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ERM II Membership – the View of the Accession Countries

Luboš Komárek, Zdeněk Čech, Roman Horváth*

Abstract

With EU accession looming, a new chapter has been opened in the debate about the candidate countries' exchange rate strategies. A heated discussion has arisen in relation to ERM2 membership. The experience of the present eurozone members with ERM/ERM2 membership shows that none of them faced a significant challenge in the two-year "evaluation" period in terms of the exchange rate stability convergence criterion. This could also be attributable to the stability policies prescribed by the Maastricht Treaty. However, for catching-up countries in the run-up to joining the eurozone, given the existing functioning of the mechanism, the ERM2 appears be of little help for ensuring exchange rate stability. The mechanism should be viewed rather as a tool for "persuading" the markets of the appropriateness of the euro-locking rate. Since the Maastricht rules do not allow downward adjustment of the central parity within the ERM2 for two years before introduction of the euro, the authorities should be familiar with the preferred real exchange rate path prior to entering the mechanism. We conclude that countries could face large costs if they fail to do so.

JEL Codes: E58, E52, E32, F42, F33.
Keywords: EU/eurozone, convergence, exchange rate, transition.

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Nontechnical Summary

The exchange rate policies of the EU candidate countries, and the ERM2, in particular its effectiveness and wisdom, have been subject to a heated debate ever since the prospects of eurozone accession appeared. This discussion intensified in 2002 after statements made by several accession countries about "as-soon-as-possible" adoption of the euro.

While proposals to revamp the ERM2 appear by the day, no systematic analysis has been carried out so far of the "management" of the exchange rate under the existing EU rules in the eurozone accession process. The study addresses the issue of management of the candidate countries' exchange rates under the existing institutional and legislative framework of the EU. We draw general conclusions about the role of the ERM/ERM2 in the convergence process, in particular during the period before eurozone accession. Subsequently, we discuss the "economic" factors influencing exchange rate strategies on the path towards eurozone accession and briefly review the present exchange rate strategies of the EU candidate countries in the light of their Pre-accession Economic Programmes. In the final section, we provide an in-depth review of the EU legislation and institutional framework in the area of exchange rate strategies in the phased process of eurozone accession.

In this study we first look at the experience and motives of the present member countries for joining the ERM. For the more advanced EU nations, participation in the mechanism was in line with their monetary policy strategy of exchange rate stability vis-à-vis the German mark. Since these currencies traded in a very narrow band, the ERM was merely an "emergency brake" when major exchange turbulence threatened. Another reason for joining the mechanism was institutional, as membership of the mechanism is a necessary condition for fulfilment of the convergence criteria. A third reason for joining the ERM was to boost the credibility of their exchange rate targets. However, the ERM crises in 1992–1993 confirm that joining the mechanism is no panacea guaranteeing macroeconomic stabilisation if nations fail to implement sound macroeconomic policies that are consistent with the exchange rate target.

Experience shows that the EU countries' exchange rate convergence in the second half of the 1990s was a relatively smooth process. This was mainly due to fiscal discipline in each country (in accordance with the Maastricht criteria). The exchange rate stability of the former EU entrants was further fostered by a relative absence of shocks to the ERM economies and also by satisfactory development of the real economy at the time just prior to eurozone entry.

As far as the exchange rate policies of the candidate countries are concerned, many economists have also devoted a great deal of attention to the question of the optimal choice of exchange rate regime in the run-up to eurozone accession. This research is certainly useful for identifying potential sources of instability. Aware of the fact that many of the candidate countries have not yet definitively finished the transition period, we identify several basic determinants that should influence the candidates' nominal exchange rates prior to eurozone entry. In particular, these include productivity growth and the wage-setting process in the economy, the way in which fiscal and monetary policy is pursued, and the effect of external (exogenous) shocks.

However, we argue that the original question of the optimal regime choice seems to be of limited practical use, as most of the candidate countries seem to be satisfied with their current

arrangements and are planning to retain them until their entry into the eurozone (with possible modification within ERM2). The common denominator of exchange rate policy for those countries (as indicated by the *Pre-accession Economic Programmes*) will probably be a politically "stated" preference for faster, rather then slower, adoption of the euro. Using a similar framework for evaluating exchange rate stability, the EU candidate countries do not fare badly. Had there been an evaluation of the convergence criteria in 2002, all ten countries (with the exception of Slovenia) would have satisfied the exchange rate criterion (as regards exchange rate fluctuation without ERM2 membership) in the reviewed period.

The candidate countries will nevertheless have to address the very important issue of the setting of their initial monetary conditions at the time of entry to the eurozone. The potential risks from overvaluation or undervaluation of their currencies will depend to a large extent on the right choice of parity. Non-fulfilment of this condition could result in higher-than-optimal inflation or in an economic slowdown below the growth rate of potential output until the real exchange rate adjusts to its equilibrium level. Given the absence of the nominal exchange rate as a possible channel, this adjustment would be sluggish and costly to the economy. When deciding on the central parity in the ERM2, the authorities should take into account estimates of the trajectory of the equilibrium real exchange rate and the likely path of the exchange rate within the ERM2. We have identified the following factors influencing the nominal exchange rate trajectory: the period of participation in the ERM2; the assessment of the exchange rate convergence criterion; the trajectory of the real exchange rate; and the setting of the central parity relative to the market exchange rate.

The final part of the paper deals with institutional issues influencing the exchange rate convergence process. Although the final form of the institutional regulations for exchange rate policy will depend on the final decision of the European authorities, we believe that the rules currently applied create a relevant framework for discussing the accession process. First, the candidate countries are faced with a decision: "either EU membership with subsequent introduction of the euro, or nothing". Second, the candidate countries will have to achieve a "high degree of sustainable convergence", yet the Community legislation does not specify this period in any more detail. It follows that the only two areas that leave prospective members of the eurozone with any room for decision-making are the speed with which they adopt the single currency and the "conversion" rate between the national currency and the euro.

1. Introduction

The accession of the candidate countries to the eurozone is generally regarded as an important milestone in their long-term process of integration into European structures. Their efforts to achieve full integration, including monetary integration, are intended to ensure sustainable growth and hence convergence toward living standards in the advanced EU economies. In pursuing this growth, monetary policymakers employ various instruments that affect the form and speed of the convergence. One such instrument is exchange rate policy.

Different problems have also appeared in relation to ERM2 membership and the interpretation of the exchange rate criterion. This study aims to contribute to the discussion on the candidate countries' exchange rate convergence process, in particular by applying the experience of former eurozone entrants to the current candidates. The study also reviews the present institutional and legislative procedures relating to the exchange rate convergence process and ERM2 participation.

The second section contains an analysis of the exchange rate convergence process of the EU candidate countries. Emphasis is given to an analysis of the exchange rate policy of the Member States within the ERM/ERM2 (in the several years before introduction of the euro) and to an evaluation of the exchange rate criterion. This section discusses the ERM and ERM2, analyses in detail the exchange rate convergence process in the EU countries (including a segmentation of those countries) and summarises the main experiences with the EU countries' exchange rate convergence process in the ERM and ERM2 period.

The third section features a description of the exchange rate convergence process for the EU candidate countries. In particular, it reviews the exchange rate strategies of the selected candidate countries using a similar analytical framework as presented in section two in the case of the EU Member States, and discusses the selected strategies (directed towards introduction of the euro) presented in the *"Pre-accession Economic Programmes"* (PEPs). In the light of the exchange rate experience of the EU countries, this section also summarises possible incentives for ERM2 accession in the candidate countries. We also discuss the challenging issue of setting the central parity within the ERM2.

The fourth section includes a general analysis of the institutional issues relating to the EU candidate countries' exchange rate convergence process. We provide an in-depth discussion of the relevant legislative rules and the exchange rate convergence criterion – especially its definition, time frames and possible room for interpretation based on previous evaluations by the European authorities. The basic assumption for this analysis is that we take the EU rules guiding the exchange rate policies within the EU member states as given. *The final section* concludes with summarisation of our main findings.

2. A Comparison of Experiences from Member States of the European Union

This section focuses on comparing the exchange rate experiences of the EU/eurozone countries, i.e. countries that (in the main) have already been through the exchange rate convergence process. We show that, when formulating their exchange rate strategies, these nations not only had to take into consideration their initial position at the economic level (i.e. real convergence), but also, as the euro target date neared, had to devote more and more attention to achieving exchange rate stability (i.e. one of the nominal convergence criteria).

2.1 ERM and ERM2

The exchange rate mechanism (ERM) started operating in March 1979. This mechanism can be regarded *as a target band for the exchange rates* of the EU member states. It represented a compromise between a freely floating regime and a Bretton–Woods-type system of pegged exchange rates. Under the ERM, the monetary authorities intervened on the forex market in order to maintain a fixed bilateral central parity in a "currency grid".[1] When the authorities were unwilling to intervene (for example, because of the high costs of doing so), the central parity was realigned. For most currencies, the target zones were set initially at ±2.25% around their bilateral central parities. The more volatile currencies (the Italian lira, the Spanish peseta, the UK pound and the Portuguese escudo) were allowed a range of ±6%.

The history of the ERM's operation can be split into three broad phases. In the first phase, running from its launch in 1979 up until the end of 1983, the target zones suffered from a lack of credibility and frequent devaluations. Figure 2.1 illustrates the changes to the fluctuation bands and central parities of the EU-12 nations (i.e. the eurozone member states) from the ERM's establishment in 1979 up until the introduction of the euro. In the second phase, running between 1984 and 1991, the ERM recorded growth in credibility (linked with initial considerations regarding the possible formation of a monetary union), with the central parities being realigned only in exceptional cases. But this period was interrupted at the start of the 1990s by a series of currency crises in the ERM countries, due chiefly to German reunification and economic recession in the EU. A speculative attack in September 1992 forced Italy and the UK out of the mechanism. In August 1993 the ERM fluctuation band was widened from ±2.25% to ±15%.[2]

In the third phase, from 1993 until 1998, substantial progress was made in nominal (and real) convergence between the EU nations. Macroeconomic stability, structural reforms and the

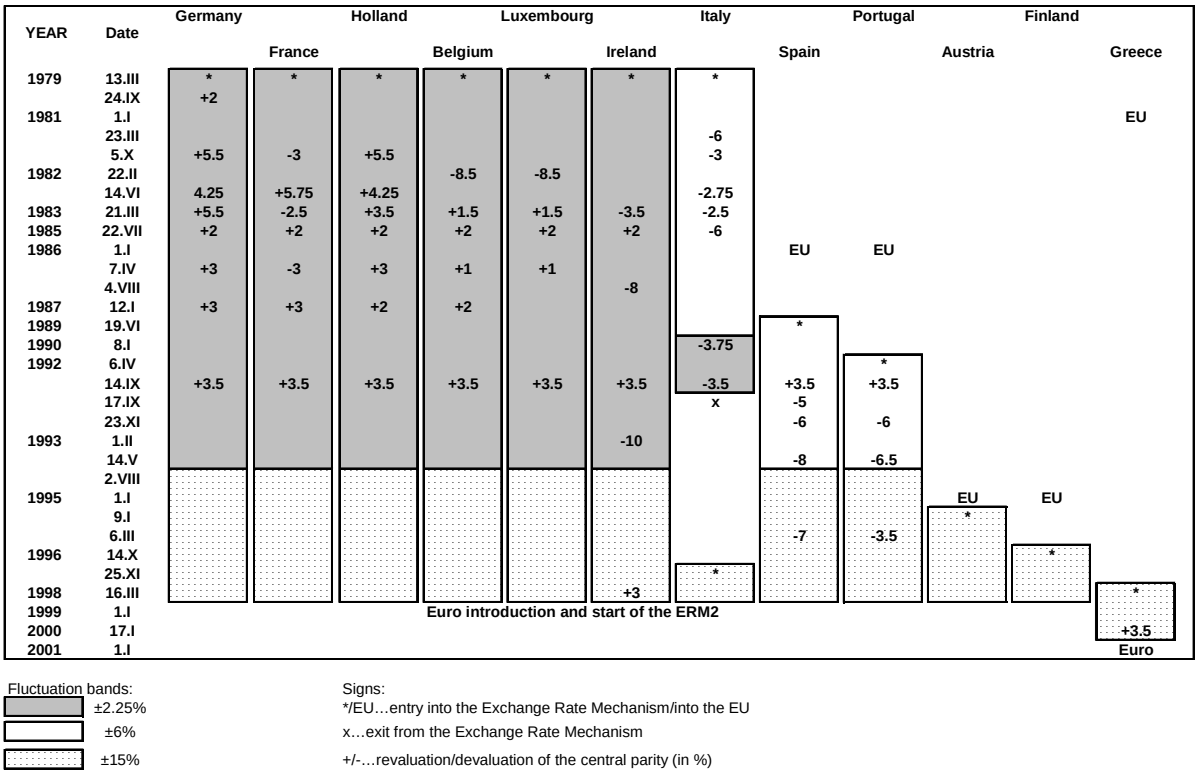
[1] For a more detailed discussion of the European Monetary System and ERM, see, for example, EC (1999).

[2] Economic theory currently distinguishes four generations of models of financial crisis (i.e. currency, debt and banking crises). It is the second-generation models – inspired by the ERM crisis in the autumn of 1992 – that try to explain that the probability of a speculative attack depends on the extent to which the exchange rate being maintained is compatible with the entire set of current and future policies. These models concede that a speculative attack may occur even if an economy is fundamentally healthy where the existing situation necessitates a minor correction. Should the notion that a "minor correction" is necessary become generally shared, speculators may launch an attack if the authorities are unwilling to defend the existing central rate in the event of an attack (because of concerns that the resultant rise in interest rates would cause excessive problems to domestic firms, weaken the banking sector or lead to an increase in unemployment). Often, the authorities' best way out of such a predicament truly is to devalue rather than to make costly attempts to convince the markets that they (the authorities) are in the right. In such cases, one can speak of "self-fulfilling" speculative attacks.

Maastricht process to introduce a single currency fostered a situation where the central parities were adjusted with ever-decreasing frequency. Figure 2.1 shows that the last devaluation occurred in March 1995 (in Spain and Portugal). Subsequently, still prior to the introduction of the single currency, there were only revaluations – in Ireland (March 1998) and Greece (January 2000).

In January 1999, owing to the introduction of the single currency and the establishment of the ECB (European Central Bank), the multilateral ERM was replaced with the bilateral ERM2 mechanism.[3] During 1998, eleven EU countries met the conditions for introducing the single currency. Greece joined them in the eurozone at the start 2001. The United Kingdom and Denmark, which at the start of the Maastricht process insisted on an opt-out clause, are not currently part of the single currency project. Despite not having an opt-out clause, Sweden, too, remains outside the eurozone for the time being (chiefly for domestic political reasons). The only member state now in the ERM2 (following Greece's accession to the eurozone) is Denmark, which has a fluctuation band of ±2.25%, i.e. a more restrictive band than the maximum allowed bandwidth.

Figure 2.1: Exchange Rate Parities and Fluctuation Bandwidths of the EU-12 Nations in the ERM and the ERM2



Note: On 23 August 1993 the standard fluctuation band was widened to ±15%, with the exception of Germany and Holland, which mutually agreed upon (outside the ERM) a bilateral fluctuation band of ±2.25%

Sources: *ECB and authors.*

[3] For a more detailed discussion of the differences between ERM and ERM2, see section 4, or Čech and Komárek (2002a).

2.2 Exchange Rate Convergence and Segmentation of the EU Countries

The exchange rate experiences of the EU countries can be split into four groups as regards the ERM/ERM2 convergence process: (i) *Group A* – countries with close historical ties to the German mark (euro), (ii) *Group B* – real-convergence (peripheral) countries, (iii) *Group C* – countries that have been in the ERM/ERM2 for a relatively short period, and (iv) *Group D* – eurozone non-members. This breakdown makes it easier to identify the motives that led each nation to enter (or defer entry into) the ERM/ERM2.

In the following analysis, we shall focus primarily on the nominal exchange rate developments prior to the fixing of the central parity against the euro, and in particular during the period of fulfilment of the Maastricht exchange rate criterion (i.e. in 1997–1998 for the first eleven members of the eurozone). Table 2.1 contains a detailed breakdown of the individual countries into the aforementioned groups.

Table 2.1: Segmentation[a] of EU Countries for the Analysis of Exchange Rate Experiences

	Group A	**Group B**	**Group C**	**Group D**
Country	Belgium Luxembourg Netherlands France Austria	Portugal Spain Ireland Greece	Finland Italy	Denmark Sweden United Kingdom
Nature of exchange rate policy in eurozone accession process	Monetary and exchange rate policy strongly affected by ties to DEM	Exchange rate policy an instrument of macroeconomic stabilisation; bolstering of disinflationary process	ERM/ERM2 a qualifying condition for joining the eurozone	Non-members of the eurozone

***Notes**: Group A – countries closely linked to the German mark, Group B – real-convergence (peripheral) countries, Group C – countries that have been in the ERM/ERM2 for a relatively short period, Group D – eurozone non-member countries.*

[a] This breakdown gives only the basic nature of each country's exchange rate policy in the eurozone accession process (for instance, Greece's entry into the ERM/ERM2 was simultaneously an instrument of macroeconomic stabilisation and a qualifying condition for joining the eurozone).

[b] Since 1921, the Luxembourg franc (LUF) has been in a monetary union with Belgium under an agreement known as the BLEU (The Belgium–Luxembourg Economic Union).

Our discussion of the exchange rate experiences of the EU countries is based on an analysis of the exchange rate volatility of each particular country in the four years running up to introduction of the single currency. Period I denotes the period 0–24 months prior to introduction of the euro and Period II the period 25–48 months prior to introduction of the euro.[4] To assess nominal exchange

[4] The euro was introduced in cashless form on 1 January 1999 and in cash form on 1 January 2002.

rate stability we used the German mark (DEM) as the reference currency,[5] owing to the informal "leading" role of the German currency in the ERM (as confirmed by the practice of several central banks of directly or indirectly pegging their national currencies to the mark). In the case of Greece (which joined the eurozone on 1 January 2001) and the Group D countries, whose exchange rate stability was assessed as of 1 January 2002, the reference nominal currency was the euro. Table 2.2 shows our calculated values of the volatility of each country's exchange rate (the arithmetic mean of the absolute deviations from the central parity, and the standard deviation), decomposed by economic/territorial group (country groups A–D) and time period (periods I and II). Table 2.3 shows the maximum deviations of each country's nominal exchange rate from the central parity (DEM/EUR) in the two years running up to eurozone entry. It is therefore analogous to the assessment of the criterion on exchange rate stability conducted by the European Commission and European Central Bank in the Convergence Report (see section 4).

