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Exchange Rate Economics in Transition Economies

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Abstract: The goal of this paper is to empirically and theoretically analyze real exchange rate movements in transition countries. Since the beginning of the transition process, continuous real exchange rate appreciation has become stylized fact of all transitional economies. Most of the mainstream models of exchange rate economics have proven to be inadequate in explaining the real exchange rate movements in transition economies. Therefore, new, transition specific theories emerged as possible explanations. This paper seeks to investigate and empirically validate all transition specific theoretical frameworks which were used in explaining real exchange rate movements since the beginning of the transition.

Key words: real exchange rate, exchange rate based stabilization syndrome, Harrod Balassa Samuelson theorem, Feldstein-Horioka puzzle

JEL Classification: F02, F31; F41

Introduction

The economics of exchange rates is an area which has generated and continues to generate a large number of discussions between academics, policy-makers and practitioners. During the last fifteen years a huge body of empirical and theoretical papers has been written on the issues of exchange rate. Much of this activity has been so revolutionary as to induce a significant change in the profession's way of thinking about the area.

Within the transition countries, the economics of exchange rate has generated even larger number of discussions. Real exchange rate movements in transition countries were quite unexplainable within the framework of the main stream real exchange rate economics. Therefore, new transition specific theories emerged.

In this paper, four major theories of transition exchange rate movements are analyzed and some of them are empirically tested. In the first part of the study,

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mainstream exchange rate economics is analyzed together with analysis of real exchange rate movements in Croatia, Czech Rep., Hungary, Poland, Slovakia and Slovenia. In the second part, theory of initial depreciation of transition economies have been analyzed and empirically tested with cross-country data for 1990. In the third part, the Harrod-Balassa-Samuelson theory has been analyzed and tested. In the fourth part, the theory of exchange rate based stabilization syndrome has been analyzed together with major explanations of the syndrome. In the last part of the text Feldstein-Horioka puzzle in the framework of EU integration has been analysed.

Exchange Rate Economics

In the last few decades exchange rate economics has seen a large number of developments. Substantial contribution has been made to the theory and empirics of the exchange rate determination. The end of the Bretton-Woods and a dawn of a float period have created a huge gap between stylized facts on exchange rate movements of the time and the mainstream theory of the time. Unprecedented volatility of exchange rates combined with important developments in econometrics and the increase in availability of high quality data have been responsible for stimulating the large amount of empirical work on exchange rates published over this period.

A decade after the beginning of the float period, a large body of theoretical and empirical research has created a need for a survey of literature. First exchange rate economics surveys appeared as early as 1983. Anne O. Krueger published a book titled 'Exchange-Rate Determination'. Later, two more books specialized in exchange rate economics appeared. The first one was published by Isard (1995), and a second one by Taylor and Sarno (2005).

Beside the books, several survey articles were published also. Dornbusch et. al. (1980) published an extremely interesting paper with interesting comments of William H. Branson, Hendrik Houthakker and others. In the paper, the field of exchange rate economics was subdivided to research related to exchange rate determination, research of effects of news on exchange rates and research of official intervention on exchange rates. Much later in 1987 Dornbusch published another survey, which was solely focused on the exchange rate determination. MacDonald and Taylor (1992a, 1992b) published a two volume collection of most important articles with introductory survey written by them. In a similar way as Dornbusch et. al. (1980), MacDonald and Taylor (1992a, 1992b) subdivided the field in to research of exchange determination and research of effects of news on exchange rates. Furthermore, they added two additional groups of research: survey of empirical evidence and tests of market efficiency. In 1995, MacDonald's and Taylor's (1992a, 1992b) introductory text had evolved and has been published by Taylor (1995).

Taylor used five subdivisions that were previously used by Dornbusch et. al. (1980) and MacDonald and Taylor (1992a, 1992b). Devereux (1997) published a paper on exchange rate economics with body of research subdivided to exchange rate determination, empirical evidence and effects of official intervention on exchange rates (Table 1).

