Linkages of New EU Country Currencies to the Euro

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1. Introduction

Ten Central and East European countries[1] have participated in the European Union (EU) on May 1, 2004. The new EU member countries have been proceeding with economic integration with the EU member countries. The economic integration should be accelerated after they joined the EU. The countries that have strong economic relations tend to have willingness of stabilizing their exchange rates. Economic agents will face trade barriers such as foreign exchange costs and foreign exchange risks after countries remove custom barriers. At first, the monetary authorities will tend to stabilize the exchange rates each other. In the case of the new EU member countries might have already stabilized the exchange rates against the euro in a process of joining the EU. They will stabilize the exchange rates after they join the EU. In addition, the new EU member countries are trying to join the euro area also in several years. The countries have to satisfy the convergence conditions for joining the euro area. One of the convergence conditions is to stabilize their exchange rates in terms of the euro.

In this paper we investigate how the new EU countries have conducted the exchange rate policy against the euro in the process of joining the EU and how strong linkage their currencies have with the euro. For the purpose, we use the methodology of Frankel and Wei (1994) for sub-sample quarterly periods from 1999:Q1 to 2004:Q3 to the euro after a part of EU countries introduced the euro in 1999. We conduct the empirical analysis for not only all of the new EU member countries but also future EU member candidates (Rumania, Bulgaria, Croatia, and Turkey) and the three countries (Denmark, Sweden, and the United Kingdom) that have been already the EU members but have not yet joined the euro area.

2. Overviews of the East European currencies

We overview recent situations in Central and East European currencies before we identify what kind of exchange rate systems have been *de facto* adopted in the countries. At first we outline major trends of Central and East European currencies. Figure 1a shows movements in monthly data of Central and East European currencies studied in this paper vis-à-vis the euro in a whole sample period from

[1] The new EU member countries include Poland, Czech, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania, Malta, and Cyprus.

December 1998 to September 2004.[2] It indicates that most of them are very stable against the euro except for the Turkish lira and the Romanian leu. For the former, the Turkish government is negotiating to enter the EU. For the latter, Romania is scheduled to enter the EU in 2007. Figure 1b shows movements in monthly data of the Central and East European currencies that have entered the EU since May 1, 2004. We find that most of them are fluctuating within a band of +/- 20 percents except for the Slovenian tolar and the Lithuanian lita. Especially the Estonian kroon and the Cyprus pound are moving within a very narrow band.

Next, we overview the countries' adopting exchange rate arrangements reported by the IMF. Table 1 shows their changes from December 1997 (before the starting of the euro) to June 2004 (immediately after the EU enlargement). In December 1997 a half of the sampled countries were reported to adopt the currency pegged arrangements while the rest of them were reported to adopt the managed floating and independently floating arrangements. In January 1999 when the euro has just started, some of currency pegging countries have moved to the currency board arrangement (the Estonian kroon, the Lithuanian lita, and the Bulgaria lev) and the other conventional fixed peg arrangements (the Maltese lira and the Latvian lat). Some of managed floating countries have set their crawling bands (within 2.25 percent for the Polish zloty and within 12.5 percents for the Hungarian forint). In December 2003, some of the managed floating countries have widen their band (within 15 percent for the Hungarian forint) or moved to independently floating (the Polish zloty and the Turkish lira). The fixed arrangement countries have not changed. In June 2004 when the EU has enlarged to 25 countries, there are no changes in their exchange rate arrangements. According to the report by the IMF, we can recognize that the Central and East European countries have been managing their exchange rates under their exchange rate arrangement.

The ERM II was established as a new Exchange Rate Mechanism to succeed the old European Monetary System (EMS) in order to maintain exchange rate stability between the euro and national currencies of non euro area countries.[3] Denmark and Greece initially participated in the ERM II while the UK did not join in the EMR II. Since Greece adopted the euro in January 2001, Denmark has been

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[2] We calculate every currency's index vis-à-vis the euro which equals to 1 on December 31, 1998 in order to compare their movement with each other.

[3] A central rate against the euro is defined for the currency of each country not participating in the euro area but participating in the exchange-rate mechanism if the country expresses a desire to participate in this system. There is one standard fluctuation band of 15% on either side of the central rate.

the only participant. The new member states that joined the European Union on May 1, 2004 will join the ERM II as their preparations for adopting the euro advance. On June 27, 2004, the Estonian kroon, the Lithuanian lita and the Slovenian tolar joined the ERM II. The levels of current fluctuation band are +/- 2.25% for Denmark and +/- 15% for Estonia, Lithuania and Slovenia. [4]

3. Methodology

According to the methodology of Frankel and Wei (1994) and Bénassy-Quéré and Coeuré (2000), we identify exchange rate regimes of Central and East European currencies through the estimation of an equation which relates the fluctuations of each East European currency to the fluctuation of three major currencies which include the euro, the US dollar and the Japanese yen as follows.

$$\dot{e}_{ikt} = a_0 + a_1\dot{e}_{Eurokt} + a_2\dot{e}_{USkt} + a_3\dot{e}_{Jpykt} + \varepsilon_t \qquad (1)$$

where $\dot{e}_{ik}$ is rates of change in the exchange rate of currency *i* against currency *k*.

In the above equation, the constant term a_0 is positive if the exchange rate of the relevant currency regularly depreciates (or is devalued) against the other currencies. The coefficients a_0, a_1, a_2 are interpreted as weights of the three major currencies in an implicit basket peg system which include the euro peg system if $a_1 = 1$.

According to the estimated coefficients, we can classify the relevant currencies into the three types of actual exchange rate regime as follows:

1. If none of the coefficient is significant, then the exchange rate system is identified as a floating system.
2. If the coefficient $a_1(a_2)$ does not significantly differ from unity whereas all others are not significant, then it is identified that the currency is pegged to the euro (the US dollar).
3. If various coefficients a_1, a_2, a_3 are significant and bound by zero and one, then the currency is pegged to a basket of the three major currencies.

While this method to identify the exchange rate regime is very simple to

[4] Please see Appendix about the ERM II countries.

understand, it causes the serious problem how to decide a numeraire currency k of anchor currencies. It should not be linked to each of anchor currencies. In the previous works, they used the Swiss francs, the Sterling pound, and the SDR as a numeraire currency.[5] We compare the correlation among each of the numeraire currency candidates and the three major currencies. Table 1 shows the results. Among the three numeraire currency candidates, the Sterling pound has the smallest correlation coefficient with all of the three major currencies. Accordingly, we choose the Sterling pound as a numeraire currency in the above regression equation.

Then we estimate the following equation for all of the new EU member country (Poland, Czech, Slovakia, Hungary, Slovenia, Estonia, Latvia, Lithuania, Malta, and Cyprus). In addition, we estimate it for potential participants into the EU (Rumania, Bulgaria, Croatia, and Turkey). Moreover, we estimate some non-euro area EU countries which include Denmark, Sweden, and the United Kingdom for our concern. We use the Canadian dollar as a numeraire currency to estimate the regression equation for the Sterling pound.

$$\Delta log\, e^{HOME/UK} = a_0 + a_1 \Delta log\, e^{EURO/UK} + a_2 \Delta log\, e^{USD/UK} + a_3 \Delta log\, e^{JPY/UK} + \varepsilon_t \qquad (2)$$

All foreign exchange data are downloaded from Datastream. The whole sample period is 1/1/1999 to 9/30/2004. We divide the whole sample period into some sub-sample quarterly periods and estimate the coefficients on the three major currencies for each of the sub-sample quarterly periods. The movements in the coefficients show how linkage of the currency to the three major currencies has been changing in the total sample period.[6] It implies how the monetary authorities have been changing their exchange rate policy over time.

4. Analytical Results

Table 3 to Table 19 shows the analytical results for the new EU country

[5] Takagi(1996) and others who analyzes the coefficients of Asian currencies use the Swiss francs, while Frankel et al., use a basket currencies as the numeraire (the SDR in Frankel and Wei, 1995; a basket of five major currencies weighted by GDPs in Frankel et al., 1999).
[6] If one of the estimated coefficients is significantly negative, we re-estimate the equation without them.

currencies, the potential participants in the EU, and the non-euro area EU country currencies. Figures 3 to 19 focus on the coefficient on the euro to summarize the regression results as shown in Tables 3 to 19. A solid line in the figures represents estimates of the coefficients for each quarter of the sample period. Broken lines represent estimates plus or minus 2 times standard deviations of the coefficients. A band between the two broken lines means a statistically significant interval at about 95%. From the analytical results, we describe the feature of each of the currencies as follows.

(1) New EU member countries

Polish zloty

Table 3 shows coefficients on the three major currencies for the Polish zloty. Coefficients on the euro and the US dollar are statistically significant in most of the sub-sample periods while figure 3 focuses on movements in coefficients on the euro. It means that the Polish zloty has been pegged to the euro and the US dollar. The coefficients on the US dollar were larger than the euro before the 3rd quarter of 2002. However, it has changed since the 2nd quarter of 2003. The coefficients on the euro have become larger than the US dollar (except the 4th quarter of 2003). In the 3rd quarter of 2004, the coefficients of the euro and the US dollar are 85.7 percent and 21.8 percent, respectively. The levels of adjusted R-squared are mostly lower than 50 percent while it was 97.4 percent in the 3rd quarter of 2004. It means that there should be other factors in explaining the movements in the Polish zloty.

Czech koruna

Table 4 shows movements in the coefficient on the three major currencies for the Czech koruna while figure 4 focuses on movements in coefficients on the euro. It is remarkable feature for the Czech koruna that all of the coefficients on the euro are statistically significant. Most of the coefficients are higher than 80 percent. The coefficients on the US dollar are statistically significant in several periods. Especially in 2002, the coefficients on the US dollar are statistically significant and the coefficients on the euro are lower than 90 percent. However, the coefficients on the euro have become close to unity recently. The levels of adjusted R-squared are not stable through the sample period. It might have an implication that the exchange rate policy stance of the monetary authorities has been not stable. In the 3rd quarter of 2004, the coefficient on the euro is close to unity and the level of adjusted R-squared is 98.8 percent. It implies that the monetary authorities have changed their exchange rate policy to a euro peg system.

Slovak koruna

Table 5 shows movements in the coefficient on the three major currencies for the Slovak koruna while figure 5 focuses on movements in coefficients on the euro. Most of the coefficients on the euro are statistically significant and are above 50 percent except in the 1st quarter of 1999. The coefficients on the US dollar are statistically significant in several periods. From the 3rd quarter of 2001 to the 1st quarter of 2003, the coefficients are statistically significant and their levels were between 35 to 75 percent. However, only the coefficients on the euro have been statistically significant since the 2nd quarter of 2003. The coefficient is close to unity in the 2nd quarter of 2004. The levels of adjusted R-squared are below 50 percent except in the last period while it is 98.7% in the 3rd quarter of 2004. The recent higher level of the adjusted R-squared means that the monetary authorities have changed their exchange rate policy to a euro peg system.

Hungary forint

Table 6 shows movements in coefficients on the three major currencies for the Hungary forint while figure 6 focuses on movements in coefficients on the euro. The Hungary forint had had linkage to both the euro and the US dollar before the 4the quarter of 1999. The coefficients on the euro and the US dollar were almost 70 percent and 30 percent, respectively while the coefficient on the Japanese yen was statistically significant and 10percent in the 1st quarter of 2000. Then the coefficients on the euro have been close to unity since the 1st quarter of 2000. The coefficients on the US dollar are statistically significant in several periods. However, the Hungary forint has been pegged to only the euro since the 4th quarter of 2002. The levels of adjusted R-squared have been not stable over the sub-sample period. It means that the Hungarian monetary authorities have not had any stable stance of exchange rate policy. In the 3rd quarter of 2004, the coefficient of the euro is close to unity and the level of adjusted R-squared is very high.

Slovenia tolar

The Slovenian tolar has joined the ERM II with fluctuation band of +/- 15% on June 27, 2004. Table 7 shows movements in coefficients on the three major currencies for the Slovenia tolar while figure 7 focuses on movements in coefficients on the euro. The coefficients on the euro are statistically significant and close to unity since the 3rd quarter of 1999 although they were not statistically significant in the 1st and 2nd quarters of 1999. The coefficients on the US dollar were sometimes statistically significant especially in the 1st and 2nd quarters of 1999. The coefficients were from 36% to 38% in the 1st and 2nd quarters of 1999. The coefficients on the euro have become almost close to unity and the levels of the adjusted R-squared also are close to 100 percent since the 2nd quarter of 2003. It means that the Slovenia tolar has been strictly pegged to the euro since the 2nd quarter of 2003.

<u>Estonian kroon</u>

The Estonian kroon has joined the ERM II with fluctuation band of +/- 15% on June 27, 2004. Table 8 shows movement in coefficients on the three major currencies for the Estonian kroon while figure 8 focuses on movements in coefficients on the euro. The feature of the Estonian kroon is that the coefficients on the euro are statistically significant and close to unity in all of the sub-sample periods and that levels of adjusted R-squared are nearly 100 percent in most of the sub-sample periods. The coefficients on the US dollar also are statistically significant in some periods although they are very small. The coefficients on the euro have been unity and the levels of the adjusted R-squared have been 100 percent since the 4th quarter of 2003. It means that the Estonian kroon has perfectly pegged to the Euro from the 4th quarter of 2003.

<u>Latvian lat</u>

Table 9 shows movements in coefficients on the three major currencies for the Latvian lat while figure 9 focuses on movements in coefficients on the euro. The remarkable feature of the Latvian lat is that it has been pegged to a currency basket of the three major currencies in all of the sub-sample periods. It means that the monetary authorities in Latvia have adopted a currency basket peg system. However, the coefficients on the three major currencies have been changing over time in the sample period. The coefficients on the euro had been below 25 percent and those of the US dollar were mostly above 50 percent before the 2nd quarter of 2001. The coefficients on the euro have become around 30 percent while those on the US dollar have become below 50 percent since the 3rd quarter of 2001. The coefficients on the Japanese yen are kept at around 10 to 15 percents in all of the sub-sample periods. The levels of adjusted R-squared are above 90 percent. In the 3rd quarter of 2004, the coefficients of the euro, the US dollar and the Japanese yen are 45 percent, 40 percent and 15 percent, respectively.

Lithuanian lita

The Lithuanian lita has joined the ERM II with fluctuation band of +/- 15% on June 27, 2004. Table 10 shows movements in coefficients on the three major currencies for the Lithuanian lita while figure 10 focuses on movements in coefficients on the euro. The interesting feature of the Lithuanian lita is that it has clearly changed from the US dollar peg to the euro peg in the 1st and 2nd quarters of 2002. The monetary authorities had almost perfectly pegged the Lithuanian lita to the US dollar before the 4th quarter of 2001. The coefficients on the US dollar were nearly unity and the levels of the adjusted R-square were 100 percents. They pegged it to a currency basket of the three major currencies in the 1st quarter of 2002. The coefficients on the euro, the US dollar and the Japanese yen were 33 percents, 39 percents and 13 percents, respectively. After the 2nd quarter of 2002, the coefficients on the euro have been nearly unity. Levels of the adjusted R-squared have been near 100%. It means that the Lithuanian monetary authorities have adopted the euro peg system since the 2nd quarter of 2002.

Maltaese lira

Table 11 shows movements in coefficient on the three major currencies for the Maltese lira while figure 11 focuses on movements in coefficients on the euro. The feature of the Maltese lira is that it had linkages to both the euro and the US dollar in all of the sub-sample periods. However, the coefficients on the two major currencies have changed over time. The coefficients on the euro had been around 50 percent and those on the US dollar had been mostly above 20 percent before the 3rd quarter of 2002. The coefficients on the euro have increased above 60 percent while those of the US dollar have become around 10 percent since the 4th quarter of 2003. The levels of the adjusted R-square are close to 100 percent in the 2nd quarter of 2004. In the 3rd quarter of 2004 the coefficient of the euro is 86 percent which is the highest in the whole periods while the coefficient of the US dollar is 13 percent.