Table 2.2: Nominal Exchange Rate Volatility of the EU Countries vis-à-vis DEM/EUR Prior to Entering the Eurozone

Group	Country	Currency	Period I		Petiod II	
			Arithmetic mean (of absolute value; in %)	Standard deviation	Arithmetic mean (of absolute value; in %)	Standard deviation
Group A	Germany	DEM	0.00	0.00	0.00	0.00
	Belgium/Luxembourg	BEF/LUF	0.17	0.17	0.30	0.25
	Netherlands	NLG	0.20	0.23	0.57	0.30
	France	FRF	0.32	0.37	2.61	1.50
	Austria	ATS	0.17	0.18	0.19	0.22
Group B	Portugal	PTE	0.79	0.78	2.31	2.77
	Spain	ESP	0.46	0.35	2.59	4.09
	Ireland	IEP	4.95	3.59	3.68	3.42
	Greece	GRD	4.65	3.30	9.83	3.55
Group C	Finland	FIM	0.84	0.80	1.39	1.55
	Italy	ITL	0.59	0.57	9.30	7.04
Group D	Denmark	DEK	0.30	0.31	0.23	0.23
	United Kingdom	GBP	6.75	1.74	2.56	3.24
	Sweden	SEK	4.57	5.08	2.48	3.02

Notes: *a) Calculations based on monthly data.*

b) Group D: reference rate = average rate against DEM (EUR) in 1999, Period I (2001–2002) and Period II (1998–1999).

c) Period I: 0–24 months; Period II: 25–48 months prior to irrevocable fixing of the central parity in the eurozone.

Sources*: Eurostat, IMF-IFS CD-ROM and the authors' own calculations.*

[5] In its assessments of exchange rate stability, the European Commission uses what it terms the *median currency approach*. This is determined by computing the percentage deviation of each currency from the central rate vis-à-vis the euro. The currencies are arranged in order of these deviations, and the ERM median is the currency at the middle of this sequence. The deviation of each currency from the median is then computed using the bilateral rate. Given the availability of data for our calculations (and also for comparability with Group D countries in the next instalment of our series) we have approximated the median of the exchange rates for our stability assessment using the German mark (DEM). This currency showed (in 1996–1998) minimal deviations from the ERM median and thus constituted an informal anchor for the exchange rate system. The choice of the DEM (i.e. to some extent an "asymmetric" assumption) prevents us from evaluating the exchange rate stability of the DEM reference currency itself.

Table 2.3: Assessment of Criterion on Exchange Rate Stability vis-à-vis DEM/EUR 0–24 Months Prior to the Fixing of the Central Parity in the Eurozone

Group	Country	Currency	Maximum (in %)	Minimum (in %)	Central parity (c.u./DEM)
	Germany	DEM	0.00	0.00	1.00
	Belgium/Luxembourg	BEF/LUF	-0.21	0.31	20.63
Group A	Netherlands	NLG	-0.48	0.52	1.12
	France	FRF	-0.39	1.00	3.81
	Austria	ATS	-0.19	0.38	7.04
	Portugal	PTE	-2.23	0.22	102.50
Group B	Spain	ESP	-0.99	0.16	85.07
	Ireland	IEP	-10.28	-0.12	0.42 / 0.40 [d)]
	Greece	GRD	-8.83	0.00	180.54 / 174.22 [d)]
Group C	Finland	FIM	-2.42	0.23	3.04
	Italy	ITL	-1.58	0.63	990.00
	Denmark	DEK	-0.65	0.35	3.81
Group D	United Kingdom	GBP	10.68	-4.13	0.33
	Sweden	SEK	-6.72	9.47	4.50

Notes: *Calculations based on monthly data.*

a) Direct quotation of exchange rates was used in the calculation, i.e. (-) denotes appreciation and (+) depreciation; exchange rate deviations were adjusted for revaluations/devaluations of central parities.

b) Group D: reference rate = average rate against DEM (EUR) in 1999, Period I (2001–2002) and Period II (1998–1999).

c) The revaluations of the central parity by Ireland and Greece have been taken into account in the calculation.

d) (max. – appreciation against the central parity; min. – depreciation against the central parity)

Sources: *Eurostat, IMF-IFS CD-ROM and the authors' own calculations.*

Group A: Countries closely linked to the German mark

This first group comprises those countries which have historically close ties to the German mark. Besides Germany, which belongs by definition, it includes other countries with a high economic level (see Figure 2.1a in Appendix 2), i.e. a high level of GDP per capital – Belgium (the monetary union with Luxembourg), the Netherlands, Austria and to some extent also France. Figures 1.1a and 1.2a demonstrate the stability of the nominal exchange rates of the Group A countries against the mark, i.e. no major fluctuations or changes in central parities (i.e. devaluations or revaluations) in the run-up to eurozone entry. In the two years prior to introduction of the euro, these currencies traded against the mark within a very narrow fluctuation band, not exceeding ±1% (see Table 2.2). Only the French franc showed any greater volatility, most notably in 1995–1996. Figure 1.2a shows two brief depreciation episodes for the franc (reflecting relative weakness in the French economy during that period) followed by a clear appreciation trend (toward the central parity) up until its fixing against the euro. GDP per capita in the Group A countries in 2001 was higher than the EU-15 average[6] (see Figure 2.1a).

[6] In 2001 this average was EUR 20,020 (at 1995 prices).

Joining the ERM and endeavouring to meet the exchange rate criterion had no major effect on the exchange rate policies of the Group A countries. The fixed conversion rates of their currencies vis-à-vis the euro were determined on the basis of their long-run central parities in the ERM2. This is evidenced, *inter alia*, by the fact that the last realignment of the Group A countries' central parities prior to their joining the eurozone came in the wake of the ERM crisis in September 1992.[7] As Table 2.2 shows, the Group A countries had no problem meeting the exchange rate convergence criterion either. In the two-year run-up to eurozone entry, their maximum deviations from the central parities came nowhere near the margins of the "narrow" ERM fluctuation band (±2.25%).[8] The stability of these exchange rates was also reflected in very narrow interest rate differentials for both long-term and short-term rates (see Figures 1.1b and 1.2b in Appendix 1).[9]

Group B: Real-convergence ("peripheral") countries

For the second group (Spain, Portugal, Ireland and Greece), their participation in the ERM/ERM2 was marked by greater exchange rate volatility than that of the Group A countries. Group B can be characterised as the EU's real catch-up economies, having lower income levels than the Group A countries (see Figure 2.1a). These nations used exchange rate policy in the convergence process very often as a means of bolstering their disinflationary process.[10] Take Portugal, for example, which in 1990 in order to suppress inflation switched from a crawling peg to a fixed rate with a basket of five reference currencies. The composition of that basket (DEM, GBP, FRF, ITL, ESP) *de facto* meant a "shadowing" of the ERM and prepared the escudo for entry into the mechanism in 1992. In Greece as well, exchange rate policy attracted ever more attention through the 1990s. At the start of the decade, the Bank of Greece (BoG) tried to curb the depreciation of the drachma in such a way that would not cause a weakening of the real exchange rate. From 1996 onwards, the BoG's exchange rate policy was directed at maintaining exchange rate stability vis-à-vis the ECU. These efforts culminated in March 1998 (see Figure 2.1) with entry into the ERM in the standard fluctuation band (±15%).

The calculations confirm that the Group B countries experienced greater long-run exchange rate volatility than the Group A countries. However, in the reference period for assessing the exchange rate criterion (Period I) the exchange rate movements in the Group B countries showed two distinct trends:

(i) *exchange rate stabilisation* – Spain and Portugal stabilised their exchange rates against the German mark (experiencing less exchange rate volatility in the period before eurozone entry).

[7] For more on the ERM's "black autumn", see, for example, Frait (1993).

[8] The exchange rate stability of the Group A currencies is also evidenced by the fact that in the EC's assessment of exchange rate stability in 1998 (European Commission, 1998), the ERM median currency was always one of the countries from this group.

[9] Owing to space restrictions and the effort to use a consistent data source, we present in Appendices 2 and 4 the interest rate differentials for monthly average day-to-day money market rates relative to German rates (source: Eurostat and IMF-IFS CD-ROM).

[10] Unlike Group A, where Austria and the Netherlands, for example, have chosen relatively strict exchange rate targets since the 1970s.

These countries also saw a continuously falling and almost identical interest rate differential vis-à-vis Germany (see Figure 1.3b) as well as a moderately rising inflation differential.[11]

(ii) *strong appreciation* – Ireland and Greece recorded a relatively strong appreciation path of their nominal exchange rates inside the standard ERM/ERM2 fluctuation band of ±15%. This appreciation was later partially "accommodated" by revaluation[12] of the central parity within the ERM/ERM2 (in the case of the punt by 3% and in the case of the drachma by 3.6%). The full cancelling out of the "exchange rate overshooting" (the maximum deviations against the mark were 11.1% for Ireland and 9.2% for Greece – see Table 2.3) took place through a gradual depreciation of the punt and drachma in line with expectations of the irrevocable fixing of their rates and with a narrowing of the interest rate differential (see Figure 1.4b), which from a theoretical perspective reflects the condition for uncovered interest parity. An exchange rate appreciation in the period prior to the fixing of their currencies against the euro made it easier for both Ireland and Greece to achieve simultaneous fulfilment of the price convergence criterion.

The conversion rates against the euro set for the Group B countries were – as for the other countries – based on the central parities in the ERM/ERM2. With the exception of Greece, the Group B countries joined the mechanism before the start of the two-year reference period. However, the repeated devaluations of central parities during the 1990s suggested that there were problems in finding their equilibrium exchange rates against the other European currencies. The market rates of the Group B countries' currencies in the two years prior to joining the eurozone – the reference period for assessing exchange rate stability (Period I) – fluctuated in both directions around the central parity within a range of approximately ±4% (see Figures 1.3a and 1.4a). Greece entered the ERM in March 1998 with a market exchange rate of around 3.5% in the appreciation band.

Group C: Countries that have been in the ERM2 for a short period

Italy and Finland entered the exchange rate mechanism "at the last minute" and successfully met the exchange rate criterion and introduced the euro at the same time as the other EU countries. Though they joined in the wide-band arrangement in the two years prior to joining the eurozone (Period I), their fluctuations stayed within ±2.25% of the central parity (except for a short-lived appreciation of the Finnish markka).

The characteristic feature of the exchange rate situation in both Italy and Finland back in the early 1990s was a fairly strong depreciation trend. In Italy's case, this was chiefly due to inconsistent macroeconomic policies (strong fiscal expansion) that led the lira to exit the ERM, whereas in Finland's case it was caused by a decline in exports to the former Soviet Union. The mid-1990s saw a sharp appreciation of the lira and a stabilisation of the markka. For both nations, the central parity (in the band vis-à-vis the ECU) when they entered the ERM was set very close to the market rate. Figures 1.5a and 1.5b show the convergence efforts of Italy, which after entering the mechanism markedly stabilised its nominal exchange rate and also steadily reduced the several-

[11] This will be demonstrated in the next instalment of our series as part of an analysis of convergence using the exchange rate or inflation channel (including pass-through into the real exchange rate).

[12] In section 4, or in Čech and Komárek (2002a), we show that a revaluation of the central rate is consistent with fulfilment of the Maastricht exchange rate criterion.

per-cent difference between the Italian and German (reference) interest rates. Compared with Italy, Finland recorded greater exchange rate stability vis-à-vis the German mark and a smaller interest rate differential relative to Germany (again see Figures 1.5a and 1.5b). The economic level of the Group C countries is depicted in Figure 2.1b.

Group D: Eurozone non-member countries

Group D comprises Denmark, the United Kingdom and Sweden, i.e. those countries, which have yet to introduce the single currency. Denmark can be compared to the Group A countries, i.e. those strongly linked to the German mark. The stability of the Danish krone is confirmed by the fact that since 1987 its parity in the ERM/ERM2 has remained unchanged. Tables 2.2 and 2.3 also illustrate the aforementioned fact that the Danish currency has not been exploiting the entire ERM2 fluctuation band (of ±2.25%). So, the only thing preventing Denmark from entering the eurozone is the 'no' vote by Danish voters in the referendum on the introduction of the single currency.

The central banks of the United Kingdom and Sweden, unlike Denmark, do not focus their key monetary policy strategies primarily on exchange rate targets. In these countries, the operational framework for monetary policy is inflation targeting. This difference – as against strict targeting of the exchange rate – translates into greater exchange rate volatility of their currencies against the mark/euro. (see Tables 2.1 and 2.2). Sweden currently has no plans to change its exchange rate regime and considers ERM2 entry only as a preparatory step linked with its decision on joining the monetary union.[13] The situation is similar in the UK, which has yet to declare a clear timing for adopting the euro. The UK's negative views on joining the mechanism reflect its experience in 1992, when it was forced to abandon the ERM following a speculative attack on the pound. Appendices 1 and 2 contain Figures plotting the exchange rates (Figures 1.6a and 1.7a), interest rate differentials (Figures 1.6b and 1.7b) and economic levels (Figure 2.1b) of the Group D countries.

2.3 Experiences of the EU Countries with the Exchange Rate Convergence Process

The following conclusions can be drawn from the experiences of the advanced EU economies with the exchange rate convergence process:

- *Central parities were realigned with decreasing frequency as the launch of the eurozone approached.* This was mainly because exchange rate flexibility was a useful policy tool primarily in the earlier phase of the convergence process, when the macroeconomic fundamentals of the countries involved differed substantially. It is also true that the lower frequency of the realignments was also due to the rising probability that market participants assigned to the eurozone's launch date and by expectations regarding the selection of participating nations.
- The experiences of the present eurozone members shows that *successful membership in the ERM/ERM2 requires harmonisation of the business cycles of the countries bound by the fixed exchange rate system.* Take, for example, the aforementioned ERM crisis in 1992 and 1993, which demonstrated that business cycle mismatches (in this case primarily a

[13] See Government Bill on Sweden and EMU, October 10, 1997; Ministry of Finance, Sweden.

shock in the form of rapid growth in domestic demand in Germany following the reunification of the country and the very sudden creation of a monetary union between its western and eastern parts) can jeopardise a fixed exchange rate arrangement. The acceptance of an out-of-step country can further damage the domestic economy and cause fallout in other countries.

- *The group of countries with a higher economic level (the "core" of the eurozone) implemented exchange rate policy in the convergence process within a narrower fluctuation band.* The conversion rates vis-à-vis the euro (i.e. the exchange rates at which the currencies were fixed irrevocably within the Eurosystem) were for these countries based on long-term parity in the ERM/ERM2 grid. Conversely, the catching-up countries used exchange rate policy to achieve other objectives, in particular to bolster the disinflationary process.
- *The exchange rate experiences of the EU countries during the two-year run-up to eurozone entry show that the market exchange rate fluctuated either close to the central parity or in the appreciation half of the exchange rate band.* This was linked with the efforts of the candidate countries' central banks to meet the exchange rate convergence criterion.
- *The crisis in the early 1990s also demonstrated that the target in the form of the ERM/ERM2 exchange rate band must be underpinned by credible domestic economic policy.* In some cases, the nominal exchange rate of an EMS country came under strong pressure even though the primary cause of the crisis lay outside that country. Take, for example, Denmark's rejection of the Maastricht Treaty, which led to a deepening of the ERM crisis in 1992 and seriously undermined the credibility of the mechanism. This event provoked doubts about the prospects of forming the eurozone, and also focused the markets' attention on those countries whose policies were regarded as inconsistent with the ERM's fixed exchange rate system (most notably those with large and persistent inflation differentials vis-à-vis Germany, large budget deficits and so on).[14]

2.4 Section Conclusion

In the 1990s, the monetary policy strategies of the present eurozone member states often differed markedly. The importance of exchange rate strategy in these countries increased as the euro's launch date neared. The objective was to enter the ERM at a particular exchange rate (i.e. to select the central parity of the mechanism), fulfil the exchange rate criterion (i.e. no devaluation within the ERM for a period of two years), and to fix irrevocably the exchange rate parity in the eurozone.

From the above analysis, it is possible to identify the motives for joining the ERM. For the more advanced EU nations (Group A), participation in the mechanism was in line with their monetary policy strategy of exchange rate stability vis-à-vis the German mark. For their exchange rate policies, the ERM was not a necessary restriction (as these countries often had stricter exchange rate targets than those implied by membership of the mechanism), but rather an "emergency brake" when major exchange turbulence threatened. The second reason for joining the mechanism was institutional. A big motive for entering the ERM (for Greece, Italy and Finland, and – looking ahead – for Sweden as well) was fulfilment of the qualifying criteria for joining the eurozone. A

[14] We will examine the possibility of another ERM crisis occurring during the much-heralded period of accession of the new candidate countries to the ERM2 in a future instalment of our series.

third reason for joining the ERM that we have identified was to boost the credibility of the exchange rate target. However, the ERM crises in 1992–1993 (for instance the series of devaluations of the Spanish peseta and the Portuguese escudo) confirm that joining the mechanism is no panacea guaranteeing macroeconomic stabilisation if nations fail to implement sound macroeconomic policies that are consistent with the exchange rate target. This is evidenced by the fact that the number of devaluations of the central parity by the ERM member states fell sharply after they began to focus their economic policies on meeting the Maastricht convergence criteria. The "convergence programmes" played a vital role in this process, setting out clear policy objectives for the countries converging toward entry into the eurozone. Adherence to these programmes helped to boost the credibility of economic policies and of the exchange rate target.

The successful completion of the EU countries' exchange rate convergence in the second half of the 1990s was also fostered by satisfactory development of the real economy and a relative absence of shocks to the ERM economies. In addition to fiscal discipline in each country (in accordance with the Stability and Growth Pact), a key prerequisite for the smooth operation of the eurozone will be sufficient wage flexibility and a strong financial sector. The functioning of such adjustment mechanisms – reacting quickly to any asymmetric shocks within the eurozone – is a fundamental condition for bolstering the growth rate of the EU economy, for successful real convergence of the less-advanced peripheral economies toward the "core" of the EU, and also for successful integration of the current candidate countries, including the Czech Republic.

3. A Comparison of Experiences from Selected Candidate Countries and Member States of the European Union

Aware of the fact that many of the candidate countries have not yet definitively finished the transition period, we identify several basic determinants that should influence the candidates' nominal exchange rates prior to eurozone entry. As the main determinants of the central parity set for entry into the ERM2 (and later into the eurozone) we have identified the trajectory of the equilibrium real exchange rate and the assumed path of the nominal exchange rate in the ERM2. The candidate countries' exchange rate strategies will furthermore be illustrated using the strategies presented in the *Pre-accession Economic Programmes*.