Table 1: The most often surveyed areas of research in exchange rate economics

The most important areas of research in exchange rate economics	Dornbusch et. al. (1980)	Dornbusch (1987)	MacDonald i Taylor (1992a, 1992b)	Taylor (1995)	Devereux (1997)	Taylor i Sarno (2002)
Exchange rate determination	X	X	X	X	X	X
Surveys of empirical papers			X	X	X	X
Tests of market efficiency			X	X		X
News and exchange rates	X		X	X		
Official intervention in the exchange rate market	X			X	X	X

Source: Dornbusch et. al. (1980), Dornbusch (1987), MacDonald and Taylor (1992a, 1992b), Taylor (1995), Devereux (1997), Taylor and Sarno (2002)

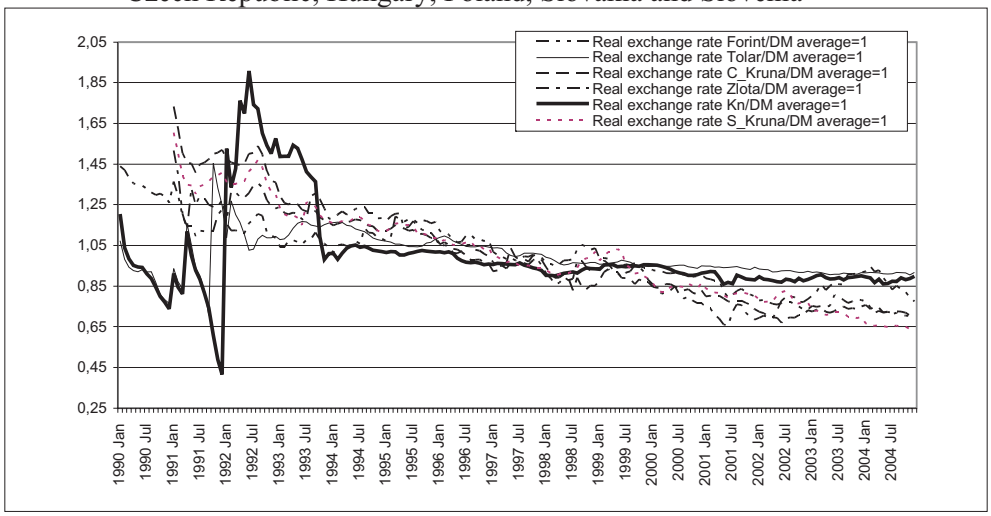
A large body of empirical and theoretical papers, as well as presented body of surveys of literature in the field of exchange rate economics has resulted with a high level of consensus on several significant issues. Simulations of general equilibrium models with sticky prices or with liquidity approach, ended up with output which had not been persistent and volatile as real exchange rates really are (Devereux 1997). Frankel's (1986) early warning on the power problem of tests of nonstationarity managed to restore belief in purchasing power parity as long run equilibrium. Among the long-span studies and panel data studies which report significant mean-reversion of the real exchange rate, there appears to be a consensus that the half-life of deviation from PPP is about three to five years (Taylor and Sarno 2002, p. 67). Nonlinear time series econometric techniques provided tools for explaining high degree of persistence of real exchange rates with slow rate at which shocks appear to damp out (Taylor and Sarno 2002, p. 68).

Nevertheless, huge advances in exchange rate economics did not proved to be sufficient in order to explain movements of exchange rates in transitional countries.

Transition of former communist countries in central and Eastern Europe resulted with real exchange rate behavior which was quite unprecedented within the framework of mainstream exchange rate economics.

Real exchange rates in Croatia, Czech Republic, Hungary, Poland, Slovakia and Slovenia appreciated constantly throughout transition period. Compared to the period of transition nadir and/or stabilization program relative prices were much higher in all countries. Furthermore, in the first stage of transition, prior to nadir, exchange rate movements were completely uncorrelated with movements of relative and/or total productivities (Figure 1 and Figure 2).

Figure 1: Relative bilateral real exchange rates of German mark/Euro in Croatia, Czech Republic, Hungary, Poland, Slovakia and Slovenia

