Economic Integration, Uncertainty, and Trade – The European Experience

by

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Abstract

In monetary unions of the European type the reduction in exchange rate uncertainty is not able to explain the differences in the economic performance of member countries. It is shown that traditionally unstable countries like Portugal and Ireland benefit significantly from a decrease in inflation and interest rate uncertainty while traditionally stable countries do not. The reduction in political uncertainty defined as the probability to become a full member of the monetary union contributes to a more stable development in inflation and interest rates in accession countries. For countries outside the monetary union the perspective to join shortens the adjustment period available for structural economic reforms.

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I. Introduction

Globalized markets, the revolution in technology, and the instantaneous availability of information from all corners of the world have increased the speed of economic integration. In particular, the pressure of currency consolidation has caused integration processes in Latin America and in Europe resulting in unilateral dollarization (Ecuador) or multilateral euroization (Europe), respectively (Kopits (2002)). These integration processes have far reaching effects on the domestic monetary and real economic developments as well as on the international relations of the countries affected, depending on the specific forms integration processes take place. In Europe a Maastricht-type integration was adopted leading to the introduction of a new common currency for all EU-members and to the removal of the former national currencies after a specific qualification procedure. This is in sharp contrast to a unilateral dollarization consisting in the complete substitution of the home currency by a strong foreign money like the dollar so that the latter serves as legal tender money inside the dollarized country. Primarily Maastricht-type integration completely changes the monetary sectors of all members of the monetary union. Naturally, this is of far reaching importance for all real macroeconomic developments like investment, ex- and imports, consumption, and government budgets (Alexander/von Furstenberg (2000)).

The present paper deals with the relation between economic integration, real output, and international trade. Maastricht-type integration requires basic changes in the monetary and fiscal sectors of all member countries even before its final implementation in order to fulfil the qualification criteria. Former unstable countries must bring down inflation rates and budgets deficits. National monetary and exchange rate policies are no longer possible and lose their roles to fight national economic slowdowns or to smooth asymmetric shocks. Establishing a single common market increases competition between the member countries and changes the competitiveness of national industries requiring adjustments in the structure of the production and distribution processes.

It is obvious that the substantial changes described above have a strong influence on the volume of international trade flows both between the member states and against the countries outside the monetary union, the direction of these flows, the types of international trade (inter- versus intra-industry), and the relative prices of export and
import goods. A huge bulk of literature has emerged analysing different economic aspects at the beginning, during and at the end of a Maastricht-type integration process ranging from the discussion about the qualification criteria, necessary adjustment procedures in the labour markets and fiscal systems, stabilization requirements up to the constitution and monetary policy of the new common central bank and the role of the member countries in the global trade and financial system (Giovannini/Mayer (1990), Checchini (1992), De Grauwe (1994), Siebert (1997), Beetsma/Bovenberg (2001)).

The present paper is focussed on the following specific aspect of the integration process: How is international trade influenced by changes in uncertainties occurring as a consequence of a Maastricht-type integration? In particular, three aspects have to be distinguished: (1) uncertainty about exchange rate movements, (2) uncertainty about inflation and interest rates and (3) political uncertainty defined as the probability of not becoming a full member of the monetary union. In order to evaluate the influence uncertainty exerts on international trade as a result of a Maastricht-type integration process the above three aspects should to be discussed together.

The paper, therefore, is organized as follows: Chapter II analyses the relation between exchange rate uncertainty and trade during the European integration period, which is the most obvious channel of influence. By definition, a monetary union with a common currency completely and permanently eliminates exchange rate uncertainties between the member states and thus stimulates international trade within the union. Questions arise about the quantitative effects of this trade increase and about the losers and winners.

A second important shift in uncertainty is related to inflation and interest rates: In order to fulfil the Maastricht criteria formerly unstable economies have to bring down inflation with the consequence of substantial falls in nominal interest rates. If this development is accompanied by decreasing uncertainty about future inflation and interest rates investment and output will be stimulated with far reaching consequences for international trade. This aspect is discussed in Chapter III.