3.1 The Exchange Rate Strategies of the Candidate Countries

3.1.1 The Exchange Rate "History" of the Candidate Countries

Simplifying somewhat, two common principles can be identified for the choice and timing the candidates' exchange rate strategies in the period running from the start of the transformation process until accession to the EU. The first principle was the requirement for *sufficient exchange rate flexibility*. Each of the candidates had to initiate a society-wide (and, within that, economic) transformation with the declared aim of convergence towards the advanced European economies.[15] This required considerable freedom as regards national economic policies and – by the same token – the exchange rate regime. The second principle was the need to offer economic

[15] For more details, see Frait and Komárek (1999), which contains a discussion of "successful" versus "unsuccessful" transformations with respect to the real exchange rates.

agents *exchange rate predictability*. Given the size and openness of many transition economies, the exchange rate constitutes one of the most important pieces of economic information. At first glance, though, these two principles would appear to be contradictory. Consequently, different transition countries applied different exchange rate strategies (with different regimes, different timings of changes in central rates and so on), for each was compelled to launch its transformation process at a different "starting line", each had different short-term reform preferences (economic policies), and each had a different susceptibility to shifts in the external economic environment.

The current group of candidate countries is very heterogeneous, and not just with respect to exchange rate strategy. This heterogeneity stems from the aforementioned initial conditions,[16] which (leaving aside the special cases of Cyprus and Malta) led to the existence of two types of exchange rate strategy. The first consisted of the *more advanced nations* (the Czech Republic, Hungary, Poland and Slovakia), which after initial devaluations soon introduced internal convertibility (especially the Czech Republic) and applied more fixed exchange rate systems. Owing to the introduction of reform measures, to the monetary policy scheme adopted and/or to economic developments at home and abroad, they were later forced to switch to more flexible arrangements. Simplifying somewhat, one can say that owing to sizeable inflows of foreign investment and positive interest rate differentials (exceeding the countries' risk premia) the fixed exchange rate regime became unsustainable. Of the more advanced candidates, the country with the highest economic level – Slovenia – had a rather different exchange rate strategy; its currency appreciated several times in the initial period (1992) but later steadily depreciated against the German mark.

The start of the 1990s saw various exchange rate strategies applied in the *less advanced candidate countries* (for example Estonia, Lithuania, Latvia and Bulgaria), which owing to a shortage of the foreign reserves needed in order to "defend" a peg, coupled with the low credibility of their newly established central banks and their commercial banking systems as a whole (for example in the Baltic and Balkan states), were forced to defer the adoption of a more fixed exchange rate system. This "experiment", however, eventually led to accelerating inflation and to adverse economic developments (especially in Bulgaria). Accordingly, the authorities in these countries switched to more fixed regimes (a currency board with DEM/EUR in Bulgaria, a currency board with USD and subsequently EUR in Lithuania, and a peg in Latvia – see Table 3.1 for more details).

3.1.2 Exchange Rate Convergence and Segmentation of the Candidate Countries

Two common elements can be seen when we examine the exchange rates of the post-socialist candidate countries (Groups E and F defined below). The first is considerable uncertainty about the market levels of their nominal exchange rates at the start of the economic reform process. And the second is the issue of finding the irrevocable conversion rates of their currencies against the euro. Between these two points in time, which clearly demarcate their often vague medium-run economic policy horizons, the different countries have been applying various exchange rate strategies in order to achieve nominal, real and institutional convergence towards the EU.

[16] These included the process of creating an independent history in each of the five candidate countries. For the Baltic States, the collapse of the Soviet empire implied – with respect to the exchange rate issue – a need to exit the Soviet monetary union and establish a new central bank and currency. Of the reviewed countries, both Slovenia and the successor states of the former Czechoslovak Federal Republic have a similar experience.

In this section, we conduct a similar analysis as in Čech and Komárek (2002b). Here, however, we focus our attention on examining the candidate countries' exchange rate strategies. We divide them into three groups (see Table 3.1) based on exchange rate history. Following on from the breakdowns described in the previous part of our series, we define *Group E* as containing those candidate countries which currently apply a more fixed exchange rate regime, *Group F* as containing those which currently apply a more flexible regime, and *Group G* as containing the remaining three candidates, which still have a relatively long time to go before joining the EU.

Table 3.1: Segmentation of the Candidate Countries for the Analysis of Exchange Rate Experiences[17]

Group E	Group F	Group G
Estonia	Czech Republic	
Lithuania	Hungary	Bulgaria
Latvia	Poland	Romania
Cyprus	Slovakia	Turkey
Malta	Slovenia	
Countries with a fixed exchange rate arrangement	Countries with a more flexible exchange rate arrangement	Countries with a longer association process

The exchange rate history of the countries in groups E, F and G is naturally reflected in the volatilities of their nominal exchange rates.[18] We present these in Tables 3.2 and 3.3, which use the same methodology as applied in the part featuring the EU/eurozone member states. The figures have been computed for two 2-year periods. These can be viewed as the periods prior to, and during, participation in the ERM2, which these countries – should they decide to introduce the euro – will have to join relatively soon.

Period I denotes the period 0–24 months, and Period II the period 25–48 months, prior to notional adoption of the euro (on 1 January 2002). The previously described "informal role of DEM/EUR", as confirmed *de jure* by the monetary arrangements in the Baltic States and Bulgaria, as well as by the exchange rate policies of the other candidate countries, was again used as the reference currency.

Table 3.2[19] shows the volatility of each candidate's exchange rate (the arithmetic mean of the absolute deviations from the central parity, and the standard deviation), broken down by economic/territorial group (groups E–G) and time period (periods I and II). Table 3.3 shows the maximum deviations of each candidate country's exchange rate from the central parity in the

[17] For the sake of completeness, it is possible to distinguish a fourth group, which we term *Group H*, consisting of those countries which have verbally or informally expressed an interest in integrating into the EU but which as yet do not have the status of "candidate country". These include the remaining countries of the former Yugoslavia, along with Albania, Belarus, Moldavia, Ukraine, other states of the former Soviet Union, and other nations seeking greater integration with the EU (certain North African countries, for instance).

[18] The countries' nominal exchange rate paths against the euro can be broken down, according to the common features of their nominal exchange rate indices, into those which, between the start of 1993 and the present, have predominantly appreciated, depreciated or have been (by definition of their exchange rate regime) stable against the DEM/EUR or ECU/EUR rates.

[19] A similar calculation method was used for the EU/eurozone member states in section 2, or in Čech and Komárek (2002b).

notional two years running up to eurozone entry. It is again therefore somewhat analogous to the assessment of the criterion on exchange rate stability to be conducted by the European authorities prior to eurozone entry.

Table 3.2: Exchange Rate Volatility of the Candidate Countries vis-à-vis the EUR (fluctuation bands against average exchange rate against the EUR in 1999)

Group	Country	Currency	Period I		Period II	
			Arithmetic mean (absolute values; in %)	Standard deviation	Arithmetic mean (absolute values; in %)	Standard deviation
	Estonia	EEK	0.00	0.00	0.34	0.45
	Lithuania	LTL	14.73	3.81	3.88	4.38
Group E	Latvia	LVL	10.58	2.38	3.80	3.60
	Cyprus	CYP	0.69	0.37	0.32	0.88
	Malta	MTL	5.25	1.27	1.66	1.71
	Czech Rep.	CZK	5.56	2.67	2.93	3.68
	Hungary	HUF	2.80	2.33	3.17	4.14
Group F	Poland	PLN	9.18	2.38	4.80	3.60
	Slovakia	SKK	2.63	1.40	6.29	6.22
	Slovenia	SIT	9.19	3.32	2.89	2.47
	Bulgaria	BGN	0.28	0.21	0.34	0.45
Group G	Romania	ROL	40.85	20.52	23.06	21.07
	Turkey	TRL	87.77	71.11	22.12	19.93

***Notes**: a) Calculations based on average monthly market exchange rate data.*
b) Period I = 2000–2001; Period II = 1998–1999.

***Sources**: Eurostat, IMF-IFS CD-ROM and authors' calculations.*

Table 3.3: Assessment of Criterion on Exchange Rate Stability for 2001–2002

Group	Country	Currency	*Maximum (in %)*	*Minimum (in %)*	*Central parity (c.u./DEM)*
	Estonia	EEK	0.00	0.00	15.65
	Lithuania	LTL	-20.05	-4.95	4.27
Group E	Latvia	LVL	-14.95	-5.06	0.63
	Cyprus	CYP	-1.12	0.08	0.58
	Malta	MTL	-7.66	-2.57	0.43
	Czech Rep.	CZK	-11.79	-0.90	36.88
	Hungary	HUF	-2.17	5.64	252.74
Group F	Poland	PLN	-19.86	-1.27	4.23
	Slovakia	SKK	-5.75	-0.90	44.11
	Slovenia	SIT	2.77	13.27	194.42
	Bulgaria	BGN	0.49	0.00	1.96
Group G	Romania	ROL	12.79	72.59	2862.29
	Turkey	TRL	23.69	226.77	446541.08

Notes: *a) Calculations based on monthly data.*
b) Direct quotation of exchange rates was used in the calculation, i.e. (-) denotes. revaluation/appreciation and (+) devaluation/depreciation.
c) Maximum = appreciation; Minimum = depreciation.
d) Reference rate.
e) Central parity = average rate against EUR in 1999.

***Sources**: Eurostat, IMF-IFS CD-ROM and authors' calculations.*

Group E: Countries with a fixed exchange rate arrangement

The first group of candidate countries comprises the Baltic States and small Central European nations, i.e. countries which have a currency board against DEM/EUR (Estonia since 1992 and Lithuania since February 2002) or whose exchange rate is restricted to a narrow fluctuation band against the reference currencies (Malta and Cyprus) – for more details again see Table 3.4 below. The monetary policy arrangements chosen by these countries were accompanied by low exchange rate volatility, something that is confirmed by our calculations summarised in Table 3.2. The calculations show high volatility against DEM/EUR only for Lithuania and Latvia, whose reference currencies were USD and SDR respectively (see Table 3.3).

Group F: Countries with a more flexible exchange rate arrangement

The second group of candidate countries is made up of the post-communist countries having a higher economic level. The higher exchange rate volatility of the countries with more flexible arrangements (the Group F countries relative to Group E) is comparable to several real-convergence member states of the EU (Group B). The Czech Republic and Poland saw sizeable appreciation of their nominal exchange rates in the period under review (Period I). As regards "notional" fulfilment of the exchange rate criterion, this means that the Czech Republic[20] and Poland – in the event of nearing the margin of the wider ERM2 band – would have had to make larger interventions to counter the appreciation (in collaboration with the ECB). The only country with a significant depreciation trend in this period was Slovenia.[21]

Group G: Countries with a longer association process

The remaining group of candidate countries, which are some way off accession to the EU, consists of Bulgaria, Romania and Turkey. Bulgaria has been recording significantly better indicators since establishing a currency board in 1997 (stabilised inflation, a standard interest rate differential against Germany, etc.). In this respect, its results are comparable with those in the Group E countries, i.e. a stable exchange rate against DEM/EUR and a very low interest rate differential. Nonetheless, it has not made any further progress with its association process. Considerably worse off are Romania and, in particular, Turkey, which was recently hit by a hyperinflationary spiral. The rapid depreciation of the Turkish lira and Turkey's very large interest rate differential can be seen in Figure 3.6b. All these nations have a relatively low economic level (see Figure 4.1c).

3.2 Pre-accession Economic Programmes

The candidate countries have been drawing up *Pre-accession Economic Programmes* (PEPs) since 2001. Updated versions of these documents were published in October 2002. Although as precursors of the Convergence Programmes and Stability Programmes they focus primarily on the fiscal sector, they also contain four-year macroeconomic scenarios that include envisaged

[20] The Czech Republic's maximum deviation from the average CZK/EUR rate for 1999 (19.4% on the appreciation side) occurred in the first half of 2002.

[21] Although Slovenia is the wealthiest of the former socialist economies (see Figure 4.7b), a large part of its economic transformation still lies ahead. Nevertheless, it is true that its incomplete privatisation process could have – by comparison with the other candidate countries – an effect on the inflow of foreign capital into the country and hence an effect on the exchange rate "history" of the tolar.

developments in the area of monetary and exchange rate policy. Although many analysts have questioned the credibility of the PEPs – especially in the fiscal part – the PEP is without doubt a significant (albeit "political") indicator of exchange rate policy orientation in the candidate countries' process of integration into European monetary structures.

It is clear from the PEPs that the prospect of membership in the ERM2 and the preparations for adopting the euro are having a strong bearing on the candidates' exchange rate strategies. Most of the programmes envisage a continuation of the present exchange rate regimes until accession. Similar constancy is also apparent if we look back into the past – the exchange rate regimes are practically unchanged compared with the 2001 PEPs (save for a number of technical details, for example a change in reference currency from USD to EUR in Lithuania). Table 3.4 summarises the basic information on the candidates' current exchange rate regimes and the changes expected during the process of joining the EU and eurozone.

The specification of the post-accession exchange rate regimes is fairly vague. Most of the programmes only refer to the exchange rate policy restrictions implied by the European legislation (see Čech and Komárek, 2002a). However, explicit euro target dates have almost disappeared from the 2002 PEPs (by comparison with 2001). Table 3.4 shows that some of the PEPs indicate that the euro should be introduced as soon as possible, with Hungary being among the most ambitious in this respect. By contrast, the least ambitious are the Group G countries. The only two countries that make no mention of a euro target date are Turkey and Romania. Along with Bulgaria, these countries still have many reforms lying ahead of them. The difference between them and the other candidate countries is clearly demonstrated by their exchange rate and interest rate histories (Appendix 4) and their economic levels (Appendix 5).

The considerations of the candidate countries – as set forth in the PEPs – can be summarised as follows. Most of the countries envisage continuing with their present exchange rate regimes up until accession. The PEPs do not go into detail about exchange rate policy following accession, reckoning only on a two-year "transition" period within the ERM2. Many countries express a preference for entering the eurozone as soon as possible after accession, but they do not identify a specific target date for adopting the euro.

Table 3.4: The 2002 PEPs: The Exchange Rate Objectives of Some of the Candidate Countries and Their Envisaged Participation in the Eurozone

	Country	Exchange rate regime	Euro target date	ERM2 participation	Changes to exchange rate regime
GROUP E	**Estonia**	Currency board with euro	Not stated in PEP	Not stated in PEP	Not stated in PEP
	Lithuania	Currency board with euro	Not stated in PEP	Not stated in PEP	Not stated in PEP
	Latvia	Peg to SDR	Not stated in PEP	As of accession or later	ERM2 may allow a more active monetary policy
	Cyprus	Peg to euro with wide band and soft inner band	As soon as possible after accession	As of accession	Not stated in PEP
	Malta	Peg to trade weighted basket	Not stated in PEP (reference to ongoing dialogue between government and central bank)	As soon as possible after accession	Maintaining peg, raise weight of euro in basket
GROUP F	**Czech Republic**	Managed float	Not stated in PEP	Standard fluctuation band	Maintenance of managed float, efforts to neutralise inflow of privatisation capital
	Hungary	Peg to euro with band of +/-15%	As soon as possible after accession	After accession to EU	Not stated in PEP
	Poland	Float	Not stated in PEP (after publication of PEP: report on directing policies towards satisfying Maastricht criteria in 2005)	After accession	Finding optimum parity in ERM2 identified as challenge
	Slovakia	Managed float (euro)	Not stated in PEP	After accession	Not stated in PEP
	Slovenia	Managed float (euro)	As soon as possible after accession	Not stated in PEP	Unchanged
GROUP G	**Bulgaria**	Currency board (euro)	Not stated in PEP	Participating, but keeping currency board	Maintaining currency board
	Turkey	Float	Not stated in PEP	Not stated in PEP	Switch to peg being considered (EUR/USD basket; EUR after 2004)
	Romania	Managed float (dollar)	Not stated in PEP	Not stated in PEP	Switch to euro as reference

In February 2002 (on 2 February, to be precise) the Lithuanian central bank switched its currency board anchor from the dollar (at 4 LIT/USD) to the euro (at 3.4538 LIT/EUR).

Sources: *PEPs (2001 and 2002), Bloomberg and http://www.bank.lv.*

3.3 The Main Determinants of Exchange Rate Movements in the Candidate Countries

To analyse the main exchange rate determinants in the final stages of the candidates' exchange rate convergence towards the eurozone countries, the priority is to examine the nominal dimension of the exchange rate in the short and medium run. However, given the complex interdependencies of the various aspects of the exchange rate and the factors affecting them, this nominal dimension cannot be separated from the other dimensions.[22]

Our analysis aims to present – from a theoretical and application viewpoint – the main factors linked with the determination of the nominal exchange rate in the medium run, i.e. in the period leading up to adoption of the euro, especially in the ten candidate countries expected to join the EU in 2004 (the Group E and Group F countries). We also intend to point out the existence of transitory factors affecting the exchange rate paths in those countries. The overall objective of this section is to take the first step towards a discussion of the main arguments that will influence the exchange rate trajectories in the ERM2.

It follows logically from the definition of the real exchange rate (R=E.P*/P, where R is the real exchange rate, P* is the foreign price level and P is the home price level) that factors affecting the real exchange rate must necessarily affect the nominal exchange rate (especially in the medium and long run), and also that factors affecting the nominal exchange rate also affect the real exchange rate (especially in the short run). Frait and Komárek (1999c) split the factors affecting the real exchange rate into two broad groups: those that affect the tradables sector and those that affect the non-tradables sector. They conclude that the systematic variability of the real exchange rate for tradables is due to changes in national saving and investment, the terms of trade and international real interest rates. They also analyse the supply and demand factors that cause real appreciation of the exchange rate in transition economies. The *supply factors* include the Balassa–Samuelson effect, the relative factor endowment hypothesis, the costs of developing the network and regulated sectors, and the "Dutch disease". The *demand factors* include the income elasticity of demand for nontradables and capital inflows following liberalisation of the financial (capital) account.