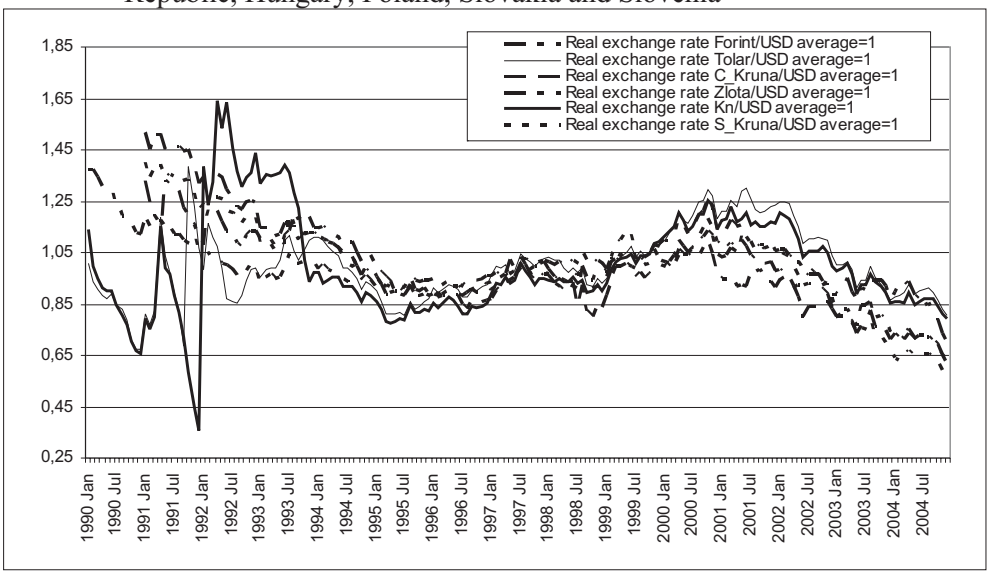


Source: HNB 2005; Tecajevi i tecajne liste 1945.-1993., 1993; Anusic et. al. 1995; DB 2005; Service-Team 2005; BSI 2005; SURS 2005; MNG 2005; WIIW 2005; GUP 2005; Riha 2004

The length and persistence of appreciation trend before and after nadir was something that theories of exchange rate could not explain. Therefore, alternative theories emerged in order to shed light on a question of sustainability of real exchange rate appreciation in transition economies. Generally speaking it is possible to divide transition specific exchange rate theories in to four major groups.

First, the theory of initial absolute depreciation of transition countries was closely connected with Harrod-Balassa-Samuelson theorem. The basic explanation of appreciation was idea that absolute price levels, measured as absolute purchasing power parity, are depreciated in transition countries and appreciation of relative real exchange rate is basically return to the equilibrium (Grafe-a i Wyplosz-a 1997; Klaus 1992; Coricelli i Jazbec 2001).

Figure 2: Relative bilateral real exchange rates of US dollar in Croatia, Czech Republic, Hungary, Poland, Slovakia and Slovenia



Source: HNB 2005; Tecajevi i tecajne liste 1945.-1993., 1993; Anusic et. al. 1995; US Department of Labor 2005; BSI 2005; SURS 2005; MNG 2005; WIIW 2005; GUP 2005; Riha 2004

Second, Harrod-Balassa-Samuelson theory emerged as an explanation of appreciation in the later phase of transition. According to the theory, appreciation was a consequence of relative price increase in nontradable sector of economy. Strong growth of productivity after nadir resulted with economy wide wage growth. Productivity growth in nontradable sector was smaller and wage increase was accommodated with higher prices of nontradable goods and services (Harrod 1933; Balassa 1964; Samuelson 1964; Halpern and Wyplosz 1997; 1998; 2001; Krajnyak and Zettelmeyer 1998). HBS theory and theory of initial depreciation were usually used and empirically tested together.

Third theory was definitively exchange rate based stabilization syndrome. According to the theory there are several stylized facts about behavior of economy in the aftermath of exchange based stabilization. Basic idea is that empirical facts from the experience of Latin America suggest that exchange based stabilizations lead to consumption boom, appreciation of real exchange rate, strong growth of foreign debt and eventually to financial crisis. ERBS syndrome theory was mostly used by critics of transitional process in general (Kiguel and Liviatan 1992; Vegh 1992; Sobolev 2000; Druzic, Tica and Simurina 2000).

Fourth theory is the latest explanation of appreciation of real exchange rates in transition and accession countries. Basic idea is that integration process is merging western European countries which are capital abundant and accession countries which are scarce in capital. Differential in capital abundance results with differentials in rates of returns; EU integration strongly affects risk premium inducing shifts in portfolios and huge capital flows. Basically, this theory is a blend of portfolio-balance models and Feldstein-Horioka puzzle within the framework of EU integration process (Feldstein Horioka 1980; Rogoff 1992; Blanchard Giavazzi 2002; Giannone i Lenza 2002; Fischer 2002).

It is obvious that even shallow survey of mentioned theories discovers the fact that transition exchange rate economics is quite intensive field of research in economics. Furthermore, major models and theories in mainstream exchange rate economics represent minor and marginal share within the transition exchange rate economics.

