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Kiel Working Paper No. 1080

**Assessing the Advantages of
EMU-Enlargement for the EU and the
Accession Countries:
A Comparative Indicator Approach**

by

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October 2001

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Assessing the Advantages of EMU-Enlargement for the EU and the Accession Countries: A Comparative Indicator Approach*

Abstract: The paper takes into account both the concerns of the EU, arguing that convergence is incomplete, and the demands from accession countries, claiming that monetary integration is optimal. Indicators are developed which measure convergence and optimality in comparison with a reference group of the four EMU-member countries Greece, Ireland, Portugal, and Spain. The general conclusion is that the demand of accession countries for entry into EMU can be supported by looking at the net benefits from monetary integration. The more serious problem is a lack of convergence which could imply serious risks during the transition towards monetary union.

Keywords: EU-Enlargement, European Monetary Union, Exchange Rate Anchor, Convergence, Optimum Currency Area

JEL classification: E42, F15, F41

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* The paper is part of a research project on 'The Euro as an Anchor Currency' financed by the German Ministry of Finance.

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Assessing the Advantages of EMU-Enlargement for the EU and the Accession Countries: A Comparative Indicator Approach

I. Introduction

European monetary integration gains speed with Central Eastern European countries (CEECs) queuing up for entry into the European Union (EU). It is possible that the first CEECs accede to the EU already one year after the introduction of Euro banknotes and coins, i.e. in 2003 (DBResearch 2001). Countries entering the EU automatically become members of the economic and monetary union with a special status. The special status will allow for the participation in the European Monetary System (EMS II) (DeGrauwe/Lavrac 1999) with its fixed parities and wide bands (currently +/- 15 percent). After a two year waiting period, the state of convergence of the new members will be evaluated based on the Maastricht criteria. Eventually, the first new members would join the European Monetary Union (EMU) already in 2005 (Baldwin et al. 2000) if the earliest date of entry to the EU would be 2003.

Additionally, it is debated whether a two year membership in the EMS II under “non-stress conditions” is necessary to evaluate the state of exchange rate convergence. Given past experience, this provision of the Maastricht Treaty does not seem to be binding for the Council of the European Union. It approved an

early entry of Italy and Finland without EMS membership which could provide a blue print for the Eastern enlargement of EMU (Bohn 1999; Schweickert 1997a; b; 1996). Moreover, it is possible that potential member countries adopt unilateral measures such as the introduction of a Currency Board with a fixed parity against the Euro or even the introduction of the Euro as a legal tender. Such an informal euroization strategy would render monetary policy completely dependent on the policy of the European Central Bank (ECB) as would be the case in a monetary union but without participating in the decision-making of the ECB.

This implies that the enlargement of EMU is already a relevant issue which has been recognized by academics (Baldwin et al. 2000) but obviously not by European monetary authorities (ECB 2000a; ECOFIN 2000). This paper tries to contribute to the growing literature on euroization and EMU-enlargement respectively¹ by constructing indicators on the advantages of fixing exchange rates against the Euro. While most of the literature focuses on specific aspects, on individual countries, or on theoretical considerations only, the indicators introduced in the following try to integrate all this approaches.

¹ See, e.g., Hellmann (2001), Randzio-Plath (2001), Solbes (2001), Nuti (2000), Pelkmans et al. (2000), Ligeti (2000), Gros (2000), Bjoerksten (2000), Bofinger/Wollmershäuser (2000), Mourmouras/Argyrou (2000), Frenkel/Nickel (1999); DeGrauwe/Lavrac (1999).

Two prior considerations are important in this respect. First, in order to refrain from arbitrary judgements, the results will be in a comparative setting. For this reason, two groups of CEECs which are in the process of negotiating their entry into the EU – labeled accession countries in the following – are compared with a reference group:

Accession Group I: Czech Republic, Estonia, Poland, Slovenia, Hungary.

Accession Group II: Bulgaria, Latvia, Lithuania, Romania, Slovak Republic.

Reference Group: Greece, Ireland, Portugal, Spain.

The two accession groups are separated according to their entrance into accession negotiations (1998 for Accession Group I; 2000 for Accession Group II). Comparing their results with those EMU-members with the lowest per-capita income allows to determine the advantages of fixing in relative terms. The underlying reasoning is that the inclusion of peripheral EU-members into EMU so far had no negative effects for those countries or for Euroland. Hence, if accession countries outperform reference countries this can be interpreted as signalling advantages of fixing to the Euro and good prospects for the inclusion of these accession countries into EMU.

Second, an evaluation of the comparative advantages of fixing to the Euro has to consider two perspectives. From the perspective of the current members of EMU it is important that the accession countries show a high degree of convergence towards monetary Euroland standards in order to smooth or even rule out

potentially negative enlargement effects. From the perspective of the accession countries, the optimality of the exchange rate peg is decisive for ruling out potentially negative effects of giving up national exchange rate policies.

The structure of this paper follows this reasoning. Chapter II discusses the convergence issue. It starts with the Maastricht criteria, finds complementary criteria, and combines all criteria in a single indicator by means of standardization. Chapter III continues with the evaluation of the optimality issue. It reviews results achieved by means of regression analysis, detects complementary criteria, and, again, calculates a single indicator. Chapter IV summarizes the results and draws policy conclusions.

II. Concerns about Monetary Integration – Is Convergence Already Sufficient?

Any discussion about convergence has to start with the Maastricht criteria because this is how the EU defines convergence. Although the political debates in the 1990s have shown that these criteria are open to interpretation and manoeuvring, all accession countries will have to pass them in one way or another. Arguably, the criteria will be more strictly applied to the newcomers because their voting power in the Council of EU will be weak at best.

Table 1 shows the progress in convergence which accession countries have already achieved following four criteria:² inflation rate, long-term interest rate, fiscal deficit ratio, and public debt ratio. The table shows the differences between the reference value³ and the actual values for each country and each criterion. Positive values show the need for further convergence while negative values indicate that the criteria have already been fulfilled.