The determinants of real exchange rates can be distributed over time in the following way. In the short run (less than one year), movements in the real exchange rate are determined by changes in the nominal exchange rate. This means that the correlation between the nominal and real exchange rate is very high in the short run (for more details, see Meltzer 1993). In the medium run (between 1 year and 3 years) the real exchange rate is determined chiefly by *indicators associated with the balance of payments* (real interest rates, which determine developments on the financial account;[23] the current account position, which determines net foreign assets; and aggregate labour productivity[24]) and by *"real shocks" to the economy* (significant technological changes, significant changes in the terms of trade, and significant changes in state finances, for example

[22] "Economic" (factors affecting the bilateral or effective dimension of the nominal and real exchange rate), "temporal" (factors affecting exchange rates in various time periods – the short, medium and long run), and "transitory" (a comparison of factors affecting exchange rates in transition economies with factors affecting exchange rates in advanced market economies).

[23] This relationship captures the real uncovered interest parity condition.

[24] However, productivity and net foreign assets both tend to be significant in the long run rather in the short run.

rises or falls in expenditure on arms or infrastructure investment).[25] In the very long run, the real exchange rates of advanced nations that are near to steady state can be more or less constant. This is evidenced by the exchange rates of the advanced market economies, where time series stretching back more than a century can be compiled. This type of stationarity is admittedly not the norm for all the exchange rates of the advanced market economies, but it does suggest that real exchange rates return to equilibrium in the very long run.

This identification of factors affecting the nominal exchange rates of the candidates' currencies should also take into account the fact that the candidate countries have not yet fully and definitively put the transition period behind them. Aware of this fact, we identify several basic determinants that should most affect the candidates' nominal exchange rates prior to eurozone entry. These are: *(i) productivity growth and the wage-setting process in the economy; (ii) the way in which fiscal and monetary policy is pursued; (iii) the stability of the financial sector; (iv) the problem of external (exogenous) shocks; and (v) "other factors" affecting the candidates' nominal exchange rates against the euro.*

Productivity Growth and the Wage-setting Process in the Economy

Faster productivity growth in the candidate countries than in the "core of the eurozone" will be reflected (on the basis of the very well known Balassa–Samuelson effect)[26] in a tendency toward sustained real appreciation of the home currency. However, this real appreciation may be realised either through nominal appreciation (the exchange rate channel) or through the inflation differential (i.e. a higher growth rate of the domestic price level relative to the foreign price level – the inflation channel), or through both these channels simultaneously. Nominal appreciation pressures may arise in transition economies as a result of, for example, strong FDI inflows (owing to privatisation or new investment projects), which foster rapid restructuring, especially in the tradables sector. Given the nature of the economies in the final stages of economic transformation, there are considerable uncertainties associated with the pace of real appreciation and with the relative importance of the exchange rate channel versus the inflation channel in that process. In particular, central bank preferences (e.g. the inflation target or the width of the fluctuation band in a fixed exchange rate arrangement) will have a major effect on the nominal exchange rate.

Monetary and Fiscal Policy

Monetary policy affects the exchange rate in transition economies primarily in the following ways: (i) through the chosen exchange rate regime (on a scale running from an exchange rate peg through to a free float); (ii) through the chosen monetary policy scheme (exchange rate targeting, money targeting or inflation targeting); and (iii) through foreign exchange intervention strategy (only relevant in countries that do not apply a currency board).

In small, open (transition) economies, changes in the nominal exchange rate have a big effect on the level and growth rate of inflation, i.e. on price stability. Price stability has been adopted as the

[25] These factors tend to be significant more in the long run, and their influence on the real exchange rate path has to be estimated on a case-by-case basis. In the medium run, however, they are the co-determinants of the business cycle, which in turn feeds through into the real exchange rate path.

[26] The intensive convergence of countries with a lower economic level towards the advanced nations is also sometimes referred to as the Harrod–Balassa–Samuelson effect.

nominal objective in several of the candidate countries (those which have introduced inflation targeting), hence de facto thwarting indirectly the ambitions of their authorities to preferentially target or intensively influence the nominal exchange rate. According to the Tinbergen rules on policy instruments and policy targets, it is not possible in the long run to pursue two independent monetary-policy objectives with one instrument (i.e. changes in interest rates). If such a scenario really were to materialise, i.e. if an inflation-targeting central bank were to let the public know its exact idea about the "desired" exchange rate, it would simultaneously expose itself to the risk of strong uncovered speculation and "moral hazard". The veracity of this scenario was demonstrated historically by the ERM crisis in the "Black Autumn" of 1992 (for more details, see Frait 1993).

There are two main arguments for central bank intervention on the foreign exchange market. The first is to weaken an exchange rate that is out of line with economic fundamentals, which in inflation-targeting economies implies the risk of a considerable undershooting or overshooting of the declared inflation target. The second is the "classic" attempt to smooth out excessive exchange rate volatility, which creates exchange rate "bubbles". Such bubbles not only endanger the stability of the entrepreneurial environment at the microeconomic level, but also feed through into increased inflation volatility. A review by Geršl (2002) contains conclusions about the lessons to be learned from the inflation-targeting countries' experience with intervening on the foreign exchange markets. It states that for the Czech case, which as regards the exchange rate situation in the second half of 2002 is also applicable to Slovakia and Hungary, the right way to tackle the "unhealthy" appreciation of the nominal exchange rate is: *(i) to draw up an agreement with the government to sterilise the inflow of capital; (ii) to use interest rates as the main instrument of monetary policy, taking into consideration the overall economic situation; (iii) to make (sufficiently large and surprising) interventions on the foreign exchange market, justified by the need to hit the inflation target.* The authorities also have to consider whether or not – in the process of exchange rate integration – to follow the Swedish model, which involves ex ante disclosure of their intervention rules.

The influence of fiscal policy on the exchange rate in transition economies depends primarily on: *(i) fiscal and monetary policy co-ordination* (persistent fiscal expansion should result in nominal and real depreciation of the exchange rate); *(ii) the way in which privatisation payments are dealt with* (including "conversion agreements" between the central bank and the government on the gradual release of privatisation proceeds, these being a large source of income to the state budget); *(iii) the level and growth rate of the budget deficit and state debt* (this – together with growth in public debt – leads to increased foreign exchange risk and growth in the risk premium, which in turn brings about higher domestic interest rates). Under the Stability and Growth Pact, the candidate countries will be required immediately upon accession to begin steering their structural public finance deficits (i.e. deficits adjusted for cyclical fluctuations) down towards zero.[27] Consequently, the manoeuvring space for fiscal policy upon accession will be very narrow. This will no doubt foster greater fiscal discipline by the governments of the candidate countries. From the general perspective, it is also important to note that successful operation of a pegged exchange

[27] This requirement is enforced by the other EU member states and the European Commission by peer pressure under the Stability and Growth Pact procedures and by pressure from the financial markets (the threat of a downgrading of the country's rating and subsequent growth in the costs of debt financing).

rate in the longer run is incompatible with a deficit fiscal policy that causes excessive growth in domestic demand.[28]

Financial Sector Stability

Another important factor for successful exchange rate convergence is the assessment of whether the Czech Republic's (or candidate country's) financial sector is ready for the adoption of the single currency and the identification of factors that might increase the risks associated with this step. In addition to fiscal-policy and labour-market flexibility, the ability of an economy to absorb asymmetric shocks is affected by the strength and stability of its financial sector. The real convergence process is strongly influenced, among other things, (in the language of the Copenhagen criteria) by the existence of a strong financial sector capable, on the basis of market signals, of allocating savings into productive investments. In the event of rapid capital flows, the basic condition for sustainable economic growth is a strong financial sector. This is evidenced, for example, by the financial crises of the 1990s, most notably the Asian crisis in 1997. One can make the generalisation, however, that changes in exchange rates have been behind almost all financial crises (banking crises, debt crises and currency crises), for instance the Swedish banking crisis (1992), the ERM crisis (1992), the Russian crisis (1998) and the most recent, and oft-discussed, Argentine crisis (2001).

Moreover, these risks are compounded by perceptions of the developing markets, where a currency crisis in one region can spread rapidly into other regions. In this respect, the candidate countries have a geographical advantage and a different export orientation compared with the financially unstable territories in East Asia or Latin America. This reduces the contagion effect. In the Czech Republic, as well as in the other candidate countries, much progress has been achieved since the early 1990s in building financial sector stability. The share of foreign capital in the Czech banking sector stood at 70% at the end of last year. The situation is similar in the other ten candidate countries expected to join the EU in 2004 (see the indicators on the restructuring of banks, e.g. privatisation ratios, foreign holdings and so on).

Exogenous Shocks

Exchange rate pressures can be brought on by asymmetric shocks (especially from the external environment), which lead to changes in the perceptions of country risk and to possible outflows of capital. Accordingly, a priority for the candidate countries is to gradually synchronise their business cycles with those of the EU/eurozone states and to reduce the risks ensuing from failure to satisfy the conditions for an optimal currency area. The more intensive are the trading and proprietary links between the economies of a monetary area, and the more similar are the structural characteristics of the regions making up that area, the more likely it is that those risks will decrease.

The results of the analysis of the Czech Republic's cyclical and structural harmonisation with the eurozone are none too favourable. The business cycle correlation is pretty low, and the analysis also reveals a persisting large structural gap. In the area of international relations the analysis

[28] Excessive wage growth (i.e. the situation where whole-economy labour productivity rises more slowly than nominal wages) has similar consequences.

looks better for the Czech Republic, with trade integration and the international trade structure already at the EU level. This is particularly apparent for the figures on trade with the EU, where the share of exports and imports in total exports and imports is around 60%–70% (the Czech economy is meanwhile very open to trade). Most of its FDI (82% in 2000) also comes from the EU. The Czech Republic's strong financial links with the EU are demonstrated by the share of EU investors in the assets of the banking sector (according to majority owner), which stood at 88% as of 30 September 2001. Given the aforementioned trends and approaching accession to the European Union, we can safely assume that the Czech Republic will gradually converge structurally towards the EU. The same goes for the other candidate countries.

Other Factors

The other factors that affect the candidate countries' nominal exchange rates against the euro include*: (i) the exchange rates of major currencies against the euro*, in particular EUR/USD, but also EUR/JPY and EUR/GBP; *(ii) market expectations*; *(iii) risk premia*; *(iv) ratings*; *(v) interest rate and inflation differentials vis-à-vis the rest of the world* (especially the eurozone);[29] and *(vi) the levels of other fundamentals* (money supply growth, current account deficit, terms of trade, etc.).

3.4 Choosing the Optimum Central Parity for ERM2 Entry

An important macroeconomic and monetary parameter when a candidate country joins the ERM2 will be the central parity of its exchange rate and, later on – when its exchange rate is fixed against the euro – its "conversion rate". The initial monetary conditions for the new eurozone member, and hence the existence of any potential risks from overvaluation or undervaluation of its currency, will depend to a large extent on the right choice of parity.[30] Non-fulfilment of this condition could result in higher-than-optimal inflation or in an economic slowdown below the growth rate of potential output until the real exchange rate adjusts to its equilibrium level. Given the absence of the nominal exchange rate as a possible channel, this adjustment would be sluggish and costly to the economy (in the form of lost output).

When deciding on the central parity in the ERM2, the authorities should take into account estimates of the trajectory of the equilibrium real exchange rate and the likely path of the exchange rate within the ERM2. In the Czech economic community, the problem of modelling *equilibrium exchange rates* has been addressed by Lazarová and Kreidl (1997), Šmídková (1998), Barrell, Holland and Šmídková (2002), Frait and Komárek (1999a, 1999b, 2003) using various

[29] From the theoretical viewpoint this phenomenon reflects the uncovered interest parity condition.

[30] Closely linked to the analysis of the determinants of exchange rate movements is the issue of the impacts of the exchange rate in transition economies on individual economic agents (households and firms) and at the individual levels of the economy (macroeconomic and microeconomic). An appreciation of the exchange rate is good news for households and importers, as package holidays, imports and suchlike become cheaper. For exporters, though, appreciation spells the risk of financial losses or even an exit from the sector. On the theoretical level, this problem is linked with an exchange rate hysteresis effect, whereby a shock revaluation can harm firms in the sector such that in the event of a reverse correction (devaluation) they do not return to their original position. The impacts of exchange rate changes can be mitigated indirectly by the behaviour of firms, which must have the option of hedging against exchange rate risk (for them the signal will be the emphasis placed on price/financial stability, not on exchange rate stability, especially in countries applying inflation targeting and a managed float).

methodological approaches.[31] These approaches can now be used as a basis for the discussion about the overvaluation/undervaluation of the exchange rate and for the aforementioned discussion about the "optimal" central parity in the ERM2 and the most appropriate conversion rate against the euro for the national currencies.

Turning to the discussion of the likely exchange rate path, we can identify the following factors affecting the nominal exchange rate in the ERM2:

- *The expected period of participation in the mechanism*. As the eurozone entry date nears (i.e. as the risk of a change in central parity decreases), the nominal exchange rate will be affected increasingly by the uncovered interest parity condition. The exchange rate path will thus depend on the central bank's interest rate settings and on the risk premium. It is therefore important for the authorities to declare clearly a euro target date. Uncertainty about the timing of the changeover to the single currency could be counterproductive and could ultimately trigger problems with this type of exchange rate regime, especially in the event of any inconsistency with other economic policies. Given that participation in the ERM2 – unlike the irrevocable fixing of the exchange rate against the euro – does not in itself eliminate the risk of currency turbulence, it is regarded merely as a "gateway" into the eurozone. We regard the minimum stipulated period in the ERM2 (i.e. two years) as optimal.
- *The legislative and institutional arrangement of ERM2 (and, more generally, the part of the EU Treaty addressing the system of economic policy coordination)*. The exchange rate trajectory in the ERM2 will be affected primarily by the requirements regarding fulfilment of the exchange rate convergence criterion. The assessment is still based on the previous standard "narrower" fluctuation band in the ERM (±2.25% around the central rate). However, it makes a distinction between breaches of the band towards appreciation and breaches towards depreciation. Devaluations of the central rate and depreciations of the exchange rate of more than 2.25% from the central rate are not consistent with the current rule for assessing the Maastricht exchange rate criterion. Accordingly, in the two years prior to joining the eurozone (the time test) we can expect the exchange rate in the ERM2 to remain either in close proximity to the central rate or on the "appreciation side" of the band. However, revaluations of the central rate are possible in this period. In other words, given the aforementioned assumption, the conversion rate cannot be a weaker exchange rate against the euro than the central rate in the ERM2.
- *The trajectory of the real exchange rate*. The experience of the transformation economies shows that there exist sizeable uncertainties regarding the relative importance of the exchange-rate and inflation channels in the process of real appreciation. What is clear, however, is that the real convergence of the candidate countries will be accompanied by a relatively strong appreciation of the real exchange rate. In the envisaged two-year period prior to joining the eurozone, the candidates will also have to satisfy the other Maastricht convergence criteria. Convergence in the rate of inflation implies a relatively small inflation differential vis-à-vis the eurozone countries over a period of one year before the assessment of the criteria. In this period (around 1–2 years prior to eurozone entry) we can expect the real

[31] Frait and Komárek estimated the equilibrium real exchange rate using the NATREX, BEER and DARER concepts, Lazarová and Kreidl using the Edwards's approach and Šmídková using the Williamson FEER concept.

appreciation to manifest itself primarily in the form of appreciation of the nominal exchange rate (within the ERM2 band).

- *The setting of the central parity*[32] *relative to the market exchange rate*. The EU countries' experience with joining the exchange rate mechanism has shown that the central parities are typically set very close to the market exchange rate. Setting the central parity in any other way carries with it the risk of "convergence play". Alternatively, there may be a shift in market perceptions of the equilibrium exchange rate which not justified by the economic fundamentals. A "weaker" market exchange rate against the central parity carries the risk of relatively rapid appreciation towards the central parity or of problems with satisfying the exchange rate criterion. In the opposite case of a "stronger" market exchange rate, there may be a problem with a lack of "space" for any appreciation of the exchange rate. This could imply the need to intervene at the margin of the band or to revalue the central rate.

3.5 Section Conclusion

In the 1990s, the monetary policy strategies of the current candidate countries often differed markedly. We have shown that the importance of exchange rate strategy in these countries is growing as the euro adoption date nears. Their goals will be to successfully join, and stay in, the ERM2 at a particular exchange rate (i.e. to choose their central parity in the mechanism), to fulfil the exchange rate criterion (no devaluations in the ERM2 for a period of at least two years) and to fix their exchange rate parities irrevocably against the euro.

It follows from the exchange rate strategies being considered by the candidate countries (see the Pre-accession Economic Programmes) that the common denominators of exchange rate policy will probably be: (i) a political preference for faster, rather then slower, adoption of the euro, and (ii) fulfilment of the exchange rate criterion (at least two years' participation in the ERM2) preferably with the present exchange rate regime provided that it does not conflict with the EU legislation. From the observed exchange rate volatilities it also follows that all ten countries (in Groups E and F) would have satisfied the exchange rate criterion in the reviewed period. The only exceptions were a depreciation of the Slovenian tolar and sharp nominal appreciations in Poland and the Czech Republic (such developments can, however, be corrected – in harmony with the European legislation – by revaluing the central rate).

Aware of the fact that many of the candidate countries have not yet fully and definitively put the transition period behind them, we have identified several basic determinants that should most affect the candidates' nominal exchange rates prior to eurozone entry. In particular, these include productivity growth and the wage-setting process in the economy, the way in which fiscal and monetary policy is pursued, and the effect of external (exogenous) shocks. The initial monetary conditions for the new eurozone member, and hence the existence of any potential risks from overvaluation or undervaluation of its currency, will depend to a large extent on the right choice of parity. Non-fulfilment of this condition could result in higher-than-optimal inflation or in an

[32] As the EU/eurozone entry date nears, we can also count on lobbying by various interest groups – representing both exporters and importers – as regards the setting of the central parities and conversion rates against the euro. The manifestly lower price level in the candidate countries relative to the eurozone countries will be used as evidence for a "strong fixing", whereas the exporters' interest groups will argue for a "weaker fixing" and equalisation of price levels via imported inflation.

economic slowdown below the growth rate of potential output until the real exchange rate adjusts to its equilibrium level. Given the absence of the nominal exchange rate as a possible channel, this adjustment would be sluggish and costly to the economy (in the form of lost output). When deciding on the central parity in the ERM2, the authorities should take into account estimates of the trajectory of the equilibrium real exchange rate and the likely path of the exchange rate within the ERM2. We have identified the following main factors affecting the nominal exchange rate trajectory: the period of participation in the ERM2; the assessment of the exchange rate convergence criterion; the trajectory of the real exchange rate; and the setting of the central parity relative to the market exchange rate.

