

[研究ノート]

Exchange Rate Policy and Capital Flow in NewEntrants of EU

Yutaka Kurihara

Abstract

The purpose of this paper is to examine CEE (Central and Eastern Economies) countries' experience both with exchange rate management and the policies implemented to deal with capital flows. A key issue of this paper is credibility of exchange rate band. This paper focuses on this point and analyzes the deviation of the spot rate from the center of the band to be kept for participating in the common currency, euro. Countries have conducted different measures to keep exchange rate stable and keep exchange rates within the narrow band under sometimes strong pressures of capital flows from all over the world. Most countries have been manipulating domestic interest rate successfully against strong pressure in most cases. In the second period, namely, after entering the ERM (Exchange Rate Mechanism) in Europe, monetary authorities could have set interest rates adequately to keep exchange rate stable in a band. Moreover, foreign reserves have sometimes played important roles for keeping a band. Most countries might have chosen to stabilize the exchange rate by reserves through a target

zone mechanism.

1 . Introduction

Since the EU started, market integration has increased gradually and largely. Market obstacles of promoting trade and investment have been almost eliminated. Foreign direct investment (FDI) has increased rapidly as market integration has increased. Many countries have enjoyed the merits of integration. The EU economy has been in relatively in good condition before financial crisis occurred in 2008.

The process of European economic and political integration has been ongoing and has extended more to the Central and Eastern Economies (CEEs) recently. Eight countries of central and eastern Europe - the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Slovenia and Slovakia - joined the EU, finally ending the division of Europe decided by the Great Powers 60 years earlier at Yalta. Cyprus and Malta also become members. From 2004, 12 CEE countries joined the EU after satisfying severe requirements. Even before Bulgaria and Romania joined the Union, entry negotiations with two more candidate countries, Turkey and Croatia, had begun. In June 2010, the European Council decided to open negotiations with Iceland. All of them were admitted to the World Trade Organization (WTO), and some have been already been admitted to the Organization for Economic Cooperation and Development (OECD) and NATO. This integration has been facilitated by economic and political reforms that have led to the institutional convergence of the CEE countries.

When the euro was launched on 1 January 1999, it became the new official currency of 11 countries, replacing the old national currencies. First

introduced as a virtual currency for cash-less payments and accounting purposes, it appeared in physical form on 1 January 2002. The euro is not the currency of all EU countries. Two countries (Denmark and the United Kingdom) agreed an 'opt-out' clause in the Treaty exempting them from participation, while the remainders (many of the newest EU members plus Sweden) have yet to meet the conditions for adopting it.

Foreign exchange system in most countries has evolved from a fixed nominal exchange rate one to managed float to facilitate accession to the Economic and Monetary Union (EMU: Economic and Monetary Union). This requires participation in the Exchange Rate Mechanism (ERM : Exchange Rate Mechanism), leading to irrevocable monetary integration, the adoption of the euro and forgoing independent monetary policy¹.

After joining the common currency, euro, the Maastricht criterion requires participation in ERM for two years without significant exchange rate disruptions or pressures prior to becoming a member of the EMU. This obligation to keep the domestic currency within a narrow band may present a challenge.

The purpose of this paper is to examine CEE countries' experience both with exchange rate management and the policies implemented to deal with capital flows. A key issue of this paper is credibility of exchange rate band. This paper focuses on this point and analyzes the deviation of the spot rate from the center of the band to be kept for participating in the euro. Countries have conducted different measures to keep exchange rate stable and the narrow band under sometimes strong pressures of capital flows.

This paper is structured as follows. Section 2 reviews the movement of exchange rates in each country. Along with exchange rates, other economic variables related with exchange rates are examined. Section 3 analyses

theoretically credibility of the exchange rate band for empirical analysis. Section 4 provide the results and examines them. Finally this paper ends with a brief summary.

2 . Exchange Rate and Some Other Variables Performances

The absolute and conditional convergence of economic variables or performance in the Central and Eastern European countries is expected to increase². Given that these countries have common roots³ and their economies have experienced similar challenges over time, the regional convergence in the CEE region may be seen as an intermediary stage of the CEE participation to the EMU. Szeles andMarinescu (2010) suggest empirical evidence on both absolute and conditional convergence in the CEE countries, for example. Exchange rate is related with economic performance. Arratibelet al. (2011) find that lower exchange rate volatility is associated with higher growth, higher stocks of FDI, higher current account deficits, and higher excess credit in the CEE countries.

