1982 the DM revaluated 10% towards to French franc. Regarding the objective of internal stability, there was no decrease in member state’s inflation rates or inflation rate convergence in the initial period of 1979 to 1983 (See Figure 4). This can largely be attributed to the second large oil price shock from late 1979 that did not only raise inflation for the region in general, but also led to a divergence in national policy, as the EMS countries responded differently to the challenges of the shock.²³² Despite the rather modest success regarding stability, the first four years of the EMS marked a period of trial and orientation that led to progress in exchange rate policy coordination and paved the way for further joint action. Compared to the experience under the “snake”-system, the realignment procedure became less unilateral and informal, and more visibly a subject of joint decision.²³³ The move to common decision-making became especially evident in the February 1982 realignment, where Belgium and Denmark accepted substantially lower devaluations than they had initially requested (which were comprehensible from a competitiveness standpoint) due to strong objections of the other participants. This signaled a clear stand against even a presumption of preemptive and competitive devaluations and also established the EMS “strong currency” strategy, which “avoided compensating fully for past losses in competitiveness and took a dynamic, forward-looking approach with emphasis on domestic adjustment” (Ungerer, 1997, p.173) that tightened the constraints for

²²⁸ This chronological classification follows Gros/Thygesen, 1998, p. 73-104; Tsoukalis, 1997, p. 146-162.

²²⁹ See Tsoukalis, 1997, p. 147-148.

²³⁰ For a detailed discussion of all the realignments see Gros/Thygesen, 1998, p. 73-81.

²³¹ See Ungerer, 1997, p. 173.

²³² See Gros/Thygesen, 1998, p. 73.

²³³ See Ungerer, 1997, p. 173.

member countries (especially “small” members) and provided a linkage from realignments to domestic policy adjustments, therefore making long-term convergence more feasible.

4.5.1.2 The calmer intermediate consolidation phase from 1983 to 1987

The second phase, which started in 1983 and ended with the realignment of January 1987, was a calmer period of consolidation for the EMS. It was characterized by a common consensus to follow more stability-oriented policies and long periods without adjustments of the central rates (see Table 5). There was an increasing emphasis on convergence in the development of costs, prices and monetary aggregates to underpin exchange rate stability.²³⁴ The realignments in this period followed mostly internal reasons that were either political, as in the case of the April 1986 adjustment which was prompted mainly by a government change in France, or stemmed from difficulties due to real appreciation and current account deficit, like the July 1985 and August 1986 devaluations to the Italian lira and the Irish pound, both of whose emitting countries still had inflation rates well above the rest of the EMS states.²³⁵ But the final realignment of the second phase in January 1987 was the first of a new type of externally prompted adjustment that was caused more by speculative unrest in the foreign exchange and capital markets than by macroeconomic divergence among the member states. The rapid fall of the USD in late 1986 had led to an increased demand for DM funds, which put upward pressure on the German currency and finally resulted in the necessary general adjustment of central rates. Nevertheless, the second phase was, as mentioned, characterized by relative exchange rate stability that can be widely attributed to a successful policy of disinflation (and inflation convergence) during this period, as seen in Figure 4. The anti-inflationary policies of the Bundesbank had become a reference point for the policies of the other member countries and the DM slowly established itself as the anchor currency of the system.²³⁶ Furthermore, intramarginal interventions started to play a bigger role as EMS countries tried to avoid reaching their mandatory intervention points in order to counter exchange rate pressures even before they could develop a momentum of their own and, thus, enhancing overall stability of the system. Mandatory marginal interventions declined significantly in comparison to the initial phase of the system. On the other hand, the increased use of intramarginal interventions might have had the negative effect of preventing the use of

²³⁴ See Gros/Thygesen, 1998, p. 81-82.

²³⁵ Ibid.

²³⁶ See Ungerer, 1997, p. 176-177.

more aggressive and necessary interest rate policy adjustments by the member states.²³⁷ Also, the required approval of the country emitting the currency used in the intramarginal intervention could prove to be unwieldy in sudden changes of market conditions and to politicize the intervention process, as well as enhance the asymmetry in the system, because with the aforementioned reorientation of member countries' policies to follow Germany, the intramarginal interventions were mainly carried out in DM, which was accepted by the German government since they were not obliged to provide credit facilities for interventions within the fluctuation band.²³⁸

4.5.1.3 The stabile phase from 1987 to 1992

The third phase of the EMS (that lasted from 1987 to September 1992) was characterized by exchange rate stability, since the system was managed without adjustments to the central rates for over 5 years.²³⁹ This stability was especially remarkable considering for instance that during this period three additional currencies (ESP, GBP and PTE) joined the system²⁴⁰; and that following the European Common Market project, the signing of the Single European act by the EC Council of Ministers in February 1986 called for the gradual removal of capital controls by those EMS participants who had retained them.²⁴¹ Although average inflation in the EMS increased over the third phase, mainly as a result of German unification in 1990, the goal of inflation rate convergence was not negatively affected (again, see Figure 4). Regarding the development of policy coordination, important improvements were made with the adoption of the Basle-Nyborg agreement in September 1987 at the beginning of the third period. The main reason for the Basle-Nyborg agreement can be seen in the concerns regarding external (capital and foreign exchange market) pressures leading to realignments, as experienced in the last adjustment of the second phase mentioned above, which the EMS members thought could be avoided by better policy coordination and if the system had provisions that increased its resistance against speculative attacks.²⁴² Other reasons were the aforementioned removal of capital controls leading to increased capital mobility that called for more coordination of national monetary policies, and also the growing concern,

²³⁷ See Gros/Thygesen, 1998, p. 85.

²³⁸ See Ungerer, 1997, p. 177.

²³⁹ This is disregarding the merely technical adjustment of the Italian lira in January 1990 that was a consequence of adopting the narrow margins of ± 2.25 percent. See Tsoukalis, 1997, p. 148.

²⁴⁰ The Spanish peseta joined the ERM in June 1989, the British pound in October 1990 and the Portuguese escudo in April 1992. All three countries opted for the wider margins of ± 6 percent. At that time all EC countries, except Greece, participated in the ERM of the EMS.

²⁴¹ See section 4.5.2.2 for an analysis of the role of capital controls in the EMS.

²⁴² See Ungerer, 1997, p. 179.

particularly in France and Italy, regarding the asymmetric nature of the system in favor of the DM and German policy.²⁴³ The main modifications to the original institutional framework of the EMS (described in section 4.4) which resulted from the Basle-Nyborg agreement, were²⁴⁴:

- In order to improve the intervention financing mechanism, it was agreed to extend the maturity of settlements arising from mandatory interventions by one month to altogether 3,5 months, since the initially stipulated 2,5 months had at times proven to be too short to accommodate necessary adjustments after realignments. In addition, the respective debtor quotas in the Short-Term Monetary Support, which can automatically extend part of the accumulated intervention credits for another three months, renewable once, were doubled in amount.
- Even more significantly, the efficiency of the intervention rules design was enhanced by extending the access of the Very-Short-Term to the financing of intramarginal interventions, as long as the creditor central banks concerned did not explicitly object and the drawings did not exceed twice the debtor quota of the intervening country. This measure was especially important due to the reliance on intramarginal interventions in the EMS (as mentioned above) that had before been subject to the approval of the intervention currency's issuing central bank, but under the new rules established a "presumption" of agreement.
- Finally, as another measure to facilitate settlement procedures, it was agreed that the acceptance limit of the creditor central bank for the settlements paid by the debtor central bank in official ECU would be raised from a maximum of 50 to 100 percent.

Apart from these institutional reforms, the Basle-Nyborg agreement recommended a better balance of the EMS's operating instruments that were exchange rate mobility within the band, changes in interest rate differentials and interventions. The concern was that the use of intervention had been excessive, so for instance, the flexible use of the fluctuation margins to deter speculation and avoid prolonged bouts of intramarginal interventions was recommended. Furthermore, an intensified surveillance of monetary developments, in particular to highlight any policy inconsistencies within the EMS and incompatible approaches to third currencies was determined.²⁴⁵

²⁴³ See Gros/Thygesen, 1998, p. 92-94.

²⁴⁴ For the agreed on measures of the Basle-Nyborg agreement see Press communiqué of the Committee of Governors of the Central Banks of the EEC member states of September 18th 1987, printed in Gros/Thygesen, 1998, p.104-105.

²⁴⁵ See Ungerer, 1997, p. 180.

Finally, it is also noteworthy that during this phase of relative stability the debate on the goal of monetary union was restarted with the Delors Report in 1988 and the signing of the Maastricht Treaty in 1992.

4.5.1.4 The turbulent phase from 1992 to 1993; Period of Reconsolidation

Despite the relative stability and convergence achieved over the three previous phases, the fourth phase was characterized by crises and a near de facto suspension of the fixed rate system. Before the main reasons for the crises are presented, the historical facts of the turbulent phase as well as the subsequent period of reconsolidation will be briefly detailed. Following a continued anti-inflationary stance of high interest rates by Germany, in September 1992 massive interventions had to be carried out by the Bundesbank and the Italian central bank to support the lira, which nevertheless briefly left its fluctuation band, having come under severe pressure. These large interventions led the German officials to assess the possibility of suspending intervention obligations because of the threat to domestic price stability, and to urge for an exchange rate adjustment.²⁴⁶ The Italian lira was subsequently devaluated seven percent on September 14th 1992, but this appeared not to be enough from the market's perspective, as both the lira and the British pound came under massive pressure in the following days. On September 16th 1992 (the so-called "Black – Wednesday"), the Monetary Committee suspended both the Italian lira and British pound from further EMS participation after heavy interventions had failed to lift them above their agreed lower limits, and also decided a devaluation of the Spanish peseta by five percent.²⁴⁷ This was followed by further downward adjustments of the peseta as well as the Portuguese escudo and the Irish pound (see Table 5).²⁴⁸ The following official EC reports assessing the 1992 crisis – which failed to emphatically state the obligation of defending central rates that could not be regarded as misaligned – as well as the continuing strong recession in most of Europe, the persisting restrictive German monetary policy and a new French government committed to aggressively lowering interest rates; all together increased the tensions in the EMS beyond control.²⁴⁹ In July 1993 the French, Belgian and Danish currencies all fell below their lower band margins, implying a breach of EMS stipulations. In order to prevent a further erosion of the EMS and avoid giving one-way bets to speculators through massive

²⁴⁶ See Gros/Thygesen, 1998, p. 95-96.

²⁴⁷ The Spanish peseta can be seen as having entered the ERM overvalued, leading to devaluation pressure in the crisis. See Gros/Thygesen, 1998, p. 96-97.

²⁴⁸ For detailed case studies on individual member currencies during the EMS crisis see Johnson/Collignon, 1994.