Cyprus pound

Table 12 shows movement s in coefficients on the three major currencies for the Cyprus pound while figure 12 focuses on movements in coefficients on the euro. The Cyprus pound had had linkage to both the euro and the US dollar before the 2nd quarter of 2000. Coefficients on the euro and the US dollar are almost 95 percent and 5 percent, respectively. However, only the coefficients on the euro have been statistically significant and nearly unity since the 1st quarter of 2001 except the 2nd quarter of 2002. The levels of adjusted R-square are constantly close to 100 percent over time. It means that the monetary authorities in Cyprus have adopted the euro peg system since the 2nd quarter of 2002.

(2) Potential participants into the EU

Rumanian liew

Table 13 shows movements in coefficients on the three major currencies for the Rumanian leu while figure 13 focuses on movements in coefficients on the euro. The coefficients on the US dollar had been close to unity before the 4th quarter of 2002. However since the 2nd quarter of 2003 the Rumanian leu has had linkages to both the euro and the US dollar. The coefficients have been around 80 percents and around 20 percents, respectively. In the 3rd quarter of 2004, the Romanian leu has linkage to the euro only and the coefficient on the euro is close to unity. The level of the adjusted R-squared is close to 100 percents. It means that the monetary authorities have adopted the euro peg system in 2004.

Bulgarian lev

Table 14 shows movements in coefficients on the major the three currencies for the Bulgarian lev while figure 14 focuses on movements in coefficients on the euro. The feature of the Bulgarian lev is that the coefficients on the euro are statistically significant and close to unity in all of the sub-sample periods. The levels of adjusted R-squared are close to 100 percent in most of the sub-sample periods. The coefficients on the US dollar and the Japanese yen are statistically significant in several periods although they are very small.

Croatian kuna

Table 15 shows movements in coefficients on the three major currencies for the Croatian kuna while figure 15 focuses on movements in coefficients on the euro. Similar to the Bulgarian lev, the coefficients on the euro are statistically significant and mostly close to unity. Levels of adjusted R-squared were above 80 percent except in some of sub-sample periods. The coefficients on the US dollar were significant and their weights were around 10 percents in some periods. In the 4th quarter of 2004, the coefficient on the euro is unity and the levels of the adjusted r-squared are 100 percent. It means that the monetary authorities in Croatia have adopted the euro peg system.

Turkish lira

Table 16 shows movements in coefficients on the three major currencies for the Turkish lira while figure 16 focuses on movements in coefficients on the euro. The Turkish lira had had linkages to both the euro and the US dollar before the 4th quarter of 2000. The coefficients on the euro and the US dollar are from 50 percent: 50 percent to 40 percent: 60 percent in 1999 and 2000. Levels of the adjusted R-squared in the period were relatively high. However, the Turkish lira had linkages only to the US dollar since the 2nd quarter of 2001 although the adjusted R-squared decreased to very low levels. The Turkish lira has linkages to both the euro and the US dollar since the 4th quarter of 2003. The Turkish monetary authorities have started to peg to a currency basket of both the euro and the US dollar again while it pegged to the basket of three major currencies only in the 2nd quarter of 2004. It seems that the exchange rate policy in Turkey has not been stable yet.

(3) Non-euro area EU countries

Danish krone

Denmark has joined the ERM II with fluctuation band are +/- 2.25% since 1999. Table 17 shows movements in coefficients on the three major currencies for the Danish krone while figure 17 focuses on movements in coefficients on the euro. The feature of the Danish krone is that the coefficients on the euro are statistically significant and close to unity. The levels of adjusted R-squared are nearly 100 percent in most of the sub-sample periods. The coefficients on the US dollar are statistically significant in some of the sub-sample periods although they are very small. It means that the Danish monetary authorities have actually pegged the Danish krone to the euro in the whole sample period under the EMR II.

Swedish krona

Table 18 shows movements in coefficients on the three major currencies for the Swedish krona while figure 18 focuses on movements in coefficients on the euro. The coefficients on the euro are significant in the whole sample period and are in a wide range between 46 percent to unity. On one hand, the coefficients on the US dollar are statistically significant in a half of the whole period and are in a rage between 20 and 40 percents. The coefficients on the Japanese yen are statistically significant in some sub-sample periods although they are around 10 percents. The levels of the adjusted R-squared are between 40 and 70 percents while it is 99.6 percents in the 3rd quarter of 2004. These indicate that the Swedish monetary authorities had partially pegged the Swedish krona to the euro before 2004 and have perfectly pegged it to in 2004..

Sterling pound

Table 19 shows movements in coefficients on the three major currencies for the Sterling pound while figure 19 focuses on movements in coefficients on the euro. The coefficients on the US dollar are statistically significant in the whole sample period. The coefficients are between 20 and 60 percents. The coefficients on the euro are statistically significant in several sub-sample periods. Most of the coefficients on the Japanese yen are significantly negative and we get rid of the significantly negative coefficients on the Japanese yen from the estimated regression equation as we explained in the previous section. The coefficients on the euro have been larger than those on the US dollar since the 4th quarter of 2001. It means that the Sterling pound has been affected by the euro more strongly than the US dollar. However, the linkages are relatively weaker because the levels of the adjusted R-squared are small in comparison with the other countries studied here.

(4) Summary

As we described above, we recognized that there are some differences in the exchange rate systems among the non-euro-area countries in Europe. We summarize our analytical results for new EU member countries in Table 19. According to the estimated coefficients on equation (2), we classify four types of exchange rate system according to Bénassy-Quéré and Coeuré (2000). The four types of exchange rate system are classified as follows:

A. Rigid peg to a single currency

   Only one of the estimated coefficients is statistically significant and its estimate is unity.

B. Partial peg to a single currency

   Only one of the estimated coefficients is statistically significant and its estimate is smaller than unity.

C. Peg to a currency basket

   Some of the estimated coefficients are statistically significant and a sum of the coefficients is close to unity. There are four types of currency basket.

(a) Peg to a currency basket of US dollar/euro

The home currency is pegged to a currency basket of the US dollar and the euro. The coefficient on the US dollar is larger than that on the euro.

(b) Peg to a currency basket of euro/US dollar

The home currency is pegged to a currency basket of the euro and the US dollar. The coefficient on the euro is larger than that on the US dollar.

(c) Peg to a currency basket of euro/Japanese yen

The home currency is pegged to a currency basket of the euro and the Japanese yen. The coefficient on the euro is larger than that on the Japanese yen.

(d) Peg to a currency basket of euro/US dollar/Japanese yen

The home currency is pegged to a currency basket of the euro, the US dollar, and the Japanese yen.

D. Free floating

None of the estimated coefficients are statistically significant.

Table 20 shows the changes in exchange rate systems of the new EU member countries during a period from 1999 to 2004. In 1999 a share of the peg to a currency basket of euro/US dollar is 30 percents, which is the highest among exchange rate systems in 1999. The partial peg to the euro has the second share which is 22.5 percents. Total of the shares of the peg to currency baskets is 62.5 percents. These show that most of the countries adopted a partial peg to the euro or a peg to currency baskets in 1999. A share of the unitary peg to the US dollar is 10 percents while a share of unitary peg to the euro is zero.

However, a share of the rigid peg to the euro has started to increase gradually since 2000. It was 10 percents in 2000 and it becomes 30 percents in 2004. On one hand, a share of the rigid peg to the US dollar has become to zero since 2002. A share of the partial peg to the euro also has increased from 22.5 percents in 1999 to 40 percents in 2004. On the other hand, shares of the peg to currency baskets have decreased from 62.5 percents in 1999 to 30 percents in 2004.

These results indicate that the new EU member countries have changed their exchange rate systems to the rigid peg to the euro or the partial peg to the euro from the rigid peg to the US dollar or the partial peg to the US dollar and the peg to currency basket. The changes were made immediately before the participation into the EU in May 2004. Especially Estonia, Lithuania, and Slovenia before their currencies joined the ERM II in June 2004.

As for the potential participants into the EU, the monetary authorities in Rumania, Bulgaria, and Croatia have been adopted a rigid peg to the euro while the authorities in Rumania had been adopting a rigid peg to the US dollar before 2002. On one hand, the monetary authorities in Turkey have adopted a partial peg to a currency basket of the euro and the US dollar recently.

Lastly, we can find a rigid peg to the euro for the Danish krone and the Swedish krona among the non-euro area EU countries. On one hand, we can find somewhat linkages to the euro and the US dollar.

5. Conclusion

The new EU member countries have changed their exchange rate system to the euro peg system or have increased a weight on the euro in their currency basket peg system in recent years. It reflects a fact that they have joined the EU and have begun to prepare for joining the ERM II and, in turn, joining the euro area in the near future.

The stronger linkage of the new EU country currencies and the EU candidate currencies to the euro might have adverse effects on their economy under the current situation where the euro has been appreciating against the US dollar. The appreciation of the euro against the US dollar should weaken their international price competitiveness of their domestic products while is should improve their terms of trade. We should investigate what effects the new EU member countries and the EU member candidate countries will have on their economy after they have changed the exchange rate system to prepare for their joining the euro area in the near future.

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Table 1. The East European countries' reported Exchange Rate Arrangements to IMF

	as of Dec 1997	as of Jan 1999	as of Dec 2003	as of June 2004
Polish zloty	Managed floating	Exchange rates within crawling bands(2.25%)	Independently floating	Independently floating
Hungarian forint	Managed floating	Exchange rates within crawling bands(12.5%)	Pegged exchange rates within horizontal bands (15%)	Pegged exchange rates within horizontal bands (15%)
Czech koruna	Managed floating	Managed floating *	Managed floating *	Managed floating *
Slovak koruna	Currency pegged to other composite	Managed floating *	Managed floating *	Managed floating *
Slovenian tolar	Managed floating	Managed floating *	Exchange rates within crawling bands(unannounced)	Pegged exchange rates within horizontal bands (15%)
Cyprus pound	Currency pegged to other composite	Pegged exchange rates within horizontal bands	Pegged exchange rates within horizontal bands	Pegged exchange rates within horizontal bands
Maltese lira	Currency pegged to other composite	Other conventional fixed peg arrangements	Other conventional fixed peg arrangements	Other conventional fixed peg arrangements
Estonian kroon	Currency pegged to DM	Currency board arrangements	Currency board arrangements	Currency board arrangements
Latvian lat	Currency pegged to SDR	Other conventional fixed peg arrangements	Other conventional fixed peg arrangements	Other conventional fixed peg arrangements
Lithuanian lita	Currency pegged to USD	Currency board arrangements	Currency board arrangements	Currency board arrangements
Bulgaria lev	Currency pegged to DM	Currency board arrangements	Currency board arrangements	Currency board arrangements
Turkish lira	Managed floating	Crawing pegs	Independently floating	Independently floating
Croatian kuna	Managed floating	Pegged exchange rates	Managed floating *	Managed floating *
Rumanian leu	Independently floating	Managed floating *	Exchange rates within crawling bands(unannounced)	Exchange rates within crawling bands(unannounced)

Source: International Financial Statistics, IMF

Managed floating * means Monaged floating with no predetermined path for the exchange rate.

Table 2. Correlation matrix between 3 major currencies and the candidates of numeraire*

	US dollar	euro	Japanese yen
US dollar	1.000	0.377	0.374
euro	0.377	1.000	0.326
Japanese yen	0.374	0.326	1.000
Swiss francs*	0.303	0.839	0.397
SDR*	0.781	0.816	0.597
Sterling pound*	0.537	0.713	0.364

Data: All foreign exchange data are from Datastream. Sample period is 1/1/1999 to 9/30/2004.

1. To calculate each correlation, we use the Canadian dollar as a numeraire.

Appendix: EU countries who join ERM II

Country	Date to join	Central rate (for 1 euro)	Fluctuation band
Denmark	1-Jan-99	7.46038	+/-2.25%
Estonia	27-Jun-04	15.6466	+/-15%
Lithuania	27-Jun-04	3.4528	+/-15%
Slovenia	27-Jun-04	239.64	+/-15%

Source: the portal site of the European Union

Table 3. POLISH ZLOTY

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0014 (0.0009)	0.6988 *** (0.2201)	0.9239 ** (0.2335)	-0.0257 (0.1009)	1.9589	0.3344
2Q 1999	-0.0008 * (0.0004)	0.5987 *** (0.0904)	0.6102 *** (0.1171)	-0.0413 (0.0620)	1.9549	0.5711
3Q 1999	0.0008 (0.0007)	0.1073 (0.1428)	0.7081 *** (0.1560)	-0.0455 (0.0855)	1.6158	0.2434
4Q 1999	-0.0004 (0.0007)	0.6557 (0.1809)	0.7287 *** (0.1932)	-0.0928 (0.1079)	1.8806	0.2717
1Q 2000	-0.0004 (0.0005)	0.5438 ** (0.0998)	0.5442 *** (0.1311)	0.0572 (0.0691)	2.0130	0.5068
2Q 2000	0.0006 (0.0012)	0.3624 ** (0.1697)	0.4433 * (0.2542)	-0.1309 (0.1589)	2.1960	0.1065
3Q 2000	0.0002 (0.0006)	0.3264 *** (0.1071)	0.7173 *** (0.1989)	-0.0689 (0.1290)	1.7200	0.3737
4Q 2000	-0.0010 * (0.0006)	0.5259 *** (0.0950)	0.7238 *** (0.1011)	- -	2.0048	0.6376
1Q 2001	-0.0010 (0.0006)	0.6376 *** (0.0944)	0.1720 (0.1327)	0.0783 (0.0895)	2.2825	0.4362
2Q 2001	-0.0005 (0.0005)	0.3389 *** (0.1073)	0.5009 *** (0.1452)	0.0115 (0.0891)	1.7726	0.3158
3Q 2001	0.0005 (0.0011)	0.0081 (0.2308)	1.4146 *** (0.2756)	-0.0124 (0.1823)	1.2905	0.2939
4Q 2001	-0.0013 ** (0.0005)	0.3555 ** (0.1373)	0.6521 *** (0.1317)	0.1127 (0.1349)	2.1998	0.4727
1Q 2002	0.0005 (0.0007)	0.2349 (0.1753)	0.6146 *** (0.2441)	0.1008 (0.1164)	1.9120	0.1205
2Q 2002	0.0003 (0.0005)	0.4616 *** (0.1522)	0.8870 *** (0.1415)	- -	1.9567	0.3779
3Q 2002	0.0003 (0.0006)	0.3449 * (0.1925)	0.7074 *** (0.1188)	-0.0577 (0.1291)	1.8973	0.3443
4Q 2002	-0.0006 (0.0005)	0.5253 *** (0.1643)	0.3157 ** (0.1284)	0.0509 (0.0976)	2.0533	0.3115
1Q 2003	0.0011 (0.0007)	0.1422 (0.2127)	0.6017 *** (0.1721)	0.0469 (0.1693)	2.1491	0.2137
2Q 2003	-0.0002 (0.0008)	0.5965 *** (0.1663)	0.2264 (0.1592)	- -	2.4895	0.2256
3Q 2003	0.0003 (0.0005)	0.8133 *** (0.1191)	0.1029 (0.1316)	-0.0266 (0.1089)	1.8924	0.4198
4Q 2003	-0.0005 (0.0005)	0.5952 *** (0.1319)	0.7561 *** (0.1563)	0.1716 (0.1049)	2.1968	0.5175
1Q 2004	0.0005 (0.0006)	0.3651 ** (0.1529)	0.3368 *** (0.1086)	-0.1172 (0.1153)	1.5819	0.2243
2Q 2004	-0.0009 (0.0005)	0.6747 *** (0.1173)	0.0960 (0.0900)	0.1454 * (0.0847)	2.1606	0.4750
3Q 2004	-0.0004 (0.0005)	0.8573 *** (0.1135)	0.2183 * (0.1129)	-0.0769 (0.1251)	2.2249	0.9739