In this paper, firstly, exchange rate volatility is examined. It is necessary to examine whether exchange rate policy has actually had the desired stabilizing effects on the exchange rates The sample period is different from each country as they participate in ERM at different stage. Also, some countries have not yet introduced euro. Table 1 is the time of a) entering ERMdate and b) introducing the euro date.

The sample period is divided into two according to Table 1. The first one is from 1999: 1, the starting time of the euro before participating in the ERM⁴. The second one is from the time to now (Feb. 2011). However, tests of unit roots for all the variables did not reject the hypothesis of unit roots

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Table 1. ERM Participation and Introduction of the Euro

country	Entering ERM date	Introducing the euro date
Cyprus	April 29, 2005	
Denmark	January 1, 1999	
Estonia	June 27, 2004	January 1, 2011
Latvia	April 29, 2005	
Lithuania	June 27, 2004	
Malta	April 29, 2005	January 1, 2008
Slovakia	November 25, 2005	January 1, 2009
Slovenia	June 27, 2004	January 1, 2007

Table 2. Volatility of the Exchange Rate

country	Cyprus	Denmark	Estonia	Latvia	Lithuania	Malta	Slovakia	Slovenia
First period	0.0398	0.0798	0.4787	0.0078	0.0637	0.0523	1.1396	6.5976
Second period	0.0153		1.3759	0.0169	0.0798	0.0148	0.8424	0.1271

at conventional significance level (5%), so volatility was measured as the standard deviation of the first differences of each variable. The data is against the euro and monthly. The results are presented in Table 2.

The results are interesting. In some countries exchange rate volatility has shrank greatly, however, the volatility is similar and not so different across periods. Introducing the band or limitation of exchange rates fluctuation has not reduced the volatility at least in some countries. One reason is that there is some big turmoil in international financial markets. Lehman shock is one of them. The other reason is that to reduce volatility costs side effects. Bertola and Caballero (1992) and Werner (1995) indicate

Table 3. Volatility of fundamental variables of exchange rates

		Cyprus	Denmark	Estonia	Latvia	Lithuania	Malta	Slovakia	Slovenia
GDP indicator	First period	0.8032	7.0467	13.1821	5.1857	6.5922	0.4357	3.4499	0.1895
	Second period	0.9423		15.8576	4.4006	7.0467	0.7331	6.1671	2.5418
Interest rate	First period	0.5076	0.4045	0.9493	1.0150	0.5670	0.0710	0.4247	0.5237
	Second period	0.4832		0.3583	3.4032	0.4045	0.0958	0.2281	0.1271

that although the variability within the band may fall for narrow bands, expectations of realignment may be greater.

Examining volatility by looking at the evolution of exchange rates only may be misleading because the variability of exchange rate fundamentals may have changed across periods⁵. Along with exchange rates, other economic variables should be examined. Table 3 is volatility of exchange rate fundamentals. Volatility was also measured as the standard deviation of the first differences of each variable. The data is also monthly. Interest rates are money market rates in each country.

The results show that economic activity (GDP)⁶ are almost same across periods, however, some countries show that interest rates⁷ have been stable during the second period. Introducing euro requires keeping interest rates low, however, one of the reasons may be the result of foreign reserve accumulation. A lot of countries have increased foreign reserves to combat speculative attacks against domestic currency. It may have contributed to stable economic conditions.

Finally, Table 4 is foreign reserves in each country. We can say that most

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Table 4. Foreign Reserve Accumulation (million; US dollar)