The convergence values also appear in standardized form in order to make them comparable. Standardization means that the difference between the convergence values and the means of the convergence values achieved by the reference countries is divided by the standard deviation of the convergence values of all countries. Hence, the standardized variables measure the differences to the reference countries in terms of standard deviations. This allows for an overall assessment by adding up the results for the single criteria.

The results presented in Table 1 for the year 2000 show that on average the accession countries already made good progress towards convergence:

² The exchange rate criterion is not discussed here because, according to the Treaty, the evaluation period does not start before the entry into EMS II.

³ The average of the three best performing Euroland countries in the case of the inflation and interest rates and the threshold values defined in the Treaty for the deficit and debt ratio.

Table 1 — Convergence of Accession and Reference Countries: The Maastricht Criteria, 2000^a

	Inflationrate Rate		Interest Rate		Fiscal Deficit		Public Debt		Total (1)+(2)+ (3)+(4)
	percent	stand. (1)	percent	stand. (2)	percent of GDP	stand. (3)	percent of GDP	stand. (4)	
Reference Value	2.8		7.3		3.0		60.0		
Estonia	1.2	-0.1	-0.2	-0.1	-1.9	-0.2	-49.0	2.1	1.6
Poland	7.2	-0.7	5.7	-0.8	-0.6	-1.0	-16.3	0.9	-1.5
Slovenia	6.2	-0.6	5.7	-0.8	-2.0	-0.2	-35.0	1.6	0.0
Czech Rep.	1.3	-0.1	0.4	-0.2	2.2	-2.5	-31.0	1.4	-1.4
Hungary	7.1	-0.7	1.7	-0.3	0.0	-1.3	10.5	-0.0	-2.4
Accession Group I	4.6	-0.4	2.7	-0.4	-0.5	-1.0	-24.2	1.2	-0.7
Bulgaria	7.4	-0.7	-2.3	0.1	-1.5	-0.5	35.5	-0.9	-2.0
Latvia	0.6	-0.1	3.1	-0.5	-1.1	-0.7	-49.4	2.1	0.9
Lithuania	-1.3	0.1	0.9	-0.3	-0.1	-1.2	-33.7	1.5	0.2
Romania	41.4	-3.9	36.1	-4.0	0.5	-1.6	-28.7	1.3	-8.2
Slovak Rep.	9.3	-0.9	0.4	-0.2	2.5	-2.7	-33.0	1.5	-2.3
Accession Group II excl. Romania	11.4 (4.0)	-1.0	7.6 (0.5)	-1.0	0.1	-1.3	-21.9	1.1	-2.3
Greece	-0.6	0.1	-0.8	-0.1	-1.4	-0.5	44.4	-1.2	-1.8
Ireland	1.4	-0.1	-1.9	0.0	-5.0	1.5	-7.6	0.6	2.0
Portugal	-0.8	0.1	-1.7	0.0	-1.0	-0.7	-3.2	0.4	-0.2
Spain	0.1	-0.0	-1.8	0.0	-1.9	-0.2	3.5	0.2	-0.0
Reference Group excl. Greece	0.0	0.0	-1.6	0.0	-2.3	0.0	9.3 (-2.4)	0.0	0.0

^a 1999 for fiscal deficit and debt of reference countries.

Source: DB Research (2000a); EUROSTAT (2000); own calculations.

- Average inflation rates of the accession country groups were only 4.6 and 4.0 percent above the reference value if Romania is excluded. In the Baltic countries and in the Czech Republic inflation rates were already lower than in booming Ireland which showed the highest inflation rate in Euroland. All countries except Romania showed single digit inflation rates. Arguably, the financial crisis in Russia which affected most of the accession countries helped to reduce demand pressures.
- Fiscal deficits were also reduced significantly. In this respect, convergence has even been more pronounced. Notwithstanding the unfavourable impact of the

Russian crisis, eight out of ten accession countries had fiscal deficits below or only slightly above 3 percent of GDP. This implies that only the Czech and the Slovak Republics still have to face substantial consolidation efforts.⁴

- The same applies to the public debt burden showing that public debt plays only a minor role in accession countries. Only Hungary and Bulgaria have debt ratios above 60 percent of GDP and all accession countries have lower debt ratios than Greece. Even if one excludes Greece, the average debt ratio of the reference countries is well above the averages for the accession country groups.
- Convergence performance with respect to interest rates is much more difficult to analyze. Capital markets with long-term debt instruments do not yet exist in most accession countries and the interest rates, therefore, reflect monetary policy influences to a larger extent than is the case for the reference countries. Moreover, the four reference countries already gain from definitely fixed exchange rates or from the participation in the EMS II. It can be safely assumed that the exclusion of the currency risk significantly contributed to lower interest rates in the reference countries and thus helped the convergence of long-term rates.⁵ Spain, e.g., does not pay a premium for its high public

⁴ Of course, the result for Poland is biased because it does not include the huge quasi-fiscal deficits which have been published only very recently.

⁵ Generally, high growth rates are accompanied by higher productivity gains in the tradable rather than in the non-tradable sector and induce prices for non-tradables to rise faster than prices for tradables. On this point, see Eichengreen/Hausmann (1999).

debt ratio. The results for the accession countries also reveal a strong impact of exchange rate policies because both countries with Currency Boards and fixed Euro exchange rates already passed the interest rate test as well as the other criteria. The explanation is that the institutional backing for the fixed exchange rate reduces exchange rate risks meaning that a credibly fixed exchange rate furthers convergence. To the contrary, interest rates are among the highest in Poland and Slovenia, i.e. in two countries which allow for a high flexibility of exchange rates.