²⁴⁹ For further detail see Gros/Thygesen, 1998, p. 98-99.

realignments (especially since the central rates were still considered to be appropriate), on August 1, 1993 the ECOFIN Council and central bank governors decided to drastically widen the fluctuation margins to ± 15 percent. This announcement to dramatically extent the bilateral exchange rate bands was essentially a suspension of the fixed rate system's rules since the EMS moved close to de facto flexible rates, and also fundamentally questioned the goal of monetary unification.²⁵⁰ Nevertheless, it can be argued that by maintaining the main elements of the EMS (particularly the well-tested central rates, which were preserved after the widening of the margins), the member states signaled that they were willing to continue pursuing monetary integration. A period of reconsolidation and de facto informal convergence in the monetary stance of the remaining members followed. The desire of member countries to again stabilize and keep exchange rates within lower limits than ± 15 percent was indicated by the high volume of intramarginal interventions in 1993 and 1994.²⁵¹ A final realignment of the peseta and the escudo took place in March 1995. In the fall of 1996, the Italian lira re-entered the EMS, as did the Finnish markka. The system continued to operate with relative stability until the beginning of the European Monetary Union in January 1999. Following monetary unification, the ERM II was set up as a successor to the ERM (the institutional framework of the ERM II is basically the same as that of the EMS with the ± 15 percent margins) that is intended to provide stability between the euro and other non-EMU EU currencies as well as serve as an intermediate step towards participation in the euro area.²⁵² Turning to the main reasons of the EMS crises, there were several aspects that contributed in leading to tensions in the EMS and eventually the 1992/1993 crises, which will be briefly described:

- One of the main aspects that led to the crisis can be seen in the growing tensions within the ERM due to real appreciation.²⁵³ Despite the overall success of the EMS countries in fighting inflation, there still might have been insufficient convergence.²⁵⁴ Countries that had joined the EMS later, like Spain and the UK, but also initial members like Italy and Ireland, still had considerable inflation differentials vis-à-vis Germany.²⁵⁵ Thus, all of these countries experienced substantial real appreciations of

²⁵⁰ See Gros/Thygesen, 1998, p. 101.

²⁵¹ See Bofinger, 2000b, p. 12.

²⁵² For a description of the ERM II, as well as an analysis of exchange rate policies in the transition process to EMU, see Bofinger, 2004.

²⁵³ For general evidence that real appreciation can be a very serious warning signal for currency crisis see Kaminsky et al., 1998.

²⁵⁴ See Ungerer, 1997, p. 261-262.

²⁵⁵ See Gros/Thygesen, 1998, p. 207; and Figure 4.

their currencies that could at least partially be compensated in the initial phases of the EMS through the constant realignments, but in later periods (of constant nominal exchange rates) led to massive losses in international competitiveness and to growing current account deficits. This strong overvaluation of some currencies, in the absence of realignments (see Figure 6 that shows the real exchange rates of EMS currencies vis-à-vis the DM), coupled with the restrictive monetary policy of high interest rates pursued by the EMS countries in order to accelerate the disinflation and inflation-convergence process, caused major tensions within the system. The prime example of this is Italy, that after regularly devaluating its currency in nominal terms (vis-à-vis the DM) during the initial period of the EMS (see Table 5), changed its exchange rate policy after 1987 to target an almost stable nominal exchange rate, while experiencing strong real appreciation throughout (Figure 6). At the same time, the Banca d'Italia pursued a restrictive monetary policy of high interest rates to fight domestic inflation and the continuing real appreciation.²⁵⁶ The resulting rise of interest differentials vis-à-vis the DM shortly before the crisis, since DM interest rates were considerably lower at the time, would have required a high risk premium (of expected depreciation) on the lira in order to establish an equilibrium on the international financial markets.²⁵⁷ But this high risk premium was not given, because the markets now considered the Lira as relatively stable due to Italy's switch to a more stable exchange rate policy and the narrowing of the lira's fluctuation margins (see 4.5.1.3). As a result, the interest rate differential led to huge short-term capital inflows that combined with the persisting real appreciation became unsustainable for the Italian economy.²⁵⁸ Political failure to agree on a large downward realignment of the lira to counter these effects, led to the lira being forced out of the ERM in September 1992.²⁵⁹ Since other currencies (e.g. the peseta and the pound sterling) had similar real appreciation problems as the lira, a continued nominal depreciation or correction in form of a "maxi-realignment" that devaluated might have been adequate to at least mitigate the effects of the crisis.²⁶⁰

- Another reason for tension in the EMS during the turbulent crisis phase was the insufficient coordination of the national monetary and economic policies within the

²⁵⁶ For an analysis of the reasons for persisting inflation and real appreciation despite non-accommodating monetary policy see Micossi/Padoan, 1994, p. 69-76.

²⁵⁷ For a detailed explanation of this "disinflation-adjusted uncovered interest parity condition", see Bofinger/Wollmershäuser, 2000, p. 4-10.

²⁵⁸ See Bofinger, 2000b, p. 16.

²⁵⁹ See Micossi/Padoan, 1994, p. 65-67.

²⁶⁰ See Gros/Thygesen, 1998, p. 233.

system.²⁶¹ The inflationary effects induced by the expansionary fiscal policy, product of the German unification, led the Bundesbank to pursue a more restrictive monetary policy of high interest rates.²⁶² At the same time, the other EMS experienced high unemployment and overall stagnating activity, as well as an effective reduction of inflation rates in some cases (e.g. France).²⁶³ Following the tightness of German monetary policy was therefore not appropriate for the other EMS countries, but because of the commitment to stable exchange rates in combination with the central role of the DM in the system, the other EMS countries could not lower their interest rates below the level set by the Bundesbank.²⁶⁴ This dominance of German monetary policy in the EMS will be further detailed in section 4.5.2.3. As a result, the incompatibility of the monetary and fiscal policies between the member states led to strong tensions within the EMS.²⁶⁵ “German (and European) interest rates remained too high in a period of recession, the domestic opposition to deflationary policies kept on growing in several countries, while market operators placed ever larger bets on a general realignment of currencies, thus questioning the sustainability of existing exchange rates and/or policies.” (Tsoukalis, 1997, p. 156)

- In addition to the differences in the economic situation of the EMS countries that put pressure on the ERM, there were political uncertainties that provided further fuel for speculative attacks. For instance, the narrow “no” in the Danish referendum regarding the ratification of the Maastricht Treaty in June 1992 led to growing doubts in the further development of European monetary cooperation (specifically EMU) and therefore might have motivated speculation against the existing central rates of the EMS.²⁶⁶ Because the second wave of speculative attacks in 1993, after the first crisis of 1992 had led to the dropping out of Italy and the UK, targeted currencies (like the French franc and the Danish krone) that were underpinned by much stronger economic performance and not systematically overvalued, it can be argued that the reasons for these attacks were at least partially determined by perceptions of low political decisiveness in the EMS.²⁶⁷

²⁶¹ See Monticelli/Papi, 1996, p. 20.

²⁶² See Gros/Thygesen, 1998, p. 218.

²⁶³ See Ungerer, 1997, p. 261.

²⁶⁴ See Bofinger, 2000b, p.18.

²⁶⁵ See Ungerer, 1997, p. 260.

²⁶⁶ See Tsoukalis, 1997, 153.

²⁶⁷ See Gros/Thygesen, 1998, 233.

- Finally, the expansionary monetary policy of the USA in 1992 created a high interest differential in favor of European currencies, that in turn lead to a weakening of the USD and an increased demand for the DM. As a result, the DM appreciated vis-à-vis the other EMS currencies, creating further disturbances for the system.

4.5.2 Lessons from the EMS: Achievements and Deficiencies

4.5.2.1 Internal and External Stability

As noted in section 4.3.2, the EMS was intended to establish a “zone of monetary stability” in both an internal (i.e. low inflation and inflation convergence) and external (i.e. stable exchange rates) dimension.

Regarding the goal of external stability, the ERM contributed immediately upon its inception in 1979 to a rather stable development of nominal exchange rates. In order to illustrate this, Figure 5 shows that the nominal exchange rate of the DM vis-à-vis other EMS currencies followed rather stable and convergent paths. This stabilization is further confirmed by the data in Table 6, which indicates that the monthly variability of bilateral ERM exchange rates declined directly after the start of the EMS and continued to decline gradually along the first three phases until rising again sharply during the turbulent phase of 1992-95. Table 6 also shows that the monthly variability of bilateral ERM exchange rates was considerably lower than the variability against non-ERM EU currencies and against the USD. The real DM exchange rate paths were very different from the nominal paths they were associated with, as Figure 6 shows. While Denmark, France and the Benelux countries kept a relatively stable exchange rate against the DM, Ireland and Italy underwent a vast real appreciation until the EMS crisis of 1992, as mentioned in section 4.5.1.4. In retrospect it seems clear that in order to correct this disequilibrium both Italy and Ireland should have targeted a continuing nominal depreciation vis-à-vis the DM instead of a stable nominal path; this correction then happened forcefully with the massive nominal depreciations that followed the crisis.²⁶⁸ Nevertheless, if one considers that the real intra-EMS exchange rate variability during this time is comparable with the nominal measures and significantly lower than the variability vis-à-vis the USD, it can be argued that the EMS contributed to both nominal and real exchange rate stabilization.²⁶⁹

²⁶⁸ See Bofinger, 2000b, p. 11.

²⁶⁹ For further evidence see Giavazzi/Giovannini, 1989; Fratianni/Hagen, 1992; as well as Gros/Thygesen, 1998, 112-128, that provide a detailed analysis of exchange rate stabilization under the EMS.

The contribution of the EMS to the aspect of “internal” stability, meaning the reduction of inflation, is not as evident. Although not immediately (due to second oil price shock) inflation rates in the EMS countries decreased and converged over the course of the EMS experience, especially during the 1980s, as described in the chronological analysis and illustrated in Figure 4. In the academic discussion of the late 1980s this reduction of the inflation rates in the EMS area was often pointed at as an evident sign of the system’s success in inducing the disinflation process.²⁷⁰ It proves difficult to effectively assess the real impact of the fixed rate system on disinflation since the alternative condition of an “experience without exchange rate arrangement” (Monticelli/Papi, 1996, p. 21) can obviously not be tested for the member countries. To somewhat mitigate this difficulty, the inflation rate development for EMS countries can be compared with that of non-EMS economies sufficiently similar to the EMS states, except for the fixed rate system.²⁷¹ Figure 7 shows that the inflation rates of both EMS and non-EMS countries behaved very similar over the period 1973-1990. It could therefore be argued that the exogenous shocks or policy factors at the time, which affected both groups similarly, had a bigger impact on inflation rate development than the EMS membership. Furthermore, the argument of importing credibility to achieve disinflation (described in section 4.3.2.2.) relied on the idea of a credible commitment to an exchange rate peg vis-à-vis the DM, but the allowed fluctuation within the band as well as the frequent realignments during the first phases of the EMS (see Table 5) do not indicate that the central parities were seen as a fully binding constraint by the participating countries. This is in line with empirical studies that analyze the success of the EMS in reducing the costs of disinflation by importing credibility, measured by the “sacrifice ratio” (i.e. the reduction in inflation over the increase of unemployment for a given period), which conclude that EMS countries did not in general pay a lower price for disinflation “bought” by unemployment than other countries.²⁷² Finally, when evaluating the disinflation process in Europe during the EMS experience, it has to be considered that there are two possible levers a relatively open country can use to achieve disinflation. It can do this via the aggregate demand channel by raising the domestic real short-term interest rate; or alternatively through the real exchange rate via its effect on enterprise profitability, since a real appreciation increases domestic costs compared to the

²⁷⁰ See for instance Fisher (1987), that describes the EMS as “an arrangement for France and Italy to purchase a commitment to low inflation by accepting German monetary policy”.

²⁷¹ See Fratianni/Hagen, 1992, p. 30.