	Cyprus	Denmark	Estonia	Latvia	Lithuania	Malta	Slovakia	Slovenia
1999	1783.80	21145.00	852.12	868.92	1190.61	1701.90	3369.90	3058.79
2000	1694.00	14469.00	920.62	850.83	1310.21	1385.80	4021.80	3110.00
2001	2221.90	16117.00	820.20	1148.59	1599.27	1582.40	4140.30	4244.33
2002	2953.20	25901.00	1000.34	1241.27	2295.86	2115.25	8807.50	6852.57
2003	3154.50	36004.00	1373.27	1432.22	3371.89	2624.53	11676.80	8343.09
2004	3832.70	38196.00	1788.13	1911.74	3512.47	2621.68	14416.10	8662.27
2005	4155.90	32510.00	1943.12	2231.91	3720.14	2473.00	14899.40	8013.12
2006	5621.50	29160.00	2781.14	4353.13	5654.26	2865.00	12645.20	6987.08
2007	6100.10	32029.00	3262.59	5553.11	7565.61	3662.00	18025.80	942.04
2008	585.53	39823.00	3964.77	5027.17	6281.33	288.29	17804.90	809.91
2009	562.92	71259.00	3874.69	6444.99	6237.91	329.68	50.42	589.55
2010	276.21	70334.00	2460.36	7069.48	6362.04	340.49	52.11	543.18

Note) Data source is from IFS (IMF).

countries have increased the reserves. This reason is examined in later.

3 . Theoretical and Empirical Framework: Credibility of the Exchange rate band

A key point in the functioning of an exchange rate band is credibility. Rose and Svensson (1994) examined the expected changes of the exchange rate implied by the interest rate differential and infer whether it is consistent with the exchange rate staying within the band. However, because of the existence of foreign reserves for capital inflows and the absence of any cost for outflows, interest rate differentials do not reflect expectations of

exchange rates depreciation. Also, Svensson (1992) has argued that the method is inclusive for short horizon expected rates of realignments vary more than interest rate differentials. Moreover, although the method can identify when the band is not credible it cannot identify when it is credible, because forward rates may be inside the band regardless of credibility. Afonso et al. (2011) indicates that foreign reserves and default history are important long-run determinants of sovereign debt credit ratings in the CEE countries. Liesenfeld et al. (2010) suggest that current account balance, terms of trades, foreign reserves and concessional debt are important determinants of current account reversal.

This paper employs another method following Helpman, Leiderman, and Bufman (1994).

$$st = ct + dt \tag{1}$$

st is the log of the each country's spot exchange rate against the euro at time t is assumed to be the sum of two components: One is the log of the central parity (ct) and the other is the deviation of the spot rate from the center of the band (dt). Helpman, Leiderman, and Bufman (1994) and Magendzo, Rojas, and Vergara (1996) used interest rate differentials as a proxy. On the other hand, foreign reserve sometimes may play important role for exchange rate determination.

A linear model is where future the difference between st - ct depends on the domestic interest rate i (domestic interest rate), and international interest rates i* (the euro interest rate: interest) and the foreign reserve (reserve).

$$et - ct = \beta_1 i_t + \beta_2 i^* + \beta_3 RESERVE_t \tag{2}$$

β_1 is expected to be minus, as the domestic interest rate decreases (increases), exchange rate (et) appreciates (depreciates). On the other hand, β_2 should be positive. β_3 should be positive. As foreign reserve increases

(decreases), depreciation of exchange rate occurs. However, there is some possibility that accumulating foreign reserves result in appreciation of domestic currency as measures against speculative attacks or future selling preparation of foreign currencies would be sufficient. In this case, β_3 should be negative. Which is correct is checked by empirical method. In the next section, empirical analysis is performed and the results are examined.

4 . Empirical results and its implications

For regression, GMM (Generalized Method of Moments) is employed. The estimates are chosen to minimize the weighted distance between the theoretical and actual values. GMM is a robust estimator in that, unlike maximum likelihood estimation, it does not require information of the exact distribution of the disturbance. The results of the equation (2) are shown in Table 5.

For the interest rates, the results are as expected in most cases. Compared to the first period, the second period is more in accordance the expectation mentioned above. On the other hand, euro interest rate has not moved in both periods as expected. It has made countries difficult to keep exchange rates in a band. However, each country may have been manipulating domestic interest rate successfully against strong pressure in some cases. Target zone or ERM system should have stabilizing effects on the evolution of exchange rate successfully. It may have stabilizing effects as long as the band is maintained at its edges through explicit intervention to keep the exchange rate within the band.