All in all, the discussion of the Maastricht criteria yields that the accession countries have good chances to achieve full convergence by the time of entry into the EU. The most serious problem remaining is the reduction of interest rates. Obviously, the high level of long-term rates is not related to high fiscal deficits or a high public debt burden. Even more solid fiscal policies will, therefore, not do the trick. It is reasonable to assume that risk premia depend on the fact that countries which lack the possibility to issue debt in their own currency always face exchange rate risks. As already argued above, the causality rather runs from eliminating exchange rate flexibility to lower interest rates than the other way round. This, however, implies, that the interest rate criterion is inconsistent. Convergence would be more or less immediate if membership in EMU would be declared, i.e., convergence is endogenous. This endogeneity hypothesis has often been stressed by those arguing against the so-called

coronation theory and for the vehicle theory seeing EMU as a vehicle to goods and factor markets.⁶

Additionally, accession countries which experience high growth rates of GDP face a dilemma. This is because high growth rates lead to the need for real appreciation which has to be achieved either by exchange rate revaluation or by higher inflation rates.⁷ This implies that countries which sped up convergence by fixing the Euro exchange rate will be likely to face inflationary pressure during the year of transition towards EMU. Therefore, it can not be excluded that they will either miss the inflation criterion or that they will have to give up fixing the Euro exchange rate. This argumentation shows that the current inflation rates do not necessarily reflect inflationary preferences as implicitly assumed in the Maastricht Treaty and in political-economy models of European monetary integration based on partisan behavior (e.g. Jochem/Sell 2001; Vaubel 1999).

Generally, it should be clear that the Maastricht criteria do not constitute a set of criteria adequate to measure convergence efforts in the case of the accession countries. This is in line with the fact that they already have been heavily criticized in the context of the formation of EMU in the 1990s (see, e.g.

⁶ For the coronation theory, see, e.g., Siebert (1998), Ohr (1996); for the vehicle theory, see, e.g., DeGrauwe (2000).

⁷ Generally, high growth rates are accompanied by higher productivity gains in the tradable rather than in the non-tradable sector and induce prices for non-tradables to rise faster than prices for tradables. On real exchange rate strategies, see, e.g., Schweickert (1993).

Schweickert 199.; Bofinger 1994). Nevertheless, they are the only criteria which are legally defined and represent a fact for all countries seeking to join Euroland.

It is, therefore, interesting to calculate an overall index for convergence à la Maastricht in order to evaluate the chances of accession countries to pass this test. The last column in Table 1 shows the negative sum⁸ of the standardized convergence values assuming equal weights for the single criteria. A result which was to be expected is that the Reference Group outperforms Accession Group I and that Accession Group I outperforms Accession Group II. However, looking at the results for individual countries reveals quite striking results:

- The Baltic countries and Slovenia outperform all reference countries except Ireland.
- A rather heterogeneous group consisting of the Czech Republic, Poland, Bulgaria, the Slovak Republic, and Hungary does not perform as good as Portugal and Spain but comparable to Greece which recently became a member of EMU.
- Only Romania lacks far behind Greece in terms of convergence.

This result rather confirms the arbitrariness than the meaningfulness of the Maastricht criteria. From an economic point of view, a well functioning

⁸ For each criterion the resulting standardized value has been multiplied by (-1) so that the value of the indicator increases the better the performance of a country.

competition on goods and capital markets are much more important for the functioning of a currency union than fiscal and monetary convergence. The reason is that countries participating in a monetary union give away an independent monetary and exchange rate policy as a means to react to external shocks. They will also lack the possibility to stabilize the financial system in the case of a crisis because there will be no regional lender-of-last-resort. According to this argumentation, convergence would be required with respect to institution building and capital market development.

Institution building is especially difficult to measure in quantitative terms. For this reason, the analysis relies on the convergence indicators as provided by the European Bank for Reconstruction and Development (EBRD). The classification according to the EBRD source ranges from 1,0 (no or only minor progress) to 4,3 (standard of advanced industrialized countries). Because data is not provided for the reference countries it is assumed that they reached a value of 3,7 (standard of average industrialized countries with qualifications).

The results for two groups of indicators which are relevant for institution building in goods and capital markets are shown in Table 2. For both groups the

Table 2 — Institution Building in Accession and Reference Countries, 2000

	Market and Trade					Financial Institutions				Sum of Standardized Averages (1)+(2)
	Price Liberalization	Trade and Foreign Exchange	Competition Policy	Average	Standardized Average (1)	Bank Reform and Interest Rate Liberalization	Security Markets and Non-bank Financial Institutions	Average	Standardized Average (2)	
Estonia	3.0	4.3	2.7	3.33	-2.04	3.7	3.0	3.35	-0.71	-2.74
Poland	3.3	4.3	3.0	3.53	-1.32	3.3	3.7	3.50	-0.40	-1.72
Slovenia	3.3	4.3	2.7	3.43	-1.68	3.3	2.7	3.00	-1.41	-3.09
Czech Rep.	3.0	4.3	3.0	3.43	-1.68	3.3	3.0	3.15	-1.11	-2.79
Hungary	3.3	4.3	3.0	3.53	-1.32	4.0	3.7	3.85	0.30	-1.02
Accession Group I	3.18	4.30	2.88	3.45	-1.61	3.52	3.22	3.37	-0.67	-2.27
Bulgaria	3.0	4.3	2.3	3.20	-2.50	3.0	2.0	2.50	-2.42	-4.92
Latvia	3.0	4.3	2.3	3.20	-2.50	3.0	2.3	2.65	-2.12	-4.62
Lithuania	3.0	4.0	2.7	3.23	-2.39	3.0	3.0	3.00	-1.41	-3.81
Romania	3.0	4.0	2.3	3.10	-2.86	2.7	2.0	2.35	-2.73	-5.58
Slovak Rep.	3.0	4.3	3.0	3.43	-1.68	3.0	2.3	2.65	-2.12	-3.80
Accession Group II	3.00	4.18	2.52	3.23	-2.38	2.94	2.32	2.63	-2.16	-4.55
Reference Group	3.70	4.30	3.70	3.90	0.00	3.70	3.70	3.70	0.00	0.00

Source: EBRD (2000); own calculations.

averages are calculated and standardized according to the procedure adopted in the case of the Maastricht criteria. The last column, then, shows the overall assessment with respect to institutional convergence.