4. Institutional Framework of the Exchange Convergence Process – Choices for the Candidate Countries

The preparation process for future adoption of the euro and for the choice of exchange rate strategy in the individual candidate countries also encompasses institutional and legislative aspects. Therefore, in the fourth section we will show that the candidate country's choice of exchange rate strategy in the process of preparation for adopting the euro is strongly influenced by the EU legislative framework. In particular, this includes the rules guiding ERM2 participation, the requirement for economic policy co-ordination between the EU member states and the procedures associated with evaluation of the exchange rate criterion.

4.1 Legislative and Institutional Preconditions for Accession to the EU/Eurozone

In the first part of this section we discuss the general framework for economic policy co-ordination within the eurozone. With growing integration into European structures, central bank policy will be influenced ever more strongly by this system, as it will by Community law[33] and the other institutional requirements ensuing from accession to the EU and the eurozone. In the second part, we describe those exchange rate regimes which are ruled out by membership of the EU and those which are incompatible with the ERM2 system. The primary legal sources for this area are the Treaty establishing the European Community (Title VII), the protocols annexed to that Treaty and the Council regulations relating to the operation of the eurozone and to the enlargement process.[34]

4.1.1 Basic Stages of Integration into the Eurozone

The Pre-accession Period

In the pre-accession period, the main tasks are to ensure that the legislation in the future member states, including their central bank statutes, is compatible with Community law (in particular Articles 108 and 109 of the EU Treaty and the ESCB Statute[35]), to implement a ban on the direct

[33] As regards the powers of the central bank this chiefly concerns the legislation relating to the Economic and Monetary Union (*the EMU acquis*).

[34] See, for example, EC (1999) or http://europa.eu.int/euro.

[35] ESCB – the European System of Central Banks

financing of the public sector, and to complete the liberalisation of capital flows. Before joining the EU, the candidate countries are required to continue with the transformation of their economies and to focus on meeting the Copenhagen criteria.[36] The Copenhagen criteria do not lay down a detailed list of economic indicators or clear requirements for the functioning of the political system and specific institutions, but rather set broad requirements for the accession countries.

In the area of exchange rate policy, no specific requirements have been stipulated for the candidate countries in the pre-accession period. However, the application for ERM2 membership, which should start simultaneously with accession to the EU, will need to be prepared in the pre-accession period.

The CNB's monetary policy instruments are now fully compatible with those of the European Central Bank (ECB), save for a few aspects of the reserve requirement (where there remain some differences in the definition of the calculation and maintenance period). In the area of monetary and balance-of-payments statistics, full compatibility with EU standards is expected by the end of 2002. Compatibility of instruments and statistics should help foster effective co-ordination between the autonomous policy of the CNB and the single monetary policy of the Eurosystem when the Czech Republic becomes a member of the EU.

The Period Following Accession to the EU

Upon accession to the European Union, the candidate countries will be accorded the status of EU member states with a derogation, i.e. they will be allowed to defer introducing the euro. This status will be conferred on the new member states – which from the outset will be participants in the single market and the eurozone – in their accession treaties. Unless transition periods are granted in particular areas (e.g. free movement of capital), the new member states will be compelled to accept Community law to the full extent.

Upon accession, the Czech National Bank will become a member of the European System of Central Banks (ESCB).[37] Non-membership of the Eurosystem, however, will imply limited powers for the central bank, and the Czech Republic will not take part in pan-European monetary policy decision-making until it introduces the euro.

For the central bank's monetary and exchange rate policy, though, the process of joining the eurozone will imply the need to adjust its strategy and monetary policy framework so as to achieve – by agreement with the government and within a "relevant" time period (one can speculate about the length of that period) – a "high degree of sustainable convergence".[38] This basically means fulfilment of the nominal convergence criteria. Simultaneously with EU

[36] See, for example, http://www.evropska-unie.cz.

[37] The central banks of countries with a derogation (i.e. deferred introduction of the euro) will not pay up their subscribed capital in the ECB. The General Council of the ECB, however, may decide that the national central banks have to pay up a minimal percentage as a contribution to the operational costs of the ECB. The central banks of the candidate countries will not become members of the Eurosystem – currently consisting of the ECB and the 13 eurozone member states – immediately upon accession (although there are certain institutional implications, for example for the decision-making process within the ECB). The transfer of foreign reserve assets from the CNB to the ECB will happen only after the Czech Republic joins the Eurosystem.

[38] See Article 121 of the *EU Treaty*.

accession, the central bank will also become an active participant in the process of economic policy coordination within the eurozone.

Upon accession to the EU, exchange rate policy will be treated as a matter of common interest (see Article 124 of the EU Treaty). Specifically, the exchange rate policies of the countries participating in the eurozone should not lead to competitive devaluation. However, the new member states will have a new strategic opportunity with respect to exchange rate policy – membership of the ERM2.

The ERM2 exchange rate mechanism (see *Resolution of the European Council on the establishment of an exchange rate mechanism in the third stage of economic and monetary union, 16 June 1997*) was designed as a fairly flexible exchange rate regime linking the currencies of member states outside the eurozone to the euro. The standard fluctuation band of ±15% around the central parity can be narrowed (following a formal procedure). The new member states therefore have a significant degree of freedom when it comes to choosing an exchange rate mechanism, as the ERM2 is compatible with quite a wide range of systems.[39] The Ecofin Council[40] will decide on the form of the specific arrangement of the exchange rate regime relationship and on the level of the currency's bilateral central rate on the recommendation of the European Commission and the ECB.

The legal rules governing economic policy co-ordination are based on the EU Treaty. Numerous other regulations have been issued in connection with the continuing process of economic integration. *Resolution of the European Council of 13 December 1997 on economic policy co-ordination in stage 3 of EMU* expressly provides that co-ordination of economic policies is also a matter of common interest in the case of countries with a derogation. It sets out general requirements for monitoring, and sharing information on, trends in the economy which, given the strong interdependence of the eurozone countries, have the potential to influence monetary and financial conditions throughout the eurozone or the smooth running of the internal market.

During this stage, the European Commission, in co-operation with the ECB, will carefully monitor monetary developments, fiscal sector developments (most notably compliance with the *Stability and Growth Pact* – see *Resolution of the European Council on the Stability and Growth Pact, 17 June 1997*), and the implementation of structural policies. The European authorities' main instruments for achieving the objective of effective coordination of economic policies are the *Broad Economic Guidelines* (BEGs), in which the European Council publishes recommendations for each member state to help them enhance their growth potential without negatively affecting inflation either in the country concerned or in the eurozone. If the economic policy of the member state either fails to comply with, or deviates from, the BEGs, the Council is entitled to recommend corrective action. However, the making public of such recommendations can be seen as a form of sanction – a negative report sends out a strong signal to the markets that the nation's economic policy conflicts with the EU's objectives, i.e. sustainable growth in a non-inflationary environment. The Council has no other mechanisms at its disposal to enforce

[39] For a discussion of regimes that are incompatible with the ERM2 exchange rate system, see the Exchange Rate Strategies for Accession Countries (described in more detail in Section 2.2.2).

[40] The supreme EC body dealing with economic policy coordination within the EU and EMU. See, for example, www.evropska-unie.cz

economic policy co-ordination, since, under the rules of the Stability and Growth Pact, financial penalties cannot be imposed on countries with a derogation.

The Period Following Entry to the Eurozone

Entry into the eurozone will mean – with respect to exchange rate policy -an irrevocable fixing of central parity. At the same instant, the candidate country's central bank will become a full member of the European System of Central Banks (known as the Eurosystem), which comprises the ECB and the central banks of the eurozone member states. This means that the Czech Republic will contribute fully to the decision-making process within the ECB, including the decisions on monetary policy. There will also be a partial transfer of foreign reserve assets from the CNB to the ECB. The Czech Republic will simultaneously gain the right to a share of the income from seigniorage. Joining the eurozone will imply also that if the Czech Republic fails to abide by the rules of the Stability and Growth Pact, it will face financial sanctions specified by the EU legislation.

4.1.2 Exchange Rate Strategies Incompatible with the Current European Legislation

Of the possible exchange rate arrangements, we can immediately rule out those which contravene the Community legislation. These fall into two groups: first, those exchange rate strategies which are at odds with the spirit of the EU Treaty and hence with EU membership itself; and second, those regimes which are incompatible with the ERM2 – these can still be applied temporarily after accession to the EU but must be abandoned upon joining the ERM2.

Exchange Rate Strategies Incompatible with EU Membership

a) Unilateral euroisation

The concept of "unilateral euroisation" means unilateral introduction of the euro regardless of the stipulated legislative procedures. In a country that decides to "euroise" its economy, the euro becomes legal tender without that country contributing in any way to the ECB's common monetary policy. Theoretically, then, this step can occur regardless of membership in the European Union.

Although much work has been published which supports the idea of adopting a foreign currency, especially in developing and transition economies (see, for example, EC (2000c)), the European authorities are resistant to the idea of euroisation. Their view is that unilateral euroisation by its very nature runs counter to the legislative and economic logic of the EU Treaty, for the following reasons:

- *Euroisation would upset the "process" of integration.* Membership of the eurozone is regarded as the final step in the process of economic integration. Candidate countries are supposed to accept the obligations associated with EU membership, and this includes accepting the objectives of political, economic and monetary union in the manner stipulated in the EU Treaty. The individual stages of integration are perceived as certain interim "test" stages. The main danger in the eyes of the European authorities is that the euroising nations will bypass this gradual process and thus expose themselves to certain risks associated with

the irrevocable fixing of their exchange rates (e.g. the need for labour market flexibility, the question of finding the right conversion rate, and so on).

- *Euroisation would create a new group of countries not reckoned upon in the EU legislation.* Under the EU Treaty, there are two types of member state (in addition to Denmark and the United Kingdom, which have a special status): eurozone members, and countries with a derogation. Unilateral euroisation would lead to the creation of a new category: candidate/member states that are not members of the eurozone (and are not represented on the ECB's Governing Council) but which have introduced the euro.
- *In some candidate countries, euroisation could undermine the credibility of the economic and monetary union.* The convergence criteria for entering the eurozone were created to prevent any danger to macroeconomic development in the single currency area. Unilateral euroisation would bypass the EU's legislative procedures, meaning that the euro could be introduced in countries that would otherwise fail to meet the prescribed criteria. This argument, however, does not take on board the fact that the monetary bases of the potential euroisation candidates account for a negligible share of the eurozone monetary base.[41]

b) EU membership without the obligation to introduce the euro

The current candidates will join the Union at a time when the single currency will have been a long-term reality in several member states. Economic and monetary policy is a key area of cooperation between the EU member states. Consequently, the granting of an opt-out clause, as negotiated by the United Kingdom and Denmark at the start of the Maastricht process, is not envisaged at present. The current candidate countries will thus be faced with a decision: "either EU membership with subsequent introduction of the euro, or nothing".

There is no option of EU membership minus the obligation to introduce the single currency, so the candidate countries will not be able to avoid introducing the euro. By acceding to the EU Treaty, each candidate country will have to accept the rights and duties associated with membership to their full extent, including those in the area of economic and monetary integration. With the acceptance of Community legislation, introduction of the euro will become the clear endpoint for exchange rate policy.

Regimes Incompatible with ERM2 Membership

At some time after joining the EU (although not necessarily immediately upon accession), the candidate countries will be required to join the ERM2. This follows from the obligation to introduce the euro and from the related necessary conditions for achieving that objective. One of those conditions is the exchange rate criterion, fulfilment of which is independent of membership in the ERM2 and observance of the normal fluctuation margins for at least two years.

At present it is very difficult to estimate which regimes will be compatible with the ERM2 (and therefore with fulfilment of the exchange rate criterion) over a period of several years. That is because the key procedural feature of the ERM2 is the multilateral approach taken by the member states when making decisions on key issues relating to the operation of the mechanism. The

[41] See the discussion in Section 4.2: *Fulfilment of the exchange rate convergence criterion*.

exchange rate regimes that can be identified already at this stage as incompatible with the ERM2 include *(i) free floating (including managed floats), (ii) crawling pegs, and (iii) pegs against anchors other than the euro.* This demarcation comes from a Commission document published in November 2000 (EC, 2000a). The European authorities also mention in the same document that the ERM2 will also accommodate the currency boards of the present candidate countries. From the procedural perspective, the fluctuation band for these countries will be narrowed to the "maximum" extent, i.e. to 0%. Such an arrangement would not impose any intervention obligation on the CNB.

4.2 Fulfilment of the Exchange Rate Convergence Criterion

The convergence criteria[42] can be viewed as a comprehensive set of requirements for each eurozone candidate country. The point of this test is to assess the readiness of each EU member state for membership of the monetary union.[43] Those countries whose economic conditions are assessed as a potential threat to price stability within the eurozone will not be allowed to join the monetary union and will keep the status of "member state with a derogation". The member states' progress towards introducing the euro is assessed periodically (at least every two years) by the European Commission and the ECB in a Convergence Report (EC, 1998, 2000b). The nominal convergence criteria (known as the Maastricht criteria) are summarised in Table 4.1.

Table 4.1: The Maastricht Criteria

Budget deficit	Government budget deficit not allowed to exceed 3% of GDP
Government debt	Government debt not allowed to exceed 60% of GDP
Inflation	Maintenance of price stability and an average rate of inflation that over a period of one year is close to that of the three best-performing member states in terms of price stability (i.e. not allowed to exceed by more than 1.5 percentage points the inflation rate in the three best-performing member states)
Interest rates	Long-term interest rates not allowed to exceed by more than 2 percentage points those of the three best-performing member states in terms of price stability
Nominal exchange rate	The member state must have respected the margins prescribed for its currency in the ERM without devaluation for two years

***Source**: www.cnb.cz.*

[42] The basic definition and purpose of the Maastricht (convergence) criteria are contained in Article 121 of the *Treaty establishing the European Community* as amended by the Treaty of Amsterdam. A more detailed interpretation of the assessment and fulfilment of each criterion is given in two Protocols annexed to the EU Treaty: Protocol No. 20 on the excessive deficit procedure and Protocol No. 21 on the convergence criteria.

[43] The nominal convergence criteria for joining the eurozone have been criticised by many economists, among them Collignon (1997), Begg, Einchengreen, Halpern, Hagen and Wyplosz (2001) and Buiter and Grafe (2001).

4.2.1 The Exchange Rate Criterion

Fulfilment of the criterion on exchange rate stability is conditional on:

- *successful membership in the exchange rate mechanism* – the state being assessed must not have devalued its currency's bilateral exchange rate against the euro on its own initiative in this period.[44] If it does so, the period it spends in the mechanism is extended, i.e. its two-year period in the mechanism starts running again from the date of the devaluation of the central parity;
- *fulfilment of a time test* – the state must have been in the mechanism for at least two years.

Demonstrable exchange rate stability is therefore not the sole condition for meeting the exchange rate criterion. The nation must also belong to the exchange rate mechanism, which in its present form is called the ERM2. As mentioned above, certain types of exchange rate regime are not compatible with this mechanism (EC, 2000a).

BOX: SIMILARITIES AND DIFFERENCES BETWEEN THE ERM AND THE ERM2

The main common elements of the ERM and the ERM2 are:

(a) central rates and fluctuation band set by common procedure (involving finance ministers, ECB, national central bank governors and the European Commission);
(b) standard fluctuation band is ±15%, while not excluding the possibility of closer links;
(c) intervention support (with "appropriate financing") is automatic at the margin;
(d) Any adjustment of central rates is conducted according to a standard procedure.

The main differences between the ERM and the ERM2 are:

(a) bilateral rates between the euro and the accession currencies replace the multilateral links in the ERM; accordingly, intervention obligations in the ERM2 will be bilateral between the ECB and each accession national central bank. The ERM system was characterised by multilateral intervention obligations between the individual central banks;
(b) the euro is the formal anchor of the ERM2; while the German mark acted de facto as anchor in the ERM, this was not a formal role (even though experience – and the behaviour of certain national banks in anchoring to the mark – corresponded to this). With the euro as anchor, the operation of the ERM2 is focused on the need to foster convergence among the accession countries and support macroeconomic stability in the eurozone;
(c) the ECB or any national central bank has a formal right to suspend intervention if its price stability objective is jeopardised. This "safeguard clause" did not formally exist in the ERM, although the events during the "Black Autumn in the ERM" (1992/1993) indicated that there were limits to the commitment of "unlimited intervention" – see, for example, Frait (1993);
(d) all parties to the agreement guarantee that realignments of central parities, where necessary, will take place in a timely manner. The experience of the ERM crisis revealed the danger of a failure to adjust central parities before the emergence of speculative pressures. In the ERM2, all the parties to the agreement, including the ECB, have the right to initiate a procedure which may result in a realignment. In the ERM, a procedure for realignment of a currency's central rate.

[44] or, in Stage 2 of EMU, against any other ERM member state's currency.