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 4. CZECH KORUNA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0014 (0.0007)	1.0501 *** (0.1629)	0.2383 (0.1728)	-0.0042 (0.0747)	1.5151	0.4408
2Q 1999	-0.0009 ** (0.0003)	0.9368 *** (0.0798)	-0.0485 (0.1034)	0.0159 (0.0548)	1.9682	0.6948
3Q 1999	-0.0003 (0.0004)	0.9190 ** (0.0785)	0.0773 (0.0858)	-0.0076 (0.0470)	2.0979	0.6863
4Q 1999	0.0004 (0.0005)	0.7640 *** (0.1285)	-0.0312 (0.1372)	0.1302 * (0.0766)	2.2393	0.3374
1Q 2000	0.0001 (0.0004)	0.8979 *** (0.0680)	0.1959 ** (0.0893)	0.0094 (0.0471)	2.1860	0.7469
2Q 2000	-0.0003 (0.0003)	0.9346 *** (0.0481)	-0.0009 (0.0721)	0.0359 (0.0450)	1.8055	0.8707
3Q 2000	0.0001 (0.0002)	0.9156 *** (0.0437)	0.0327 (0.0812)	0.0385 (0.0527)	2.3055	0.8735
4Q 2000	-0.0002 (0.0004)	0.8423 *** (0.0732)	0.3061 *** (0.1133)	-0.0713 (0.0965)	2.0619	0.7362
1Q 2001	-0.0002 (0.0004)	0.9087 *** (0.0562)	0.1059 (0.0790)	0.0441 (0.0533)	2.2318	0.8088
2Q 2001	-0.0003 (0.0003)	0.9244 *** (0.0508)	0.0564 (0.0688)	-0.0073 (0.0422)	2.2934	0.8405
3Q 2001	-0.0002 (0.0003)	0.8329 *** (0.0634)	0.1751 ** (0.0757)	0.0390 (0.0501)	1.9955	0.7414
4Q 2001	-0.0008 (0.0006)	0.9277 *** (0.1621)	0.1680 (0.1555)	-0.1405 (0.1592)	2.2693	0.3306
1Q 2002	-0.0003 (0.0004)	0.9378 *** (0.1095)	0.1606 (0.1524)	-0.0070 (0.0727)	2.0999	0.5487
2Q 2002	-0.0013 (0.0007)	0.8843 ** (0.2263)	0.2275 * (0.1937)	-0.1389 (0.1338)	1.9302	0.1677
3Q 2002	0.0007 (0.0007)	0.5877 *** (0.2048)	0.1530 * (0.1264)	-0.0650 (0.1374)	1.7446	0.0895
4Q 2002	0.0004 (0.0004)	0.7065 * (0.1410)	0.1402 * (0.1102)	-0.0898 (0.0838)	1.6913	0.3354
1Q 2003	0.0002 (0.0005)	0.8835 ** (0.1561)	0.1026 (0.1263)	0.0117 (0.1242)	2.2119	0.4352
2Q 2003	-0.0002 (0.0003)	0.9987 *** (0.0706)	0.0455 (0.0677)	0.0032 (0.0654)	1.9942	0.8333
3Q 2003	0.0002 (0.0005)	0.7814 *** (0.1042)	- -	0.0577 (0.0774)	1.6464	0.4663
4Q 2003	0.0001 (0.0004)	0.9894 *** (0.0908)	0.0952 (0.1077)	-0.0785 (0.0723)	1.7949	0.6650
1Q 2004	0.0003 (0.0005)	0.9617 *** (0.1288)	-0.0709 (0.0915)	0.1012 (0.0971)	2.2353	0.4970
2Q 2004	-0.0005 (0.0005)	1.0170 *** (0.1131)	-0.0386 (0.0868)	0.0157 (0.0817)	2.0706	0.5911
3Q 2004	-0.0001 (0.0004)	1.0424 *** (0.0695)	-0.0479 (0.0697)	- -	1.8501	0.9882

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 5. SLOVAK KORUNA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0019 ** (0.0008)	0.3585 * (0.1820)	0.6905 *** (0.1930)	0.0871 (0.0834)	2.3290	0.2790
2Q 1999	0.0003 (0.0009)	0.7650 *** (0.2174)	0.3433 (0.2817)	0.2613 * (0.1492)	2.5899	0.2616
3Q 1999	-0.0006 (0.0007)	0.5522 *** (0.1386)	0.2509 * (0.1514)	0.1453 * (0.0830)	3.0259	0.2839
4Q 1999	-0.0003 (0.0005)	0.8844 *** (0.1385)	0.0099 (0.1480)	-0.0457 (0.0826)	2.4441	0.3821
1Q 2000	0.0000 (0.0006)	0.7520 *** (0.1163)	0.0078 (0.1527)	0.1117 (0.0805)	2.3774	0.3980
2Q 2000	0.0001 (0.0008)	0.5361 *** (0.1213)	0.1054 (0.1817)	-0.1239 (0.1135)	2.4542	0.2368
3Q 2000	0.0005 (0.0006)	0.7872 *** (0.1088)	0.0451 (0.2020)	0.2208 * (0.1311)	2.3953	0.4795
4Q 2000	-0.0005 (0.0008)	0.6606 *** (0.1340)	0.2065 (0.2075)	0.3046 * (0.1768)	2.7100	0.4619
1Q 2001	0.0001 (0.0006)	0.6137 *** (0.0895)	0.1022 (0.1258)	0.0092 (0.0849)	2.4174	0.4234
2Q 2001	-0.0005 (0.0005)	0.6975 *** (0.1051)	0.2284 (0.1422)	-0.0761 (0.0872)	2.5198	0.4103
3Q 2001	-0.0001 (0.0012)	0.8563 *** (0.2520)	0.7497 ** (0.3009)	-0.1400 (0.1990)	2.9076	0.1555
4Q 2001	-0.0002 (0.0006)	0.6383 *** (0.1537)	0.3670 ** (0.1474)	-0.0061 (0.1510)	2.7052	0.3054
1Q 2002	-0.0002 (0.0006)	0.8625 *** (0.1384)	0.5241 *** (0.1927)	-0.0022 (0.0919)	2.8140	0.4444
2Q 2002	-0.0005 (0.0007)	0.2007 (0.2441)	0.4756 ** (0.2089)	-0.0750 (0.1443)	2.5176	0.0330
3Q 2002	-0.0009 (0.0007)	1.0143 *** (0.2162)	0.4394 *** (0.1334)	-0.0330 (0.1450)	2.3386	0.3132
4Q 2002	-0.0003 (0.0005)	0.8598 *** (0.1755)	0.3684 ** (0.1419)	- -	2.2395	0.4123
1Q 2003	0.0000 (0.0008)	0.9559 *** (0.2343)	0.3506 * (0.1896)	-0.0792 (0.1866)	2.7563	0.2876
2Q 2003	-0.0001 (0.0007)	0.9479 *** (0.1437)	0.1463 (0.1376)	- -	2.9227	0.4559
3Q 2003	-0.0001 (0.0006)	0.7324 *** (0.1321)	0.0286 (0.1460)	0.0327 (0.1209)	2.5607	0.3127
4Q 2003	-0.0002 (0.0005)	0.8019 *** (0.1279)	0.1532 (0.1516)	0.0996 (0.1017)	2.9295	0.4532
1Q 2004	-0.0001 (0.0009)	0.5301 (0.2310)	0.1445 (0.1640)	0.0711 (0.1742)	2.9139	0.1130
2Q 2004	-0.0001 (0.0005)	1.0474 *** (0.1238)	-0.0188 (0.0950)	-0.0358 (0.0894)	2.6999	0.5528
3Q 2004	0.0000 (0.0004)	0.8875 *** (0.0801)	0.0472 (0.0796)	0.0703 (0.0882)	2.5850	0.9870

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 6. HUNGARIAN FORINT

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0008 (0.0005)	0.5675 *** (0.1268)	0.6993 *** (0.1345)	0.1062 * (0.0581)	2.0337	0.5494
2Q 1999	-0.0001 (0.0002)	0.6226 *** (0.0481)	0.2888 *** (0.0623)	-0.0229 (0.0330)	2.2337	0.7745
3Q 1999	0.0003 (0.0001)	0.7159 *** (0.0296)	0.3045 *** (0.0323)	-0.0071 (0.0177)	1.7806	0.9231
4Q 1999	0.0001 (0.0001)	0.7120 *** (0.0320)	0.3183 *** (0.0341)	-0.0056 (0.0191)	2.2413	0.8990
1Q 2000	0.0002 (0.0001)	0.9649 *** (0.0274)	0.0435 (0.0359)	-0.0117 (0.0189)	2.2882	0.9521
2Q 2000	0.0001 (0.0002)	0.9921 *** (0.0246)	0.0242 (0.0327)	- -	2.5480	0.9666
3Q 2000	0.0002 (0.0001)	0.9874 *** (0.0139)	0.0065 (0.0257)	0.0134 (0.0167)	2.7821	0.9877
4Q 2000	0.0001 (0.0001)	0.9950 *** (0.0226)	0.0741 ** (0.0350)	-0.0146 (0.0298)	2.3673	0.9725
1Q 2001	0.0001 (0.0001)	1.0012 *** (0.0170)	-0.0142 (0.0239)	0.0212 (0.0161)	2.8507	0.9822
2Q 2001	-0.0014 *** (0.0005)	0.9813 ** (0.0962)	-0.1033 (0.1302)	-0.0147 (0.0798)	1.6409	0.6152
3Q 2001	0.0005 (0.0010)	1.0763 *** (0.2140)	0.5061 * (0.2554)	-0.1321 (0.1690)	1.6596	0.2664
4Q 2001	-0.0007 (0.0004)	0.6523 *** (0.1147)	0.2769 ** (0.1100)	0.0468 (0.1127)	2.1634	0.4397
1Q 2002	-0.0001 (0.0004)	0.8848 *** (0.0894)	0.0427 (0.1245)	0.0187 (0.0594)	2.0500	0.6135
2Q 2002	-0.0003 (0.0003)	0.9398 *** (0.1085)	0.2857 *** (0.0929)	-0.0888 (0.0642)	2.2392	0.5541
3Q 2002	-0.0001 (0.0005)	1.0387 *** (0.1381)	0.1709 ** (0.0852)	-0.0799 (0.0927)	1.7483	0.4790
4Q 2002	-0.0005 (0.0003)	0.9527 *** (0.1046)	0.0046 (0.0817)	0.0712 (0.0621)	1.7916	0.6522
1Q 2003	0.0006 (0.0007)	0.8287 *** (0.1983)	0.0421 (0.1604)	0.1042 (0.1578)	1.2861	0.3206
2Q 2003	0.0012 (0.0009)	1.0661 *** (0.2186)	0.0220 (0.2095)	-0.0410 (0.2023)	1.7685	0.3360
3Q 2003	-0.0006 (0.0004)	0.9105 *** (0.0987)	-0.0206 (0.1090)	0.0677 (0.0902)	1.7509	0.5702
4Q 2003	0.0005 (0.0009)	0.8916 *** (0.2206)	-0.1242 (0.2616)	0.2102 (0.1755)	2.1291	0.2592
1Q 2004	-0.0008 (0.0006)	0.9818 *** (0.1630)	0.0058 (0.1158)	0.0158 (0.1229)	1.9160	0.3723
2Q 2004	0.0001 (0.0005)	0.8797 *** (0.1148)	- -	0.1020 (0.0801)	1.7590	0.5371
3Q 2004	-0.0003 (0.0004)	0.9948 *** (0.0927)	0.0012 (0.0922)	-0.0171 (0.1021)	1.7413	0.9818

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2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 7. SLOVENIAN TOLAR

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0007	0.4134	0.3846 ***	-	2.7064	0.2829
	(0.0006)	(0.2861)	(0.1203)	-		
2Q 1999	0.0006	0.6525	0.3567 ***	-0.0365	2.7163	0.1623
	(0.0005)	(0.3487)	(0.1278)	(0.0735)		
3Q 1999	-0.0001	1.0741 ***	0.0939	-0.0296	2.8850	0.2214
	(0.0003)	(0.3590)	(0.0739)	(0.0369)		
4Q 1999	0.0003	0.9455 ***	0.0657 *	-	2.4434	0.4162
	(0.0002)	(0.1623)	(0.0371)	-		
1Q 2000	0.0003 ***	0.9822 ***	0.0128	-0.0068	2.2404	0.8763
	(0.0001)	(0.0474)	(0.0158)	(0.0080)		
2Q 2000	0.0003 *	0.9928 ***	-0.0348	0.0334	2.6592	0.7585
	(0.0002)	(0.0714)	(0.0404)	(0.0229)		
3Q 2000	0.0002	0.9177 ***	0.0006	-0.0134	2.9824	0.4784
	(0.0003)	(0.1245)	(0.0970)	(0.0522)		
4Q 2000	0.0003 ***	1.0154 ***	0.0048	-0.0076	2.8221	0.9096
	(0.0001)	(0.0408)	(0.0231)	(0.0143)		
1Q 2001	0.0002 *	0.9390 ***	-0.0144	0.0003	2.5204	0.8740
	(0.0001)	(0.0454)	(0.0240)	(0.0136)		
2Q 2001	0.0002	1.0390 ***	0.0217	0.0030	2.6738	0.7829
	(0.0001)	(0.0682)	(0.0286)	(0.0154)		
3Q 2001	0.0001	1.0202 ***	0.0026	0.0073	2.6871	0.9613
	(0.0001)	(0.0298)	(0.0229)	(0.0175)		
4Q 2001	-0.0001	1.0205 ***	0.0172	0.0063	2.5629	0.7720
	(0.0002)	(0.0926)	(0.0660)	(0.0440)		
1Q 2002	0.0003	1.3958 ***	0.0097	-0.0336	2.8269	0.4979
	(0.0003)	(0.1796)	(0.0947)	(0.0565)		
2Q 2002	0.0000	0.9418 ***	0.0147	-0.0190	0.9445	0.6368
	(0.0001)	(0.0972)	(0.0341)	(0.0268)		
3Q 2002	0.0002	1.0137 ***	-0.0409	0.0576	2.1785	0.6676
	(0.0002)	(0.1035)	(0.0463)	(0.0373)		
4Q 2002	0.0001	0.7802 ***	0.0582	0.0002	2.9523	0.3436
	(0.0002)	(0.1802)	(0.0687)	(0.0396)		
1Q 2003	-0.0001	0.4665	0.2467 *	-0.1348	2.5213	0.0731
	(0.0005)	(0.4131)	(0.1278)	(0.0881)		
2Q 2003	0.0001 ***	0.9825 ***	0.0106 **	-	2.2796	0.9921
	(0.0000)	(0.0121)	(0.0051)	-		
3Q 2003	0.0001 **	1.0091 ***	-0.0069	-0.0029	2.4420	0.9756
	(0.0000)	(0.0226)	(0.0149)	(0.0091)		
4Q 2003	0.0001 **	0.9797 ***	0.0148 ***	-	2.1434	0.9911
	(0.0000)	(0.0161)	(0.0053)	-		
1Q 2004	0.0001 **	0.9708 ***	0.0105	-0.0065	2.2423	0.9707
	(0.0000)	(0.0235)	(0.0126)	(0.0074)		
2Q 2004	0.0001 **	0.9789 ***	0.0080	-0.0036	2.4297	0.9842
	(0.0000)	(0.0202)	(0.0096)	(0.0062)		
3Q 2004	0.0000	0.9406 ***	0.0217	0.0067	3.1577	0.9327
	(0.0001)	(0.0442)	(0.0187)	(0.0120)		