It becomes evident that convergence up to now is significantly more advanced for goods markets than for capital markets. This holds above all for the 'Trade and Foreign Exchange' category. With the exception of Lithuania and Romania all accession countries have reduced tariffs and non-tariff barriers to trade to the level shown by industrialized countries,⁹ they became members of the WTO, and they have introduced full current account convertibility. Of course, this also applies to the reference countries being members of the customs union. Looking at the standardized averages for the 'Market and Trade' category, however, demonstrates that the accession countries still lack behind the reference countries.

The picture changes somewhat when 'Financial Institutions' are considered. Here, the Accession Group I and especially Hungary, Poland, and Estonia reduced the institutional backlog even more than was the case with respect to 'Market and Trade'. However, Hungary remains the only case where an accession country reached the level assumed for the reference countries. Therefore, the overall result is quite different from the picture provided by focusing on the Maastricht criteria: convergence in general is still a rather long way to go for

⁹ Although the EU external tariff level is still lower (Langhammer 2001: Table 5.3).

most accession countries and convergence in particular is most advanced in Hungary and Poland.

Table 3 shows the results with respect to capital market development. Three groups of indicators have been considered. First, the credit rating by Standard & Poor's was transformed proportionally into a range between 0 (D: default) and 9,5 (AAA: best quality). Values above 5,0 signal investment grade implying that the market for government debt is open for investment by international institutional investors. The credit standing is then determined by the average of the credit rating with respect to internal and external long-term government debt. Second, credit supply is measured as the sum of bank credits and capitalization of stock markets. Third, the potential external debt position is calculated as potential external indebtedness in 2003, i.e., the first year when accession countries may enter the EU. These three indicators are thought to measure the qualitative and the quantitative aspects of capital market development.

The results for all three indicators of capital market development have in common that they reveal a clear ranking of the country groups. As was the case with institution building, Accession Group II lacks far behind with a credit ranking below investment grade, capital supply below 50 percent of GDP, and external debt above 50 percent of GDP. Accession Group I is closer but still significantly behind the Reference Group.

However, looking at the averages does not provide a complete picture. It is only with respect to capital supply where all reference countries show top rankings. Credit ratings for Slovenia, the Czech Republic, and Poland are better than for Greece. Higher external debt positions are only shown by Hungary and Bulgaria – with a clear downward trend – and Romania. The overall result shown in the last column is that the countries forming Accession Group I and Latvia are quite close to the standard established by Greece which is significantly worse than capital market development in the other reference countries especially in Ireland and Spain.

All in all, the Maastricht criteria, the institutional indicators, and the capital market development reveal a rather heterogeneous picture of convergence achieved by the accession countries. The baseline, however, is that institutional and capital market convergence toward the standards set by the reference countries has yet to be achieved. Taking these indicators as complementary to those provided by the Maastricht criteria implies to sum up the results shown in the last columns of Tables 1 to 3.

Graph 1 shows the graphical representation of the overall convergence indicator for the year 2000:

- The four reference countries perform better than all accession countries.

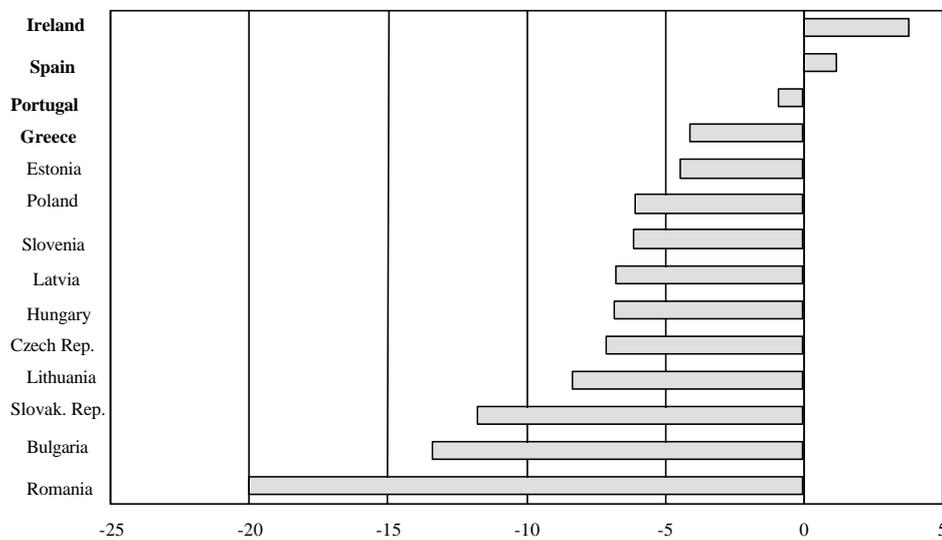
Table 3 — Capital Market Development in Accession and Reference Countries, 1998/2000^a