Chapter IV analyses the effect on trade due to changes in political uncertainties during a Maastricht-type integration process. The final success of the stabilization efforts in traditionally unstable countries crucially depends on the probability of becoming a full
member of the monetary union. If there is a realistic chance not to be accepted because of not fulfilled requirements the developments of investment, output and international trade will be influenced dramatically. In Chapter V a few consequences of a Maastricht-type integration process for countries outside the monetary union are discussed. The last Chapter VI tries to draw some basic conclusions.

The agenda described above makes clear that the focus of the paper is not to give a survey about the theoretical discussion of all issues involved. We will concentrate on some consequences from empirical facts observed during the European integration. This might be of great interest for all future monetary integration processes in other parts of the world.

II. Economic Integration and Trade – The Problem of Exchange Rate Uncertainty

According to Rose (2004, p. 101) the effects of currency union on trade can be summarized as follows: (a) the hypothesis that there is no effect of currency union on trade can be rejected, (b) currency union approximately doubles trade, and (c) the estimates are heterogeneous and not consistently tied to features of the studies\(^1\). If we look to the effects on trade coming from a reduction in exchange rate volatility as a consequence of a currency union the enormous positive increase in the trade volume cannot be explained completely. In contrary, the effects of exchange rate uncertainty on trade are sometimes of uncertain direction and depend on model structures and estimation techniques.

While some theoretical models suggest that an increase in exchange rate volatility depresses trade others show uncertain or even positive effects. Clark (1973) and Hooper/Kohlhagen (1978) analyse the export or import decisions of risk averse firms. The only source of uncertainty are changes in the nominal exchange rate affecting export receipts and/or import expenditures. Firms are not diversified and hedging of foreign exchange rate risk is limited or absent so that exchange rate volatility directly affects the firms’ profits. These models conclude that an increase in exchange rate uncertainty makes firms reduce trade. However, risk aversion is not a prerequisite for deriving a negative effect of
exchange rate volatility on trade. Assuming irreversible investment decisions Demers (1991) shows that exchange rate uncertainty has a negative effect on trade even if the firm is considered to be risk-neutral.

De Grauwe (1988) points out that risk aversion is not sufficient to produce a negative relationship between exchange rate volatility and trade. He yields ambiguous results depending on the degree of risk aversion. For a low level of risk aversion exports rise with increasing nominal exchange rate volatility while a high degree leads to a negative relationship. If forward markets are introduced into standard models exchange rate volatility only affects the hedging decision but has no effect on trade (Ethier (1973), Baron (1976)). However, Viaene/de Vries (1992) show that exchange rate volatility can affect trade in a model with perfect forward markets through its effects on the forward rate. The direction of this effect depends on the trade balance. While the early trade models focus on nominal exchange rates Cushman (1983) studies the effects of real exchange rate uncertainty and derives a negative influence on the trade volume.

A more recent literature drops the assumption that a firm will be restricted by its current investment, production, export, or import decisions which have to be taken before exchange rate uncertainty is resolved. If firms are allowed to adjust later exchange rate volatility even can have a positive impact on profits because firms can take advantage of higher profit opportunities offered by good realizations of the exchange rate. In order to derive the overall effect of exchange rate volatility on trade this positive ‘income’ effect has to be compared to the negative ‘substitution’ effect of an increase in exchange rate volatility under risk aversion (De Grauwe (2003)). Franke (1991) models the export decision of a firm operating under monopolistic competition with exports depending on the real exchange rate. He also assumes that the firm has to incur entry and exit costs when starting or stopping to export. The effect of real exchange rate uncertainty on profits depends on the curvature of the cash flow function. If it is convex in the real exchange rate, higher exchange rate volatility makes the firm enter the export market at a lower rate and leave it at a lower rate as well. Sercu/Uppal (2003) develop a general equilibrium model in which exchange rate volatility is caused by various structural economic shocks. They show an ambiguous effect on trade depending on the underlying source of exchange rate volatility.
A deeper look at the empirical literature shows that the evidence for the impact of exchange rate volatility on trade corresponds quite well with the theoretical considerations. While the overwhelming part of the literature results in significant negative effects we can also find studies revealing insignificant influences or significant effects in both directions. It should be noticed that the numerous empirical studies diverge from each other in many respects: Nominal as well as real exchange rates are used, bilateral and effective rates are analysed, uncertainty is measured by ex post exchange rate volatility as well as statistically generated volatility forecasts. The studies use aggregated or disaggregated trade figures and consider either short run or long run horizons for different countries or groups of countries.