Theory of Initial Depreciation of Transition Countries

In the initial stage of transition, appreciation of exchange rate was accompanied by general decrease of aggregate economic activity. Decrease in economy wide productivity followed by appreciation is not exactly stylized fact of Harrod-Balassa-Samuelson theory. Therefore, the theory of initial depreciation has been constructed in order to explain deviation of real exchange rates which were not cointegrated with productivity differentials in transition countries.

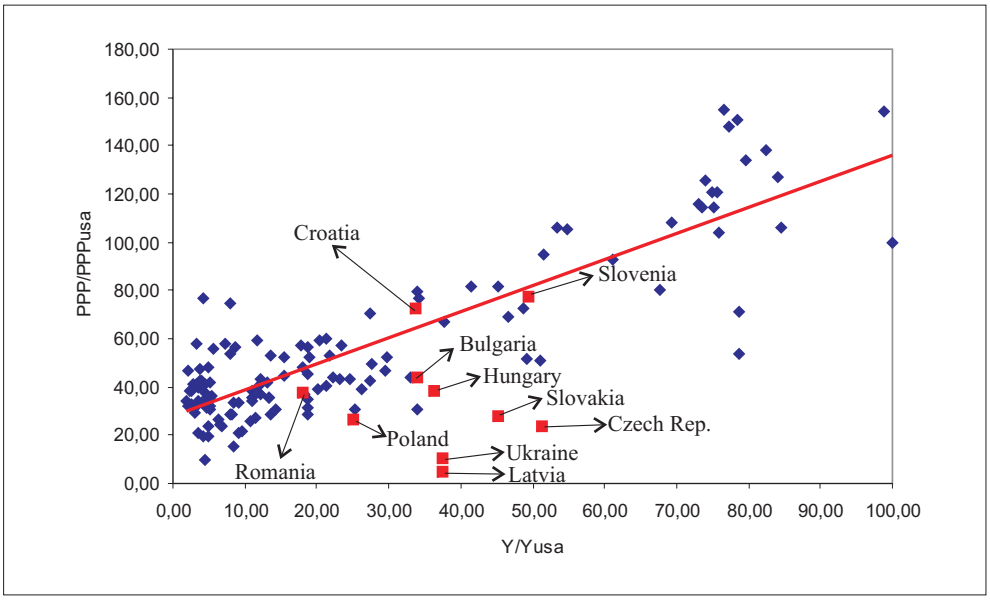
The ideas were first time mentioned by Klaus (1993). According to the theory, initial absolute depreciation of real exchange rate was necessary ingredient of successful transitional economic policy. The basic idea is that depreciation practically 'protects' tradable sector of economy during restructuring and initial transitional slump. The Klaus' (1993) theory was later upgraded by Grafe and Wyplosz (1997) and Coricelli and Jazbec (2001) and used in empirical studies by Halpern-a i Wyplosz-a (1997; 1998; 2001), Krajnyak-a i Zettelmeyer-a (1998) and Coricelli and Jazbec (2001).

Grafe and Wyplosz (1997) presented a model intended to reconcile theory with stylized facts of transition: the gradual emergence of a private sector with low but rising productivity, and lasting wage differentials between the 'modern' traded and nontraded sectors and the 'old' industrial sector which often continues to operate under soft budget constraints. This theoretical investigation shows that wage plays the crucial role of reallocating productive resources as is usually performed by the real exchange rate in 'normal' economies. Labor costs and the real exchange rate need to be initially low to allow the new traded sector to generate high enough profit margins to be able to expand. At the same time a continuous real appreciation is

needed to attract labor away from the state sector which is then forced to close down inefficient production lines. The link between real appreciation and rising productivity in the traded good sector can be seen as a Harrod Balassa Samuelson effect in reverse: labor productivity increases are a consequence of real appreciation, not the exogenous driving force behind it.

According to Coricelli and Jazbec (2001) there is one crucial distinction made to the classical HBS two-sector model concerning the relationship between the real exchange rate development and labor market adjustment. The preferences of planners during the period of planned economy were quite different to the preferences of consumers during transition period. The preferences of central planners stand as a proxy for the initial conditions in transition economies. The higher was the required volume of the tradable goods production (industrialization), the greater were the initial price discrepancy between the relative tradable prices measured in terms of non-tradables in transition economies and market economies.