	Credit Rating Long-term Public Debt				Capital Supply				External Debt				Total (1) +(2) +(3)
	Internal (Index)	External (Index)	Average	Stand. Average (1)	Bank Credits (percent of GDP)	Stock Market Capi- talization (percent of GDP)	Sum	Stand. Sum (2)	External Debt (percent of GDP)	Current Account Deficit excl. FDI (percent of GDP)	Potential External Debt 2003 ^b (percent of GDP)	Stand. Potential Debt (3)	
Estonia	6.5	6.0	6.25	-1.06	32.24	9.98	42.22	-2.09	15.04	-3.31	31.57	-0.16	-3.31
Poland	7.5	6.0	6.75	-0.79	36.48	12.90	49.38	-1.96	30.00	-0.02	30.10	-0.10	-2.85
Slovenia	8.5	7.0	7.75	-0.26	40.12	12.55	52.67	-1.90	56.90	1.33	50.27	-0.92	-3.08
Czech Rep.	8.0	6.5	7.25	-0.53	64.29	21.36	85.65	-1.27	44.86	-2.04	55.07	-1.11	-2.91
Hungary	7.0	6.0	6.50	-0.93	49.20	29.34	78.54	-1.41	59.83	0.76	56.03	-1.15	-3.48
Accession Group I	7.50	6.30	6.90	-0.71	44.47	17.23	61.69	-1.73	41.33	-0.66	44.61	-0.69	-3.13
Bulgaria	3.5	3.0	3.25	-2.64	18.13	8.09	26.22	-2.39	80.57	3.58	62.67	-1.42	-6.46
Latvia	6.5	5.5	6.00	-1.19	17.21	5.97	23.18	-2.45	11.81	-0.15	12.56	0.62	-3.02
Lithuania	6.0	5.0	5.50	-1.45	13.08	10.00	23.08	-2.45	18.22	-5.74	46.94	-0.78	-4.69
Romania	2.5	2.0	2.25	-3.17	23.92	2.66	26.58	-2.39	24.90	-4.12	45.52	-0.72	-6.28
Slovak Rep.	6.0	4.5	5.25	-1.59	67.50	4.74	72.24	-1.53	48.48	-8.71	92.03	-2.62	-5.73
Accession Group II	4.90	4.00	4.45	-2.01	27.97	6.29	34.26	-2.24	36.80	-3.03	51.95	-0.98	-5.24
Greece	6.5	6.5	6.50	-0.93	57.14	66.26	123.40	-0.56	33.10	-3.03	48.26	-0.83	-2.32
Ireland	9.0	9.0	9.00	0.40	98.61	36.55	135.16	-0.34	12.40	5.67	-15.93	1.78	1.83
Portugal	8.5	8.5	8.50	0.13	107.81	59.00	166.81	0.26	37.20	-3.66	55.51	-1.13	-0.74
Spain	9.0	9.0	9.00	0.40	114.51	72.70	187.21	0.64	30.60	1.49	23.14	0.19	1.23
Reference Group	8.25	8.25	8.25	0.00	94.52	58.63	153.15	0.00	28.33	0.12	27.74	0.00	0.00

^a 2000 for credit rating; 1998 for capital supply and external debt; average 1996-98 for current account excl. FDI. - ^b External debt in 1998 plus five times the current account deficit excl. FDI.

Source: Standard & Poor's (2000); World Bank (2000a); IMF (1999, 2000a, 2000b, 2000c); own calculations.

Graph 1 — Convergence Indicator for Accession and Reference Countries, 2000



Source: Tables 1–3.

- Convergence achieved by Estonia which ranks best among the accession countries comes close to convergence achieved by Greece which ranks worst among the reference countries.
- Taking the performance of Greece as a yardstick, the other countries from Accession Group I and the other Baltic countries lag somewhat behind.
- Only the Slovak Republic, Bulgaria, and especially Romania are far from reaching a level of convergence shown by reference countries.

It can be concluded that, from the perspective of the EU and based on convergence data available in 2001, entry into EMU could start with Estonia which could provide a pilot case. Estonia could be followed by the other countries which started accession negotiations already in 1998 and by Latvia. In

other words, a rather quick inclusion of these countries into EMU after entry into the EU cannot be expected to be more harmful to the Euro than the accession of the reference countries to the EMU.

III. Demands for Monetary Integration – Will the Accession Countries Actually Gain?

From the perspective of the accession countries, however, convergence is the end and not the means of monetary integration because early entry into EMU could be expected to speed up convergence and, therefore, to save costs in terms of prior adjustment efforts. It is only the aspect of institutional development which matters for both sides equally. A low level of institutional development implies a low adjustment capacity with the consequences of above average unemployment and below average income growth.

Generally, optimality from the perspective of accession countries is defined by the theory of optimum currency areas (OCA). The OCA theory focuses on the benefits and the costs of monetary integration, i.e. the fixing of the national currency against an anchor currency or the entry into a monetary union including the anchor currency. A first approximation of benefits and costs in the case of the accession countries is provided by Vaubel (1999) who measures the benefits in terms of bilateral openness and the costs in terms of real exchange rate adjustment as a catch-all variable for the need to use the exchange rate to adjust

to external shocks. This allows for a taxonomy of the advantages of EMU enlargement. Countries showing a high degree of trade integration with the EU and below average real exchange rate adjustment in the recent past can be assumed to benefit from European monetary integration.

This approach is open to two caveats. First, measuring benefits and costs by two variables only neglects important information. This applies especially to the measurement of benefits which is confined to savings of transaction costs. This excludes, e.g., credibility gains and faster convergence of inflation and interest rates. Second, the real exchange rate adjustment variable could be misleading in the case of high-growth countries which, as argued above, would be expected to show equilibrium real exchange rate appreciations.

Widening the number of variables considered implies that simple taxonomy has to be substituted by statistical methods. One possibility is the calculation of an OCA index by means of regression analysis (Eichengreen/Bayoumi 1996; Bénassy-Quéré/Lahrèche-Révil 2000). The explanatory variables are the relative size of countries and the share of bilateral trade in total trade (measuring benefits) as well as the asymmetry of business cycles¹⁰ and the differences in trade structures (measuring costs). After estimating the relationship between these variables and the standard deviation of bilateral exchange rates (considering

¹⁰ 'Business cycle' is used as a catch all expression meaning different economic developments. For some accession countries this rather reflects erratic economic development.

potential anchor currencies), the estimated coefficients in combination with the actual values of the variables allow to calculate an optimal degree of exchange rate variability for each pair of national currencies and anchor currencies. The lower the optimal variability the higher the net benefits from fixing the bilateral exchange rate.

Own calculations on the basis of the coefficients estimated by Eichengreen/Bayoumi and a comparison to the results achieved by Bénassy-Quéré/Lahrèche-Révil are provided in Table 4. They show the optimal variability against the Euro in absolute terms and relative to the optimal variability against the dollar. The two regression exercises differ with respect to the country sample used for regression analysis, the frequency of data, the estimation period, and the definition of the explanatory variables.

The comparison reveals the lack of robustness of the results. Contrary to Bénassy-Quéré/Lahrèche-Révil, the results achieved using the Eichengreen/Bayoumi specification show the fixing against the Euro to be more appropriate for the Accession Group I than for the Reference Group. Moreover, while the Reference Group should be rather indifferent between fixing against the Euro and the Dollar according to both approaches, fixing the Euro exchange rates of Accession Groups I and II is more advisable based on the Bénassy-Quéré/Lahrèche-Révil results and less advisable based on the Eichengreen/Bayoumi results.