While Cushman (1983), Akhtar/Spence-Hilton (1984), Gotur (1985), Perée/Steinherr (1989), Bini-Smaghi (1991), Grobar (1993), Arize (1995a, 1995b), and Sauer/Bohara (2001) find clear negative effects of exchange rate volatility on trade the evidence in Hooper/Kohlhagen (1978), Bailey/Tavlas/Ulan (1996), and McKenzie (1998) indicates ambiguous or insignificant effects. Of special interest is an empirical study presented by de Nardis/Vicarelli (2002) who try to explain the trade increase after the introduction of EMU by three different effects: the effect of (eliminated) exchange rate volatility, the effect of the introduction of the EMU, and the effect due to other integration policies. Their estimates for a dynamic version of the gravity equation clearly show a negative relationship between trade and the eliminated exchange rate volatility. The introduction of EMU per se had only a small impact on trade between its members. Most of the increase can be attributed to other integration policies adapted before the introduction.

To sum up we can first conclude that the trade increase measured by Rose can only partly be explained by a reduction in uncertainty about exchange rates. As an important second point it comes out that a Maastricht-type integration process leads to a boost in trade activities mainly before the final introduction of a common currency because exchange rate uncertainty is reduced to insignificant levels far before EMU finally was established.

In order to analyse the issue of winners and losers as a result of a Maastricht-type integration it is helpful to distinguish between traditionally stable and unstable countries. For decades countries like Germany and Netherlands have been confronted with very low inflation and interest rates while, for example, Italy, Spain, and Portugal suffered from
sometimes two digit inflation rates. As a consequence the German DM and the Dutch
Guilder frequently were revaluated. From the beginning of the EMS in 1979 eleven Lira
devaluations against the DM occurred reaching from 2 % in Sept. 1979 to 8.8 % in Oct.
1981. Even in Sept. 1992 the Lira was devaluated by 7 %. The DM-value of 1000 Lire
went down from 2.187 to 1.0101 during the time period 1979 to 1992. The DM also was
revalued against French Franc (FF) (6 times between 1987 with the highest individual rate
of 10.6 % in June 1982) with the consequence of a decrease in the DM-value of 100 FF
from 43.299 in 1979 to 29.816 in 1987.

All realignments were the results of political decisions among the member countries in
order to reduce tensions within the EMS. For German exporters they are equivalent to a
tax on German goods lowering the international competitiveness of the German export
industry. As the law of one price only holds for tradable goods so that differences in
national inflation rates mainly are the result of price increases of national products and not
of goods traded in free international markets a Maastricht-type integration process and the
final introduction of a common currency supports the German export industry. Since 1992
no realignment took place and the DM, the FF and the Lira were converted into the Euro
with their relative values of 1992.

The empirical experience for Germany is quite striking: Since 1995 after the disturbances
of the German reunification the surplus of the German trade balance against the EU
member countries increased from 31.7 billion $ in 1995 to 72.96 billion $ in 2003 though
Germany was confronted with serious growth problems. At the same time the trade
balance surplus against the other European countries went down from 4.2 billion $ in
1995 to 3.4 billion $ in 2003 and the trade deficit against Asian countries increased from –
7.7 billion $ in 1995 to –9.1 billion $ in 2003. An increase in the trade balance surplus
only could be observed against the US (from 4.96 billion $ in 1995 to 22.4 billion $ in
2003) mainly because of the substantial increase in the value of the Dollar.