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 8. ESTONIAN KROON

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0001 (0.0002)	0.9594 *** (0.0493)	0.0586 (0.0523)	-0.0262 (0.0226)	2.9420	0.8686
2Q 1999	0.0000 (0.0002)	0.9707 *** (0.0487)	- -	-0.0197 (0.0314)	2.8749	0.8673
3Q 1999	0.0001 (0.0002)	0.9880 *** (0.0327)	-0.0212 (0.0357)	0.0291 (0.0196)	2.9210	0.9355
4Q 1999	0.0001 (0.0002)	0.9564 *** (0.0520)	- -	0.0375 (0.0292)	2.9761	0.8388
1Q 2000	0.0000 (0.0001)	0.9852 *** (0.0134)	0.0368 ** (0.0176)	-0.0122 (0.0093)	2.9080	0.9886
2Q 2000	0.0000 (0.0001)	1.0221 *** (0.0133)	-0.0174 (0.0200)	-0.0040 (0.0125)	3.0534	0.9903
3Q 2000	0.0000 (0.0000)	1.0045 *** (0.0068)	0.0047 (0.0126)	-0.0128 (0.0082)	2.5836	0.9971
4Q 2000	0.0000 (0.0000)	0.9912 *** (0.0074)	-0.0182 (0.0114)	0.0084 (0.0097)	2.5832	0.9969
1Q 2001	0.0000 (0.0001)	1.0043 *** (0.0080)	0.0158 (0.0112)	-0.0056 (0.0076)	3.0030	0.9961
2Q 2001	0.0000 (0.0001)	0.9537 *** (0.0227)	0.0858 *** (0.0307)	-0.0194 (0.0188)	2.8553	0.9660
3Q 2001	0.0000 (0.0001)	1.0071 *** (0.0108)	0.0272 ** (0.0129)	-0.0013 (0.0085)	3.0229	0.9932
4Q 2001	0.0000 (0.0001)	1.0097 *** (0.0214)	-0.0252 (0.0206)	0.0058 (0.0211)	2.9495	0.9738
1Q 2002	0.0000 (0.0001)	0.9894 *** (0.0266)	-0.0358 (0.0370)	-0.0087 (0.0176)	3.0659	0.9572
2Q 2002	0.0000 (0.0001)	1.0107 *** (0.0263)	0.0057 (0.0225)	-0.0060 (0.0155)	2.8803	0.9688
3Q 2002	0.0000 (0.0001)	0.9502 *** (0.0324)	-0.0074 (0.0200)	0.0293 (0.0217)	2.9190	0.9429
4Q 2002	0.0000 (0.0001)	0.9951 *** (0.0237)	-0.0161 (0.0185)	0.0105 (0.0141)	3.1069	0.9731
1Q 2003	0.0000 (0.0001)	0.9942 *** (0.0384)	0.0025 (0.0311)	0.0285 (0.0306)	2.9919	0.9427
2Q 2003	0.0000 (0.0001)	0.9964 *** (0.0139)	-0.0010 (0.0133)	0.0084 (0.0129)	2.6663	0.9921
3Q 2003	0.0000 (0.0000)	0.9971 *** (0.0092)	0.0019 (0.0101)	-0.0037 (0.0084)	3.0040	0.9947
4Q 2003	0.0000 (0.0000)	0.9999 *** (0.0001)	0.0001 ** (0.0001)	- -	2.8381	1.0000
1Q 2004	0.0000 (0.0000)	1.0001 *** (0.0001)	0.0000 (0.0001)	0.0000 (0.0001)	3.0439	1.0000
2Q 2004	0.0000 (0.0000)	1.0000 *** (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	2.7235	1.0000
3Q 2004	0.0000 (0.0000)	1.0000 *** (0.0001)	0.0000 (0.0001)	-0.0001 (0.0001)	2.9769	1.0000

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 9. LATVIAN LAT

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0001 (0.0003)	0.2415 *** (0.0611)	0.5365 *** (0.0648)	0.1072 *** (0.0280)	1.9418	0.7111
2Q 1999	0.0001 (0.0002)	0.2404 *** (0.0381)	0.5751 *** (0.0493)	0.1081 *** (0.0261)	2.1109	0.8286
3Q 1999	0.0000 (0.0001)	0.2880 *** (0.0182)	0.4344 *** (0.0199)	0.1372 *** (0.0109)	1.9458	0.9539
4Q 1999	0.0000 (0.0001)	0.2319 *** (0.0387)	0.4663 *** (0.0413)	0.1229 *** (0.0231)	1.4898	0.7871
1Q 2000	-0.0001 (0.0002)	0.2369 *** (0.0351)	0.4688 *** (0.0461)	0.1698 *** (0.0243)	2.0165	0.8665
2Q 2000	0.0000 (0.0001)	0.2318 *** (0.0133)	0.5350 *** (0.0199)	0.1433 *** (0.0124)	1.8382	0.9749
3Q 2000	0.0001 * (0.0001)	0.2103 *** (0.0122)	0.5621 *** (0.0226)	0.1476 *** (0.0147)	2.2340	0.9831
4Q 2000	0.0001 (0.0001)	0.2193 *** (0.0151)	0.5104 *** (0.0235)	0.1769 *** (0.0200)	1.3621	0.9771
1Q 2001	-0.0001 (0.0001)	0.2464 *** (0.0171)	0.5443 *** (0.0241)	0.1002 *** (0.0162)	1.8448	0.9517
2Q 2001	-0.0001 (0.0001)	0.2496 *** (0.0203)	0.5470 *** (0.0274)	0.1206 *** (0.0168)	2.0748	0.9511
3Q 2001	0.0000 (0.0001)	0.2598 *** (0.0294)	0.4923 *** (0.0351)	0.1279 *** (0.0232)	1.9779	0.8451
4Q 2001	-0.0001 (0.0001)	0.2844 *** (0.0177)	0.4822 *** (0.0170)	0.1491 *** (0.0174)	1.7743	0.9738
1Q 2002	0.0000 (0.0001)	0.2907 *** (0.0361)	0.4849 *** (0.0502)	0.1053 *** (0.0239)	1.7739	0.7879
2Q 2002	0.0000 (0.0001)	0.3173 *** (0.0404)	0.4795 *** (0.0346)	0.0906 *** (0.0239)	1.6750	0.8152
3Q 2002	0.0000 (0.0001)	0.2910 *** (0.0305)	0.4636 *** (0.0188)	0.1230 *** (0.0205)	1.9284	0.9270
4Q 2002	-0.0001 (0.0001)	0.2712 *** (0.0426)	0.4750 *** (0.0333)	0.1464 *** (0.0253)	1.8413	0.8954
1Q 2003	0.0000 (0.0001)	0.3265 *** (0.0309)	0.4794 *** (0.0250)	0.1330 *** (0.0246)	1.8525	0.9443
2Q 2003	0.0000 (0.0001)	0.3374 *** (0.0212)	0.4549 *** (0.0203)	0.1123 *** (0.0197)	1.9996	0.9702
3Q 2003	0.0000 (0.0001)	0.3077 *** (0.0244)	0.4242 *** (0.0270)	0.1206 *** (0.0223)	2.3832	0.9287
4Q 2003	-0.0001 (0.0001)	0.3666 *** (0.0178)	0.4373 *** (0.0211)	0.1291 *** (0.0142)	2.0094	0.9593
1Q 2004	0.0000 (0.0000)	0.3444 *** (0.0128)	0.3878 *** (0.0091)	0.1253 *** (0.0096)	2.4541	0.9919
2Q 2004	0.0000 (0.0001)	0.3342 *** (0.0201)	0.3884 *** (0.0155)	0.1634 *** (0.0146)	2.2129	0.9709
3Q 2004	0.0001 (0.0001)	0.4514 *** (0.0183)	0.4052 *** (0.0182)	0.1498 *** (0.0202)	2.4713	0.9993

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 10. LITHUANIAN LITA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0000 (0.0000)	-0.0003 (0.0054)	1.0005 *** (0.0057)	0.0016 (0.0025)	2.6473	0.9982
2Q 1999	0.0000 (0.0000)	-0.0022 (0.0033)	0.9967 *** (0.0043)	0.0018 (0.0023)	2.0119	0.9990
3Q 1999	0.0000 (0.0000)	-0.0026 (0.0040)	0.9990 *** (0.0043)	-0.0017 (0.0024)	1.9920	0.9989
4Q 1999	0.0000 (0.0000)	-0.0032 (0.0038)	0.9976 *** (0.0040)	0.0004 (0.0023)	2.0491	0.9991
1Q 2000	0.0000 (0.0000)	-0.0001 (0.0039)	1.0013 *** (0.0041)	- -	2.3432	0.9989
2Q 2000	0.0000 (0.0000)	0.0020 (0.0023)	0.9973 *** (0.0034)	-0.0022 (0.0022)	1.9174	0.9995
3Q 2000	0.0000 (0.0000)	0.0029 (0.0025)	0.9972 *** (0.0046)	0.0015 (0.0030)	2.0963	0.9995
4Q 2000	0.0000 (0.0000)	-0.0012 (0.0035)	1.0089 *** (0.0054)	-0.0064 (0.0046)	2.4885	0.9992
1Q 2001	0.0000 (0.0000)	-0.0011 (0.0034)	0.9920 *** (0.0048)	0.0069 ** (0.0032)	2.2803	0.9990
2Q 2001	0.0000 (0.0000)	-0.0036 (0.0043)	1.0056 *** (0.0058)	-0.0030 (0.0035)	2.1373	0.9987
3Q 2001	0.0000 (0.0000)	0.0004 (0.0048)	1.0005 *** (0.0057)	-0.0015 (0.0038)	3.1490	0.9981
4Q 2001	0.0000 (0.0000)	0.0135 (0.0088)	0.9994 *** (0.0084)	-0.0040 (0.0086)	2.5538	0.9971
1Q 2002	-0.0003 (0.0003)	0.3305 *** (0.0638)	0.3885 *** (0.0889)	0.1285 *** (0.0424)	1.7047	0.5293
2Q 2002	0.0000 (0.0000)	0.9995 *** (0.0070)	0.0101 * (0.0060)	-0.0040 (0.0041)	2.7914	0.9977
3Q 2002	0.0000 (0.0000)	0.9949 *** (0.0075)	0.0012 (0.0046)	0.0019 (0.0050)	2.7784	0.9970
4Q 2002	0.0000 (0.0000)	0.9948 *** (0.0070)	0.0026 (0.0055)	-0.0013 (0.0041)	2.6319	0.9976
1Q 2003	0.0000 (0.0000)	0.9909 *** (0.0089)	-0.0012 (0.0072)	0.0044 (0.0071)	3.0157	0.9966
2Q 2003	0.0000 (0.0000)	1.0030 *** (0.0037)	0.0021 (0.0035)	- -	2.4012	0.9992
3Q 2003	0.0000 (0.0000)	1.0048 *** (0.0032)	0.0046 (0.0035)	-0.0004 (0.0029)	2.2637	0.9994
4Q 2003	0.0000 (0.0000)	0.9992 *** (0.0029)	-0.0055 (0.0035)	0.0020 (0.0023)	2.4328	0.9995
1Q 2004	0.0000 (0.0000)	0.9984 *** (0.0040)	0.0016 (0.0020)	- -	2.8225	0.9990
2Q 2004	0.0000 (0.0000)	0.9978 *** (0.0020)	- -	0.0024 * (0.0014)	2.8574	0.9998
3Q 2004	0.0000 (0.0000)	0.9984 *** (0.0009)	0.0001 (0.0009)	0.0011 (0.0010)	2.7075	1.0000

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 11. MALTESE LIRA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0000 (0.0001)	0.4893 *** (0.0261)	0.2240 *** (0.0277)	0.0120 (0.0120)	2.4083	0.8988
2Q 1999	0.0000 (0.0001)	0.5208 *** (0.0214)	0.2841 *** (0.0278)	-0.0104 (0.0147)	2.7945	0.9293
3Q 1999	0.0000 (0.0001)	0.5469 *** (0.0144)	0.2313 *** (0.0157)	-0.0024 (0.0086)	1.9633	0.9674
4Q 1999	0.0000 (0.0000)	0.5290 *** (0.0092)	0.2373 *** (0.0098)	-0.0065 (0.0055)	2.5752	0.9834
1Q 2000	0.0000 (0.0000)	0.5211 *** (0.0059)	0.2516 *** (0.0077)	-0.0056 (0.0041)	2.4355	0.9937
2Q 2000	0.0000 (0.0001)	0.5111 *** (0.0082)	0.2531 *** (0.0109)	- -	2.9131	0.9896
3Q 2000	0.0000 (0.0000)	0.5195 *** (0.0047)	0.2509 *** (0.0088)	0.0059 (0.0057)	2.6359	0.9958
4Q 2000	0.0000 (0.0000)	0.5021 *** (0.0060)	0.2662 *** (0.0093)	-0.0078 (0.0079)	2.8046	0.9947
1Q 2001	0.0000 (0.0000)	0.5273 *** (0.0076)	0.2623 *** (0.0106)	0.0007 (0.0072)	2.8685	0.9897
2Q 2001	0.0000 (0.0000)	0.5053 *** (0.0086)	0.2614 *** (0.0117)	0.0106 (0.0072)	2.9822	0.9864
3Q 2001	0.0000 (0.0001)	0.5306 *** (0.0108)	0.2637 *** (0.0129)	-0.0128 (0.0085)	2.6314	0.9764
4Q 2001	0.0000 (0.0001)	0.5563 *** (0.0194)	0.2460 *** (0.0186)	-0.0135 (0.0191)	2.6114	0.9509
1Q 2002	0.0000 (0.0000)	0.5138 *** (0.0077)	0.2452 *** (0.0108)	0.0001 (0.0051)	2.9214	0.9889
2Q 2002	0.0000 (0.0000)	0.4910 *** (0.0140)	0.2564 *** (0.0120)	0.0039 (0.0083)	2.7416	0.9628
3Q 2002	0.0000 (0.0001)	0.5380 *** (0.0218)	0.2074 *** (0.0134)	0.0080 (0.0146)	1.7853	0.9324
4Q 2002	0.0000 (0.0000)	0.6878 *** (0.0077)	0.1027 *** (0.0060)	-0.0012 (0.0046)	2.7324	0.9949
1Q 2003	0.0000 ** (0.0000)	0.7144 *** (0.0087)	0.0902 *** (0.0070)	-0.0038 (0.0069)	2.8450	0.9941
2Q 2003	0.0000 (0.0000)	0.7272 *** (0.0062)	0.1048 *** (0.0059)	-0.0091 (0.0057)	2.5202	0.9973
3Q 2003	0.0000 (0.0000)	0.7381 *** (0.0065)	0.0836 *** (0.0071)	0.0031 (0.0059)	2.2270	0.9954
4Q 2003	0.0000 (0.0001)	0.6917 *** (0.0216)	0.1390 *** (0.0257)	-0.0240 (0.0172)	2.7173	0.9492
1Q 2004	0.0000 (0.0000)	0.7241 *** (0.0073)	0.0820 *** (0.0052)	-0.0022 (0.0055)	2.7123	0.9948
2Q 2004	0.0000 (0.0003)	0.5777 *** (0.0763)	0.1340 *** (0.0585)	-0.0419 (0.0551)	3.0934	0.5604
3Q 2004	0.0000 (0.0001)	0.8609 *** (0.0176)	0.1287 *** (0.0175)	0.0102 (0.0194)	2.3108	0.9994

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 12. CYPRUS POUND

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0000 (0.0000)	0.9603 *** (0.0066)	0.0471 *** (0.0070)	0.0012 (0.0030)	2.5000	0.9974
2Q 1999	0.0000 (0.0000)	0.9497 *** (0.0074)	0.0586 *** (0.0092)	- -	2.9127	0.9963
3Q 1999	0.0000 (0.0000)	0.9512 *** (0.0079)	0.0454 *** (0.0086)	0.0036 (0.0047)	2.9312	0.9958
4Q 1999	0.0000 (0.0000)	0.9517 *** (0.0103)	0.0439 *** (0.0110)	0.0086 (0.0061)	2.8322	0.9926
1Q 2000	0.0000 (0.0000)	0.9395 *** (0.0051)	0.0624 *** (0.0067)	-0.0018 (0.0035)	2.7003	0.9982
2Q 2000	0.0000 (0.0000)	0.9380 *** (0.0068)	0.0540 ** (0.0103)	0.0016 (0.0064)	3.2864	0.9971
3Q 2000	0.0000 (0.0001)	0.9639 *** (0.0134)	- -	0.0208 ** (0.0093)	2.8285	0.9879
4Q 2000	0.0000 (0.0000)	0.9827 *** (0.0057)	0.0152 * (0.0088)	0.0039 (0.0075)	2.2205	0.9981
1Q 2001	0.0001 * (0.0001)	0.9801 *** (0.0099)	0.0024 (0.0139)	0.0008 (0.0094)	1.6445	0.9937
2Q 2001	-0.0001 * (0.0001)	0.9858 *** (0.0115)	0.0224 (0.0156)	0.0104 (0.0096)	2.4900	0.9916
3Q 2001	0.0000 (0.0001)	1.0173 *** (0.0131)	-0.0065 (0.0156)	0.0011 (0.0103)	2.4231	0.9904
4Q 2001	0.0000 (0.0001)	0.9788 *** (0.0145)	0.0023 (0.0139)	0.0156 (0.0143)	1.7861	0.9872
1Q 2002	0.0000 (0.0001)	1.0236 *** (0.0184)	0.0033 (0.0257)	0.0074 (0.0122)	2.2605	0.9806
2Q 2002	0.0000 (0.0001)	0.9770 *** (0.0291)	0.0370 * (0.0270)	- -	2.3354	0.9497
3Q 2002	-0.0001 (0.0001)	0.9565 *** (0.0298)	-0.0142 (0.0184)	0.0211 (0.0200)	2.9705	0.9514
4Q 2002	0.0000 (0.0001)	0.9915 *** (0.0227)	0.0081 (0.0184)	- -	2.2721	0.9719
1Q 2003	0.0003 *** (0.0001)	1.0042 *** (0.0272)	0.0097 (0.0220)	0.0004 (0.0217)	2.1126	0.9698
2Q 2003	0.0000 (0.0001)	0.9786 *** (0.0172)	- -	0.0196 (0.0136)	1.8566	0.9878
3Q 2003	0.0000 (0.0001)	1.0311 *** (0.0187)	0.0195 (0.0207)	0.0011 (0.0171)	2.0879	0.9796
4Q 2003	0.0000 (0.0001)	0.9847 *** (0.0147)	0.0097 (0.0174)	0.0041 (0.0117)	2.2926	0.9880
1Q 2004	0.0000 (0.0000)	1.0014 *** (0.0108)	0.0020 (0.0077)	0.0015 (0.0081)	2.5200	0.9933
2Q 2004	-0.0001 * (0.0001)	1.0032 *** (0.0169)	-0.0002 (0.0129)	0.0165 (0.0122)	2.3812	0.9854
3Q 2004	-0.0001 (0.0001)	1.0115 *** (0.0199)	-0.0300 (0.0198)	0.0229 (0.0219)	2.1914	0.9992