²⁷² See for instance Gros/Thygesen (1998, p. 142- 150) that conclude that “overall the evidence does not suggest that the EMS ‘follower’ countries paid a lower price in terms of unemployment for each percentage of disinflation. For some subperiods they did better than the rest of the Community, for others they did worse.”

costs of foreign competitors and therefore has a dampening influence.²⁷³ As Figure 3 shows, there was an overall increase of real short-term interest rates in the EMS countries over the course of the disinflation process in the 1980s, especially in those with high inflation rates (France, Italy and Ireland; see Figure 4). In this context it has to be noted that France targeted a real depreciation to counter the dampening effect of high real interest rates; while Italy and Ireland experienced strong real appreciation throughout the 1980s (Figure 6), so that disinflation was based on both levers. Thus, it appears that most of the disinflation during the EMS experience was achieved through the domestic lever of high real interest rates rather than through the system itself.²⁷⁴

In sum, it can be said that the EMS was successful in establishing a zone of both external and internal monetary stability. In terms of external stability, the ERM of the EMS successfully reduced both nominal and real exchange rate variability for the countries participating in the system. Regarding the reduced internal monetary instability (inflation), the role of the EMS is not as clear. While inflation rates were clearly reduced and also converged after the EMS adoption, it cannot be conclusively proved that the system was instrumental in achieving this. Nevertheless, it seems clear that the EMS did not hinder the disinflation process and might have also provided a stable framework for a coordinated policy response to outside shocks (e.g. swings in the USD and the price of oil), therefore facilitating macroeconomic convergence for the region.²⁷⁵

4.5.2.2 The Role of Capital Controls in the EMS

The general view during the late 1980s, which was based on the literature on speculative attacks, was that the capital controls imposed by several EMS countries were necessary for the survival of a fixed rate system like the EMS and thus expressed concerns regarding the liberalization of the capital markets in the early 1990s.²⁷⁶ This section will therefore discuss the general role and effects of capital controls in a fixed rate system and apply them to the experience of EMS countries that used them. The prime examples were Italy and France, who

²⁷³ Note that when the enterprises use a pricing-to-the-market-strategy, the changes of costs due to real depreciation or appreciation will have to be reflected in profit margins. See Bofinger, 2000b, p. 12.

²⁷⁴ See Bofinger, 2000b, p. 13.

²⁷⁵ See Gros/Thygesen, 1998, p. 150-155, 178-179.

²⁷⁶ See for example Obstfeld (1988) , or Giavazzi/Giovannini, 1989.

had controls on international capital movement before entering the system and tightened these during the initial uneasy phase of the EMS.²⁷⁷

The general purpose of capital controls in a fixed rate system is to retain the control over the domestic interest rate, since without controls and under fixed exchange rates the domestic and international interest rates are linked due to the fact that investors demand an equal expected return (adjusted by a risk premium) whether they invest in the domestic or the international market.²⁷⁸ Thus, if national authorities want to lower interest rates for domestic reasons, capital controls can be used to restrain capital outflow. But the evidence from empirical studies shows that the controls in Italy and France did not significantly affect the magnitude of capital flows.²⁷⁹ Furthermore, Gros (1987) as well as Gros/Thygesen (1998, p. 132-135) show that despite capital controls, the domestic interest rates in Italy and France were tightly linked to the international rates, which also suggests the long-run ineffectiveness of capital controls to isolate the domestic financial markets. The main reason for this long-run ineffectiveness can be seen in the fact that both Italy and France are open economies with many financial and commercial links to international markets that allow for a variety of ways in which capital movements can be disguised to circumvent controls.²⁸⁰

However, despite this apparent long-run ineffectiveness, there is another reason for capital controls in fixed rate system like the EMS that might be more important and is of a very short-term nature. When large adjustments of the central rates (that exceed the width of the fluctuation band) of the fixed rate system become necessary, they imply a discrete jump of the exchange rate following the realignment.²⁸¹ If this jump could be anticipated by speculators it would lead to massive capital flows in order to profit from one-way bets (see section 3.3.1.3). Thus, if it is assumed that market agents can usually to some extent anticipate the timing and size of realignments, then without the protection of capital controls the anticipation of a large central rate adjustment would lead to massive and potentially disruptive capital flows.²⁸² But, as is described in detail in section 3.3.1.3, the disruptive effect of one-way bets can be avoided by preventing adjustments of the central parities that exceed the total width of the band (assuming that before the realignment the currency in question is at the band margin)

²⁷⁷ Ireland and Spain also had capital controls until 1992, but since the developments in these two countries were less relevant for the overall EMS experience, this analysis of the effects of capital controls will concentrate on France and Italy.

²⁷⁸ See Gros/Thygesen, 1998, p. 128-129.

²⁷⁹ See for instance Gros/Thygesen, 1992.

²⁸⁰ See Gros/Thygesen, 1998, p. 135.

²⁸¹ See Giavazzi/Giovannini, 1989, p. 162.

²⁸² See Loureiro, 1996, p. 74.

through establishing a band wide enough to accommodate large adjustments and to allow for overlapping bands in the case of realignment. Therefore it has to be analysed if capital controls in the EMS were important to protect the realignment procedures against disruptive short-term capital flows resulting from a bandwidth unable to accommodate the necessary and anticipated realignment. In the case of Italy it can be said that capital controls were essentially unnecessary to avert disruptive speculation, because no realignment led to a change of the lira/DM central rate larger than the total bandwidth for Italy, which was twelve percent (\pm six percent around the central parity) until early 1990.²⁸³ Figure 8 shows that the lira/DM fluctuation bands overlapped before and after realignments, since the lira/DM central rates always remained within the \pm six percent region established by the margins of the old and new band. In France on the other hand, circumstances were different, since on four occasions the pre- and post-adjustment bands did not overlap, leading to a jump in the franc/DM market exchange rate (see Figure 9).²⁸⁴ In the case of France it can therefore be said that capital controls were necessary to protect the EMS from disruptive short-term capital flows resulting from large realignments to the franc/DM central rates.

In this context it should be noted that this need for protection might only arise if the necessary realignments are delayed (for instance due to political reasons) until their imminence becomes obvious to the market. Since this seems to have been the case in France, a policy of earlier non-predictable realignments might have allowed avoiding the pressure from capital flows that arose due to widely anticipated adjustments and could have made it possible for France to have realignments exceeding their 4.5 percent bandwidth even without the protection of capital controls.²⁸⁵

Altogether, capital controls in a fixed rate system might prove to be mostly ineffective in the long run in isolating the domestic financial market, but helpful in the short run to stabilise capital flows and protect domestic interest during realignment procedures. Also, the EMS experience shows that while capital controls may be ineffective in the long-run to protect the system, they might at least be able to give the authorities additional time necessary for them to take the appropriate decisions in the face of crisis.²⁸⁶

²⁸³ The maximum realignments were 6 percent in March 1981 and 8 percent in July 1985, see Table 5. After the adoption of the narrow margins of \pm 2.25 percent there were no realignments until the lira left the system in September 1992 due to the EMS crisis.

²⁸⁴ Note that the margins for France were \pm 2.25 throughout.

²⁸⁵ See Gros/Thygesen, 1998, p. 129-132.

²⁸⁶ In retrospect it seems clear that in the 1992/1993 crises (that built up more quickly in the absence of capital controls) the official bodies were too slow in taking the necessary decisions. See Gros/Thygesen, 1998, p. 132.

4.5.2.3 The Strong Currency Country's Dominance in the EMS

As described in section 4.4.6, the overall design of the intervention mechanism of the EMS asymmetrically favored the strong currency countries in the system and burdened the weak currency countries. The role of the strong currency country in the EMS was primarily played by Germany, since the DM was never subject to downwards realignment (see Table 5) and was generally considered to be the anchor currency of the system.²⁸⁷ As a result of the asymmetric distribution of adjustment constraints in the ERM, if a central bank wanted to target a constant nominal exchange rate vis-à-vis the DM, it was unilaterally subjected to adjustment whenever its currency came under devaluation pressure. This asymmetry caused major problems within the EMS when the Bundesbank started pursuing a very restrictive monetary policy as a response to the inflationary pressure resulting from German unification, as noted in section 4.5.1.4. The general perception during the entire EMS experience that the DM would never be devaluated vis-à-vis another EMS currency, which was justified by the fact that the German inflation rates were (together with the Dutch) always the lowest in the EMS prior to 1991 (see Figure 4), led to a transmission of the German monetary restriction to the other EMS countries.²⁸⁸ The German interest rate “set a floor for the nominal interest rates of all other countries” (Bofinger, 2000b, p.18) that committed to target a stable nominal exchange rate against the DM. This led to problems in the EMS, since some member countries were forced to maintain their interest rates above the DM threshold at a level which was much too restrictive for their own macroeconomic conditions. This can be illustrated by comparing the actual short-term interest rates of the EMS countries with their respective Taylor rates (see Table 7 that does this for 1991).²⁸⁹ According to the Taylor rate, several EMS countries could have pursued interest rates much lower than their actual short-term interest rates, which were forced to remain above the DM “floor” (9.2 percent). Thus, several EMS countries (for example France) had to import the German monetary restriction, even though there might not have been any reason for such a restrictive monetary policy stance in

²⁸⁷ The incentive for the other EMS countries to target the DM as the anchor currency of the system was, as mentioned earlier, the high credibility of the Bundesbank's monetary policy and the relatively low inflation rate in Germany at the time of the EMS's inception.

²⁸⁸ See Bofinger, 2000b, p. 18. The economic rationale for this transmission of the monetary restriction in a fixed rate system is explained by the “uncovered interest parity” (UIP) condition that establishes that a “satellite” central bank has to adjust its domestic short-term interest rates passively to those of the “dominant” central bank in order to keep a balance of payments equilibrium. If the “satellite” central bank wants to keep the nominal exchange rate stable, it is forced to follow an interest rate policy that keeps the interest rate differential in line with the central parity realignment expectations of the market. For further detail see Bofinger, 2001, p. 395-397.

²⁸⁹ For an analysis of the Taylor rule, whose theoretical core is the notion of a “neutral real short-term interest rate”, as a general guideline for monetary policy, see Bofinger, 2001, p. 268-272.

those countries, which led to large macroeconomic costs.²⁹⁰ In sum, one of the main deficiencies of the EMS was a common monetary policy for the entire EMS-area that was determined mainly according to the macroeconomic conditions of the asymmetrically favored dominant country (i.e. Germany) that transmitted it.²⁹¹

When analyzing the factors that could lead to the dominance of a single currency in an EMS-type fixed rate system, the EMS experience shows that given the institutional rules of the ERM, the reasons for the DM dominance were a combination of the size of the German economy with the very low inflation rate of Germany that led to stable expectations regarding exchange rate changes.²⁹² The hegemony of the DM could not have been explained solely by the size factor, since at the time of the EMS's inception both France and Italy were not significantly smaller in terms of population and GDP than Germany. However, a low inflation rate alone would also not have sufficed for dominance in the EMS because a small country (e.g. the Netherlands) might have struggled to sterilize the expansionary liquidity effects of upper margin exchange rate interventions.

4.5.2.4 Crises and Contagion Effects

The first waves of speculative attacks in 1992 can essentially be attributed to the systematic overvaluation of certain EMS currencies that warranted a nominal depreciation to counter the strong real appreciation (e.g. Italy and Ireland, see Figure 6) as described in section 4.5.1.4. But even after the 1992 crisis had forcefully “corrected” the overvaluation of the “peripheral” currencies (the lira and the pound sterling left the system, while the peseta and the Irish pound were strongly devaluated), the speculative attacks continued on currencies where the reasons were not as clear-cut, for example the French franc.²⁹³ Even though the real exchange rate of the franc vis-à-vis the DM showed an appreciation close to 15 percent in 1992 (see Figure 6), France had been able to manage such a level since 1985 and with the exception of a higher unemployment rate all other macroeconomic fundamentals in France were at least as good as in Germany (see Table 8). Thus, the initial 1992 crisis (product of the strong real appreciation of certain currencies), and the resulting overall loss of credibility of the ERM, had an immediate “unwarranted” effect on the French franc, as it also came under speculative

²⁹⁰ See Bofinger, 2000b, p. 18-19. Note also that this problem could have been avoided if the inflationary effects of the German unification would have led to the expectation of a possible devaluation of the DM.