To sum up there are solid theoretical and empirical proofs for the fact that a Maastricht-
type integration process is in favour of the export industries in countries traditionally
known as stable because these industries are not longer ‘taxed’ by realignments. Inside a
monetary union export industries in formerly unstable countries lose their advantage of
increasing competitiveness coming from devaluations in their weak home currencies in the past.

III. Economic Integration and Trade – Inflation and Interest Rate Uncertainty

The elimination of exchange rate risks among the member countries is not the only important risk reduction coming along with a monetary union of the Maastricht-type. An EMU integration process requires stability efforts in many fields long before the final introduction of the common currency. In particular, countries have to bring down inflation rates to a level similar to the rate of the most stable countries. As a consequence inflationary expectations and then nominal interest rates decrease provided that stabilization policies are regarded as credible and permanent. If this decrease in inflation and nominal interest rates reduces volatility (Gwartney/Lawson/Holcombe (2000), Gwartney/Schuler/Stein (2001, pp. 189, 196)) uncertainty about future nominal and real interest rates is diminished, too. From the literature we know that this has a strong influence on the behaviour of investors (see Pindyck (1991, pp. 1111-1112) or Ingersoll/Ross (1998)): For every investor the discounted future income stream from his investment expenditure is uncertain and must exceed the cost of investment. With uncertainty over future cash flows volatile interest rates will make investments only profitable when the real interest rate is lower than the internal rate of return making the net present value zero. In addition, the difference between the rate of return and the interest rate increases with interest rate uncertainty.

This implies that despite of decreasing real interest rates investors prefer not to invest but to postpone their expenditure when uncertainties about future interest rates rise. On the contrary, growing real rates may be accompanied by rising investment expenditure when uncertainty goes down (Alexander/Loef (2003, pp. 447-448)).

The development of inflation is one major source of uncertainty about the real value of expected future cash flows as well as expected real interest rates. In times of high inflation it is more difficult for investors to determine the profitability of their expenditure, particularly in the long run. Inflation also undermines the role of relative prices in signalling relative scarcity leading to lower expected real values of cash flows with a negative impact on investment expenditure. According to Pindyck (1991, p. 1141) it is
more important for stimulating investment to follow a stable and credible economic policy than a lower the level of interest rates.

The process of monetary integration in Europe clearly demonstrates the empirical relevance of the theoretical considerations briefly outlined above: Maastricht-type qualification required a strict stability orientation, which was extremely difficult for countries traditionally known as unstable (Portugal, Ireland). Bringing down inflation after long periods of instability is normally accompanied by an increase in real interest rates because the stabilization policy is treated as transitory and non-credible. On the other side gains from stability resulting in a significant reduction in uncertainty about price and interest rate developments are highest in formally unstable economies.

Figures 1, 2, and 3 show the crucial macroeconomic variables during the whole integration period (1979 – 2000) for Germany – traditionally known as stable – and Ireland and Portugal known as countries with high and volatile inflation rates before the European monetary integration started.\(^4\) In Portugal inflation rates remained high and volatile up to 1986, then were brought down to about 10 % in 1987, remained on that level until 1992 and finally were reduced gradually to levels below 5 % after 1995. Nominal interest rates remained very high until 1992 and then went down gradually. As a consequence real interest rates went up from sometimes negative levels – a clear sign for inflationary surprises – to 10 % in the first half of the 90s. In the second half of the 90s real interest rates gradually went down after it had become obvious that Portugal would have an increasing chance to become a full member of EMU from the beginning. Uncertainty about real interest rates – measured as the one step ahead forecast error – first decreased significantly between 1996 and 1998 and went down again in 1996/97.