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 13. RUMANIAN LEU

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0055 ** (0.0027)	-0.8888 (1.2281)	1.3225 ** (0.5748)	0.2908 (0.2768)	1.4966	0.1434
2Q 1999	0.0009 (0.0008)	0.2755 (0.1803)	1.1582 *** (0.2336)	-0.0870 (0.1237)	1.3883	0.3091
3Q 1999	0.0006 *** (0.0002)	0.0152 (0.0404)	1.0006 *** (0.0442)	0.0069 (0.0242)	2.3183	0.9015
4Q 1999	0.0016 *** (0.0004)	0.0328 (0.1010)	1.1137 *** (0.1079)	0.0519 (0.0603)	1.6798	0.6589
1Q 2000	0.0010 *** (0.0003)	-0.0497 (0.0516)	0.9810 *** (0.0678)	0.0201 (0.0357)	2.3461	0.8375
2Q 2000	0.0014 *** (0.0001)	0.0486 *** (0.0158)	1.0202 *** (0.0236)	-0.0237 (0.0148)	2.6123	0.9768
3Q 2000	0.0019 *** (0.0001)	-0.0057 (0.0261)	1.0187 *** (0.0484)	-0.0345 (0.0314)	2.2503	0.9503
4Q 2000	0.0011 *** (0.0001)	-0.0050 (0.0166)	0.9579 *** (0.0256)	0.0078 (0.0218)	2.3493	0.9814
1Q 2001	0.0009 *** (0.0001)	-0.0095 (0.0182)	0.9824 *** (0.0255)	0.0151 (0.0172)	2.7922	0.9715
2Q 2001	0.0009 *** (0.0001)	-0.0161 (0.0208)	1.0296 *** (0.0282)	-0.0277 (0.0173)	2.7174	0.9694
3Q 2001	0.0007 *** (0.0001)	0.0157 (0.0237)	0.9818 *** (0.0283)	0.0182 (0.0187)	1.8425	0.9555
4Q 2001	0.0006 ** (0.0003)	-0.0271 (0.0732)	0.9295 *** (0.0702)	0.0372 (0.0719)	1.7529	0.8158
1Q 2002	0.0005 (0.0005)	0.1891 (0.1255)	0.8117 *** (0.1723)	- -	2.1468	0.2872
2Q 2002	0.0004 (0.0003)	0.1406 * (0.0776)	0.9386 *** (0.0721)	- -	2.2973	0.7287
3Q 2002	-0.0001 (0.0003)	-0.0006 (0.0885)	0.8471 *** (0.0546)	0.0255 (0.0594)	2.0663	0.7958
4Q 2002	0.0002 (0.0003)	-0.0129 (0.0887)	0.9565 *** (0.0693)	0.0876 (0.0527)	2.1470	0.7981
1Q 2003	0.0000 (0.0004)	0.1934 (0.1216)	0.6050 *** (0.0984)	0.1013 (0.0968)	1.9882	0.5298
2Q 2003	0.0004 (0.0004)	0.8355 *** (0.0868)	0.1722 ** (0.0832)	0.0342 (0.0803)	2.5771	0.7372
3Q 2003	0.0003 (0.0004)	0.7175 *** (0.0833)	0.3137 *** (0.0920)	0.0372 (0.0762)	2.3199	0.6223
4Q 2003	0.0009 (0.0004)	1.0803 *** (0.0894)	0.1184 (0.1060)	-0.1137 (0.0711)	1.8732	0.7060
1Q 2004	0.0001 (0.0004)	0.7583 *** (0.1028)	0.1489 ** (0.0730)	-0.0285 (0.0775)	1.7029	0.5258
2Q 2004	-0.0001 (0.0003)	0.8910 *** (0.0637)	0.1463 *** (0.0489)	-0.0091 (0.0460)	2.3128	0.8122
3Q 2004	0.0001 (0.0003)	0.9858 *** (0.0713)	-0.0459 (0.0709)	0.0578 (0.0786)	2.9866	0.9895

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 14. BULGARIAN LEV

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	-0.0001 (0.0000)	0.9892 *** (0.0105)	0.0132 (0.0111)	-0.0010 (0.0048)	2.2080	0.9937
2Q 1999	0.0000 (0.0001)	1.0006 *** (0.0161)	0.0242 (0.0209)	-0.0044 (0.0111)	1.4979	0.9849
3Q 1999	0.0000 (0.0000)	0.9913 *** (0.0086)	0.0084 (0.0094)	0.0030 (0.0052)	1.8616	0.9953
4Q 1999	0.0000 (0.0000)	1.0077 *** (0.0078)	-0.0050 (0.0083)	0.0032 (0.0046)	1.7723	0.9962
1Q 2000	0.0000 (0.0001)	0.9752 *** (0.0117)	0.0058 (0.0154)	0.0227 *** (0.0081)	2.1930	0.9910
2Q 2000	0.0000 (0.0000)	0.9890 *** (0.0052)	-0.0015 (0.0078)	0.0116 ** (0.0049)	2.2610	0.9984
3Q 2000	0.0000 (0.0000)	0.9937 *** (0.0083)	-0.0200 (0.0155)	0.0114 (0.0101)	2.1420	0.9955
4Q 2000	0.0001 (0.0001)	0.9716 *** (0.0162)	0.0296 (0.0252)	-0.0106 (0.0214)	1.9983	0.9846
1Q 2001	-0.0001 (0.0001)	0.9890 *** (0.0114)	-0.0031 (0.0161)	0.0303 *** (0.0109)	2.0779	0.9916
2Q 2001	0.0000 (0.0000)	0.9828 *** (0.0081)	0.0066 (0.0110)	0.0119 * (0.0067)	2.1235	0.9958
3Q 2001	0.0000 (0.0000)	0.9910 *** (0.0088)	0.0053 (0.0105)	0.0041 (0.0069)	2.1094	0.9954
4Q 2001	0.0000 (0.0000)	0.9946 *** (0.0074)	0.0160 * (0.0071)	-0.0041 (0.0073)	2.0378	0.9967
1Q 2002	0.0000 (0.0001)	0.9167 *** (0.0153)	0.0005 (0.0213)	0.0207 ** (0.0101)	1.7228	0.9835
2Q 2002	0.0000 (0.0001)	0.9511 *** (0.0221)	-0.0039 (0.0189)	0.0140 (0.0131)	1.7376	0.9757
3Q 2002	0.0000 (0.0000)	0.9639 *** (0.0146)	0.0159 * (0.0090)	0.0153 (0.0098)	1.9918	0.9879
4Q 2002	0.0001 (0.0001)	0.9729 *** (0.0343)	0.0439 (0.0268)	-0.0022 (0.0204)	0.7300	0.9448
1Q 2003	-0.0002 (0.0001)	0.9440 *** (0.0322)	0.0447 ** (0.0261)	-0.0031 (0.0257)	1.9973	0.9534
2Q 2003	0.0000 (0.0000)	1.0040 *** (0.0089)	0.0150 * (0.0085)	0.0044 (0.0082)	2.3243	0.9968
3Q 2003	0.0000 (0.0000)	0.9996 *** (0.0045)	0.0031 (0.0040)	- -	2.4234	0.9987
4Q 2003	0.0000 (0.0002)	0.9235 *** (0.0375)	0.0555 * (0.0444)	0.0011 (0.0298)	2.9370	0.9178
1Q 2004	-0.0001 * (0.0000)	0.9964 *** (0.0109)	0.0080 (0.0077)	-0.0095 (0.0082)	1.3710	0.9931
2Q 2004	0.0001 (0.0001)	1.0024 *** (0.0162)	-0.0035 (0.0124)	0.0077 (0.0117)	2.1836	0.9864
3Q 2004	0.0000 (0.0001)	0.9735 *** (0.0162)	0.0302 ** (0.0162)	-0.0027 (0.0179)	2.9235	0.9995

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 15. CROATIAN KUNA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0007 ** (0.0003)	0.9982 *** (0.0774)	0.1199 (0.0821)	-0.0036 (0.0355)	3.1300	0.7535
2Q 1999	0.0001 (0.0002)	0.9289 *** (0.0406)	0.0668 (0.0526)	0.0076 (0.0278)	2.0229	0.9007
3Q 1999	0.0000 (0.0001)	0.9616 *** (0.0199)	0.0214 (0.0218)	-0.0088 (0.0119)	2.8064	0.9737
4Q 1999	0.0001 (0.0001)	1.0124 *** (0.0223)	0.0356 (0.0239)	0.0032 (0.0133)	2.6965	0.9699
1Q 2000	0.0001 (0.0001)	1.0491 *** (0.0283)	0.0372 (0.0371)	-0.0152 (0.0196)	2.3564	0.9565
2Q 2000	-0.0002 (0.0002)	0.9527 *** (0.0230)	0.0606 * (0.0344)	-0.0171 (0.0215)	2.5868	0.9687
3Q 2000	-0.0002 (0.0001)	0.9695 *** (0.0221)	0.0643 (0.0411)	-0.0360 (0.0267)	2.6882	0.9682
4Q 2000	0.0002 (0.0002)	0.9858 *** (0.0343)	0.1111 ** (0.0531)	-0.0564 (0.0453)	2.8179	0.9370
1Q 2001	0.0002 (0.0002)	0.9801 *** (0.0353)	-0.0155 (0.0496)	-0.0121 (0.0335)	1.5734	0.9246
2Q 2001	-0.0007 (0.0002)	0.9534 *** (0.0452)	0.0904 (0.0612)	-0.0198 (0.0375)	1.2187	0.8768
3Q 2001	0.0003 (0.0007)	0.8035 *** (0.1412)	0.0157 (0.1685)	0.0529 (0.1115)	1.6552	0.3421
4Q 2001	-0.0004 (0.0004)	0.7468 *** (0.0946)	-0.0109 (0.0908)	0.0728 (0.0930)	1.8311	0.5197
1Q 2002	0.0001 (0.0003)	0.9518 *** (0.0830)	- -	0.0046 (0.0547)	1.9118	0.6752
2Q 2002	-0.0002 (0.0002)	1.0534 *** (0.0719)	0.1058 (0.0668)	- -	2.5662	0.7754
3Q 2002	-0.0001 (0.0002)	1.1274 *** (0.0538)	0.0870 ** (0.0332)	0.0149 (0.0361)	2.1402	0.8901
4Q 2002	0.0003 (0.0002)	1.0065 *** (0.0755)	-0.0178 (0.0590)	-0.0261 (0.0448)	2.1721	0.7733
1Q 2003	0.0004 (0.0003)	0.9623 *** (0.0806)	0.0996 (0.0652)	0.0300 (0.0641)	2.1665	0.7862
2Q 2003	-0.0005 (0.0003)	0.9199 *** (0.0634)	0.1795 *** (0.0608)	-0.0024 (0.0587)	1.5144	0.8559
3Q 2003	0.0000 (0.0003)	1.0764 *** (0.0583)	0.1587 ** (0.0645)	-0.0551 (0.0534)	2.1528	0.8484
4Q 2003	0.0001 (0.0002)	0.9869 *** (0.0505)	0.1142 * (0.0599)	-0.0216 (0.0402)	1.8813	0.8734
1Q 2004	-0.0004 (0.0003)	1.0048 *** (0.0761)	0.0494 (0.0540)	-0.0081 (0.0573)	1.8590	0.7546
2Q 2004	-0.0003 (0.0003)	0.9979 *** (0.0674)	-0.0537 (0.0518)	-0.0463 (0.0487)	2.0186	0.7886
3Q 2004	0.0006 (0.0003)	1.0280 *** (0.0610)	-0.0360 (0.0607)	0.0258 (0.0672)	1.8098	0.9926

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 16. TURKISH LIRA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	0.0020 *** (0.0005)	0.5043 *** (0.1086)	0.5332 *** (0.1152)	-0.0115 (0.0498)	2.5553	0.4683
2Q 1999	0.0016 *** (0.0002)	0.4459 *** (0.0373)	0.6024 *** (0.0483)	-0.0342 (0.0256)	2.4670	0.8539
3Q 1999	0.0017 *** (0.0002)	0.4637 *** (0.0325)	0.4883 *** (0.0355)	0.0332 (0.0195)	2.6655	0.8889
4Q 1999	0.0020 *** (0.0002)	0.5470 *** (0.0576)	0.5022 *** (0.0615)	-0.0132 (0.0344)	2.4830	0.7036
1Q 2000	0.0010 *** (0.0001)	0.4146 *** (0.0226)	0.5321 *** (0.0296)	-0.0111 (0.0156)	2.7326	0.9329
2Q 2000	0.0008 *** (0.0001)	0.3858 *** (0.0137)	0.5948 *** (0.0205)	0.0006 (0.0128)	2.4922	0.9775
3Q 2000	0.0006 *** (0.0001)	0.3964 *** (0.0146)	0.6388 *** (0.0270)	-0.0243 (0.0175)	2.6069	0.9733
4Q 2000	0.0005 *** (0.0001)	0.3701 *** (0.0233)	0.6585 *** (0.0360)	-0.0239 (0.0307)	2.4847	0.9530
1Q 2001	0.0069 (0.0073)	2.3438 ** (1.1604)	1.4037 (1.6315)	-0.0801 (1.1007)	1.5865	0.0372
2Q 2001	0.0029 (0.0032)	-0.3524 (0.6306)	1.7602 ** (0.8535)	-0.3714 (0.5233)	1.6766	0.0301
3Q 2001	0.0029 (0.0026)	0.1539 (0.5388)	1.2946 ** (0.6299)	- -	2.1497	0.0337
4Q 2001	-0.0007 (0.0016)	-0.2661 (0.4115)	1.4498 *** (0.3947)	0.0466 (0.4044)	2.1506	0.2255
1Q 2002	-0.0013 (0.0012)	-0.3832 (0.3027)	0.7635 * (0.4214)	0.3130 (0.2009)	2.0711	0.0690
2Q 2002	0.0010 (0.0017)	-0.3687 (0.5565)	2.0962 *** (0.4763)	-0.3780 (0.3291)	1.9252	0.2687
3Q 2002	0.0006 (0.0012)	0.2972 (0.3577)	1.1229 *** (0.2208)	-0.1324 (0.2400)	2.3809	0.2621
4Q 2002	0.0002 (0.0011)	0.2039 (0.3753)	0.8379 *** (0.2932)	0.1791 (0.2229)	1.4037	0.1622
1Q 2003	0.0011 (0.0018)	0.5889 (0.5454)	1.3237 *** (0.4414)	0.0154 (0.4342)	2.8773	0.1652
2Q 2003	-0.0031 (0.0010)	0.0174 (0.2351)	1.2908 *** (0.2253)	-0.0610 (0.2176)	2.5713	0.4138
3Q 2003	-0.0001 (0.0009)	0.0526 (0.2057)	0.7852 *** (0.2273)	0.1857 (0.1882)	2.4494	0.2699
4Q 2003	0.0005 (0.0010)	0.4031 * (0.2296)	0.7192 ** (0.2721)	- -	1.7867	0.1145
1Q 2004	-0.0012 (0.0008)	0.4395 ** (0.2035)	0.6301 *** (0.1446)	-0.0100 (0.1535)	2.3169	0.4258
2Q 2004	0.0016 (0.0010)	0.6181 *** (0.2226)	0.3850 *** (0.1709)	0.3971 * (0.1609)	1.9065	0.3731
3Q 2004	0.0003 (0.0007)	0.6026 *** (0.1534)	0.2936 * (0.1526)	0.0878 (0.1691)	1.8415	0.9516