²⁹¹ The costs of such an unnecessary monetary policy adoption is one of the main arguments for the eventual substitution of an EMS-type fixed rate system by a full monetary union, since it can be assumed that a common central bank of a monetary union will set the overall monetary policy according to the macroeconomic conditions of the whole currency area.

²⁹² See Bofinger, 2000b, p.19.

²⁹³ See Gros/Thygesen, 1998, p. 219.

pressure.²⁹⁴ Since the French authorities were unwilling to devalue the franc through realignment, the BdF had no alternative other than to tighten its monetary policy in order to avoid reaching its lower intervention point and being subjected to the asymmetrical settlement obligations of the VSTF. The resulting increase in interest rates severely burdened economic growth in France, which began to decelerate, combined with growing unemployment and a strong increase in fiscal deficit.²⁹⁵ Once this situation became unbearable, the BdF aggressively lowered its interest rates which subsequently led to massive devaluation pressure on the franc that could not be contained by interventions.²⁹⁶ As the French franc as well as the Belgian and Danish currencies fell below their lower margins, the EMS countries decided to effectively suspend the narrow margins of the EMS in August 1993.

The described contagion effects of currency crises on countries with sound fundamentals establish a basic dilemma for fixed rate systems like the EMS. A method to handle problems resulting from such unjustified speculative attacks would be to suspend the settlement obligations of the system in order to allow the weak currency central bank (together with the strong currency country) to defend its currency through interventions, without being subject to any budget constraint.²⁹⁷ Such an intervention mechanism without an asset settlement obligation would provide a strong credibility gain for the intervention promise, since all interventions would essentially be financed by the strong currency country, which can create intervention assets in an unlimited amount and is not restricted in its capacity to accumulate weak currency reserves.²⁹⁸ The suspension of asset settlement obligations would also not have any negative effects on the intervening central banks as long as they are able to sterilize the liquidity effects of the interventions.²⁹⁹ As described in section 3.4, the sterilization capacity of a strong currency country is limited by its monetary base (i.e. credits to the domestic banking system), but can be made unlimited with the implementation of a deposit facility.

Nevertheless, a complete suspension of the settlement obligations in a fixed rate system is not advisable, because it could excuse the weak currency countries from monetary policy adjustments even if these proved to be necessary to maintain the monetary stability of the overall system. Thus, the settlement obligations play an important role in a fixed rate system as a device that protects against opportunistic behavior by disciplining central banks that

²⁹⁴ See Bofinger, 2000b, p.20.

²⁹⁵ See de Boissieu, 1994, p.11-17.

²⁹⁶ See Gros/Thygesen, 1998, p. 99.

²⁹⁷ See Bofinger, 1991, p. 251.

²⁹⁸ See Vehrkamp, 1995, p. 75-78.

²⁹⁹ See Bofinger, 2000b, p. 20.

could otherwise follow destabilizing (i.e. inflationary) policies (see section 3.3.5). In the EMS context, a suspension of the settlement rules could have led to an infection of the whole ERM area by the inflationary policies of the Italian and French central banks in the early 1980s.³⁰⁰

A possible solution to this dilemma could be to establish the suspension of asset settlement obligations as only temporary and contingent.³⁰¹ In order to minimize the risks of opportunistic behavior, the suspension of the asset settlement obligations could then only be allowed under explicit conditions (e.g. if the weak currency country meets certain macroeconomic criteria) and if the exchange rate pressure is clearly identifiable as a transitory speculative attack.

4.6 Overall Assessment of the EMS as an Effective Regional Exchange Rate Arrangement

The central aim of this chapter of the paper was to provide a detailed analysis of the historic, political and economic rationale as well as the overall institutional design and functioning of a specific fixed rate system that was created as a step towards further monetary integration in the region. The European experience with the EMS shows, that while the implementation of such a regional exchange rate arrangement might require a long period of political consensus-finding, once set up, it can effectively provide external stability for the region by reducing both nominal and real exchange rate variability for the countries participating in the system. Furthermore, it can possibly also contribute to the internal stabilization (i.e. reducing inflation and promoting inflation convergence) of the region by operating as a disciplinary device, although evidence proving this ability of the EMS is still rather inconclusive. Although the institutional design of the EMS as a parity grid standard system, instead of a currency basket system, was mainly the result of political negotiations rather than economic reason (section 4.4.2), such an institutional framework can still be effectively adopted if it can avoid the main mistakes that led to the EMS's 1992/1993 crisis. For instance, in case of major inflation differentials between participating countries, timely realignments of nominal rates could be necessary in order to avoid problems stemming from real appreciation and speculative capital flows (section 4.5.1.4). Also, if despite of the formally symmetric institutional design, the system is de facto asymmetrically dominated by the policy of a major participating economy (as was the case with Germany in the EMS), it might be required to put additional emphasis on a coordination of national monetary policies that takes into account the overall

³⁰⁰ See, Bofinger, 2000b, p. 21.

³⁰¹ This solution is proposed by Bofinger, 2000b; Vehrkamp, 1995; as well as Collignon et al., 1994.

macroeconomic conditions of the whole currency area and not just those of a single participating country (section 4.5.2.3).

Finally, in a situation with speculative attacks on a participating currency that have no fundamental macroeconomic justification, it may be useful to loosen the budget constraint on the weak currency country's intervention capability by suspending the asset settlement obligations (section 4.5.2.4). This would avoid the negative macroeconomic effects of otherwise necessary increases in short-term interest rates in the weak currency country and allow for a credible defence of the overall exchange rate promise of the system. It has to be noted that both a suspension of the asset settlement obligations as well as a coordination of monetary policies that is geared to the overall economic situation of the region might be problematic because they weaken the disciplining effects of the fixed rate system and should therefore be coupled to strict conditions (i.e. the meeting of certain economic criteria). Stipulating these contingencies in the institutional framework of the system may prove easier if the participating countries share a strong preference for low inflation.³⁰²

In retrospect, the European integration history shows that “without the EMS the introduction of the euro would not have been possible” (Bofinger, 2000b, p. 1) and that the system can be regarded as a very efficient monetary arrangement for most of the participating European countries. Thus, a regional exchange rate system like the EMS constitutes an effective intermediate step towards monetary union.³⁰³ Such a system is capable of stabilizing intra-regional exchange rates, therefore pave the way for an eventual irrevocable fixing of exchange rates through monetary unification, as well as possibly also produce endogenous effects that further integration in the region.³⁰⁴ Even after the 1992/1993 crisis the EMS continued to provide a steady framework and forum for monetary policy coordination and discussion between the European partners.³⁰⁵ The experience gained from the almost 20 years of cooperation within the system certainly contributed to European integration in general and specifically to the development towards monetary unification.

As Jacques Delors (1996), one of the most prominent figures in European integration history, notes:

“the EMS was the indispensable trial run which, in addition to its intrinsic benefits, provided invaluable experience for those who would go on to lay the foundations for

³⁰² See Bofinger, 2000b, p. 26.

³⁰³ See Sosvill-Rivero/Perez-Bermejo, 2006, p. 257.

³⁰⁴ See sections 2.2 and 4.5.2.1.

³⁰⁵ See Gros/Thygesen, 1998, p. 101-102

Economic and Monetary Union. It cannot be too strongly emphasized that we make progress towards European integration by increments - sometimes, admittedly, one step forward and two steps back - but all these concrete measures, succeed or fail, prepare the ground for more ambitious initiatives and serve as a learning experience.”

5 Brief Overview of Implications for Latin America

It is not the aim of this paper to propose how an EMS-type regional exchange rate system for Latin America (or a particular Latin American integration process) would specifically have to be designed, but rather to present the available institutional design options and to analyse how these interacted in a specific scenario (i.e. the historical experience of the EMS) in order to generally assess the efficiency of regional fixed rate systems. Nevertheless, after having provided an in-depth look at the European experience with such regional exchange rate mechanism, a few basic implications for the Latin American prospects to implement such a scheme can be stated.

First of all, the history of European monetary integration leading up to the creation of the EMS shows that setting up such an intermediate step on the way to monetary union can be a medium- rather than a short-term project (see section 4.2.). Before the creation of a regional fixed rate system for Latin America is viable, a higher degree of monetary cooperation might be necessary. One of the most interesting initiatives in this regard might be the “Ecuadorian Proposal for a New Regional Financial Architecture”, which presents three steps for setting up a “Regional Exchange Rate Mechanism” in Latin America.³⁰⁶ The first step would be to establish a “Regional Monetary Agreement” through a formal cooperative commitment to permanently monitor exchange-rate policies and regularly share ex-ante information on the respective national policy mixes and macroeconomic developments. The second stage would then involve setting up a type of “soft” (i.e. non-binding) regional exchange rate fluctuation band within which the optimal exchange rates for all the participating currencies would be determined via regional consensus. Finally, in step three, formally binding bands would be set up, establishing an almost-fixed, but adjustable, exchange rate regime and effectively transforming the previous “Regional Monetary Agreement” into a real “Regional Exchange Rate Mechanism”.

³⁰⁶ See Páez, 2008, for further detail on the three steps. The “Regional Exchange Rate Mechanism” is put in quotations in order to single out the specific political proposals of this initiative.

The European experience with the “snake”-system and later with the EMS crisis in 1992/1993 also showed, that even a significant progress in regional integration can be followed by momentary setbacks. The political will to pursuit integration is therefore essential, as displayed by the European governments’ (especially the German and French) tenacious attitude which paved the way for the introduction of the EMS and ultimately the EMU. Regarding political will in Latin America, it seems that especially the “newer” integration schemes UNASUR and ALBA-TCP have been pushing for further integration. Initiatives like the SUCRE and the Bank of the South might prove important in order to eventually set up a fixed rate system in Latin America. The vocal support of several Latin American presidents for monetary integration is also welcome, since progress in integration involves permanent political debate in order to ensure the acceptance of the general public. It is difficult to assess which Latin American countries could assume roles of political leadership similar to the French-German initiative crucial for the adoption of the EMS, or which countries would actually participate in the system. Due to their close trade relations and economic sizes it is often proposed that exchange rate cooperation in Latin America should start with Brazil and Argentina³⁰⁷, and move on from there; initiatives like the Local Currency Payment System (see section 2.1.) might be a step in that direction. Venezuela has also played a major political role in recent years promoting regional integration and the Venezuelan led ALBA-TCP agreement is possibly the most politically united integration scheme. Nevertheless, it should be noted that Venezuela has by far the biggest inflation rates in the region and could therefore hardly assume a stabilizing role similar to the one played by Germany in the EMS.³⁰⁸

Assuming sufficient political will and leadership, there are still general economic factors that might be of relevance. A regional exchange rate arrangement might only be worthwhile given a certain degree of trade linkages between participating countries and, as the Italian problems in the EMS showed, might be more successful if inflation rates are low or at least similar. While there are certainly studies that deem intra-regional trade in Latin America insufficient³⁰⁹, it has nevertheless steadily grown (see Table 10) and again the endogeneity argument (i.e. the stabilization of intra-regional exchange rates could ex post encourage trade) for a regional exchange rate arrangement can be brought forward. Regarding inflation rates, Table 9 shows that with the exception of Venezuela these have steadily been reduced by Latin

³⁰⁷ See for instance Medina, 2004; Moccero/Winograd, 2005; Campos, 2009; Bresser-Pereira/Holland, 2009.