The results are inconclusive for foreign reserves. It is interesting to note that there are some opposite movements to exchange rate in the second pe-

Table 5. Determinants of Change in the Exchange Rate Position (GMM)

country	period	c	interest	einterest	reserve	F-statistic	Adj. R ²
Cyprus	First period	-0.4529 (-7.3742)	0.0341 (3.4956)	0.0383 (3.4991)	7.37E-05 (5.8212)	20.0883	0.4362
	Second period	0.1504 (2.8505)	0.0005 (0.1015)	-0.0503 (-6.2903)	1.87E-06 (0.1856)	54.7456	0.8344
Denmark	First period	2.9422 (6.5374)	0.6041 (2.6247)	-0.9490 (-3.9419)	-6.10E-05 (-9.5985)	50.4126	0.5142
	Second period						
Estonia	First period	-0.9048 (-0.8673)	-0.3029 (-3.4468)	1.5306 (9.4283)	-0.0032 (-4.5874)	91.2657	0.8088
	Second period	0.1545 (8.5303)	0.0046 (1.2391)	-0.0060 (-1.6240)	-4.03E-05 (-5.4812)	31.1265	0.5600
Latvia	First period	-0.0325 (-1.5061)	0.0011 (0.5784)	0.0197 (6.0363)	-3.11E-05 (-3.2594)	52.8207	0.6775
	Second period	0.1194 (10.0521)	-0.0028 (-2.4586)	-0.0090 (-4.2094)	-1.89E-05 (-9.9034)	39.7591	0.6414
Lithuania	First period	1.2515 (12.7590)	-0.0306 (-4.5524)	0.0051 (0.3030)	-0.0006 (-27.9917)	594.2455	0.9652
	Second period	0.4676 (4.5961)	0.0328 (1.7926)	-0.0130 (-1.3817)	-0.0001 (-12.4125)	63.9701	0.7268
Malta	First period	0.0340 (0.0696)	-0.0309 (-0.6358)	0.0241 (0.8833)	8.72E-06 (0.0731)	0.9609	-0.0015
	Second period	0.3528 (5.2871)	0.0555 (2.4439)	-0.0103 (-0.7323)	-4.13E-05 (-2.5628)	72.3726	0.8699
Slovakia	First period	-5.3002 (-3.1973)	-0.6579 (-1.8965)	3.6220 (9.5613)	-0.0006 (-7.0788)	240.6632	0.8987
	Second period	24.1593 (5.6528)	-0.5086 (-0.6558)	-3.1329 (-5.2853)	-0.0006 (-2.8673)	86.1007	0.8734
Slovenia	First period	-73.7861 (-7.2433)	-5.2983 (-3.9052)	21.9317 (12.1555)	0.0058 (7.4959)	65.1910	0.7505
	Second period	-41.6082 (-0.8759)	13.5204 (1.2927)	0.6257 (0.1508)	-0.0011 (-1.4068)	2.4104	0.1236

Note) t-statistics are shown in parentheses.

riod. As already mentioned, accumulating foreign reserves may result in appreciation of domestic currency as domestic monetary policies against speculative attacks or future selling of foreign currencies would be sufficient or large. Also, some countries may have been positive stance in keeping exchange rates depreciation for promoting exports.

Central bank holdings of reserves currency assets have risen sharply in these countries⁸. Most countries might have chosen to dampen the share of these capital inflows through the use of a reserve and to stabilize the exchange rate through a target zone mechanism. It imposes a relatively higher cost on short-term inflows. The reserve might have permitted maintaining domestic interest rates above international interest rates without imposing excessive pressures on the exchange rate.

5 . Conclusions

To accomplish the criterion that requires participation in ERM without significant exchange rate disruptions or pressures prior to becoming a member of the EMU is not easy task. However, CEE countries have made much effort and have succeeded in realizing good economic conditions toward the road to participating ERM or introducing a common currency, euro.

They have succeeded in performing good economic condition and attaining the requirements for not going out of the ERM, however, their policies taken in every aspect is different. Along with domestic interest rates, foreign reserves have sometimes played important roles for keeping a band. Most countries might have chosen to stabilize the exchange rate through a target zone mechanism via foreign reserve accumulation.

Most countries have been manipulating domestic interest rate successfully against strong pressure in some cases. In the second period, namely, after entering the ERM, monetary authorities could have set interest rates adequately to keep exchange rate stable in a band.

It should be noted that capital flows have grown largely in CEE countries. Sometimes there are strong pressures to exchange rates. Under such circumstances, CEE countries have been able to conduct monetary policies adequately and attain good economic conditions, so they could enter the ERM or introduce a common currency, euro.