The experience in Ireland was lightly different: Inflation was brought down relatively quickly in the period 1982 to 1984 to levels around 5 %. Despite of this fact nominal interest rates went down only slowly – a clear sign of insufficient confidence about the persistence of the stabilization policy. A nominal interest rates reduction to levels around 5 % could not be reached before the second half of the 90ies with the consequence of rising real interest rates. Uncertainty about real interest rates – the crucial rate for investors – continuously went down during the whole integration process.
Figure 1: Inflation and Interest Rate Developments – Germany (1979-99)
Figure 2: Inflation and Interest Rate Developments – Portugal (1979-99)
Figure 3: Inflation and Interest Rate Developments – Ireland (1979-99)

- **Inflation Rates**
  - \( \pi_1 \)
  - \( \pi_2 \)

- **Expected Inflation Rates**
  - \( E[\pi_1] \)
  - \( E[\pi_2] \)

- **Nominal Interest Rates**
  - \( i_1 \)
  - \( i_2 \)

- **Expected Real Interest Rates**
  - \( r_1 \)
  - \( r_2 \)
  - \( r_3 \)

- **Conditional Standard Deviation of Expected Real Interest Rate**
The picture for Germany as a traditionally stable country looks quite different: No significant impact on the macroeconomic variables can be observed as a consequence of the European integration process. Inflation, nominal and real interest rates did not change in their long run levels from 1979 to 2000 and uncertainty about real interest rates is far more influenced by the German reunification than by the monetary integration. As a consequence no significant reduction in uncertainty about price and interest rate developments could influence the German economy in a positive way.

If we analyse the importance of this type of uncertainty reduction as a consequence of a Maastricht-type economic integration for countries formerly known as unstable on one side and countries with a history of stability on the other side a short look to the literature is of great value. When the EMU project started many economists expected a superior performance in countries like Germany. In addition to the far more painful stabilization processes in high inflation countries where more basic reforms were necessary (Giavazzi/Spaventa (1990), Walters (1986)) and to the comparative advantage of countries with hard currencies not being subject to revaluations of the home currency after the introduction of a monetary union two other arguments are discussed in favour of traditionally stable countries: (a) In addition to the legal basis for EMU the Maastricht Treaty consists of a variety of agreements to harmonize European standards in social and environmental fields. In general, this implies that underdeveloped, unstable countries with low standards are confronted with substantial increases in their cost of production in order to fulfil the new requirements. Highly regulated economies like Germany with social and environmental standards far above the required levels are pushed into a relatively better position (Vaubel (1992, pp. 44-45). (b) A single currency in Europe will have important implications for the behaviour of trade unions usually fighting for an equalization of wages. According to their philosophy ‘the same work should be paid the same money’. After the introduction of a common currency like the Euro it becomes obvious to everybody that a Portuguese worker earns only about 40 % of its German counterpart though he has the same position and qualification. It is highly probable that trade unions in a Europe with a single currency will try to improve the situation of their weakest members, an experience everybody could observe after the German reunification. As a consequence, wages will not be flexible downwards and will not be an appropriate absorber of negative shocks in weak countries. On the contrary the pressure for higher
wages will be highest in the weak low wage countries (Dohse/Krieger-Boden (1998); Siebert (1997)).

The empirical evidence is in sharp contrast to the expected developments. Formerly unstable countries like Ireland and Portugal showed a far better real performance in output, export and import growth. While the average yearly real GDP-growth for the period 1980 – 1985 was nearly the same in Germany (1.13 %), Portugal (1.53 %), and Ireland (1.05 %) the picture was different for the period 1995 – 2000, the last five years of the integration process. During that period average really GDP-growth in Ireland reached an outstanding value of 9.58 %, Portugal followed with 3.33 % and Germany only reached 1.77 %. Table 1 also shows that export and import growth during the integration period was very high in Portugal and Ireland in the second half of the 80s and the second half of the 90s. It is further obvious that the high output growth is accompanied by high growth rates of domestic investment expenditure. In the second half of the 80s and 90s Portugal and Ireland were confronted with a boom in investment expenditure with sometimes two digit growth rates. High investment growth especially stimulates exports because the domestic capital stock becomes more productive and domestic goods and services are more competitive in the world markets.