³⁰⁸ See Table 9.

³⁰⁹ See for instance Cardim, 2004; Espinosa, 2008; Peña/Flores, 2006; Foresti, 2007; Arestis et al., 2002.

American countries.³¹⁰ In this context it has to be noted that, as described in section 4.2 and shown in Table 3, at the start of the EMS the participating countries were also relatively heterogeneous.

The actual design of a possible regional fixed rate system in Latin America is difficult to assess without a clear assumption about participating countries and a required comparative analysis, which would exceed the scope of this paper. Nevertheless, some general aspects can be noted. The lack of a major credible currency in the region as well as the related political implications allow to practically rule out a key currency standard system for Latin America, while a parity grid or a currency basket could still be viable options. Due to the less asymmetrical nature of a currency basket standard and its ability to also relevantly encompass the currencies of major inter-regional trading partners (i.e. the USD and the euro), this standard is overwhelmingly proposed.³¹¹ But as described in section 4.5.2.3, the asymmetrical nature of the EMS's parity grid was mainly a result of the special characteristics of the German economy, which might not be replicated by any Latin American country. In order to accommodate for the still undeniably large differences in macroeconomic conditions between Latin American economies as well as the propensity for asymmetrical shocks in the region, the fluctuation bands might have to be relatively wide and central rate adjustments steady (possibly following an agreed upon path that could for instance be determined by interest rate differentials³¹²). Again, a more specific proposal for the institutional design of the system requires an in-depth analysis of the particular group of countries or integration scheme (e.g. UNASUR, Mercosur or ALBA-TCP) adopting it. Regarding the institutionally established intervention promise of a possible regional fixed rate system, an important difference to the EMS experience might be the lack of convertible currencies in Latin America, which hinders foreign exchange market intervention of Latin American countries in their own currencies. As a result, the intervention credit facilities of the system might have to be managed through a common fund that pools the intervention reserves of the participating countries. Institutions like the Bank of the South or the ALBA-Caribbean Fund might serve in this regard.

Other basic aspects worth consideration for future research on a specific fixed rate system proposal for Latin America are, for instance, the nature of the individual exchange-rate regimes of the countries participating in the system, dollarization in the region and the role of

³¹⁰ The overall reduction and convergence of inflation rates in Latin America is even greater when statistics from the 1980s are considered. See Gruben/Mcleod, 2004.

³¹¹ See for instance Ugarteche, 2008. Note that such a currency basket is also proposed in the East Asian monetary integration projects; see Williamson, 2005; Murase, 2007; Chey, 2008; Chai, 2010.

³¹² See Bofinger, 2000a; and Bofinger, 2009.

capital controls, to name only a few. The choice of a country's individual regime would obviously influence bilateral exchange rates in the system and determine differences between countries regarding the adjustments to common external shocks.³¹³ In this context, the role of the USD might also be of significance, not only as a reserve currency in the region, but also due to the de jure and de facto dollarization of several Latin American economies.³¹⁴ In addition, the role of capital controls would have to be considered, since these might be necessary in order to defend the regional exchange rate arrangement against speculative attacks until sufficient credibility is gained (see section 4.5.2.2).³¹⁵

All in all, there is a myriad of institutional choices and elements worthy of in-depth analysis for a coherent proposal of a regional fixed rate system for Latin America. Thus, an ample scope for further research is provided.

6 Summary and Final Remarks

For more than half a century Latin American countries have been pursuing economic integration, and in light of new political impulses in the region like UNASUR and ALBA-TCP the idea of forming a monetary union in Latin America has gained popularity. Since economic literature widely dismisses the possibility of Latin America adopting a single currency in the short-term due to an insufficient degree of integration, a variety of authors have proposed establishing a regional exchange rate system as an intermediate step towards monetary union.

In line with these proposals, the central aim of this paper was to provide a detailed look at regional fixed rate systems as an intermediate step. Following this premise, first a general analysis of fixed rate systems from an institutional perspective was given in order to describe the basic design choices available to policymakers when creating such a regional exchange rate arrangement. This analysis showed how the decided upon rules, which together constitute the institutional framework of the fixed exchange rate system, determine the overall monetary adjustment constraints for the participating countries in the system.

Then, the experience of the European countries with such a fixed rate system, the European Monetary System was described. It was shown that the EMS did not only effectively reduce both nominal and real exchange rate variability for the countries participating in the system,

³¹³ See Machinea/Rozenwurcel, 2005, p. 45-46.

³¹⁴ Officially (i.e. de jure) dollarized Latin American economies are for instance Ecuador as well as several Central American countries. For an analysis on de facto dollarization in Latin America see Feige et al., 2002.

³¹⁵ Regarding this aspect it might be relevant to analyse if introducing capital controls is possible for countries participating in the system, since for countries like Chile or Peru that have signed FTA with the US this possibility is ruled out.

but also constituted a successful intermediate step towards monetary unification in Europe. Furthermore, an EMS-type system can be considered an efficient monetary arrangement in its own right, even if sufficient integration for the full monetary union is not reached or if this goal becomes undesirable for political reasons, which could for instance emerge in light of the recent developments in Europe. The general lessons drawn from the EMS analysis provide important implications for the Latin American prospects of establishing a regional exchange rate mechanism. These implications were broadly described and will have to be considered in further research that might be aimed at proposing how a fixed rate system for Latin America (or for a particular Latin American integration project) could specifically be designed.

I. Tables and Figures

Table 1 Openness – Imports as share of GDP

	(1960)	(1987)
Belgium	39.3	75.6
Ireland	37.2	60.0
Netherlands	45.9	59.3
Denmark	33.4	36.7
Germany	16.2	28.5
United Kingdom	22.4	28.2
France	12.9	25.0
Italy	12.5	23.4
EC12	10.4	12.3
United States	4.4	10.1
Japan	11.0	11.4

Source: European Economy, No. 34, November 1987; in: Giavazzi/Giovannini, 1989, p. 3

Table 2 Trade within the 12 EC countries as share of total trade

	Exports			Imports		
	1958	1970	1986	1958	1970	1986
Denmark	59.4	44.2	46.8	60.0	48.7	47.2
Be - Lux	55.4	75.2	72.9	55.5	66.3	69.9
Netherlands	58.3	72.6	75.7	50.7	63.4	61.0
France	30.9	58.1	57.8	28.3	56.0	64.4
Germany	37.9	49.8	50.9	36.3	51.7	54.2
Italy	34.5	51.7	53.5	30.2	47.5	55.4
UK	21.8	32.7	47.9	21.8	29.4	50.4
EC12	37.2	53.4	57.2	35.2	50.3	57.8

Source: European Economy, No. 34, November 1987; in: Giavazzi/Giovannini, 1989, p. 4

Table 3 ERM founding countries in 1979

	Belgium	Denmark	Germany	France	Ireland	Italy	Luxembourg	Netherlands
EU-member since	1957	1973	1957	1957	1973	1957	1957	1957
Population (in thousands)	9,870	5,120	61,337	53,480	3,365	56,910	360	14,030
Per capita income in % of average EU income	109.7	94.3	108.6	109.9	73.7	96.1	115.0	126.0
Inflation rate in %	4.5	9.6	4.1	10.8	13.3	14.8	4.5	4.2
Unemployment rate in %	7.5	6.2	3.2	5.8	7.1	7.8	0.7	3.6
Openness: $\frac{1}{2}$ (exports + imports) in % of GDP	50.7	25.0	21.7	18.3	57.5	19.3	71.3	50.6
Share of ERM trade (exports + imports) in % of total trade	62.2	36.7	42.0	41.8	25.2	40.2	n.a.	47.6
ERM trade (= 1/2 exports + imports) in % of GDP	31.5	9.2	9.1	7.6	14.4	7.8	n.a.	23.9

Source: OECD, Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung, Statistisches Bundesamt; in: Bofinger, 2000b.

Table 4 The ecu currency basket

	Since 13. March 1979	Since 17. September 1984	Since 21. September 1989
D-Mark	0.8280	0.7190	0.6242
Pound Sterling	0.08850	0.08780	0.08784
French Franc	1.150	1.310	1.332
Italian Lira	109.00	140.00	151.80
Dutch Guilder	0.2860	0.2560	0.2198
Bel. Franc	3.660	3.710	3.301
Lux. Franc	0.14	0.14	0.13
Danish Krone	0.2170	0.2190	0.1976
Irish Punt	0.007590	0.008710	0.008552
Greek Drachma	-	1.15	1.44
Spanish Peseta	-	-	6.885
Port. Escudo	-	-	1.393

Source: Deutsche Bank October 1999; Devisenkursstatistik; in: Bofinger, 2000b.

Table 5 Realignments in the ERM

Date	D-Mark	Bel/Lux franc	Danish krone	French franc	Irish punt	Dutch guilder	Italian lira	Spanish peseta	Pound sterling	Port. Escudo
24 September 79	+2.00	-	-2.86	-	-	-	-	NM	NM	NM
30 November 79	-	-	-4.76	-	-	-	-	NM	NM	NM
23 March 81	-	-	-	-	-	-	-6.00	NM	NM	NM
5 October 81	+5.50	-	-	-3.00	-	+5.50	-3.00	NM	NM	NM
22 February 82	-	-8.50	-3.00	-	-	-	-	NM	NM	NM
14 June 82	+4.25	-	-	-5.75	-	+4.25	-2.75	NM	NM	NM
21 March 83	+5.50	+1.50	+2.50	-2.50	-3.50	+3.50	-2.50	NM	NM	NM
22 July 85	+2.00	+2.00	+2.00	+2.00	+2.00	+2.00	-6.00	NM	NM	NM
7 April 86	+3.00	+1.00	+1.00	-3.00	-	+3.00	-	NM	NM	NM
4 August 86	-	-	-	-	-8.00	-	-	NM	NM	NM
12 January 1987	+3.00	+2.00	-	-	-	+3.00	-	NM	NM	NM
8 January 1990	-	-	-	-	-	-	-3.86	-	NM	NM
14 September 92	+3.50	+3.50	+3.50	+3.50	+3.50	+3.50	-3.50	+3.50	+3.50	+3.50
17 September 92	-	-	-	-	-	-	-	-5.00	NM	-
23 November 92	-	-	-	-	-	-	-	-6.00	NM	-6.00
1 February 1993	-	-	-	-	-10.00	-	-	-	NM	-
14 May 1993	-	-	-	-	-	-	-	-8.00	NM	-6.50
6 March 1995	-	-	-	-	-	-	-	-7.00	-	-3.50

Source: Deutsche Bundesbank 1997; purely technical adjustments are not reported. NM: country did not participate in the exchange rate mechanism; in: Bofinger, 2000b.

Table 6 Nominal exchange rate variability* against ERM8 currencies

	1960-68	1969-78	1979-83	1984-87	1988-91	1992-95	1996
Average ERM8	0.24	1.16	0.78	0.54	0.39	1.00	0.64
Average non-ERM8 EC	0.62	2.09	2.73	1.89	1.43	2.14	1.55
USA	0.21	2.18	2.81	3.32	3.27	2.94	2.01

Source: Gros and Thygesen (1998).