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 17. DANISH KRONE

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	-0.0001 (0.0001)	1.0170 *** (0.0164)	-0.0192 (0.0174)	0.0054 (0.0075)	2.5262	0.9854
2Q 1999	0.0000 (0.0001)	0.9894 *** (0.0147)	0.0111 (0.0190)	-0.0065 (0.0101)	2.2466	0.9872
3Q 1999	0.0000 (0.0001)	0.9989 *** (0.0117)	0.0002 (0.0128)	-0.0047 (0.0070)	1.8672	0.9914
4Q 1999	0.0000 (0.0000)	0.9940 *** (0.0071)	- -	0.0051 (0.0040)	2.7768	0.9967
1Q 2000	0.0000 (0.0001)	0.9896 *** (0.0141)	0.0179 (0.0151)	- -	2.9815	0.9873
2Q 2000	0.0000 (0.0001)	0.9945 *** (0.0181)	0.0242 (0.0270)	-0.0210 (0.0169)	2.9017	0.9817
3Q 2000	0.0000 (0.0000)	0.9952 *** (0.0063)	-0.0024 (0.0117)	-0.0033 (0.0076)	2.2391	0.9975
4Q 2000	0.0000 (0.0000)	0.9891 *** (0.0076)	0.0032 (0.0118)	0.0002 (0.0100)	2.3663	0.9967
1Q 2001	0.0000 (0.0001)	0.9766 *** (0.0102)	-0.0045 (0.0143)	0.0049 (0.0097)	3.1140	0.9932
2Q 2001	0.0000 (0.0002)	0.9220 *** (0.0429)	0.0612 (0.0463)	- -	2.5087	0.8797
3Q 2001	0.0000 (0.0000)	0.9928 *** (0.0049)	0.0116 * (0.0059)	0.0010 (0.0039)	2.0560	0.9985
4Q 2001	0.0000 (0.0000)	0.9949 *** (0.0082)	0.0137 * (0.0079)	-0.0093 (0.0081)	1.3436	0.9960
1Q 2002	0.0000 (0.0000)	0.9793 *** (0.0053)	0.0170 * (0.0074)	0.0026 (0.0035)	2.4698	0.9982
2Q 2002	0.0000 (0.0000)	0.9810 *** (0.0080)	-0.0053 (0.0068)	0.0063 (0.0047)	1.9658	0.9969
3Q 2002	0.0000 (0.0000)	0.9988 *** (0.0048)	0.0056 * (0.0030)	0.0044 (0.0033)	2.0273	0.9987
4Q 2002	0.0000 (0.0000)	0.9933 *** (0.0056)	0.0033 (0.0044)	0.0007 (0.0033)	2.5614	0.9985
1Q 2003	0.0000 (0.0000)	1.0017 *** (0.0067)	0.0013 (0.0055)	0.0042 (0.0054)	1.9485	0.9981
2Q 2003	0.0000 (0.0000)	0.9956 *** (0.0023)	-0.0030 (0.0022)	0.0011 (0.0021)	1.7427	0.9998
3Q 2003	0.0000 (0.0000)	1.0067 *** (0.0058)	0.0002 (0.0064)	0.0031 (0.0053)	2.1494	0.9979
4Q 2003	0.0000 (0.0000)	0.9976 *** (0.0049)	0.0135 ** (0.0058)	-0.0046 (0.0039)	1.8632	0.9987
1Q 2004	0.0000 (0.0000)	1.0017 *** (0.0033)	-0.0008 (0.0023)	0.0027 (0.0025)	1.8865	0.9994
2Q 2004	0.0000 (0.0000)	1.0013 *** (0.0039)	0.0015 (0.0030)	-0.0003 (0.0028)	1.8053	0.9992
3Q 2004	0.0000 (0.0000)	0.9959 *** (0.0033)	0.0017 (0.0033)	0.0011 (0.0036)	2.2197	1.0000

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 18. SWEDISH KRONA

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	-0.0006 (0.0005)	0.5824 *** (0.1243)	0.2739 *** (0.1318)	0.1003 * (0.0570)	1.2077	0.3993
2Q 1999	0.0000 (0.0003)	0.7858 *** (0.0716)	0.3124 *** (0.0928)	0.0112 (0.0491)	1.7681	0.7105
3Q 1999	-0.0002 (0.0003)	0.6435 *** (0.0552)	0.3059 *** (0.0603)	-0.0020 (0.0331)	1.5517	0.7423
4Q 1999	-0.0001 (0.0004)	0.6920 *** (0.0981)	0.3162 *** (0.1048)	-0.0714 (0.0585)	2.1334	0.4686
1Q 2000	-0.0004 (0.0004)	0.7833 *** (0.0693)	0.0909 (0.0910)	0.1399 *** (0.0479)	1.8068	0.6983
2Q 2000	0.0002 (0.0005)	0.6660 *** (0.0709)	0.3262 *** (0.1062)	-0.0065 (0.0663)	1.7951	0.6760
3Q 2000	0.0005 (0.0004)	0.6985 *** (0.0652)	0.1832 (0.1211)	-0.0714 (0.0786)	1.6355	0.6486
4Q 2000	0.0004 (0.0005)	0.8036 *** (0.0812)	-0.0208 (0.1257)	0.0551 (0.1071)	2.1507	0.6376
1Q 2001	0.0006 (0.0005)	0.9382 *** (0.0836)	0.2297 * (0.1175)	-0.0008 (0.0792)	2.0913	0.6786
2Q 2001	0.0003 (0.0006)	0.7442 *** (0.1133)	0.1347 (0.1534)	-0.0122 (0.0940)	1.7885	0.4013
3Q 2001	0.0007 (0.0006)	1.0178 *** (0.1181)	0.2467 ** (0.1409)	-0.0701 (0.0932)	1.3225	0.5317
4Q 2001	-0.0004 (0.0006)	0.4615 *** (0.1578)	0.3582 ** (0.1514)	-0.0185 (0.1551)	1.6738	0.2031
1Q 2002	-0.0004 (0.0004)	1.0320 *** (0.0962)	0.2593 * (0.1339)	-0.0444 (0.0638)	1.9740	0.6646
2Q 2002	-0.0004 (0.0005)	0.9156 *** (0.1560)	0.3735 *** (0.1336)	-0.0748 (0.0923)	2.0591	0.3616
3Q 2002	-0.0002 (0.0005)	1.2380 *** (0.1493)	0.3972 *** (0.0984)	- -	1.5260	0.5394
4Q 2002	-0.0002 (0.0004)	0.7745 *** (0.1233)	0.1104 (0.0964)	-0.0933 (0.0733)	1.9468	0.4340
1Q 2003	0.0001 (0.0004)	0.7948 *** (0.1150)	0.2178 ** (0.0931)	-0.0404 (0.0916)	1.9395	0.5444
2Q 2003	-0.0001 (0.0003)	0.8780 *** (0.0587)	0.0978 * (0.0562)	-0.0433 (0.0543)	1.4978	0.0020
3Q 2003	-0.0002 (0.0005)	0.7771 *** (0.1055)	-0.1400 (0.1166)	0.1026 (0.0965)	1.9603	0.4496
4Q 2003	0.0000 (0.0004)	0.9611 *** (0.0975)	0.0114 (0.1156)	0.1506 (0.0776)	2.2822	0.6781
1Q 2004	0.0002 (0.0004)	1.1042 *** (0.0936)	0.0256 (0.0665)	-0.1167 (0.0706)	2.0476	0.6849
2Q 2004	-0.0003 (0.0003)	0.8418 *** (0.0678)	-0.0579 (0.0521)	0.1840 *** (0.0490)	1.9245	0.7791
3Q 2004	-0.0002 (0.0002)	0.9607 *** (0.0424)	-0.0529 (0.0422)	0.0886 * (0.0468)	1.8230	0.9963

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 19. STERLING POUND

	Constant	euro	US dollar	Japanese yen	DW	Adj.R2
1Q 1999	-0.0001 (0.0004)	0.1929 (0.1953)	0.5567 *** (0.0821)	- -	1.8074	0.5627
2Q 1999	0.0000 (0.0004)	-0.0926 (0.2609)	0.5970 *** (0.0734)	- -	1.9741	0.5049
3Q 1999	-0.0004 (0.0005)	0.1604 (0.5325)	0.5415 *** (0.0822)	- -	1.6957	0.4951
4Q 1999	-0.0002 (0.0003)	0.3420 (0.2641)	0.6006 *** (0.0945)	-0.0641 (0.0512)	2.1768	0.5854
1Q 2000	-0.0001 (0.0005)	-0.0374 (0.3336)	0.5403 *** (0.0683)	- -	2.0020	0.4988
2Q 2000	0.0010 (0.0006)	-0.0894 (0.2329)	0.6315 *** (0.0919)	- -	1.8449	0.4199
3Q 2000	-0.0002 (0.0005)	0.5095 *** (0.1718)	0.5442 *** (0.0704)	- -	1.5558	0.5072
4Q 2000	0.0003 (0.0006)	0.0937 (0.2575)	0.4984 *** (0.0892)	- -	1.9714	0.3137
1Q 2001	0.0003 (0.0005)	-0.0220 (0.2439)	0.5346 *** (0.0721)	- -	2.2943	0.4604
2Q 2001	-0.0001 (0.0005)	0.1063 (0.2749)	0.5050 *** (0.0726)	- -	1.9070	0.4215
3Q 2001	-0.0003 (0.0004)	0.5402 *** (0.0984)	0.5732 *** (0.0517)	- -	1.9944	0.7924
4Q 2001	-0.0001 (0.0004)	0.8441 *** (0.1715)	0.3612 *** (0.0684)	- -	1.5081	0.6144
1Q 2002	0.0002 (0.0003)	0.2681 (0.1690)	0.6740 *** (0.0730)	- -	1.7797	0.5991
2Q 2002	-0.0001 (0.0003)	0.2696 (0.1745)	0.4847 *** (0.0468)	- -	1.4822	0.7015
3Q 2002	-0.0004 (0.0003)	0.2132 (0.1745)	0.3545 *** (0.0502)	- -	2.0410	0.5430
4Q 2002	0.0002 (0.0004)	0.3587 (0.3095)	0.3619 *** (0.0948)	- -	2.0406	0.3076
1Q 2003	0.0008 * (0.0004)	1.2062 *** (0.3360)	0.3774 *** (0.0730)	- -	1.8766	0.5022
2Q 2003	-0.0003 (0.0006)	0.4728 ** (0.2127)	0.4665 *** (0.0899)	- -	2.1365	0.4234
3Q 2003	0.0000 (0.0004)	0.6700 *** (0.1931)	0.4348 *** (0.0725)	- -	1.3378	0.5178
4Q 2003	-0.0007 ** (0.0004)	0.1448 (0.2109)	0.6262 *** (0.0698)	- -	2.0261	0.7126
1Q 2004	-0.0008 (0.0005)	0.9652 *** (0.2343)	0.1481 ** (0.0608)	- -	1.8852	0.2944
2Q 2004	0.0002 (0.0006)	0.4955 * (0.2707)	0.3103 *** (0.0906)	- -	1.7329	0.3602
3Q 2004	0.0001 (0.0004)	0.5414 * (0.3098)	0.2527 *** (0.0805)	- -	2.4179	0.3269

1. Calculated by authors. All foreign exchange data are from Datastream.

2. If the estimated coefficient is significantly negative, we re-estimate the equation without them.

3. Standard deviations are in parenthesis. *、** and *** denote statistical significance at the 10%、5% and 1% levels, respectively.

Table 20. Classified currency regimes of 10 East european countries (% of currencies under review)

	1999	2000	2001	2002	2003	2004
Regid peg on a single currency (a_i=1, i=1,2,3)						
US dollar	10.0	10.0	10.0	0.0	0.0	0.0
euro	0.0	10.0	15.0	20.0	27.5	30.0
Japanese yen	0.0	0.0	0.0	0.0		
Partial peg on a single currency (a_i>0, i=1,2,3)						
US dollar	5.0	0.0	0.0	2.5	2.5	0.0
euro	22.5	25.0	27.5	22.5	32.5	40.0
Japanese yen	0.0	0.0	0.0	0.0		
Peg on a basket (a_1 and/or a_2 and/or a_3>0)						
dollar/euro (a_2>a_1)	12.5	10.0	10.0	10.0	2.5	0.0
euro/dollar (a_1>a_2)	30.0	27.5	27.5	32.5	25.0	16.7
euro/yen (a_1>a_3)	5.0	7.5	0.0	0.0	0.0	3.3
euro/dollar/yen	15.0	10.0	10.0	12.5	10.0	10.0
Free floating (otherwise)	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

We assign the coefficients which are estimated significantly under the level of 10%.

Source: Authors calculations

Figure 1. The movement of sampled East European currencies v.s. euro

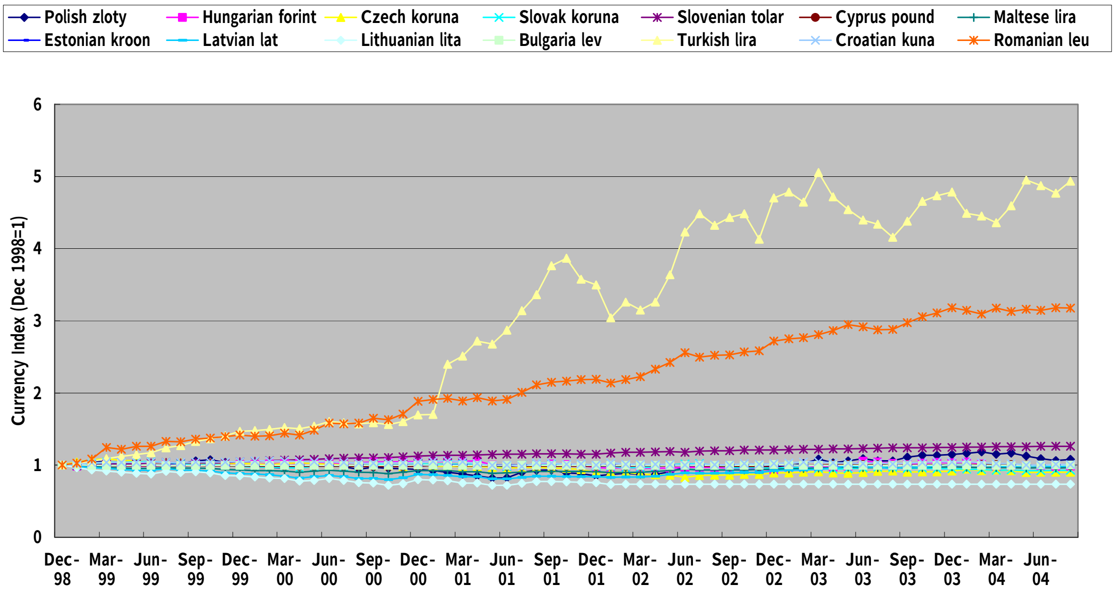


Figure 2. The movement of 10 new EU currencies v.s. euro

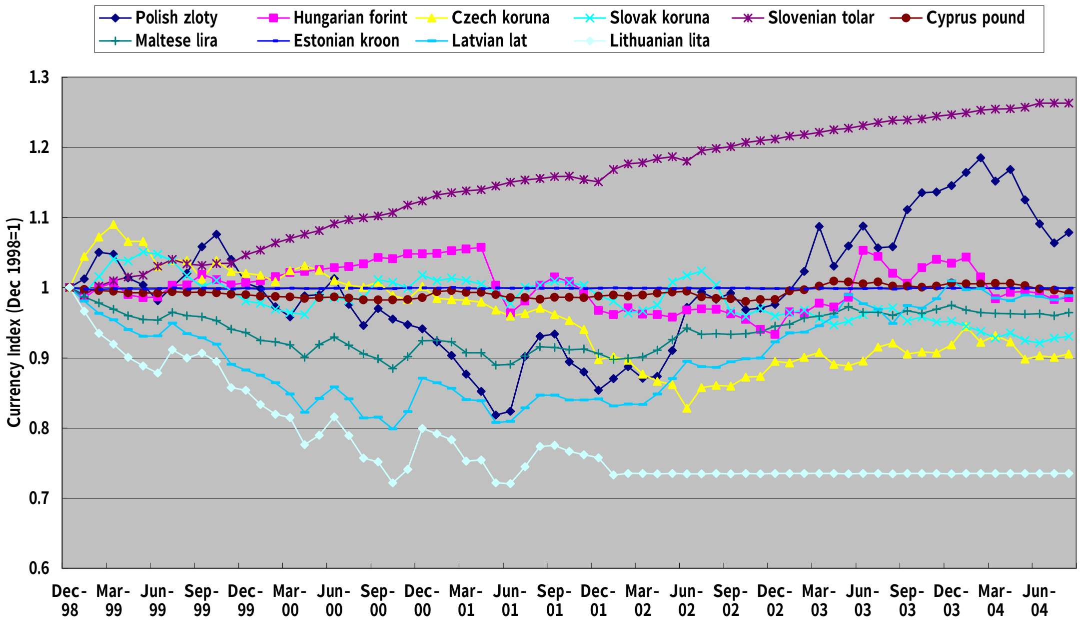


Figure 3.