Figure 3: Purchasing power parity relative to US and GDP per capita relative to US in market economies and transition economies in 1990



Source: Heston, Summers and Aten 2002; Tica 2005

It can be easily seen in a simple regression analysis that all transitional economics had much lower price level for their level of development (Figure 3). It is obvious that theory of initial absolute depreciation plays most important role in explaining initial price levels in transition countries. According to the theory start of transition has

initiated process which basically represents return to the equilibrium price level of absolute real exchange rate. Preferences of economic planners resulted with price levels which are low relative to price levels connected to consumer preferences. Once the planning was obsolete, price level started to converge to the new market equilibrium price level.

Within the framework of our simple regression, OLS line represents market equilibrium with respect to the GDP per capita. The transition process has initiated convergence toward OLS line (Figure 3). Continuous real appreciation needed to attract labor away from the state sector has resulted with relatively higher inflation in non tradable sector leading to increase of general price level.

Furthermore, due to openness and self-management system in former SFRY, Croatia and Slovenia (as well as other former republics) are exceptions within the framework of the theory of initial depreciation. Openness of former federation and the lack of central planning system have resulted with price levels which were quite similar with market economies at the similar level of development.

The Harrod Balassa Samuelson Theorem

During the last decade, the most popular theory in empirical papers throughout Europe was Harrod-Balassa-Samuelson effect. According to HBS effect, productivity growth is distributed heterogeneously across the sectors of economy. The fastest productivity growth is in tradable sector and wages will grow at the pace of productivity growth in tradable sector. Due to mobility of labor force between the sectors nontradable sector is forced to follow that wage increase. At the end, due to the fact that productivity growth in nontradable sector is small or nonexistent, accommodation is going to result in higher price level of non tradables (Harrod 1933; Balassa 1964; Samuelson 1964).

Majority of researcher find proof of cointegration between productivity differentials and relative price of nontradables, while relationship between productivity differentials and real exchange rates and/or relative price of nontradables and real exchange rates were mush less strong and/or significant.

The existence of HBS effect in transition countries were confirmed in nine papers. Halpern and Wyplosz (2001) confirmed the theory on the sample of 9 countries in the cross country analysis during 1970-1995. Cipriani (2001) confirmed the relationship in 9 out of 10 countries during 1995-1999. Coricelli and Jazbec (2001) find proof of the relationship during 1990-1998 in 19 countries. De Broeck and Slok (2001) confirmed the theory on the sample of 26 transition countries during 1991-1998. Egert (2002a) proved the theorem during 1995:6-2000:12 in 5 countries and in another paper (2002b) during 1991:I-2001:II. Year later, Egert et. al. (2003) managed

to prove the productivity biased PPP in 9 countries during 1995:I-2002:IV. Lojschova (2003) find evidence of relationship in 4 countries during 1995:I-2000:IV and Mihaljek and Klau (2003) did it on the 6 country sample during the 1992-2001.

On the other side there were two empirical studies that suggested that there is not any evidence of the Harrod-Balassa-Samuelson effect. Fischer (2002) did not find any evidence on sector bases in the sample with 10 countries during 1993-1999 with yearly frequency and 1994:I-2000:IV with quarterly frequency. Arratibel, Rodriguez-Palenzuela and Thimann (2002) tested the theory on 10 countries during 1995-2001 with negative result.

Therefore there are nine empirical papers which have find evidence of the existence of the productivity biased approach to purchasing power parity in the transitional countries, while only two papers did not find any proof. The conclusion that there is significant amount of evidence that the HBS effect affects the price levels in transitional countries is quite obvious (Figure 3).

The HBS model was used as a theory of exchange rate determination, but most important reason for its popularity is in the controversy related to its effects on EMU criterions. The question whether HBS syndrome interferes with Maastricht inflation criterions emerged as a major issue in the research connected with enlargement of European Monetary Union. Therefore, many scholars investigated HBS effect as a possible obstacle for EMU inflation targeting in accession countries.

According to surveyed papers, consensus in relation with the strength of the effect in relation with Maastrciht rules is much weaker. Three surveyed papers suggested that there is interference between EMU rules and HBS effect (Halpern and Wyplosz 2001; De Broeck and Slok 2001; Lojschova 2003). Six surveyed papers suggested that there is substantial amount of evidence of cointegration between productivity and price levels, but that there is not any evidence of interference between convergence induced inflation and EMU rules (Cipriani 2001; Coricelli and Jazbec 2001; Egert 2002a; 2002b; Egert et. al. 2003; Mihaljek and Klau 2003). As was already mentioned two empirical papers did not find evidence of the HBS effect at all (Fischer 2002; Arratibel, Rodriguez-Palenzuela and Thimann 2002).