If we compare these empirical observations with the messages from Figures 1, 2, and 3 it becomes obvious that output and trade growth were very high in periods of reductions in the uncertainty about expected real interest rates. Another important finding is that output, investment and international trade growth were very high even in the period of increasing and high levels of real interest rates but simultaneous and dramatic reductions in uncertainty.5

To sum up we can conclude that during European monetary integration formerly unstable countries realized substantial gains from a reduction in uncertainty about price and interest rate developments provided they effectively established a permanent and credible anti-inflationary policy in order to be qualified for EMU. This real gain from reduced uncertainty cannot be observed in formerly stable countries like Germany. A last point refers to the situation after the final introduction of the Euro (2000 – 2003 in Table 1): GDP, investment, export and import growth show a similar development in Germany, Portugal and Ireland. Only real GDP-growth is very high (but decreasing) in Ireland. The
### Table 1: Macroeconomic Variables during the European Monetary Integration Process*

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<td>1,1</td>
<td>-0,3</td>
<td>-0,9</td>
<td></td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>8,1</td>
<td>10,8</td>
<td>8,7</td>
<td>11,1</td>
<td>9,9</td>
<td>6,0</td>
<td>6,1</td>
<td>3,6</td>
<td></td>
</tr>
<tr>
<td>Gross Fixed Cap. Invest.</td>
<td>17,4</td>
<td>18,0</td>
<td>16,3</td>
<td>15,5</td>
<td>7,1</td>
<td>-1,8</td>
<td>3,1</td>
<td>3,6</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>12,2</td>
<td>17,4</td>
<td>22,0</td>
<td>15,2</td>
<td>20,4</td>
<td>8,5</td>
<td>5,7</td>
<td>-0,9</td>
<td></td>
</tr>
<tr>
<td>Imports</td>
<td>12,5</td>
<td>16,8</td>
<td>26,1</td>
<td>12,1</td>
<td>21,3</td>
<td>6,7</td>
<td>3,4</td>
<td>-2,3</td>
<td></td>
</tr>
</tbody>
</table>

* Source: OECD Economic Outlook, various issues.
differences in the real performances between the two groups of countries tend to be smaller after the final introduction of the common currency.

IV. Aspects of Political Uncertainties

During a Maastricht-type integration process political uncertainty plays a crucial role in a very specific sense: For originally unstable countries it is not clear whether they will fulfil the Maastricht criteria and be accepted as a full member of the monetary union from the beginning or not. The economic situation of these countries before the integration period can be characterized by high and volatile inflation rates and unsound fiscal policy with high deficits often financed by money creation. All attempts to stabilize the economy have been not successful. Inflationary surprises occurred making real interest rates negative from time to time. The currency was frequently devaluated and the banking systems as well as the capital markets were insufficient.

When the integration periods starts the announced stabilization policy is not regarded as credible from the beginning because transactors are sceptical about the staying power of monetary and fiscal authorities. Even when decreasing levels and volatilities of inflation and interest rates are observed they will not be treated as permanent. As long as the fear exists that the stabilization efforts will be reduced when the country is confronted with an economic slowdown inflationary expectations and nominal interest rates will remain high with the consequence that real interest rates will go up. Therefore, political uncertainty defined as the probability of becoming a full member of the monetary union plays a crucial role for investors, exporters and other transactors (Alexander/Loef (2003)).

Naturally this type of uncertainty is neglectable in countries traditionally known as stable. For all other countries it goes down only when it becomes clear that (-) the Maastricht criteria are fulfilled, (-) the definite political will to join the monetary union prevails in the accession country and when (-) it becomes clear that the other member countries will accept the accession. The economic consequences of such a political uncertainty can be demonstrated by a comparison between Portugal and Greece: In Fig. 4 we can see that in both countries inflation rates were brought down mainly during the 80s and during the first half of the 90s. This reduction in inflation was more successful in Portugal because in the second half of the 90s Portuguese inflation rates were below 5 % while in Greece.
Figure 4: Inflation and Interest Rate Developments in Greece and Portugal

- Inflation Rates - Greece
- Inflation Rate - Portugal
- Conditional Standard Deviation of Expected Real Interest Rates - Greece
- Conditional Standard Deviation of Expected Real Interest Rates - Portugal
- Expected Real Interest Rates - Greece
- Expected Real Interest Rates - Portugal
they remained around 10% until 1997. As a consequence Portugal was expected to become a full member of the EMU starting in January 1999 and it became clear that Greece could not be accepted from the beginning. This implies that the political uncertainty defined above was far higher in Greece than in Portugal. If we look to the conditional standard deviations of expected real interest rates – our measure of interest rate uncertainty – we can see that there are no big differences between the Greek and Portuguese developments: Uncertainty went down drastically in both countries during the 80ies.