Notes

- 1 . Syllignakis and Kouretas (2010) suggest that the financial linkages between the CEE markets and the world markets increased with the beginning of the EU accession process.
- 2 . Tanja (2011) indicates that at the moment Croatia is far from ready for the common monetary policy of the EMU, while among other CEE countries Slovenia and Latvia have the closest connection between their business cycles and those of the EMU.
- 3 . Schnabl and Ziegler (2011) show that workers in countries with fixed exchange rates are likely to benefit in the long run from higher wage increases.
- 4 . To participate in the euro, they have to limit the exchange rate volatility in the band for two years according to the ERM agreement.
- 5 . Jiménez-Rodríguez et al. (2010) find that some countries like Slovakia and Slovenia - already euro area members - react stronger to foreign industrial production shocks than other countries and that the responses to such shocks are strongly correlated for selected CEE countries.
- 6 . Industrial production is used instead of GDP for data availability.
- 7 . From 1985 to 1998: 12, money market rate in Germany is used and after that euro interest rate is used.
- 8 . Policymakers in central banks in Asia seem to have selected to get foreign reserves for self-insurance or precautionary motives against future crises or exchange rate movements. See, Kurihara (2011).

References

- Afonso, Antonio, Pedro, Gomes, and Philipp, Rother, "Short- and long-run determinants of sovereign debt credit ratings," *International Journal of Finance & Economics* 16 (1) (2011): 1-15.
- Bertola, Giuseppe, and Richard J. Caballero, "Target Zones and Realignments," *American Economic Review* 3 (1992): 520-36.
- Cowan, Kevin, and Jose De Gregorio, "Exchange Rate Policies and Capital Account Management," In R. Glick, ed., *Managing Capital Flows and Exchange Rates*, pp. 465-488. Cambridge: Cambridge University Press.
- Werner, Andres, "Exchange Rate Target Zones, Realignments and the Interest Rate Differential: Theory and Evidence," *Journal of International Economics* 39 (1995): 353-67.
- Helpman, Elhanan, Leonard Leiderman, and Gil Bufman, "New Exchange Rate Bands," *Economic Policy* 19 (1994): 260-306.
- Jiménez-Rodríguez, Rebeca, Amalia Morales-Zumaquero, and Balázs Égert, "The Effect of Foreign Shocks in Central and Eastern Europe," *Journal of Policy Modeling* 32 (4) (2010): 461-70.
- Kurihara, Yutaka, "ERM: Are There any Credibility," *Finance Research* 23 (1997): 1-12 (in Japanese).
- Kurihara, Yutaka, "Effects of Foreign Reserve in Asia," *Global Business and Economics Review* 13 (1) (2011): 84-92.
- Liesenfeld, Roman, Guilherme, Valle, Moura, and Jean-Francois, Richard, "Determinants and Dynamics of Current Account Reversals: An Empirical Analysis," *Oxford Bulletin of Economics and Statistics* 72 (4) (2010): 486-510.
- Olga Arratibel, Davide Furceri, Reiner Martin, Aleksandra Zdzienicka, "The Effect of Nominal Exchange Rate Volatility on Real Macroeconomic Performance in the CEE Countries," *Economic Systems* 35 (2) (2011): 261-75.
- Schnabl, Gunther and Christina Ziegler, "Exchange Rate and Wage Policies in Central and Eastern Europe," *Journal of Policy Modeling* 33 (3) (2011): 347-60.
- Svensson, Lars E. O., "An Interpretation of Recent Research on Exchange Rate Target Zones," *Journal of Economic Perspective* 4 (1992): 119-44.
- Svensson, Lars E. O., "Assessing Target Zone Credibility: Mean Reversion and Devaluation Expectation in the ERM 1979-1992," *European Economic Review* 37 (1993): 119-44.
- Syllignakis, Manolis N. and Georgios P. Kouretas, "German, US and Central and Eastern European Stock Market Integration," *Open Economies Review* 21 (4) (2010): 607-20.
- Szeles, Monica, Raileanu and Nicolae Marinescu, "Real Convergence in the CEECs, Euro

Area Accession and the Role of Romania," *The European Journal of Comparative Economics* 7 (1) (2010): 181-203.

Tanja, Broz, "Introduction of the euro in CEE countries - Is It Economically Justifiable? The Croatian Case," *Post-Communist Economies* 22 (4) (2010): 427-47.