*Variability is defined as the weighted sum of the standard deviation of changes in the monthly logarithm of monthly bilateral exchange rates (times 100). The weights are the implicit ecu weights derived from average exchange rates 1991.

Table 7 Taylor interest rates and actual short-term interest rates in 1991

Country	Taylor interest rate*	Actual interest rate
Belgium	6.5	9.3
Denmark	3.0	9.7
France	5.8	9.6
Germany	8.9	9.2
Ireland	5.7	10.4
Italy	11.0	12.2
Netherlands	6.5	9.3

Source: OECD, Economic Outlook; in Bofinger, 2000b.

*Taylor interest rate calculated with the original Taylor formula: $i=2+\text{inflation rate}+0.5(\text{inflation rate}-2)+0.5(\text{output-gap})$.

Table 8 Macroeconomic fundamentals in France and Germany (1992)

	Germany	France
Inflation rate	5.1	2.4
General government structural balance	-3.8	-3.6
General government gross financial liabilities	44.4	45.5
Current account balance	-1.0	0.4
Unemployment rate	7.7	10.4

Source: OECD, Economic Outlook; in: Bofinger, 2000b.

Table 9 Annual Inflation Latin America 1999-2009

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009 ¹
NAFTA REGION											
Mexico	12.3	9.0	4.4	5.7	4.0	5.2	3.3	4.1	3.8	6.5	3.5
DR-CAFTA COUNTRIES											
Dominican Republic	5.1	9.0	4.4	10.5	42.7	28.7	7.4	5.0	8.9	4.5	6.0
Costa Rica	10.1	10.2	11.0	9.7	9.9	13.1	14.1	9.4	10.8	13.9	8.0
El Salvador	-1.0	4.3	1.4	2.8	2.5	5.4	4.3	4.9	4.9	5.5	2.5
Guatemala	4.9	5.1	8.9	6.3	5.9	9.2	8.6	5.8	8.7	9.4	5.5
Honduras	10.9	10.1	8.8	8.1	6.8	9.2	7.7	5.3	8.9	10.8	9.4
Nicaragua	7.2	9.9	4.7	4.0	6.6	8.9	9.6	10.2	16.2	12.7	7.0
Panama	1.5	0.7	0.0	1.5	1.5	3.5	3.4	2.2	6.4	6.8	3.2
ANDEAN SOUTH AMERICA											
Bolivia	-	3.4	0.9	2.4	3.9	4.6	4.9	4.9	11.7	11.8	6.0
Colombia	9.2	8.8	7.6	7.0	6.5	5.5	4.9	4.5	5.7	7.7	4.6
Ecuador	60.7	91.0	22.4	9.3	6.1	1.9	3.1	2.9	3.3	8.8	2.0
Peru	3.7	3.7	-0.1	1.5	2.5	3.5	1.5	1.1	3.9	6.6	2.5
Venezuela	20.0	13.4	12.3	31.2	27.1	19.2	14.4	17.0	22.5	31.9	42.0
MERCOSUR REGION											
Argentina	-1.8	-0.7	-1.5	41.0	3.7	6.1	12.3	9.8	8.5	7.2	7.2
Brazil	8.9	6.0	7.7	12.5	9.3	7.6	5.7	3.0	4.5	5.9	4.2
Chile	2.3	4.5	2.6	2.8	1.1	2.4	3.7	2.6	7.8	7.1	2.2
Paraguay	5.4	8.6	8.4	14.6	9.3	2.8	9.9	12.5	6.0	7.5	5.5
Uruguay	4.2	5.1	3.6	25.9	10.2	7.6	4.9	6.4	8.5	9.2	6.4
LATIN AMERICA AND CARIBBEAN											
	9.7	9.0	6.1	12.2	8.5	7.4	6.1	5.0	6.4	8.4	6.2 ²

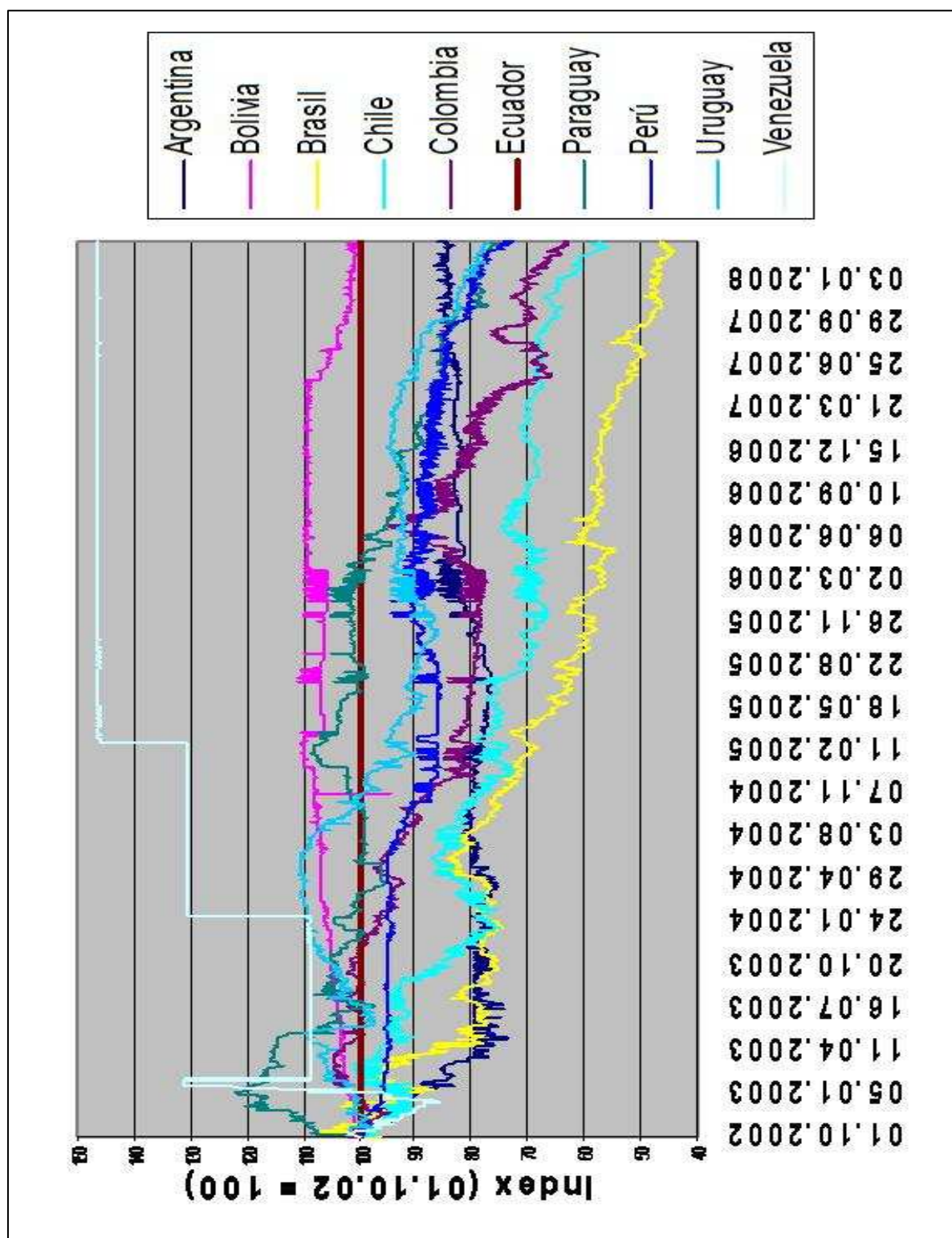
SOURCE: ECLAC, 2008-2009 Economic Survey of Latin America and the Caribbean.

Table 10 Annual growth rates of Latin American trade by regions 1980-2007

	1980- 1984	1985- 1989	1990- 1994	1995- 1999	2000- 2004	2003- 2007
South America						
Intra-regional trade	-5.6	7.8	20.7	5.7	8.9	23.6
Extra-regional trade	-4.0	4.5	11.2	5.4	10.1	23.3
Total trade	-3.7	4.1	9.2	5.3	10.5	23.3
Central America						
Intra-regional trade	-8.5	-0.3	15.5	11.8	8.4	13.9
Extra-regional trade	-0.8	3.2	10.2	18.5	4.7	17.0
Total trade	-2.4	2.5	11.0	17.3	5.1	16.5
Mexico						
Intra-regional trade	-0.8	15.5	10.8	10.5	1.6	6.4
Extra-regional trade	2.4	9.6	9.1	8.6	9.7	17.6
Total trade	0.4	13.4	10.4	10.1	3.5	9.4

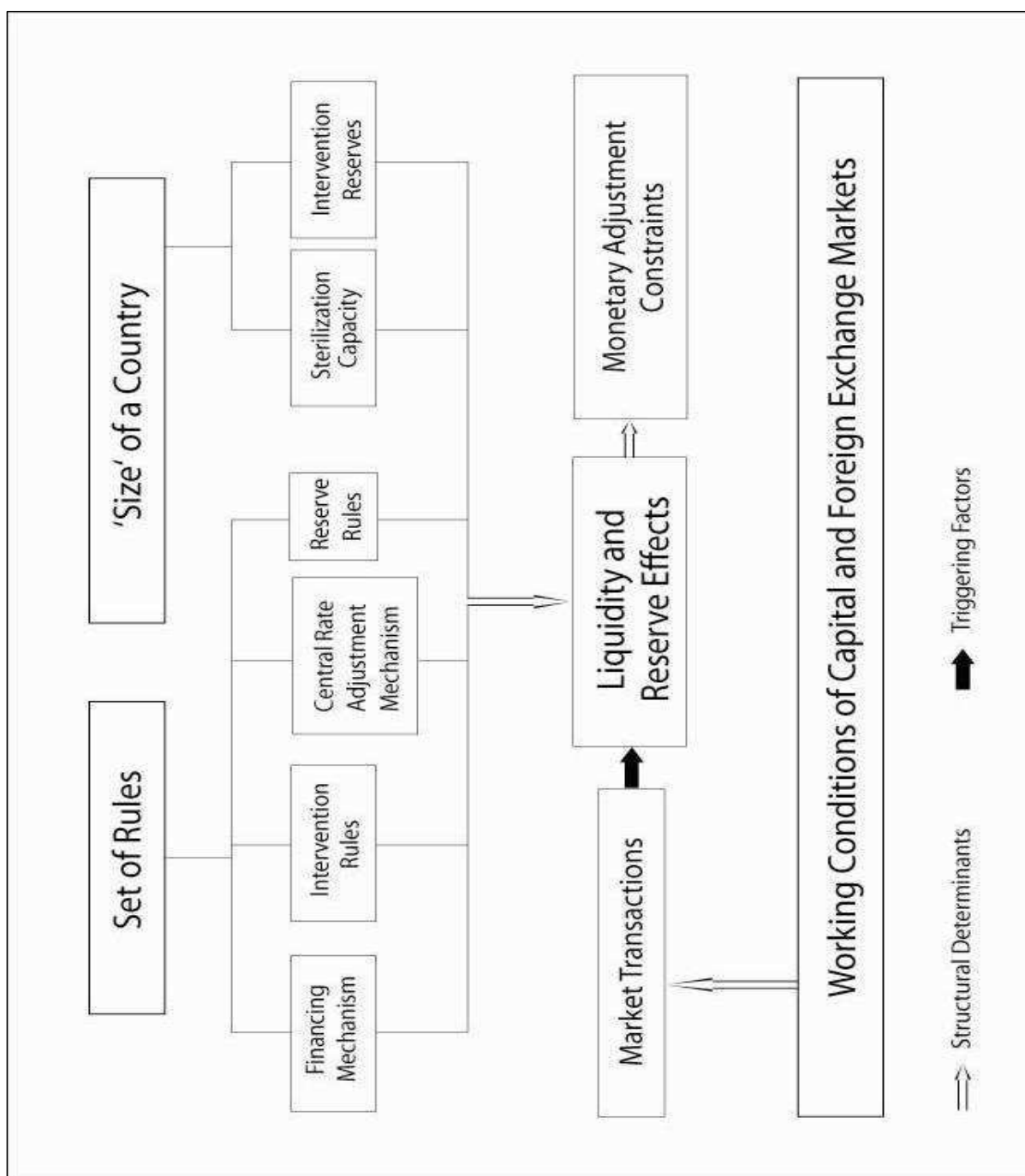
Source: DOTS FMI, IIEC-UNAM, in: Ugarteche, 2008.