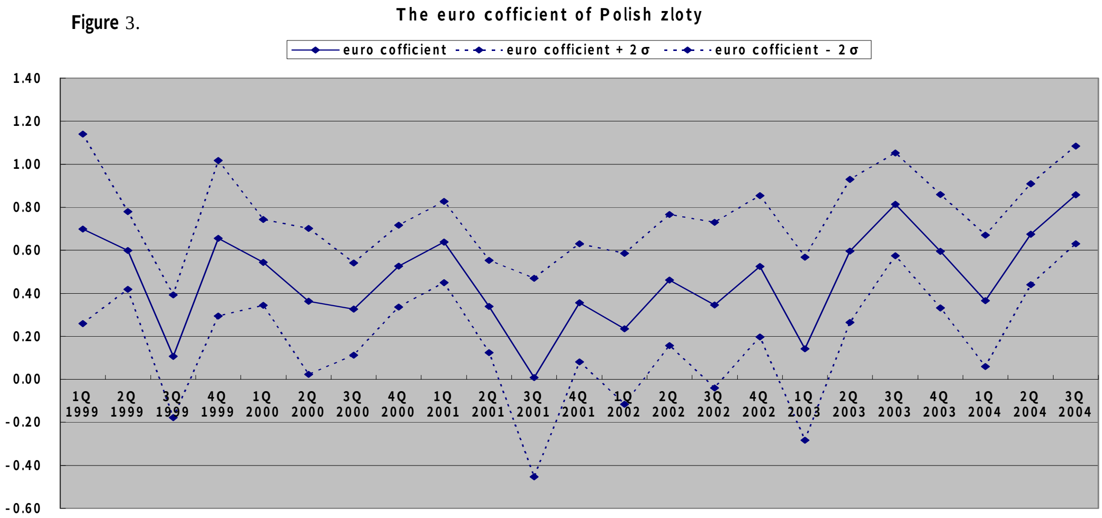
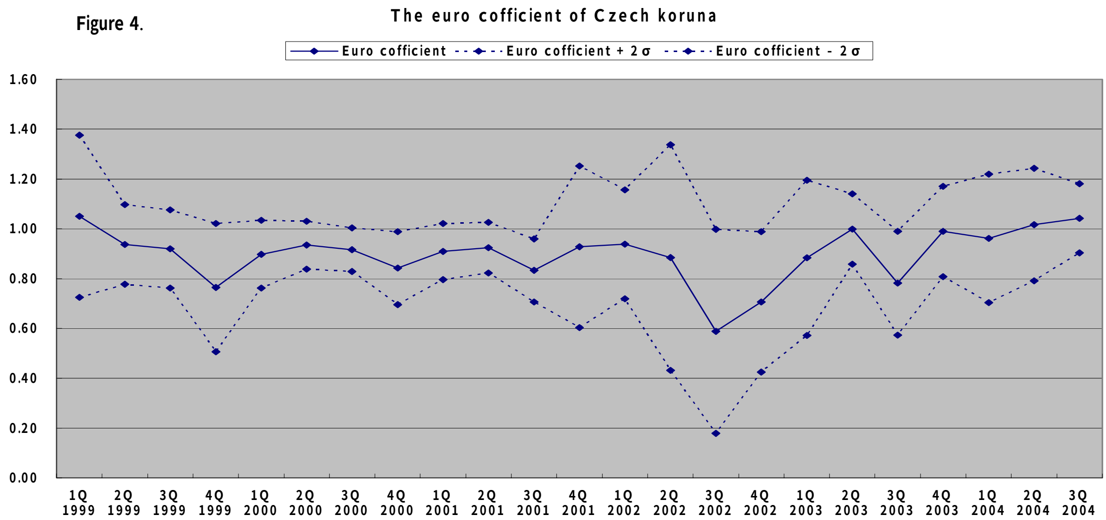


Figure 4.



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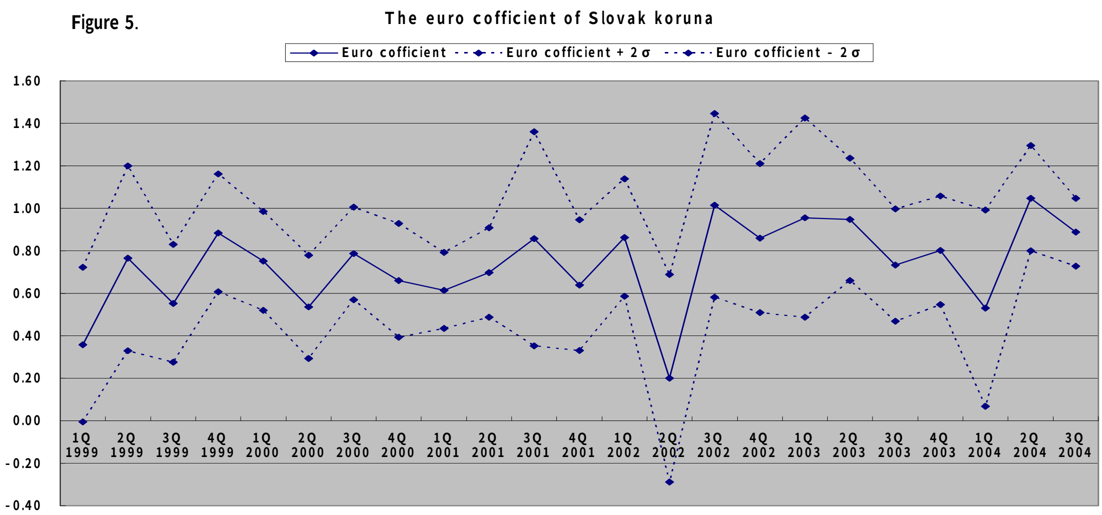

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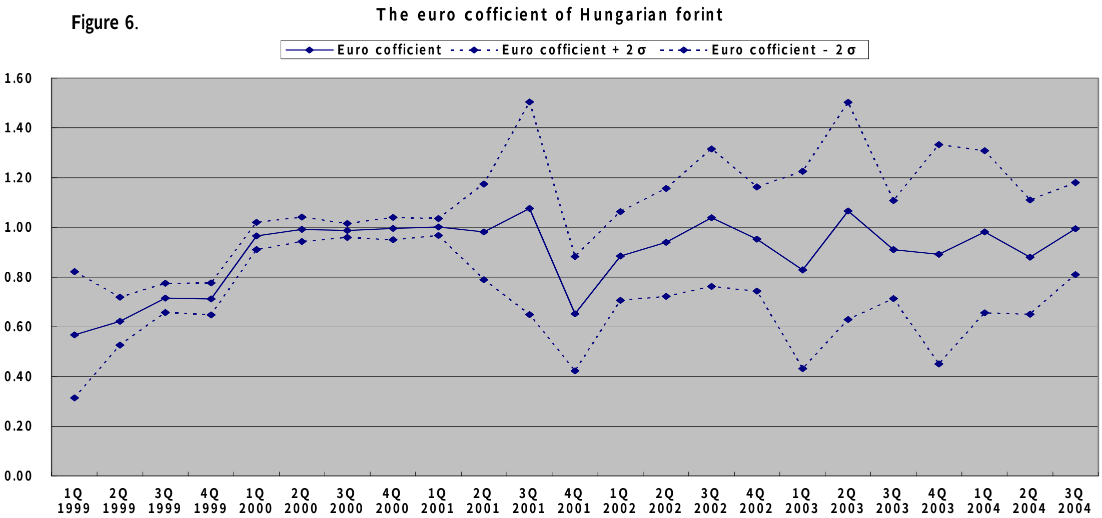

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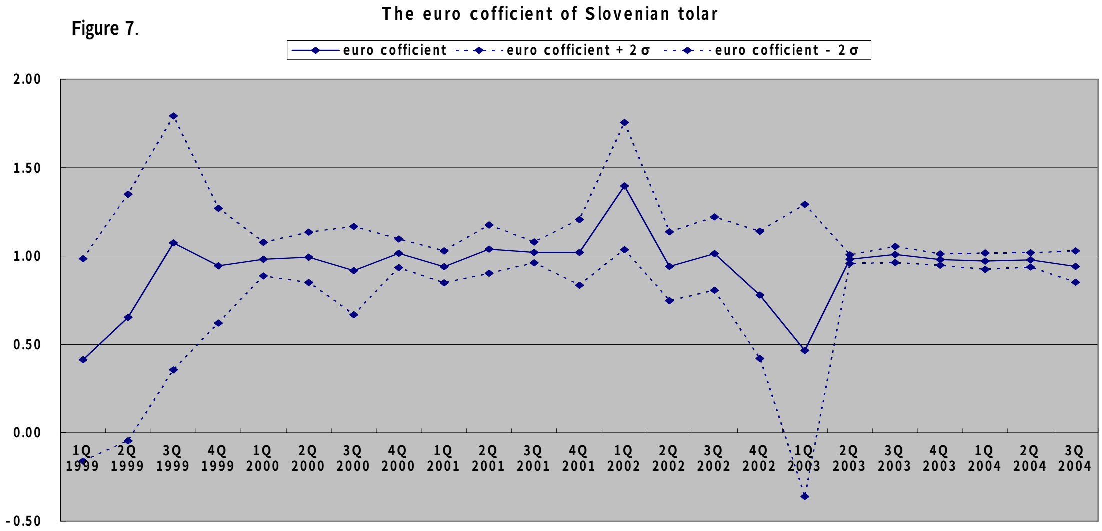

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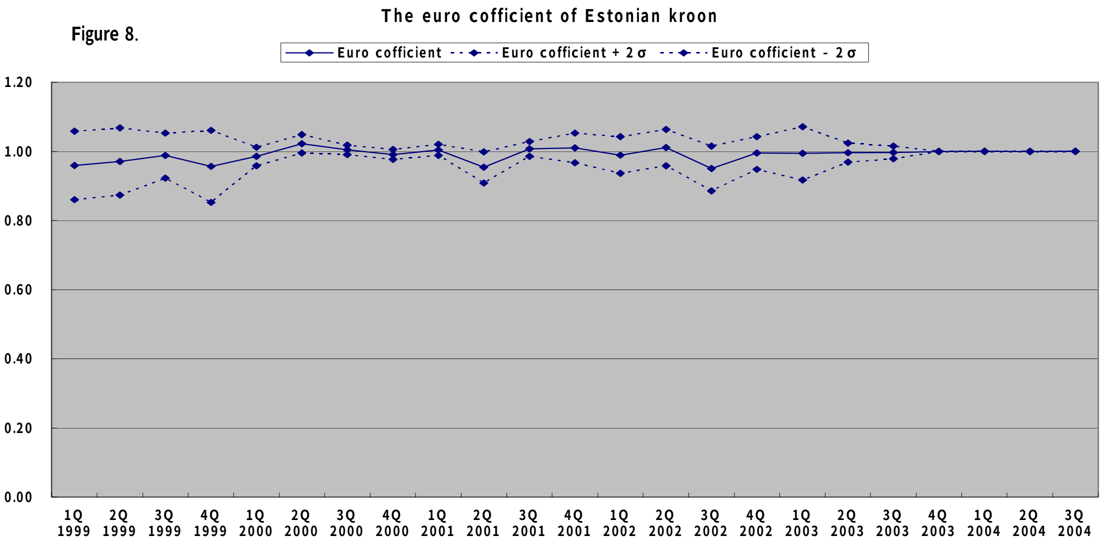


Figure 9.

The euro cofficient of Latvian lat

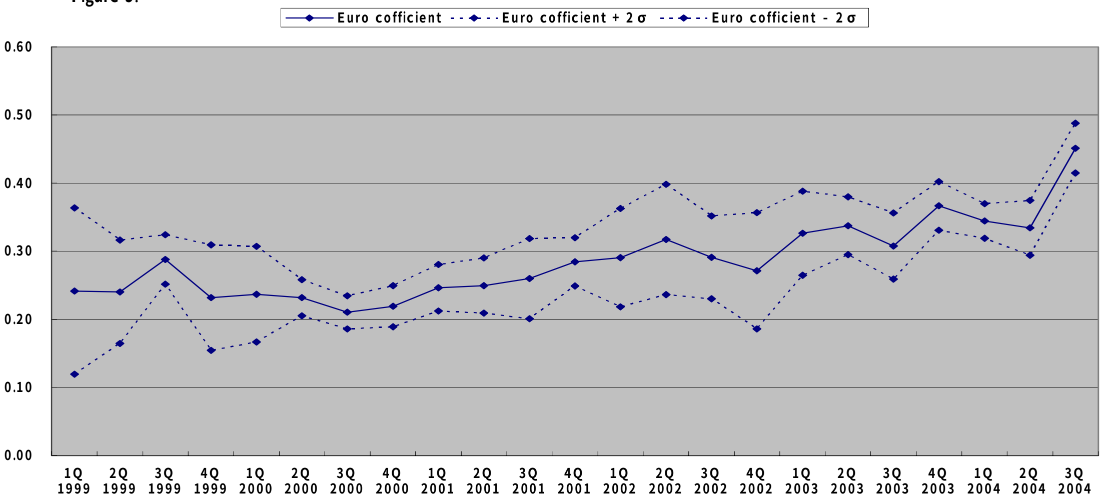
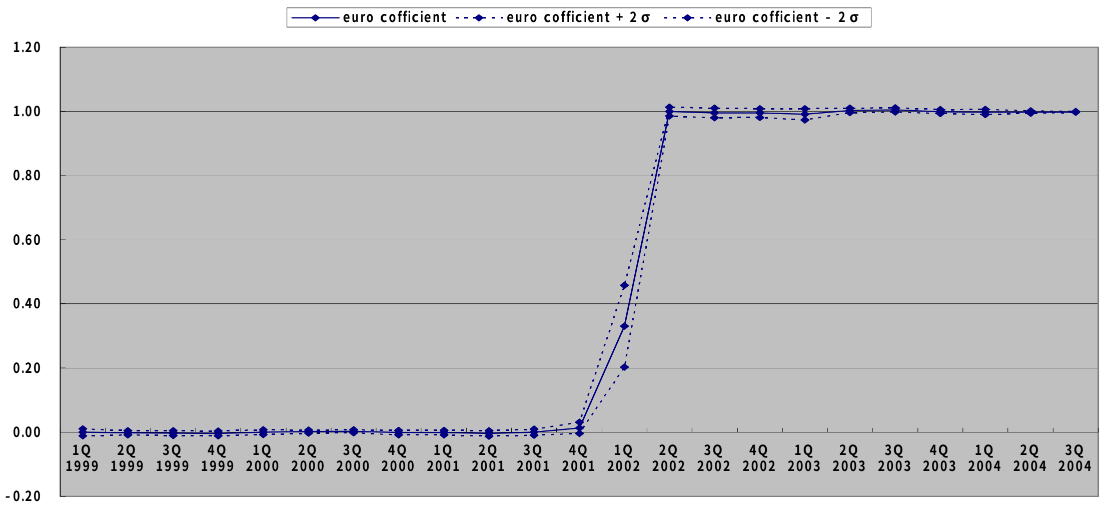


Figure 10.