What is completely different in the economic development in Greece and Portugal are the expected real interest rates. In Portugal they went up to a peak around 1992 and then went down to levels under 5%. This development corresponds to the theoretical considerations and the empirical findings discussed above: In the beginning the stabilization process is not regarded as permanent and credible resulting in rising real interest rates. When it becomes obvious that stabilization will be permanent and the country will become a full member of the EMU inflationary expectations go down and – as a consequence – nominal interest rates decline as well.

The development in Greece is typical for a country with a high uncertainty of being accepted as a full member of a monetary union: Though inflation and uncertainty about real interest rates went down expected real interest rates remained at very high levels until 2000 which is a clear sign for high inflationary expectations. As Greece was not regarded to be accepted as a full member from the beginning and as the date of its entrance was unclear even at the time of the final introduction of EMU many transactors obviously were not certain about a successful accession of Greece. As a result inflationary expectations stayed very high and made the stabilization policy more painful.

The question arises: How can such painful effects of stabilization policies be reduced or avoided? The most important contribution to less painful consequences of a stabilization policy is a strict anti-inflationary monetary and a sound fiscal policy in the country itself. Another support may come from binding international treaties containing the exact time schedule for and the definite will to promote and accept the country as a full member of the monetary union. Treaties of this type increase the probability that a country will be a member of EMU and reduce uncertainty in the sense analysed above.
V. Implications for other countries

Naturally countries outside the monetary union are affected by a monetary integration process of the Maastricht-type in many respects. It is beyond the scope of this paper to discuss all these aspects completely and in detail. From the European experience one development is of very great importance: A process of monetary integration significantly changes the types of international trade (inter- versus intra-industry) between union members and other countries (Sanguinetti, Traistaru and Martincus (2004)). At the beginning of the integration process many companies from the core highly developed states like Germany and France increased the shift of labor-intensive production to the peripheral European countries like Portugal and Ireland. Wages in these countries and social as well as environmental requirements were far below the central European standards keeping down the cost of labor-intensive production (Carstensens and Toubal (2003), Hunya (2002)). When these peripheral countries were considered to become full members of EMU many companies shifted their plants to countries outside EU (North Africa, Eastern Europe). The cost of production in the peripheral EU countries were expected to rise because (a) all the social and environmental requirements laid down in the Maastricht treaty had to be fulfilled and because (b) the fear increased that confronted with a single currency in all member countries the labor unions would fight for an equalization of wages leading to wage increases far above the productivity developments in countries like Portugal or Ireland. In addition, no further devaluation of the national currencies in these countries is expected.

As a consequence we can conclude that for all countries planning to join a monetary union in a European way it is necessary to change the domestic production process in the following way: Labor-intensive industries with comparatively low wages should be substituted in favour of high quality production. The accession to a monetary union with all its further requirements in social, environmental, etc. aspects increases the speed of necessary adjustment in the national production structures of accession countries.7

VI. Conclusions

The main conclusions from our previous analysis can be summarized as follows. A Maastricht-type integration process has strong influences on the volumes, directions, and types of international trade as well as on the relative prices of export and import goods. The reduction in uncertainty plays a crucial role in affecting real economic variables like
output and trade. The elimination of exchange rate risk increases the trade volume substantially and supports international companies in the member states traditionally known as stable because they are not further subject to the “revaluation tax” imposed on their hard currency.