Table 4 — Optimum Currency Area Indicators: Regression Analysis

	Bénassy-Quééré/ Lahrèche-Révil		Eichengreen/Bayoumi	
	Euro	Euro/Dollar	Euro	Euro/Dollar
Estonia	4.96	0.81	7.78	1.42
Poland	4.12	0.86	9.06	1.31
Slovenia	n.v.	n.v.	6.74	1.38
Czech Rep.	5.12	0.88	6.30	0.82
Hungary	5.69	0.87	6.47	1.06
Accession Group I	4.97	0.85	7.27	1.20
Bulgaria	6.92	0.82	9.03	0.80
Latvia	8.58	0.87	5.84	1.39
Lithuania	9.42	0.84	7.08	1.50
Romania	7.66	0.85	8.58	0.82
Slovak. Rep.	5.03	0.75	8.60	1.35
Accession Group II	7.52	0.83	7.83	1.17
Greece	3.52	0.64	5.58	0.99
Ireland	4.06	1.19	12.30	1.21
Portugal	5.03	0.72	6.57	1.09
Spain	4.88	1.14	6.93	1.07
Reference Group	4.37	0.92	7.84	1.09

Source: Bénassy-Quééré/Lahrèche-Révil (2000); Eichengreen/Bayoumi (1996); own calculations.

A closer examination of the results also shows that they depend on the results for one explanatory variable exclusively, i.e. the asymmetry of business cycles. Hence, the regression analysis only shows that countries with asymmetric business cycles tend towards more flexible exchange rates. This does not imply, however, that such a strategy needs to be optimal.

In order to consider other relevant variables, the approach adopted with respect to convergence is also applied with respect to optimality. The choice of variables

measuring the net benefits of accession and reference countries joining the European currency area¹¹ is based on the following assumptions:

The benefits for the accession countries are the higher...

- the stronger bilateral trade with Euroland,
- the smaller the country relative to Euroland,
- the larger the weight of the Euro in a currency basket designed to calculate effective exchange rates,
- the higher the gain in credibility from joining Euroland.

The costs for the accession countries are the higher...

- the more asymmetric the business cycle of the country concerned relative to the Euroland business cycle,
- the larger the difference in trade structures,
- the stronger the trend for real exchange rate changes,
- the larger the deviation of exchange rates from purchasing power parity.

The first two variables measuring benefits and costs respectively have been adopted from Eichengreen/Bayoumi:¹² bilateral trade is the mean of the ratio of

¹¹ In the following calculation, the European currency area (Euroland) is defined as the area covered by the EMU countries plus Denmark and Sweden which kept their exchange rates stable against the Euro.

bilateral exports to domestic GDP for each country and Euroland; relative size is the mean of the logarithm of the countries' GDP; asymmetry of business cycles is defined as the standard deviation of the difference in the logarithm of real output between the two countries; and differences in trade structures are measured by the sum of the absolute differences in the shares of agricultural and manufacturing trade in total trade of Euroland and the countries concerned.

With respect to benefits, the weight of Euro in each country's currency basket is a variable not considered by the previously discussed studies. It measures the total importance of the Euro for both external and internal macroeconomic equilibrium of accession and reference countries respectively. The calculation of the currency baskets is based on the procedure used to calculate the external value of the Euro (see ECB 2000b), i.e. using double export weighting. However, in contrast to the ECB procedure, the resulting export weights are combined with simple import weights using trade elasticities instead of a simple average. Moreover, the shares of major currencies in the denomination of external debt have been considered as well. Finally, trade and credit weights have been weighted according to their relative impact on the current account (see Bénassy-Quéré/Lahrèche-Révil 2000) for the procedure. The resulting weights are shown in Table A1.

¹² Generally, the variables are calculated with data for 1998 except for the business cycle variable (1990–1998) and the real exchange rate trend (1993–2000).

The fourth variable measuring the benefits of monetary integration is the credibility variable. It has already been argued above that a lack of convergence may constitute a disadvantage from the point of view of the EU but an incentive to seek accession from the perspective of the accession countries. It is plausible to assume that this incentive for accession countries is the larger the larger the backlog in terms of credibility: Romania would gain more credibility than Estonia which is already close to the standard established by the reference countries. Hence, the result for total convergence presented in Graph 1 is multiplied by (-1) in order to approximate the gains in credibility: low convergence promises large gains in credibility.

With respect to costs, two additional variables are introduced to measure real exchange rate trends which can be assumed to lead to adjustment costs. The variable measuring the actually observed trend uses effective real exchange rates calculated on the basis of the currency baskets defined Table A1 for the period 1993 to 2000. Here it is assumed that the past trend approximates the future trend, i.e. that the real exchange rate trend will be independent from the equilibrium level. Because this is not necessarily the case, the fourth variable tries to measure the deviation from equilibrium using the exchange rate gap concept (Schweickert 2001; DeBroek/Sløk 2001). According to this concept, the exchange rate gap (ratio of actual exchange rate to purchasing power parity rate) is regressed against per-capita income. The estimated coefficients allow to determine a normal

exchange rate gap given per-capita income, and, in comparison with the actual gap, the need for real exchange rate adjustment.

As already mentioned, the procedure is the same as used for calculating the convergence indicator. All variables are standardized, i.e. expressed as deviations from the mean of the reference countries measured in terms of standard deviations. The results are shown in Table 5 which includes the calculation of total benefits as the sum of all benefit variables, total costs as the sum of all costs variables, as well as the net benefits as the difference between total benefits and total costs.¹³

Looking at total benefits, it is clear that the benefits from monetary integration are higher for the accession countries than for the all reference countries except for Portugal. The benefits for the countries forming Accession Group I are also higher than for the other accession countries. Only Poland, with a relative low level of bilateral trade, does not fit into this pattern.

Looking at total costs reveals a more differentiated picture. On the one hand, Slovenia and Hungary show lower costs than the average of the Reference

¹³ The underlying assumption is, again, that all variables have the same weight.