The euro cofficient of Lithuanian lita



The euro cofficient of Maltese lira

Figure 11.

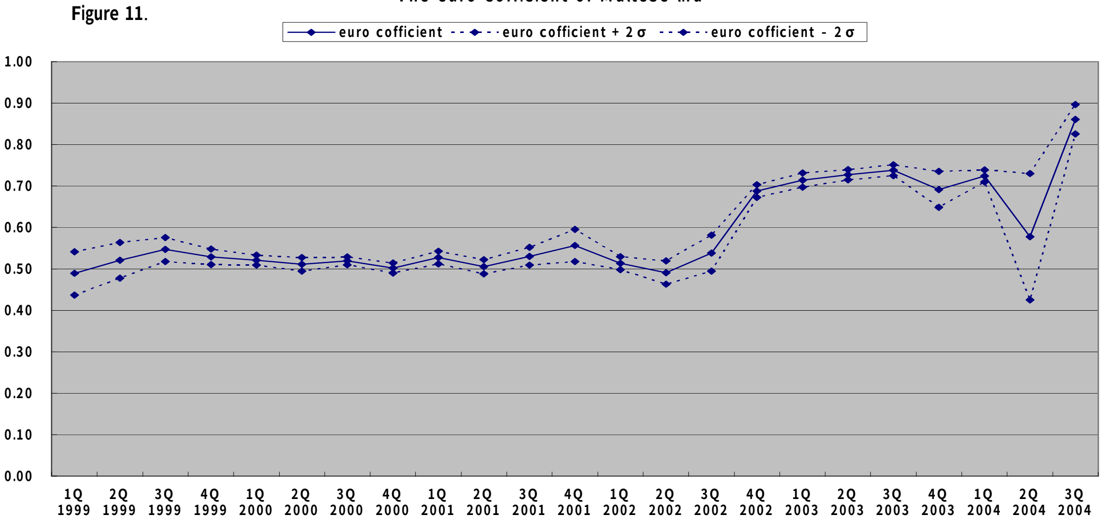


Figure 12.

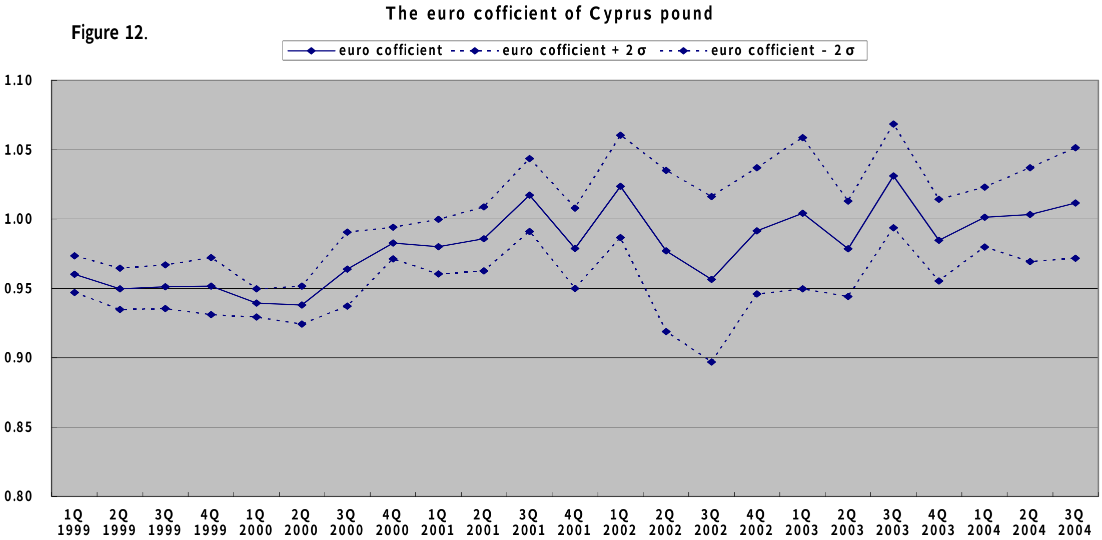
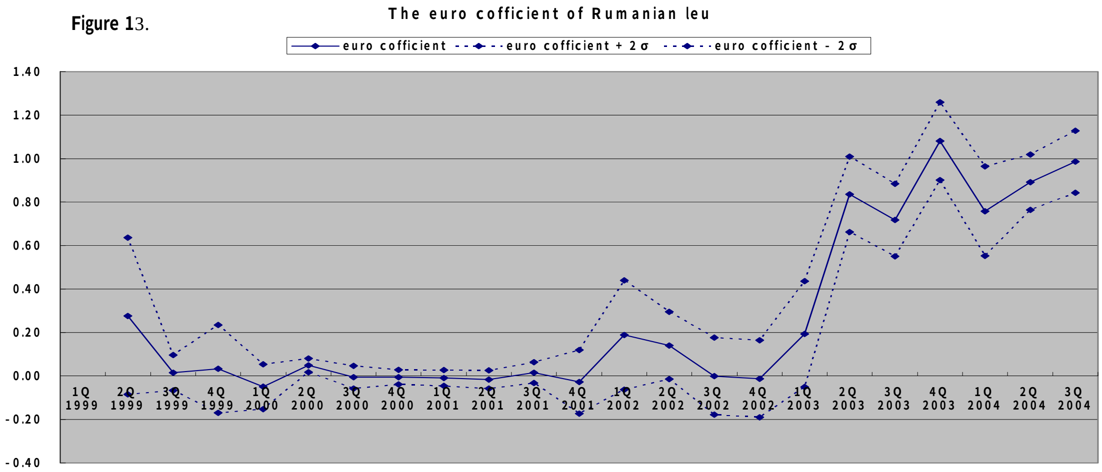


Figure 13.



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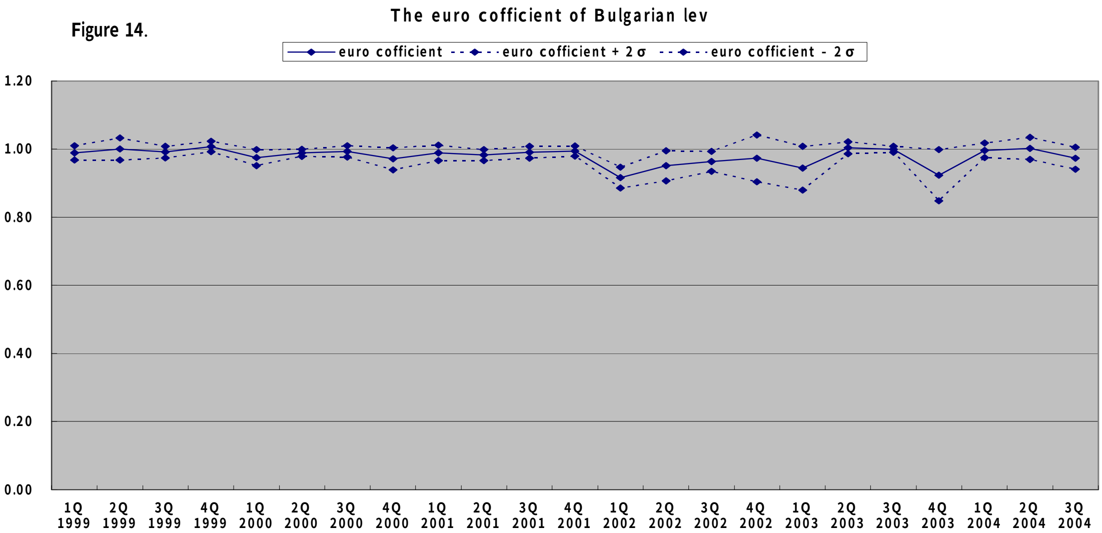

Figure 15.

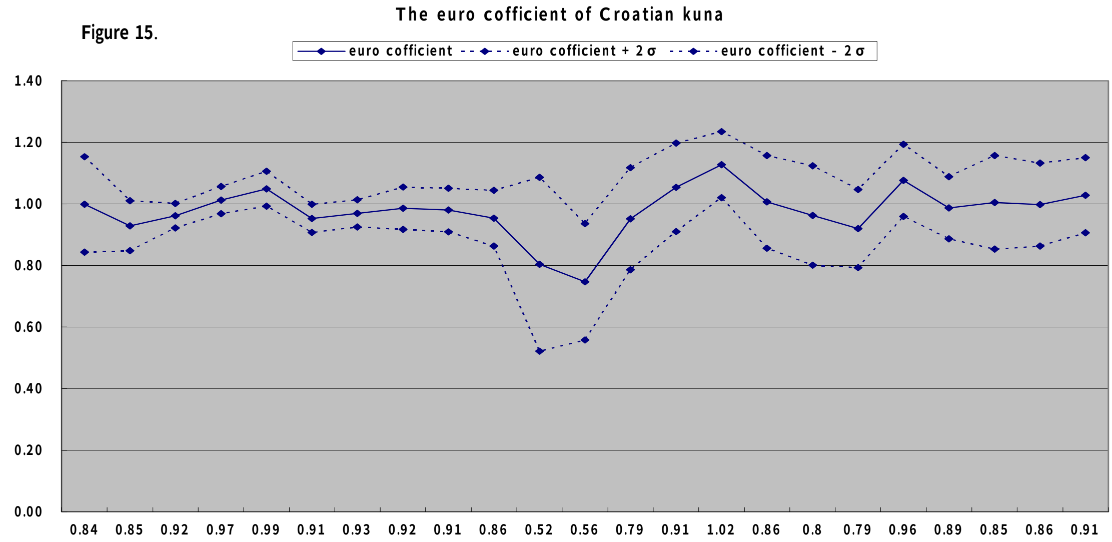

Figure 16.

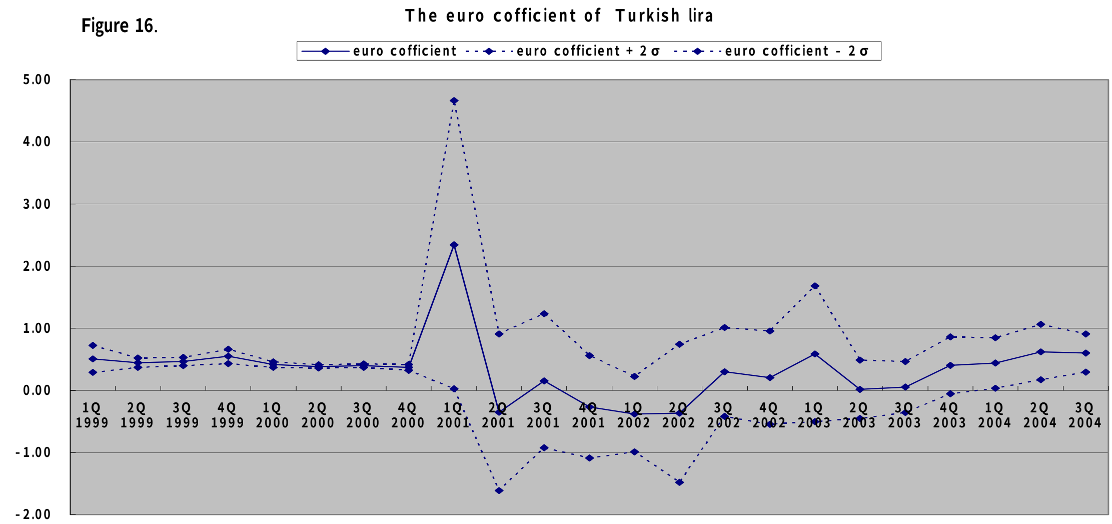

Figure 17.

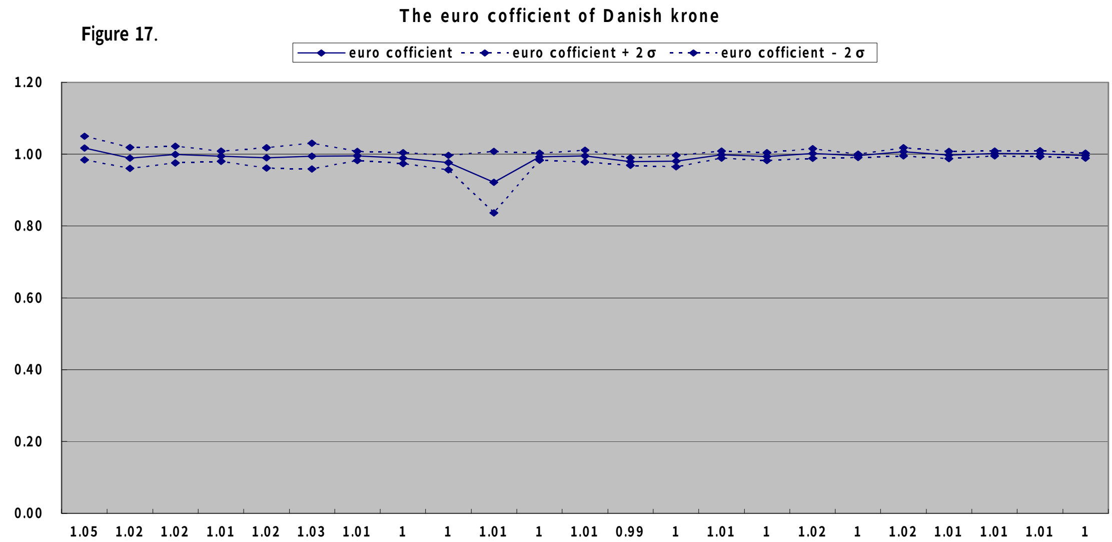

Figure 18.

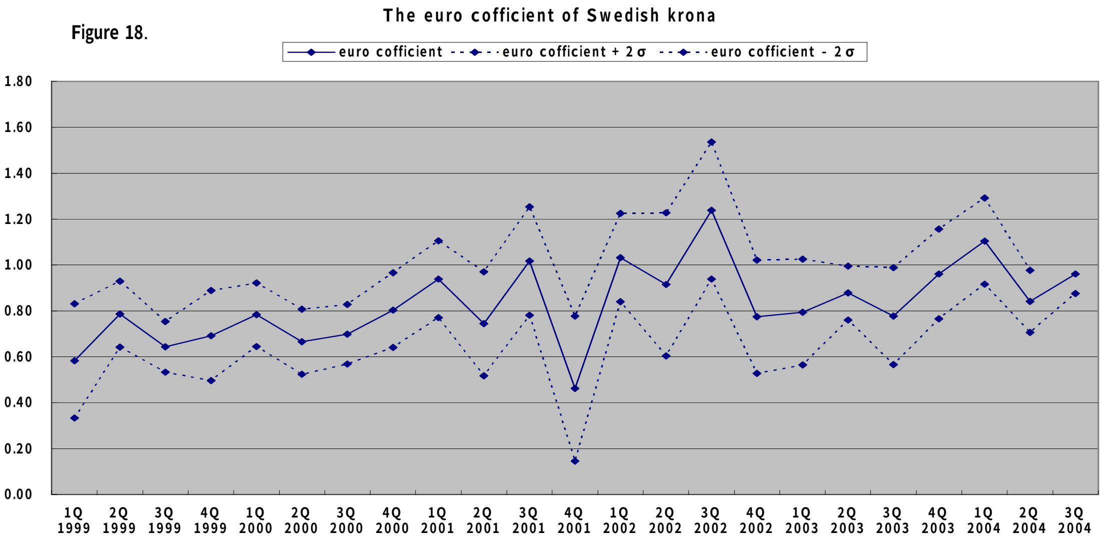

Figure 19.