Figure 1 Exchange Rates: South American currencies / 1 USD October 2002 – March 2008



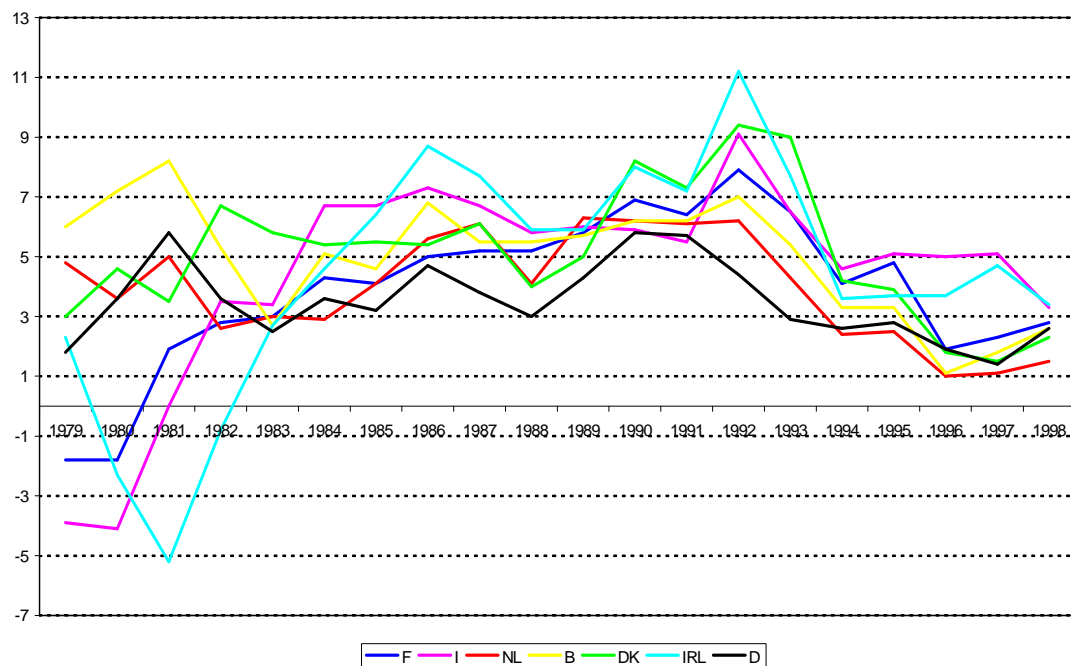
Source: OANDA, in: Ugarteche 2008.

Figure 2 Determinants of Monetary Adjustment Constraints in Institutionalized Fixed Rate Systems



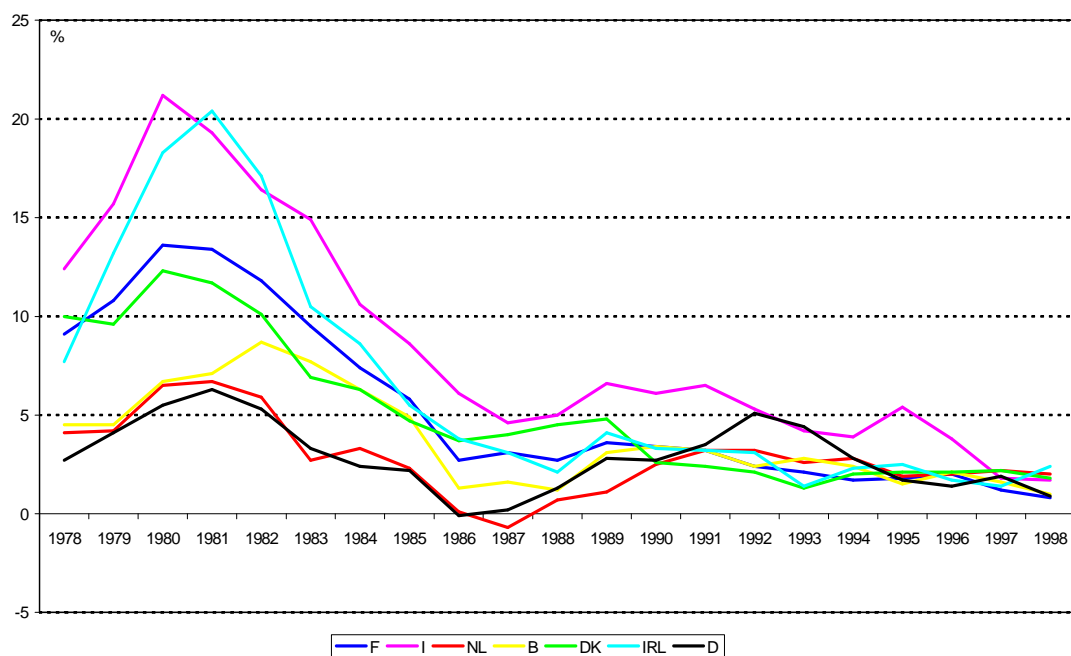
Source: Author's own illustration, adopted from Vehrkamp, 1995.

Figure 3 Real short-term interest rates in ERM countries



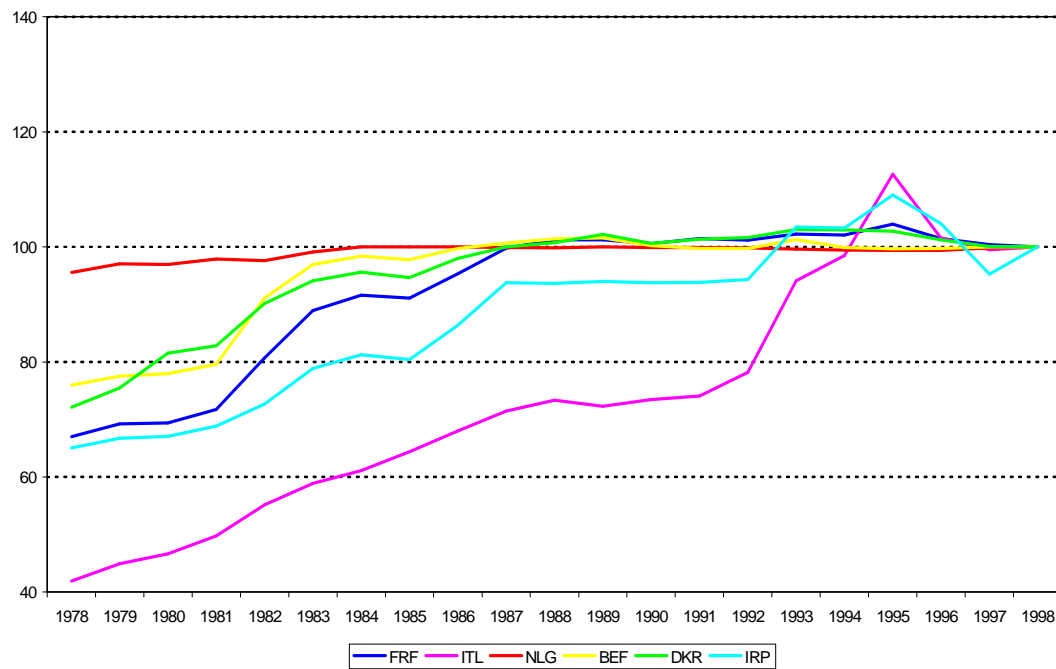
Source: OECD, Economic Outlook; in: Bofinger, 2000b.

Figure 4 Inflation convergence in ERM countries



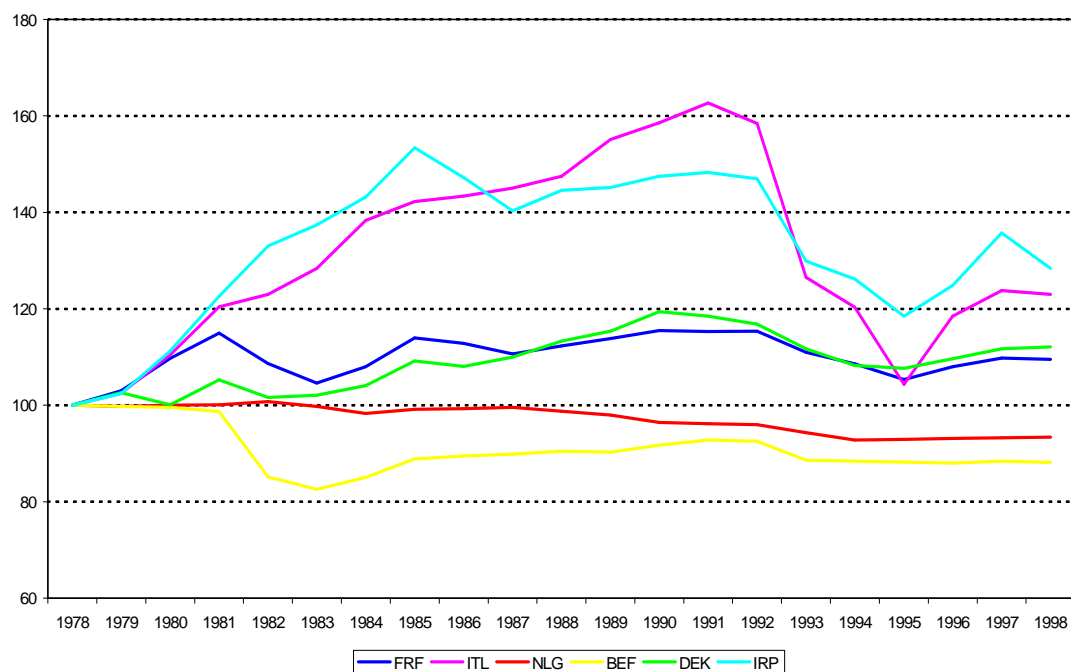
Source: OECD, Economic Outlook; in: Bofinger, 2000b.