4.2.2 The Time Period for Fulfilment of the Exchange Rate Convergence Criterion

For the process of integration of the candidate countries into the eurozone, the EU Treaty sets out three basic stages in the area of exchange rate convergence. For reasons of precise demarcation, these are shown on the time axis of Figure 4.1. They are as follows:

(I) the pre-accession stage – the period prior to joining the European Union;

(II) membership of the European Union with deferred introduction of the euro – the period between gaining EU membership and adopting the single currency; this stage breaks down into two sub-periods:

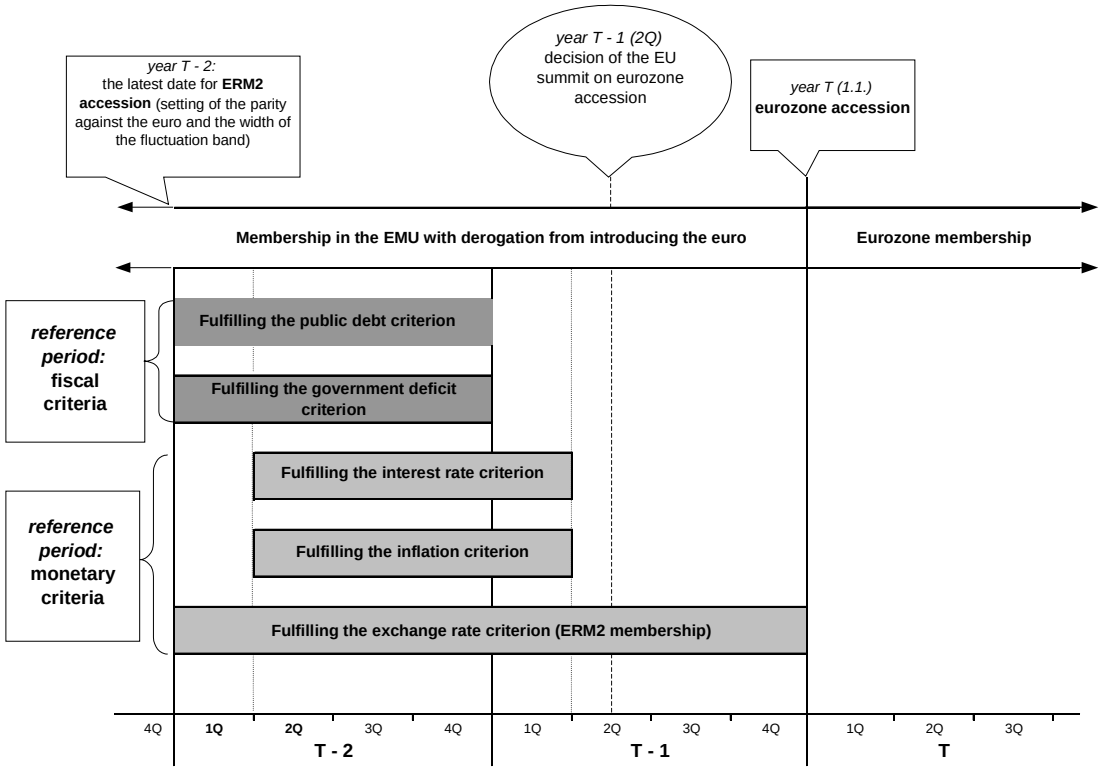
(IIa) preparation for entry into the ERM2 with unspecified duration,

(Iib) the period between joining the ERM2 and gaining full eurozone membership (introducing the euro);

(III) introduction of the euro – the period after joining the eurozone.

The timetable for meeting the exchange rate criterion and the individual stages of the process of monetary integration of the candidate countries into the eurozone are captured in detail in Figure 4.1. It follows logically from the minimum period of membership in the ERM2 that the latest possible date for joining the ERM is year T-2, i.e. two years prior to joining the eurozone (T). The period between joining the EU and joining the ERM2 is not specified in the European legislation. A new member state can, however, become a member of the ERM2 immediately upon accession to the EU. This means that the new member state could skip this period.

Figure 4.1: Fulfilment of the Exchange Rate Criterion



***Source**: Authors.*

A peculiar feature of the criterion on exchange rate stability is its duration. The EU legislation stipulates a minimum ERM2 membership of two years. The European Council, however, decided to allow Finland and Italy to join the eurozone even though their currencies had been in the ERM2 for less than 15 months in February 1998. However, these currencies remained successfully in the ERM2 until 1 January 1999, when the national currencies of the ERM2 member states were fixed irrevocably against the euro, i.e. until the launch of the cashless euro. This meant that Finland and Italy met the exchange rate criterion ex post. An awareness of this experience might be useful to the candidate countries when formulating their exchange rate convergence.

4.2.3 Interpretation of the Exchange Rate Convergence Criterion in the Third Stage of EMU

The exchange rate mechanism has developed dynamically over the past decade, and this has naturally led to differing approaches to the assessment of the eurozone candidates' exchange rate stability (EC, 2000b, Annex D). The exchange rate turbulence in 1992–1993, when the fluctuation band was widened from ±2.25% to ±15%, had a considerable effect on the design of the mechanism, as did the introduction of the euro, which meant switching from the multilateral ERM exchange rate system (based on the principle of a "grid" interconnecting the individual currencies) to the bilateral ERM2 system (i.e. a relationship solely between the ECB and the national central bank).

One needs to make a distinction within the ERM2 between the functioning of the mechanism and the assessment of the criterion on exchange rate stability. The setting of the fluctuation band (standard width ±15% around the central rate, unless formally narrowed by the Ecofin Council) is important for the functioning of (coordinated) intervention by the national central banks and the ECB, which should in principle be automatic and unlimited (provided that such intervention does not conflict with the participating banks' objective of maintaining price stability). Conversely, the assessment of the criterion on exchange rate stability was determined historically and the assessment technique has changed over time. The rules used by the European authorities to assess exchange rate stability in the ERM and the ERM2 can be summarised as follows:

(1) ERM2 membership should last at least two years between joining the ERM2 and entering the eurozone (not necessarily the examination date).

(2) The assessment of exchange rate stability is still based on a band of ±2.25%. The current standard ERM2 band (±15%) was found inappropriate by the European authorities for the following reasons:
   – the EU Treaty had been adopted when the 2.25% margins were considered to be normal;
   – the wider margins provided too accommodative a benchmark against which to measure exchange rate stability; the widening of the margins had been introduced as a temporary measure;
   – the intention in widening the bands had not been to foster volatility in the member states' exchange rates, but to reduce the danger of speculative attacks against the ERM currencies.

(3) Exploitation of the full ±15% margins of the standard ERM2 fluctuation band need not always be automatically assessed as inconsistent with fulfilment of the exchange rate criterion. Account is taken of the difference between appreciation (consistent with fulfilment of the

criterion) and depreciation (inconsistent with fulfilment of the criterion) of the currency within the band. Other factors relating to the criterion on exchange rate stability are also taken into account, for instance the duration and amplitude of the deviation from the central rate, the monetary policy response, and changes in short-term interest rates.

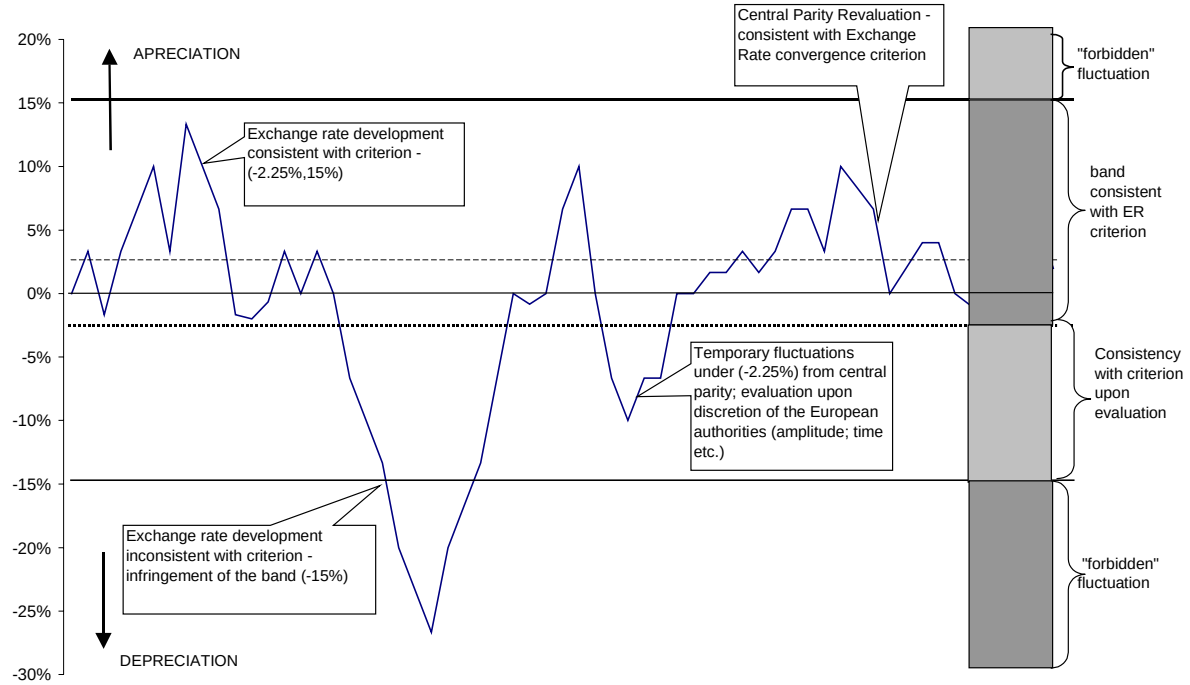
(4) In the event of sustained appreciation pressure, the central rate can be revalued without the exchange rate criterion being contravened. A situation where devaluation of the central rate follows such a revaluation[45] would probably be assessed as inconsistent with fulfilment of the exchange rate criterion, as it would not comply with the basic devaluation condition. Regardless of the way in which the central parity was previously set, devaluation would mean the start of a new two-year time test.

The aforementioned facts tell us that in the past the exchange rate criterion was regarded as fulfilled *without any problem* if the exchange rate had been fluctuating between -2.25% and +15% (or within a narrower band) around the central rate for at least two years. Exchange rate movements of between -5% and -2.25% vis-à-vis the central rate may be regarded as a problem by the evaluating authorities, but are by no means disqualifying as regards fulfilment of the criteria. However, there is insufficient evidence to judge the assessment of the European authorities with respect to the band between -15% and -2.25% vis-à-vis the central rate, as this has only ever happened once. The Irish punt began the two-year reference period around 4% below the central rate and for a further 32 days remained below -2.25% vis-à-vis the central rate. The punt's strong appreciation trend, which took its exchange rate to the upper margin of the band (+15%) and led to a subsequent revaluation of the central rate, convinced the authorities that there was no real "devaluation threat" and led the European Council to decide that Ireland had satisfied the exchange rate criterion.

The conclusions stated above are based on the experiences of the individual EU countries, whose "exchange rate" convergence was assessed by the European authorities in 1998 and 2000 in the Convergence Reports (European Commission, ECB). Figure 4.2, which is based on those assessments, summarises the criterion for evaluating exchange rate stability using the hypothetical case of the exchange rate of a country wishing to join the eurozone.

[45] For example, if the authorities decide to return the central parity to its original level.

Figure 4.2: Hypothetical Case of Fulfilment of the Exchange Rate Criterion in the ERM2 with a Fluctuation Band of ±15%



***Source**: Authors.*

4.3 Exchange Rate Policy: Do the Candidate Countries Have a Choice?

The making of exchange rate policy is affected by a whole spectrum of Community legislation (most notably the eurozone acquis) and other criteria associated with the integration of the member states into European monetary structures. We have tried to describe the economic and legislative logic used in the past when drawing up these rules and criteria and the specific way in which these rules have been applied. Even though the final form of the institutional regulations for exchange rate policy will depend on the final decision of the European authorities, we believe that the rules currently applied create a relevant framework for discussing the current accession process. The facts are as follows:the current candidate countries are faced with a decision: "either EU membership with subsequent introduction of the euro, or nothing". Economic and monetary policy is a key area of co-operation between the EU member states. The granting of an opt-out clause allowing non-membership of the eurozone is not envisaged at present.

- the candidate countries will have to achieve a "high degree of sustainable convergence" within a "relevant" time period after accession to the EU (the Community legislation does not specify this period in any more detail). This means fulfilment of the nominal convergence criteria, including the exchange rate criterion. The related legislation contains rules that are relevant to the operation of the ERM2 and a definition of the nominal convergence criterion;
- fulfilment of the criterion on exchange rate stability is conditional on successful membership in the ERM2 (the state being assessed must not have devalued its currency's bilateral

exchange rate against the euro in this period) and fulfilment of a time test (the state must have been in the exchange rate mechanism for at least two years). Monitoring the exchange rate criterion will become irrelevant after accession to the eurozone, as the exchange rate will be irrevocably fixed.

4.4 Section Conclusion

To conclude this institutional survey, the only two areas that leave prospective members of the eurozone any room for decision-making are therefore the issue of the speed of adopting the single currency and the issue of the entry conversion rate between the national currency and the euro. The entire process of integration of the candidate countries into European monetary structures can thus be likened – to paraphrase the well-worn metaphor of the "transformation train" – to an "integration train". The candidate countries' exchange rate policies can only slow their integration train down, as the European legislation implies minimum time periods for each stage leading to the "terminal", i.e. the fixing of the national currencies against the euro. However, the candidate countries' authorities will be able to choose the frequency and length of the stops along the way, i.e. to set the conversion rate and prolong each particular stage. On the other hand, and in the logic of our light-hearted illustration, we could speak of safety and technical checks on the integration train (conducted by the EU and eurozone authorities), which are a necessary, but by no means sufficient, condition for arriving safe and sound at "euro" station.

We have shown that the European legislation relating to monetary integration is fairly strict and directed clearly at full incorporation of the current candidates into the eurozone. Nevertheless, the final decision on the conditions and manner of accession to the eurozone is not just a political decision, but must take account of the candidates' economic conditions, in particular their degree of convergence and the flexibility of their economies when faced with external shocks. Macroeconomic stability and sustainable economic growth are in the interests not only of the candidate countries, but also of the present members of the eurozone, namely, the states that in the past helped to establish the rules and institutions that ensure the smooth running of this unprecedented project.

5. Conclusion

This paper takes a look at the exchange rate policies of the countries of the former eurozone entrants and compares their exchange rate convergence process to the present candidate countries.

Our conclusion is that – in the light of the rules prescribed by the EU legislation – the present candidates do not fare badly. The basic tenet of this paper is that there are no miracle prescriptions for the exchange rate policies of the eurozone candidates. The experience of the former ERM/ERM2 participants suggests that ERM2 membership will be less stressful for the present candidate countries if the exchange rate band is underpinned by stability-oriented and credible domestic economic policies. The evidence suggests that the relatively smooth process of the EU countries' exchange rate convergence in the 1990s (with a relative absence of shocks to the ERM economies) was fostered mainly by fiscal discipline in each country. The focus on the Maastricht

convergence criteria and the budgetary framework under the Stability and Growth Pact should therefore help the eurozone candidates in this respect.

We argued that the original question of the optimal regime choice seems to be of limited practical use, as most of the candidate countries seem to be satisfied with their current arrangements and are planning to retain them until their entry into the eurozone (with possible modification within ERM2). The mechanism will have to accommodate – as compared to the situation of the exchange rate convergence of the EU countries in the 1990s – specific exchange rate systems (including currency board arrangements). The greater diversity of the exchange rate regimes of the EU candidates reflects the specific features of the transition process and their economic policy preferences. This should not pose a great problem, as the European authorities envisage relatively flexible rules for ERM2 participation. Despite the fact that we have taken the EU rules guiding the exchange rate policies within the EU member states as given, the present framework for evaluating the exchange rate criterion is relatively complicated and rigid.

An important challenge to exchange rate policy when a candidate country joins the ERM2 will nevertheless be the decision on the central parity. Undervaluation or overvaluation could result in higher-than-optimal inflation or in an economic slowdown below the growth rate of potential output until the real exchange rate adjusts to its equilibrium level. Given the absence of the nominal exchange rate as a possible channel, this adjustment would be sluggish and result in lost output. The authorities will therefore have take into account estimates of the trajectory of the equilibrium real exchange rate and the likely path of the exchange rate within the ERM2. Following an analysis of the exchange rate convergence process and institutional framework, we have identified the main factors influencing the nominal exchange rate trajectory. In their decisions, policy makers should primarily reflect the assumed period of participation in the ERM2; the assessment of the exchange rate convergence criterion; the trajectory of the real exchange rate; and the setting of the central parity relative to the market exchange rate.

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Appendix

Appendix 1: Nominal Exchange Rates (Deviations from Central Parity[46] Against DEM/EUR) and Interest Rate Differentials Against Germany/Eurozone (Group A-D)[47]

Figure 1.1a: Nominal Exchange Rates of Group A Countries (Belgium and the Netherlands) Against DEM

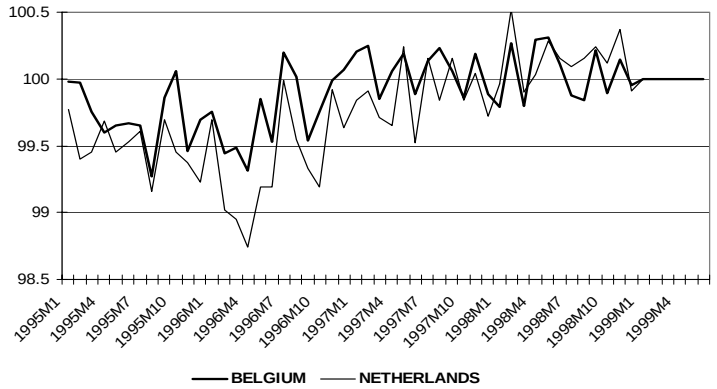


Figure 1.1b: Interest Rate Differentials of Group A Countries (Belgium and the Netherlands) Against Germany

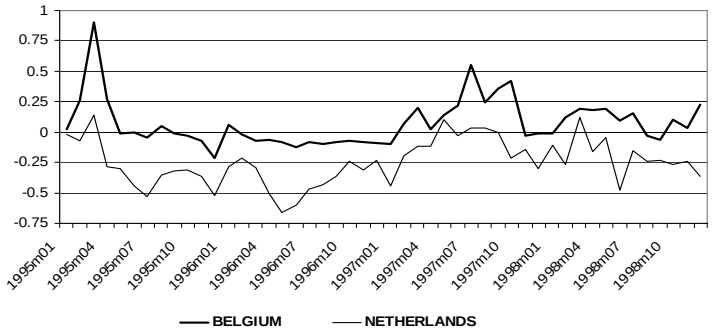


Figure 1.2a: Nominal Exchange Rates of Group A Countries (France and Austria) Against DEM

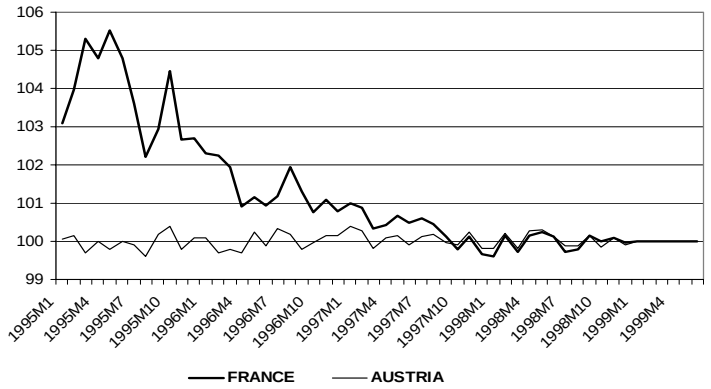
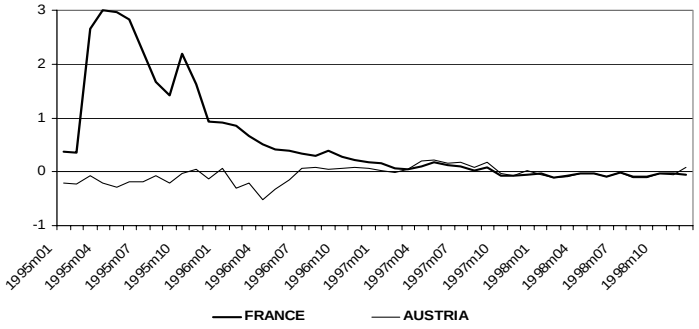


Figure 1.2b: Interest Rate Differentials of Group A Countries (France and Austria) Against Germany



[46] Central parity is defined in part 3.2.