During the integration process formerly unstable countries massively gain from a strict stability orientation: In order to fulfil the Maastricht criteria they had to bring down inflation. Finally, nominal interest rates and uncertainty about the future development of inflation and interest rates went down, too. Apparently this reduction in uncertainty about real interest rates significantly increased growth domestic investment, real output, and trade in the former unstable countries.

A Maastricht-type integration process creates political uncertainty in a very specific sense: For investors and other transactors the probability for a country not to become a full member of the monetary union is of crucial importance. To reduce this uncertainty formerly unstable countries must follow a strict stabilization policy. Binding international treaties containing the exact time schedule for and the definite will to promote and accept the country as a full member of the monetary union can help to diminish the negative effects of this uncertainty consisting in high real interest rates during the integration period.

For countries outside the monetary union an integration process of the European type has many implications and changes significantly the types of international trade (in- versus intra-industry). Possible full members are not considered to be low wage countries in the long run. Therefore, future accession countries are less attractive for direct investments in labor intensive industries. For all countries planning to join a monetary union the pressure to change the production process in favour of high-quality production and services is increased.
VII. References

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Perée, E. and A. Steinherr (1989), Exchange Rate Uncertainty and Foreign Trade, European Economic Review 33, 1241-64.


Endnotes

1 Nearly identical results are obtained by Fielding and Shields (2005) for the monetary integration in West Africa.


3 Belke and Gros (2002) analyze the effects of both exchange rate and interest rate variability on employment and investment for Mercosur countries.

4 The figures are constructed in the following way: Starting from the well-known Fisher equation \( i = r + E[\pi] \) we used long term government bond yields (\( i_1 \)) and long-term lending rates (\( i_2 \)) for the nominal interest rate. The inflation rate \( \pi \) is defined as the annual growth rate of the CPI (\( \pi_1 \)) and of labor costs (\( \pi_2 \)). It is obvious that \( \pi_1 \) is an appropriate deflator for private households and \( \pi_2 \) for domestic firms. Expected inflation rates \( E[\pi_1] \) and \( E[\pi_2] \) are static forecasts derived from an AR(1)-process in the first differences of \( \pi_1 \) and \( \pi_2 \). Only between UK and Ireland a cointegration equation was found and appropriately used to build an error-correction-model. For the expected real interest rate \( r \) we then obtain four terms because \( i_1 \) and \( i_2 \) are deflated by \( E[\pi_1] \) and \( E[\pi_2] \).

Apparently \( r_1 \) is crucial for the demand for government bonds (=supply of capital to the government). For example, a household deciding to include government bonds in its portfolio will compare their real returns with those of other assets by subtracting the expected CPI-inflation rate \( E[\pi_1] \) from the government bond yield \( i_1 \). The expected real return \( r_2 \) is obviously relevant for the demand for all bonds issued by firms. Domestic firms confronted with investment decisions will mainly look at \( r_3 \) because the long term lending rate \( i_2 \) and the expected changes in labor costs determine their cost of capital. Therefore, \( r_3 \) is the relevant expected real rate for the supply of corporate bonds (=demand for capital by firms). Correspondingly \( r_4 \) should be the relevant rate for the supply of government bonds. However, in reality government deficits are not very sensitive to expected real interest rates: Governments normally fix their expenditures, calculate their tax- and other incomes and finance the resulting deficit by issuing bonds. As a consequence \( r_4 \) is not an important determinant for the supply of government bonds and we exclude it from our further analysis. We adopt GARCH-procedures and computed the conditional standard deviations of \( r_1, r_2, \) and
$r_3 (\sigma_{r1}, \sigma_{r2}, \sigma_{r3})$ as an appropriate measure of uncertainty. For a more detailed description see Alexander/Loef (2001).

5 Similar results are obtained when we adopt the above analysis to the economic developments in Central and East European countries on their way to EU first and EMU later (see Alexander/Loef (2003)).

6 Brada, Kutan and Yigit (2004) analyze the effects of political instability on foreign direct investment in Eastern Europe.

7 Angeloni, Flad and Mongelli (2005, p. 17-20) intensively discuss the cyclical properties and their development in East European accession countries.