Figure 5 The Path to Nominal exchange rate convergence



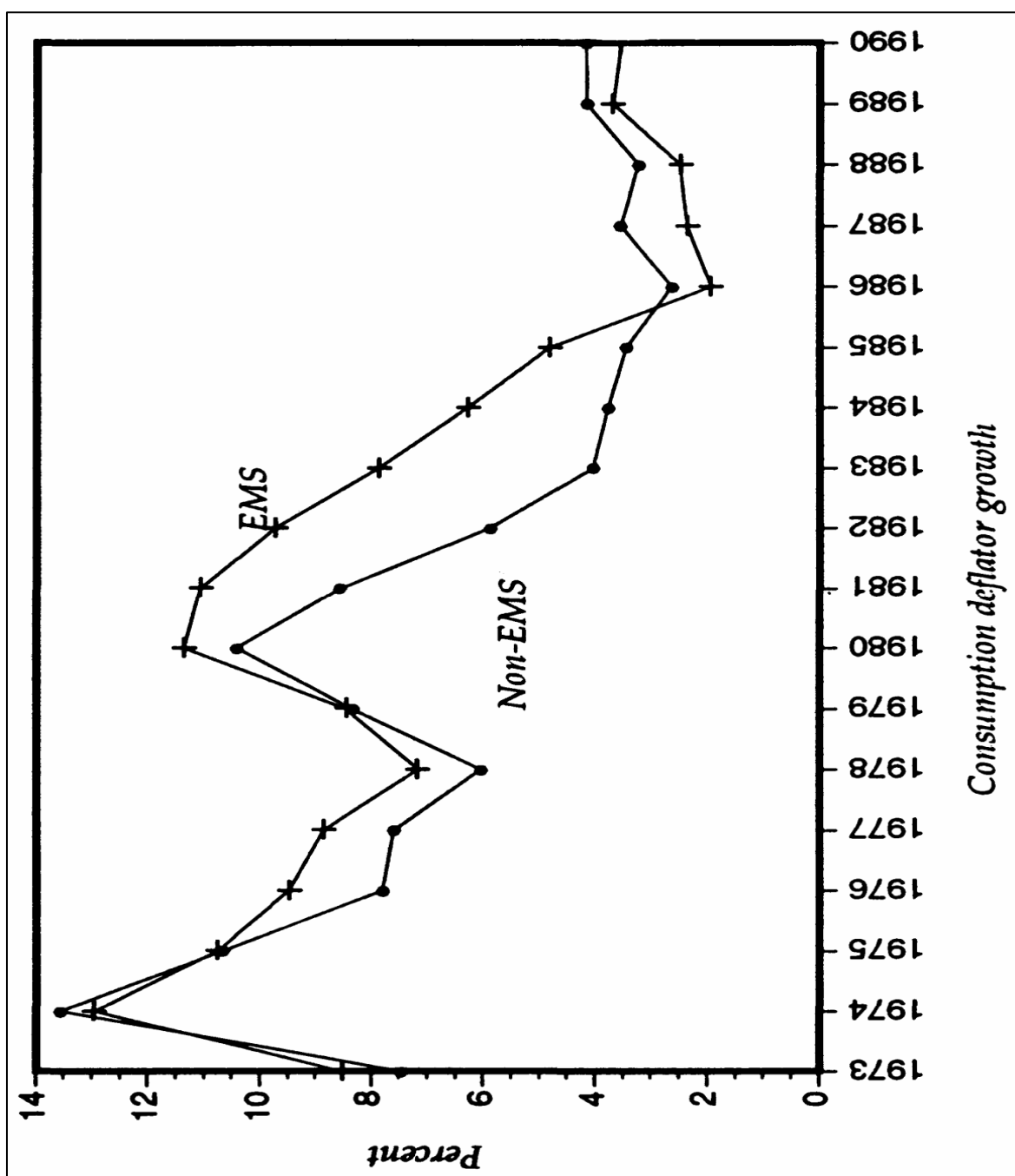
Source: OECD, Economic Outlook; in: Bofinger, 2000b.

Figure 6 Real bilateral DEM exchange rates



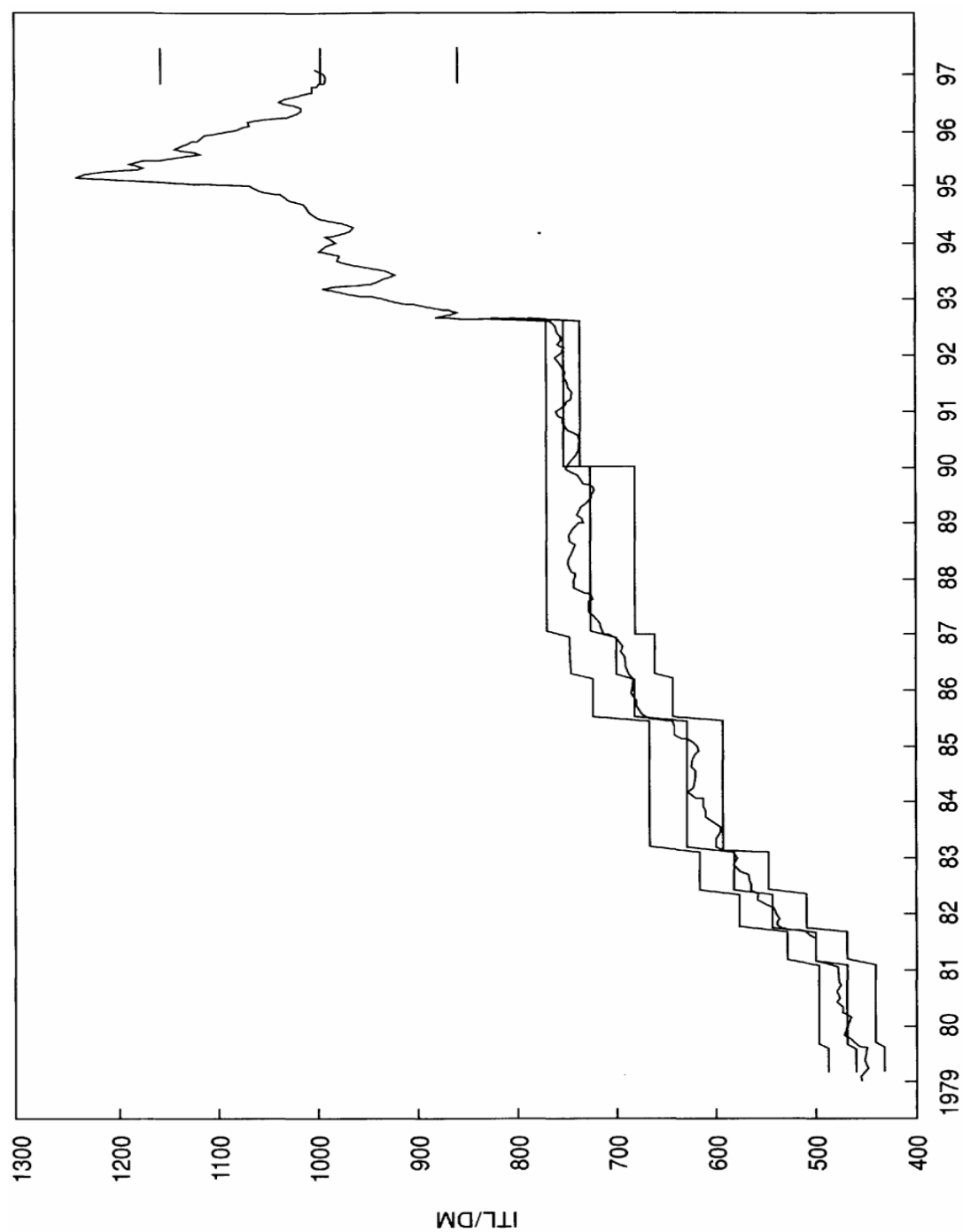
Source: OECD, Economic Outlook; in: Bofinger, 2000b.

Figure 7 EMS and Non-EMS Inflation Rates



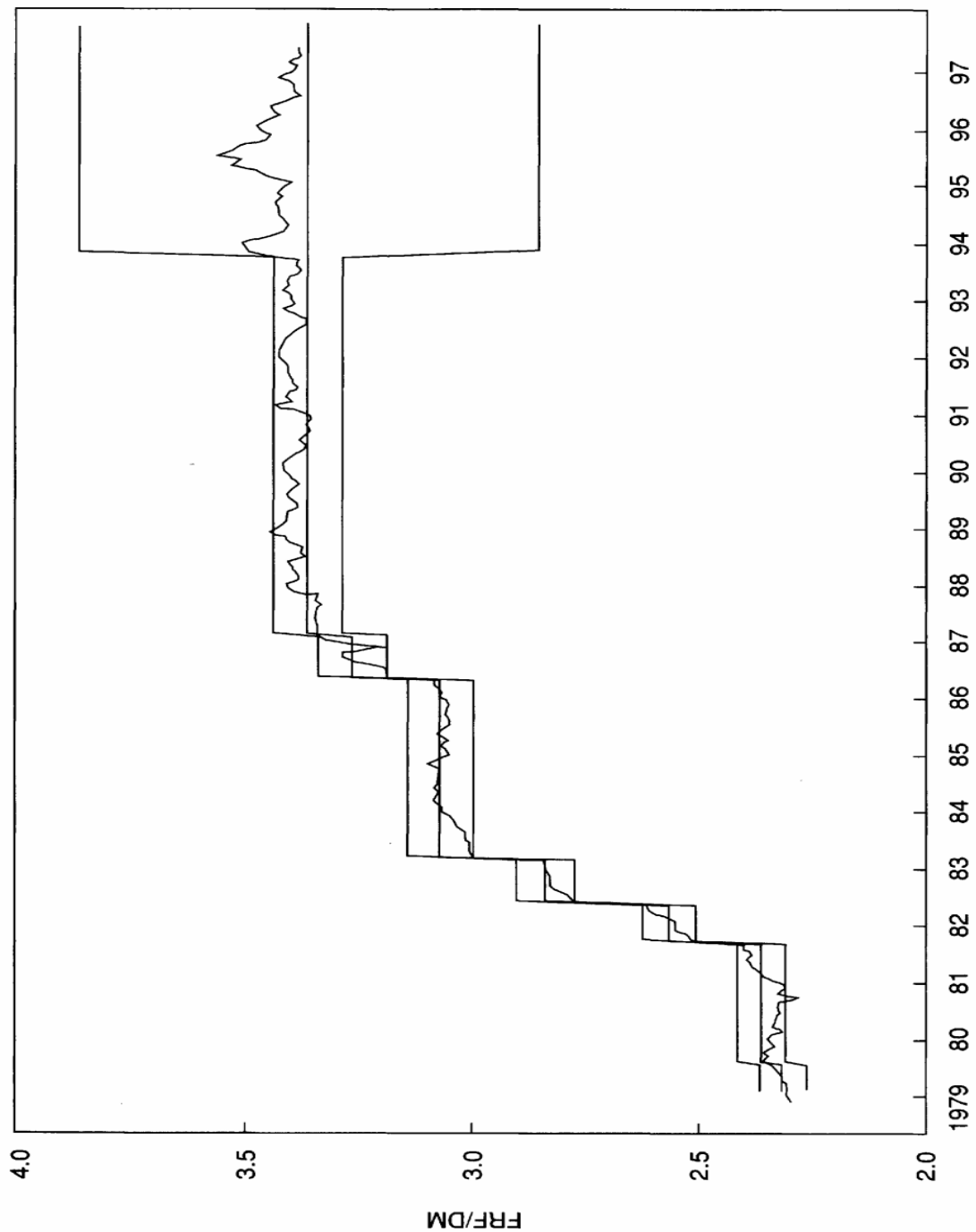
Source: OECD; in Fratianni/Hagen, 1992, p. 31.

Figure 8 ITL/DM rate within the bands



Source: IMF, International Financial Statistics, line ae; European Economy, statistical appendix; in: Gros/Thygesen, 1998, p. 130.

Figure 9 FRF/DM rate within the bands



Source: IMF, International Financial Statistics, line ae; European Economy, statistical appendix; in: Gros/Thygesen, 1998, p. 131.

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