[47] *Sources: IMF-IFS CD-ROM, Eurostat and authors' calculations.*

Figure 1.3a: Nominal Exchange Rates of Group B Countries (Portugal and Spain) Against DEM

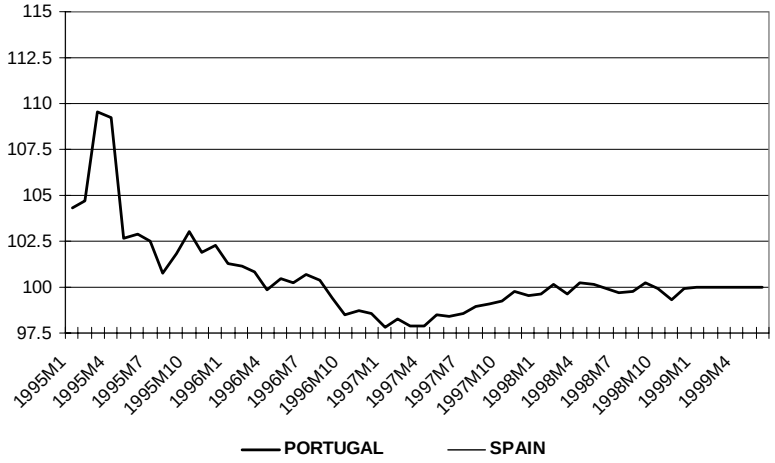


Figure 1.3b: Interest Rate Differentials of Group B Countries (Portugal and Spain) Against Germany

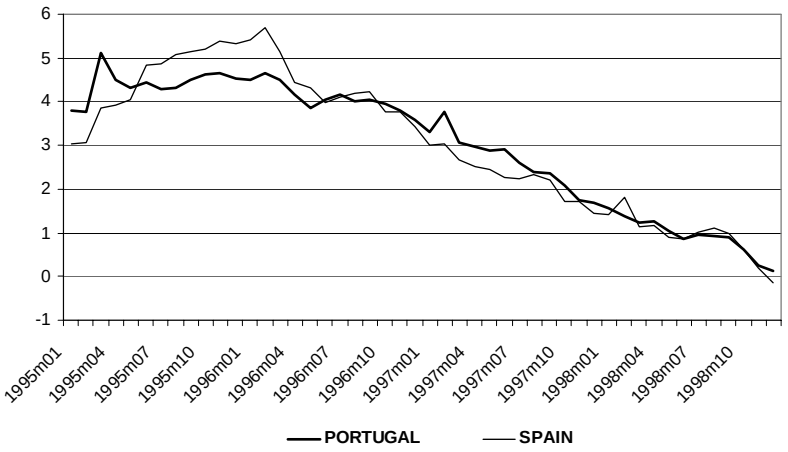


Figure 1.4a: Nominal Exchange Rates of Group B Countries (Ireland and Greece) Against DEM

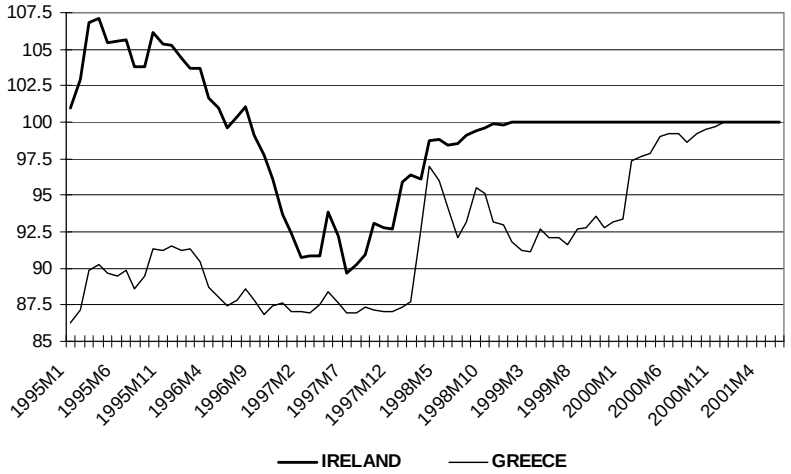


Figure 1.4b: Interest Rate Differentials of Group B Countries (Ireland and Greece) Against Germany and Eurozone

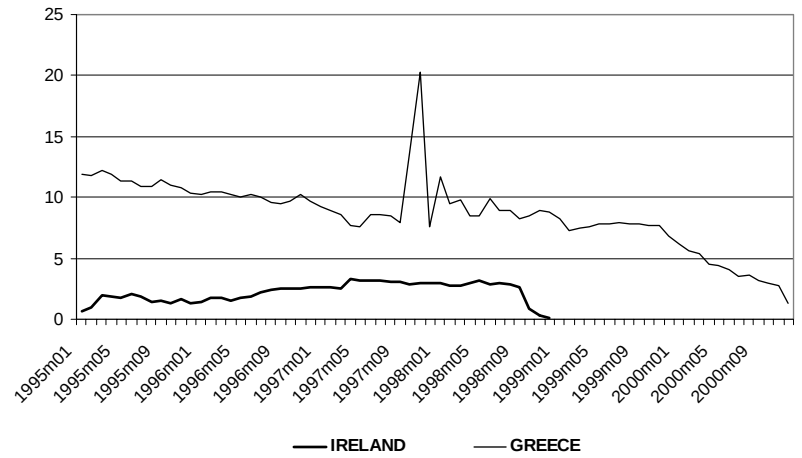


Figure 1.5a: Nominal Exchange Rates of Group C Countries (Finland and Italy) Against DEM

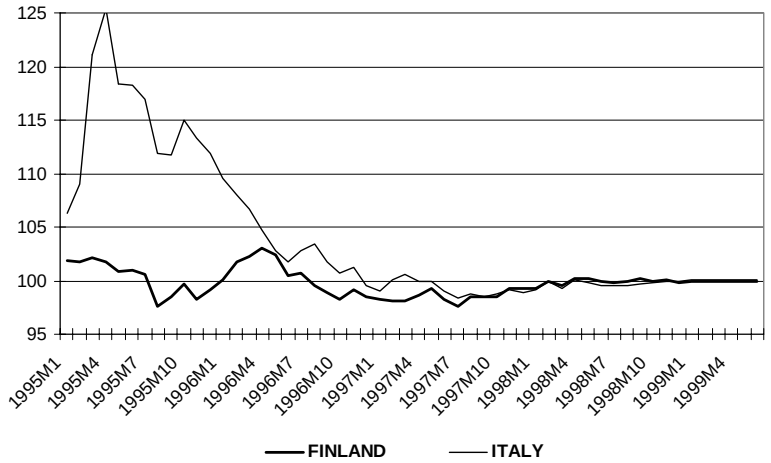


Figure 1.6a: Nominal Exchange Rates of Group D Countries (Denmark) Against DEM

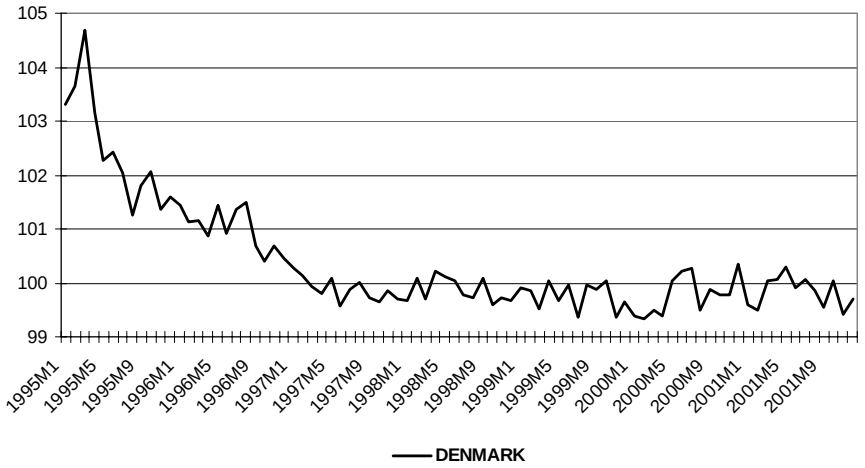


Figure 1.5b: Interest Rate Differentials of Group C Countries (Finland and Italy) Against Germany

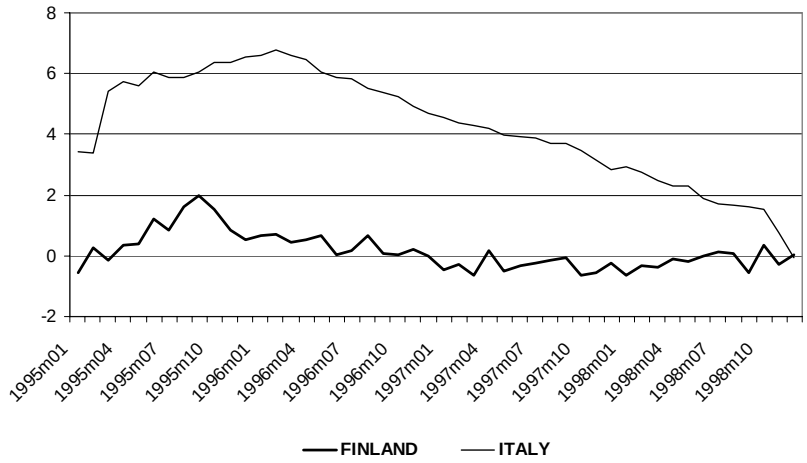


Figure 1.6b: Interest Rate Differentials of Group D Countries (Denmark) Against Germany

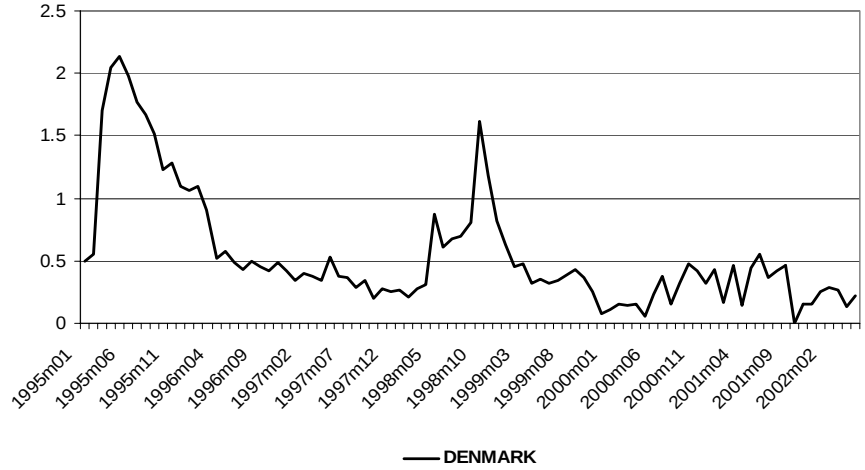


Figure 1.7a: Nominal Exchange Rates of Group D Countries (Sweden and United Kingdom) Against DEM and EUR

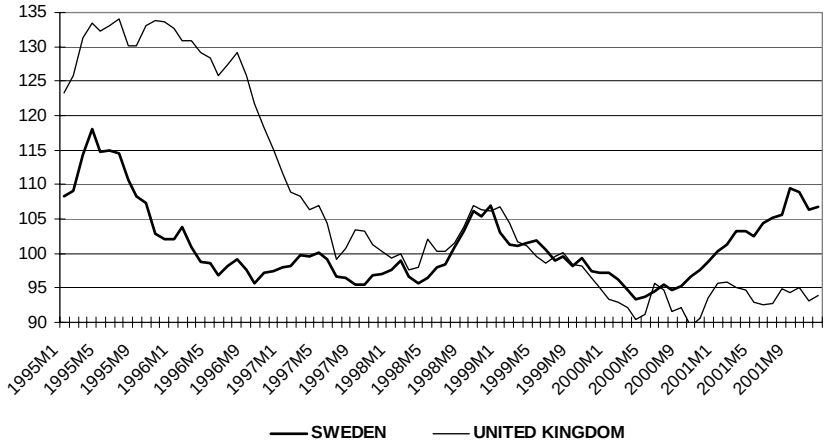
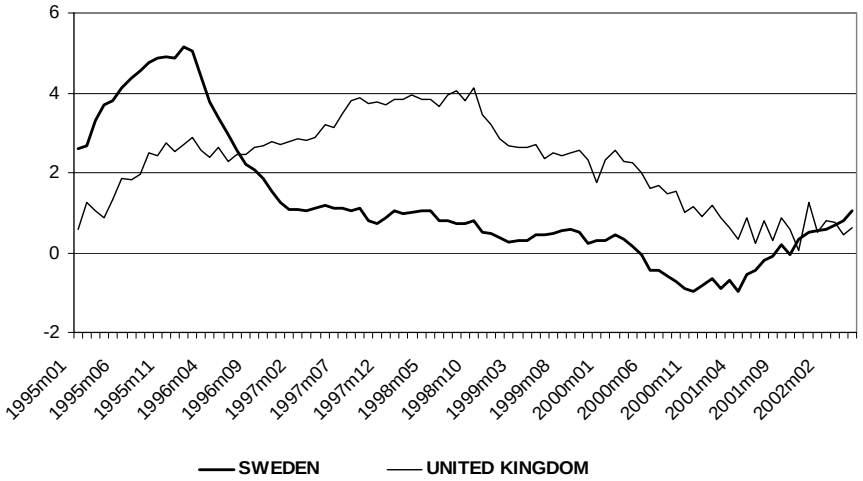


Figure 1.7b: Interest Rate Differentials of Group D Countries (Sweden and United Kingdom) Against Germany and Eurozone



Appendix 2: Economic Activity (group A-D)[48]

Figure 2.1a: GDP per Capita of Countries of Groups A and B in 2001 (1995 price level)

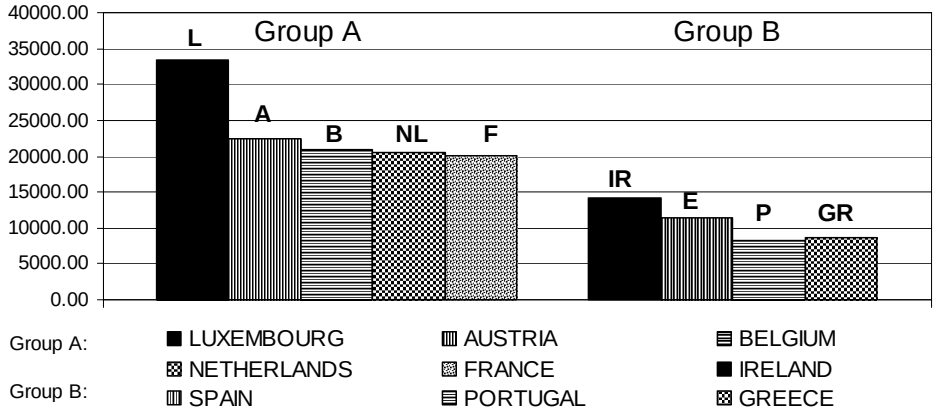
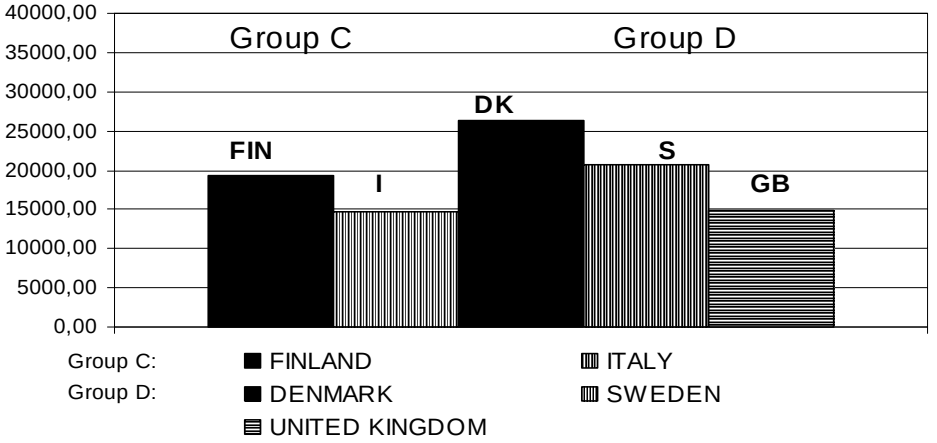


Figure 2.1b: GDP per Capita of Countries of Groups C and D in 2001 (1995 price level)



[48] *Sources: Eurostat and authors' calculations.*

Appendix 3: Nominal Exchange Rates (Deviations from Central Parity[49] Against DEM/EUR) and Interest Rate Differentials Against Germany/Eurozone (Group E-G)[50]

Figure 3.1a: Nominal Exchange Rates of Group E Countries (Cyprus and Malta) Against ECU/EUR

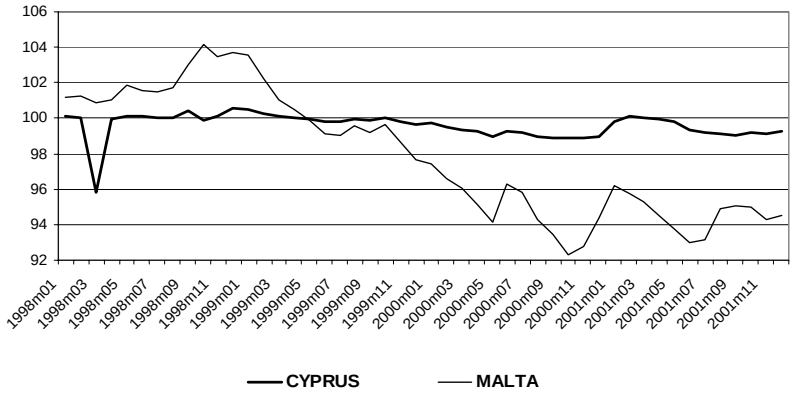


Figure 3.1b: Interest Rate Differentials of Group E Countries (Cyprus and Malta) Against Germany and Eurozone