Table 5 — Optimum Currency Area Indicator: Standardization^a

	Bilateral Trade	Relative Size	Euro Weights in Currency Basket	Credibility	Total-Benefits	Asymmetry of Business Cycles	Diversity of Trade Structures	Real Application	Exchange Rate Disequilibrium	Total-Costs	Net-Benefits
	(1)	(2)	(3)	(4)	(5) = (1)+(2)+(3)+(4)	(6)	(7)	(8)	(9)	(10) = (6)+(7)+(8)+(9)	(11) = (5)+(10)
Estonia	1.47	2.64	-0.32	-0.77	4.55	0.67	0.82	1.37	0.43	3.29	1.26
Poland	-0.50	-0.02	0.26	-1.05	0.79	0.68	-0.10	0.20	-0.31	0.47	0.33
Slovenia	1.24	1.61	0.73	-1.06	4.65	-0.37	-0.19	-0.36	-0.35	-1.27	5.91
Czech Rep.	1.16	0.79	0.08	-1.23	3.26	-0.79	-0.20	0.22	1.90	1.14	2.12
Hungary	1.64	0.92	0.26	-1.18	3.99	-0.68	-0.24	-0.26	1.15	-0.03	4.02
Accession Group I	1.00	1.19	0.20	-1.06	3.45	-0.10	0.02	0.23	0.57	0.72	2.73
Bulgaria	-0.40	1.97	-1.72	-2.31	2.15	1.59	2.19	0.86	1.89	6.53	-4.38
Latvia	-0.46	2.48	-0.81	-1.17	2.38	-0.08	2.53	1.70	-0.03	4.13	-1.75
Lithuania	-0.48	2.08	-1.49	-1.44	1.55	0.27	1.30	2.28	0.27	4.12	-2.57
Romania	-0.47	1.09	-1.34	-3.46	2.74	0.59	-0.21	0.90	2.57	3.84	-1.11
Slovak Rep.	1.14	1.58	-0.79	-2.04	3.97	0.70	-0.21	0.08	2.18	2.74	1.23
Accession Group II	-0.13	1.84	-1.23	-2.08	2.56	0.61	1.12	1.16	1.38	4.27	-1.72
Greece	-1.24	0.20	-0.03	-0.71	-0.36	-0.95	1.37	-0.35	0.10	0.16	-0.52
Ireland	1.85	0.50	-2.12	0.66	-0.43	2.58	-0.43	0.26	0.32	2.74	-3.16
Portugal	-0.10	0.29	1.26	-0.16	1.61	-0.79	-0.47	-0.11	-0.50	-1.87	3.48
Spain	-0.51	-0.98	0.89	0.21	-0.82	-0.83	-0.47	0.20	0.08	-1.03	0.21
Reference Group	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

^a For the definition of variables, see text.

Source: IMF (a); World Bank (2000a); Table 1–3; Table A1; own calculations.

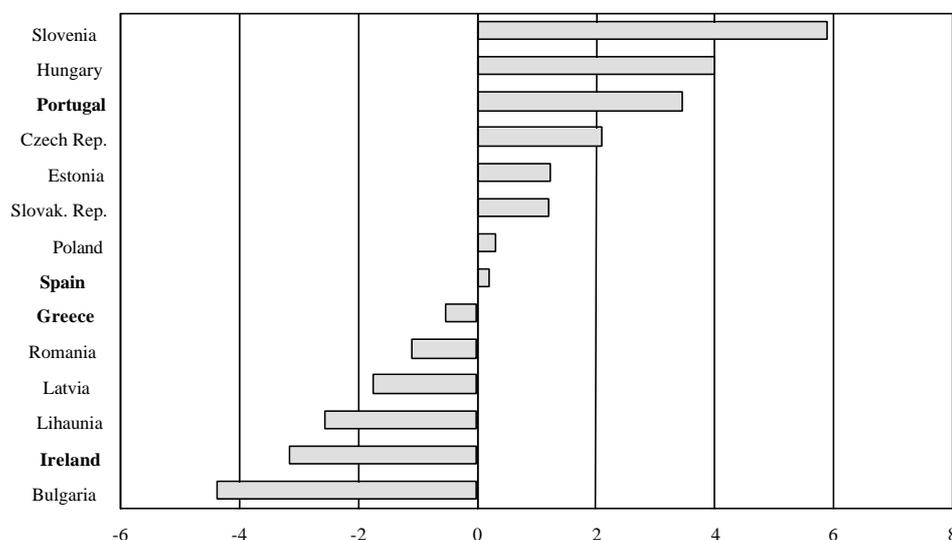
Group with Slovenia performing above average in all four cost categories. Two other countries from Accession Group I also show lower cost than the reference country with the highest costs, i.e. Ireland. Poland reveals a low level of exchange rate disequilibrium while the Czech Republic shows a low degree of business cycle asymmetry. On the other hand, Estonia shows above average costs in all categories especially with respect to the structure of trade and the exchange rate trend in the 1990s.¹⁴

Looking at net benefits, the results presented in Table 5 (last column) are shown in Graph 2. It shows a clear ranking:

- Slovenia and Hungary form a first group of accession countries for which the net benefits of joining Euroland would be even higher than they are for Portugal, the country which is supposed to gain more from European monetary integration than all other reference countries. This is because the two accession countries outperform all other accession countries in terms of low costs and high benefits (the latter except of Estonia).
- For a second group of accession countries, the other countries from Accession Group I and the Slovak Republic, the net benefits are still higher than for Spain and Greece.

¹⁴ For a comparative analysis of the specific transition problems in Estonia, see Schweickert (1995).

Graph 2 — Optimality of Fixing Euro Exchange Rates for Accession and Reference Countries



Source: Table 5.

- For the other countries from Accession Group II, the net benefits are significantly lower than for Greece but still higher than for Ireland.
- Only Bulgaria shows lower net benefits than Ireland.