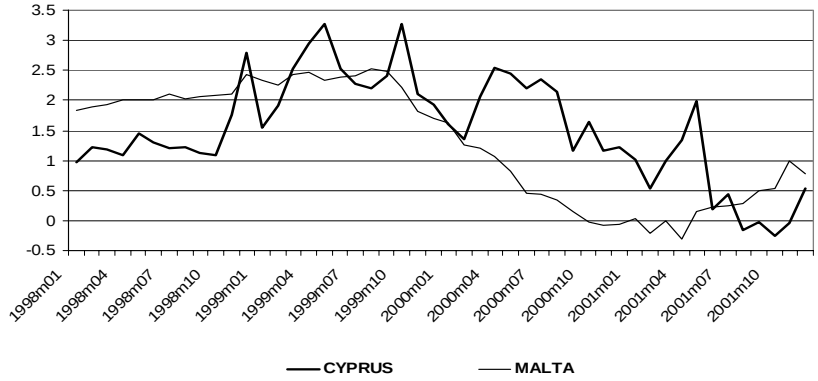


Figure 3.2a: Nominal Exchange Rates of Group E Countries (Estonia, Latvia and Lithuania) Against ECU/EUR

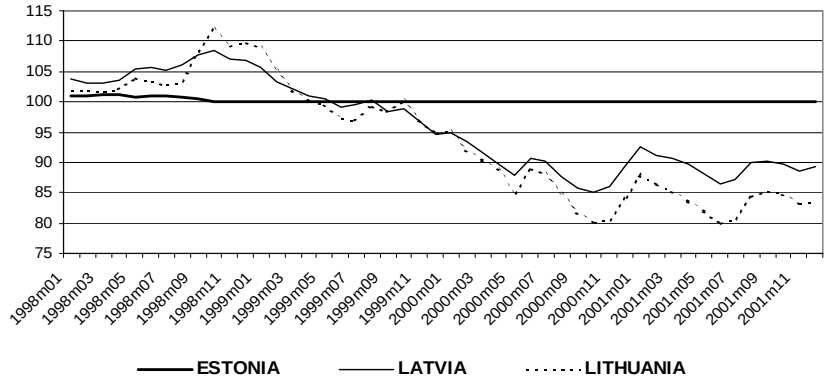
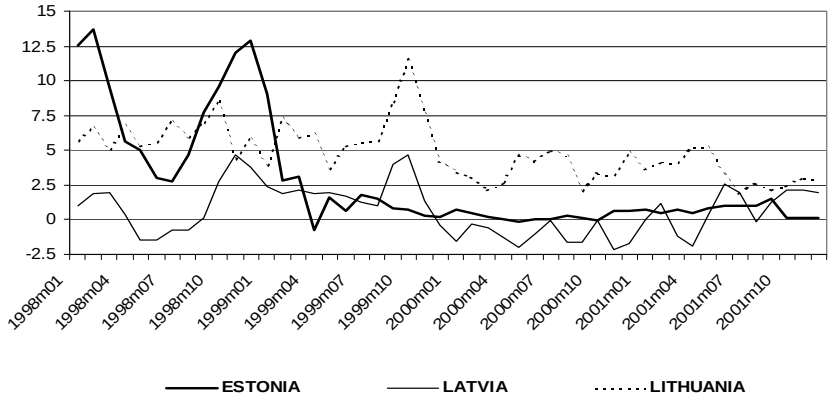


Figure 3.2b: Interest Rate Differentials of Group E Countries (Estonia, Latvia and Lithuania) Against Germany and Eurozone



[49] Central parity is defined in part 3.2.

[50] *Sources: IMF-IFS CD-ROM, Eurostat and authors' calculations.*

Figure 3.3a: Nominal Exchange Rates of Group F Countries (Czech Republic and Slovakia) Against ECU/EUR

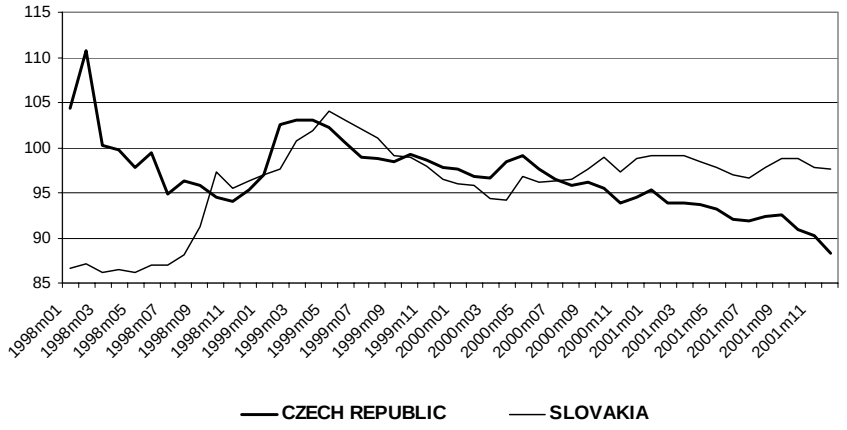


Figure 3.3b: Interest Rate Differentials of Group F Countries (Czech Republic and Slovakia) Against Germany and Eurozone

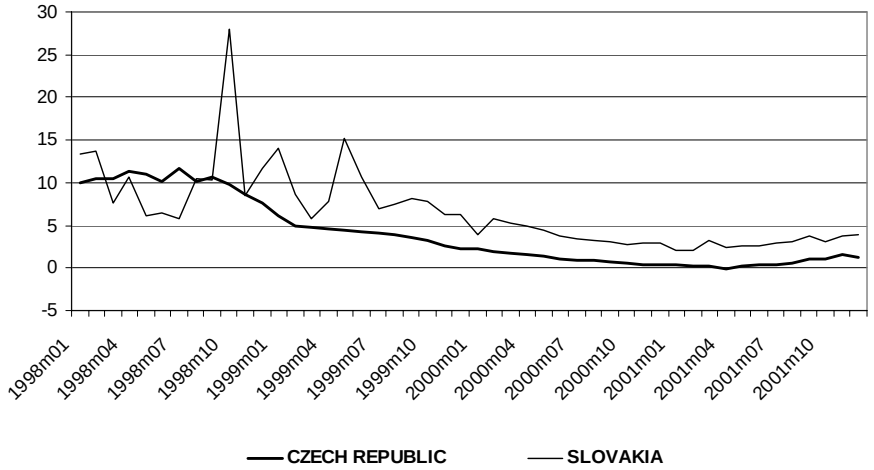


Figure 3.4a: Nominal Exchange Rates of Group F Countries (Hungary, Poland and Slovakia) Against ECU/EUR

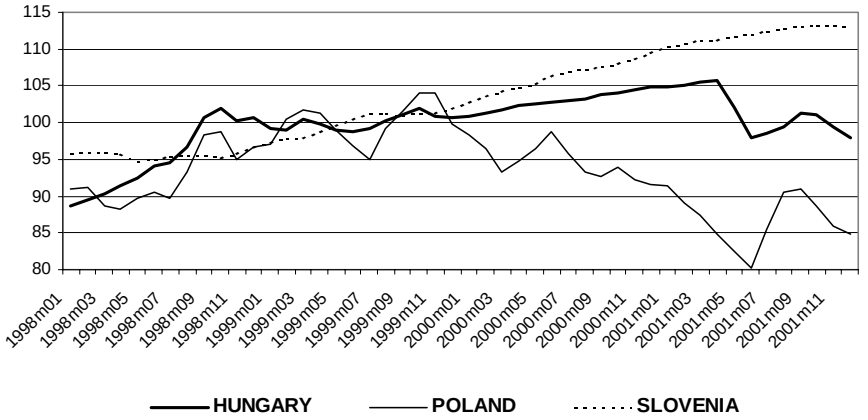


Figure 3.4b: Interest Rate Differentials of Group F Countries (Hungary, Poland and Slovakia) Against Germany and Eurozone

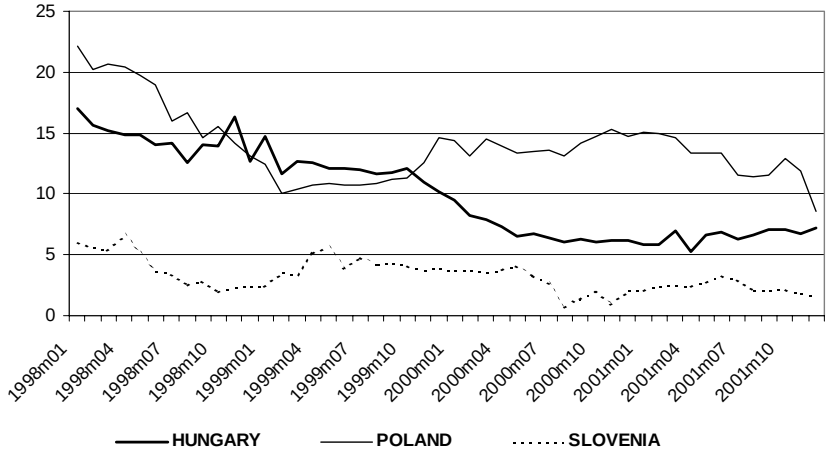


Figure 3.5a: Nominal Exchange Rates of Group G Countries (Bulgaria) Against ECU/EUR

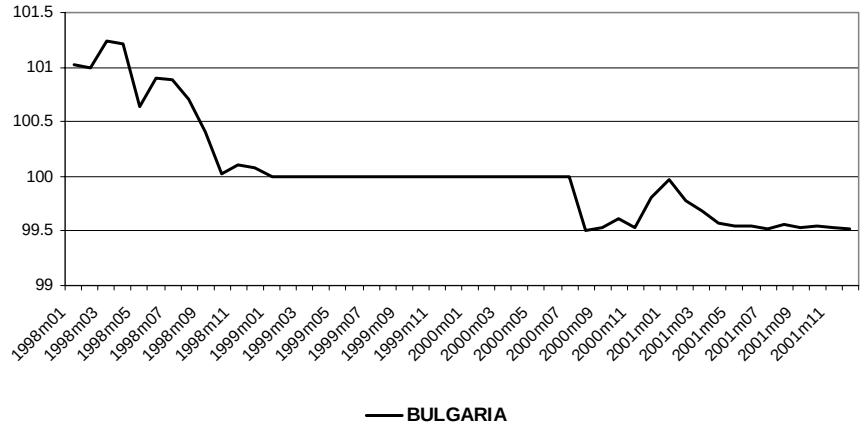


Figure 3.5b: Interest Rate Differentials of Group G Countries (Bulgaria) Against Germany and Eurozone

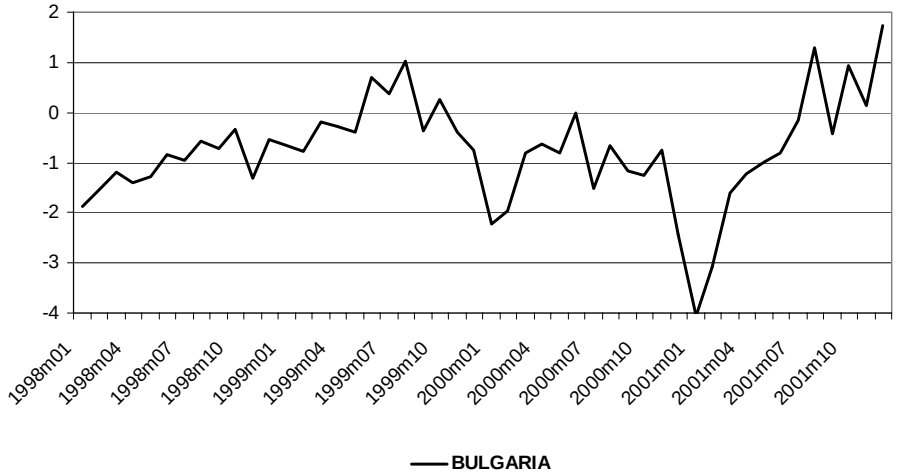


Figure 3.6a: Nominal Exchange Rates of Group G Countries (Romania and Turkey) Against ECU/EUR

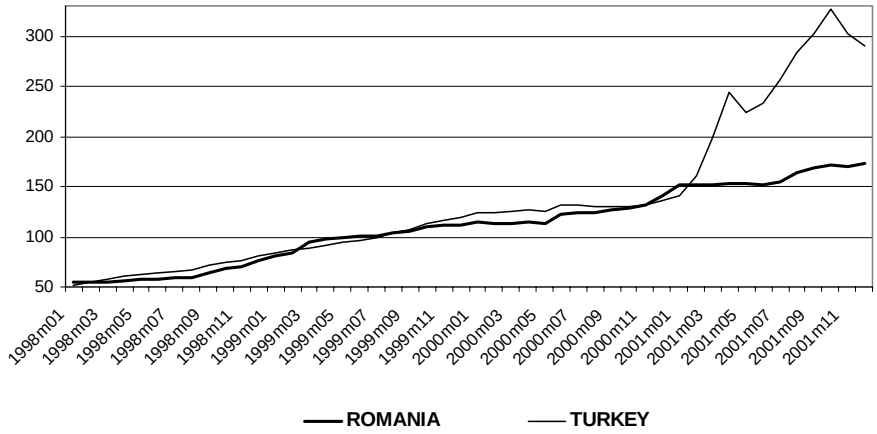
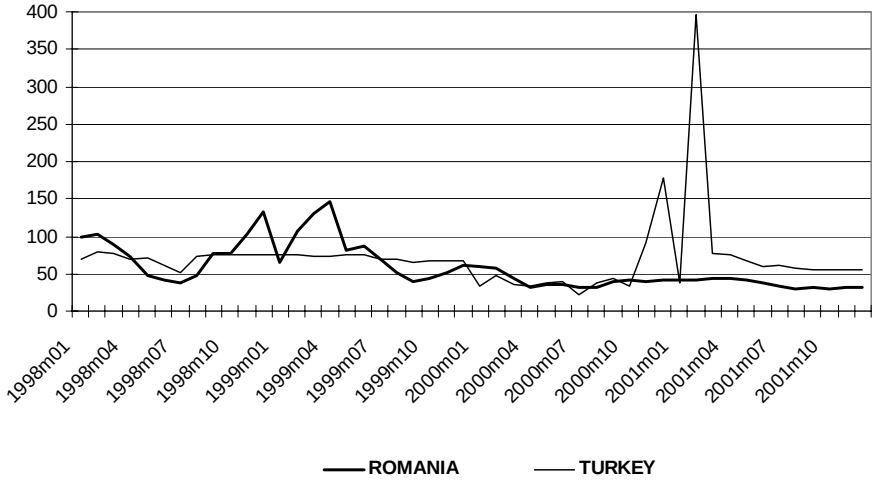


Figure 3.6b: Interest Rate Differentials of Group G Countries (Romania and Turkey) Against Germany



Appendix 4: Economic activity (group E-G)[51]

Figure 4.1a: GDP per Capita of Group E Countries in EUR in 2001 (1995 price level)

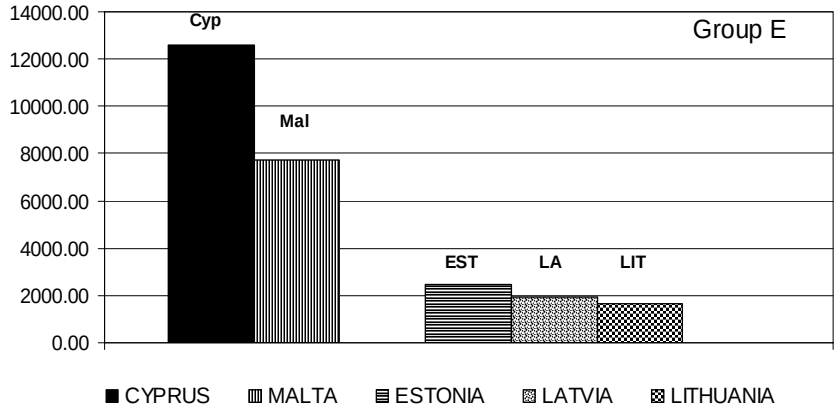


Figure 4.1b: GDP per Capita of Group F Countries in EUR in 2001 (1995 price level)

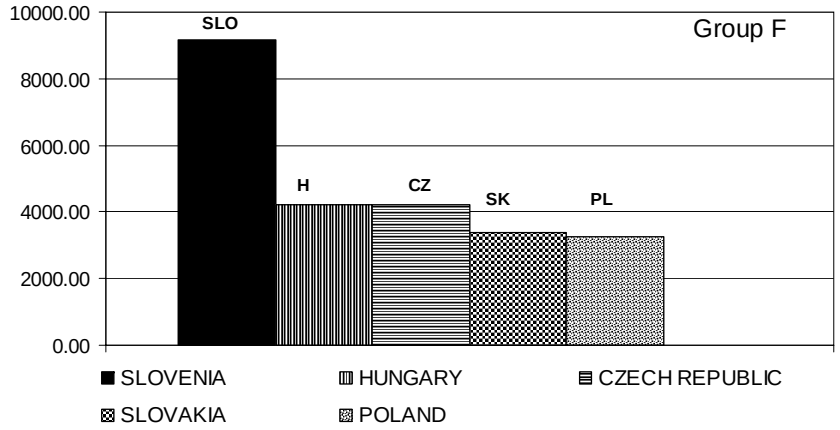
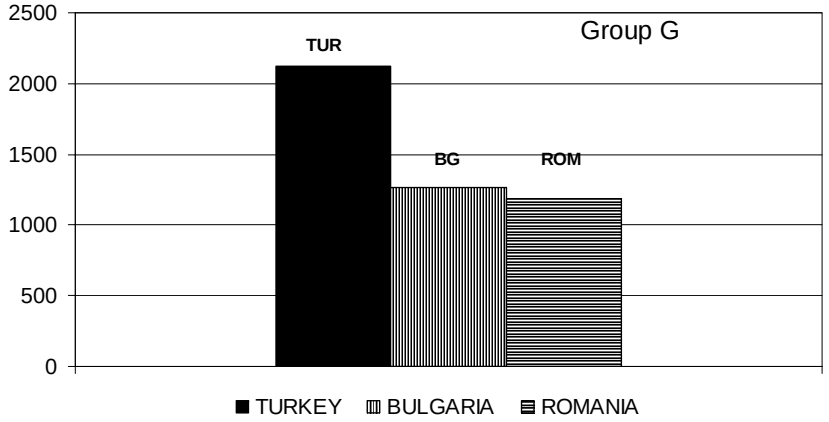


Figure 4.1c: GDP per Capita of Group G Countries in EUR in 2001 (1995 price level)



[51] *Sources: Eurostat and authors' calculations.*

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