The interpretation of these results has to consider two qualifications. First, the low level of net benefits in the case of Ireland in comparison to the other reference countries reflects relatively high costs. This fact suggests a closer look and the meaning of costs. Costs which are determined by the high degree of asymmetry between the Irish and the European business cycles may have to be interpreted in a differentiated way. The asymmetry is due to the close ties to the United Kingdom and the strong ties to the United States which both are not part of Euroland. Obviously, this has not hindered Ireland to become the star

performer in Euroland. Second, and in the same vein, the optimality of a currency area may be endogenous. It has been argued in recent papers (Rose 2000; Frankel/Rose 2000) that monetary integration even outperforms trade integration with respect to its impact on regional trade and synchronizing business cycles. Hence, the optimality of the currency area may not be a precondition for a successful fixing of the bilateral exchange rates but the fixing of exchange rates may pave the way towards an optimum currency area. This implies, in turn, that the results presented above are biased against the accession countries and in the favour of the reference countries because the former group does not yet profit from membership in a strong currency area. Hence, the gains from monetary integration are even higher for the accession countries.

IV. Summary and Policy Conclusions

The quantitative analysis of the comparative advantages of integrating accession countries into EMU or at least fixing their exchange rates against the Euro leads to quite plausible results.

- Generally, the Accession Group I performs better than the Accession Group II with respect to both convergence and optimality. This holds especially for Slovenia as well as for Hungary and Estonia.
- The comparison between Accession Group I and the Reference Group, however, depends on whether it is based on convergence or on optimality.

Adopting a broader concept of convergence, i.e. complementing the Maastricht criteria with criteria considering institutional and capital market aspects, shows that even Accession Group I fails to achieve the standards set by the Reference Group. On the contrary, all countries forming Accession Group I reveal a better performance than the average of the Reference Group if comparative advantages are defined according to optimality criteria derived from OCA theory. Moreover, only one country, Bulgaria, performs worse with respect to optimality than Ireland.

The general conclusion is that the demand of accession countries for entry into EMU can be supported by looking at the net benefits from monetary integration. The more serious problem is a lack of convergence which could imply serious risks during the transition towards monetary union. This holds especially for the Accession Group II. The possibility to enter EMS II as soon as accession to the EU is finalized does not help in this respect. With its wide bands and low support profile, it is actually a dirty block floating regime. Hence, accession countries have to target both exchange rates and inflation rates in a kind of muddling through strategy whereas fixing the exchange rate has been shown to constitute a reasonable strategy for most of them.

If shortening the waiting period for an evaluation of the exchange rate policy is excluded because of political considerations, an alternative would be to improve the support provided by the EMS II by allowing the accession countries to enter

as soon as possible, i.e. before entry into the EU. Additionally, countries which already pass the Maastricht criteria on inflation, interest rates, and public debt could be allowed to enter a regime with narrow bands. This could also help to smooth the integration path of those accession countries which successfully implemented Currency Boards.

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Table A1— Weights of Important Partner Countries' Currencies^a

	Bulgaria	Czech Rep.	Estonia	Latvia	Lithuania	Poland	Romania	Slovak Rep.	Slovenia	Hungary	Greece	Ireland	Portugal	Spain
USA	21.61	14.83	11.88	11.41	17.77	18.71	30.45	16.83	14.27	15.22	19.75	23.58	10.36	13.98
Germany	17.81	36.36	13.60	20.18	21.26	32.16	21.82	29.69	27.73	34.71	23.52	15.86	22.61	18.84
Austria	1.90	5.23	0.70	0.97	0.77	1.69	1.74	4.90	6.21	7.31	1.09	0.48	0.98	0.88
Belgium-Lux.	1.65	2.36	1.66	1.99	1.77	2.78	0.67	1.96	2.00	2.46	2.20	3.45	4.70	2.80
Denmark	0.63	0.70	3.28	4.25	3.45	1.98	0.29	0.44	0.71	0.48	0.99	0.82	1.53	0.69
Finland	0.48	0.70	17.46	5.67	1.74	1.07	0.19	0.53	0.36	0.61	0.71	0.63	0.66	0.35
France	7.37	6.21	4.49	5.02	7.35	9.60	8.52	5.73	12.00	6.72	10.58	8.99	15.86	22.27
Ireland	0.21	0.36	0.37	0.52	0.39	0.37	0.16	0.25	0.28	0.45	0.47	0.26	0.47	0.53
Italy	9.64	4.68	2.26	3.01	4.09	6.52	11.78	6.05	13.95	5.48	12.57	2.97	4.04	9.26
Netherlands	1.79	2.25	2.34	3.08	1.95	3.18	1.55	1.90	1.93	2.53	3.74	3.54	4.81	3.42
Portugal	0.34	0.25	0.20	0.14	0.13	0.23	0.14	0.15	0.19	0.33	0.41	0.38	0.00	9.33
Spain	2.01	1.41	0.66	0.91	1.22	1.81	0.79	1.09	1.59	1.49	2.99	2.07	15.42	0.00
Sweden	0.75	1.26	10.95	7.59	2.67	2.13	0.57	0.83	1.03	0.90	1.47	1.37	1.95	1.11
EMU+	44.57	61.77	57.96	53.33	46.81	63.54	48.21	53.52	67.98	63.47	60.74	40.82	73.03	69.47
UK	5.98	5.65	6.43	10.92	7.42	7.30	4.97	3.74	4.84	5.69	10.57	26.86	13.56	11.15
Japan	6.75	4.73	6.32	4.50	8.41	6.19	13.74	5.94	5.15	12.27	8.94	8.74	3.05	5.40
Russia	9.96	3.71	11.44	11.20	15.72	4.26	2.63	4.66	2.06	3.35				
Greece	6.81													
Turkey	4.33													
Poland		3.97						3.48						
Slovak Rep.		5.35												
Latvia			3.29											
Lithuania			2.67	5.36										
Estonia				3.29										
Ukraine					3.87									
Czech Rep.								11.82						
Croatia									5.69					

^a All those countries have been considered to be important which at least claim 5 percent of either export or import schemes of accession and reference countries respectively.

Source: IMF (a; b), World Bank (2000b); own calculations.