Nevertheless, although there is not any definitive evidence for or against the HBS interference with inflation criterions, all the accession countries with exception of Slovenia delayed EMU integration. Figure 3 offers quite evident explanation for the Slovenian decision to be the first accession country with in the Euroland. It is obvious that Slovenia is the only transition country within the EU that has absolute price level, or purchasing power parity that is near the level indicated by its productivity (Figure 3). In other words, price level in Slovenia is not depreciated related to similarly developed market economies and therefore there is not any danger that further convergence in price level will interfere with EMU inflation criterions.

Exchange Rate Based Stabilization Syndrome

Exchange rate based stabilization syndrome is the theory that describes stylized facts about consequences of exchange rate based stabilizations throughout the world. Weather successful or not exchange rate based stabilization in chronic inflation countries have been characterized by a series of empirical regularities documented in Kiguel and Liviatan (1992), Vegh (1992), Reinhart and Vegh (1995), Rebelo and Vegh (1995) and Soboloev (2000).

According to Rebelo and Vegh (1995, p. 6-7), there are nine empirical regularities closely connected with exchange rate based stabilization programs:

- Slow convergence of inflation to the devaluation rate.
- An initial expansion in economic activity followed by a later slowdown.
- A rise in a relative price of non-trade goods (real exchange rate appreciation).
- An increase in real wages measured in units of tradable goods.
- An ambiguous response of real interest rate.
- A remonetization of the economy.
- A deterioration of the trade and current account.
- A large fiscal adjustment (in successful or temporary programs).
- A boom in the real estate market.

According to Sobolov (2000, p. 5) there are five stylized facts about exchange rate based stabilization syndrome:

- Remonetization of economy occurs, accompanied by a strong increase in private sector credit even when measured relative to real economic activity.
- The rate of inflation converges slowly to the new lower rate of devaluation, and is accompanied by a rise in the relative price of nontraded goods – that is, an appreciation of the real exchange rate.
- The trade balance and the current account of the balance of payments deteriorate, with the current account deficits being financed by large capital inflows.
- There is an initial expansion in economic activity (output and investments) relative to trend, which is accompanied by a private consumption boom and an increase in real wages.
- There is a boom-bust 'cycle' in the sense that the stabilization program, more often than not, culminates in a financial crisis, capital flight, and forced devaluation of the currency followed by severe recession.

It is obvious that basic mechanism of the syndrome is closely related with appreciation of real exchange rate and all the consequences of the appreciation in the form of trade deficit, increasing debt and eventually financial crisis.

Although there is a strong empirical body of evidence on stylized facts about exchange rate based stabilization syndrome, body of theoretical explanation is rich but not quite successful in explaining mechanisms behind the syndrome. In total there is four theoretical explanations of the syndrome: the theory of lack of credibility (Calvo 1986), Sticky inflation (Dornbusch 1982; Rodriguez 1982), the theory of intergenerational distribution of wealth (Helpman and Razin 1987; Rebelo 1997) and the theory of financial fragility (Sobolev 2000).

The theory of financial fragility is constructed exclusively for the transitional economical environment and therefore it represents one of the most popular explanations for the real exchange rate movements among the opponents of mainstream transitional paradigm. According to the model of financial fragility in the transitional economies, banks are dominant lenders. Furthermore, due to wide range of asymmetrical information closely connected with the lack of institutional reforms, banks do not internalize the effect of their lending on the other banks' information about potential borrowers. Due to high verification costs, borrower's trustworthiness is estimated according to its liquidity and not according to its solvency. The final result is that lending basically increase lenders credibility and in that way enables borrowers to lend even more. The resulting credit boom is actually engine behind surge in investments and income which results in non tradable inflation and appreciation of real exchange rate (Sobolev 2000).

Besides Sobolov (2000), other authors have also used models developed by Dornbusch (1982) and Rodriguez (1982) in other to explain real exchange rate movements in transition. Zdunic and Grgic (1995), Grgic i Zdunic (1999) as well as Druzic, Tica and Simurina (2000) tried to explain real exchange rate movements in Croatia with sticky price model.

Feldstein-Horioka Puzzle and EU Integration Process

According to the microeconomic theory less developed country is relatively scarce with capital and therefore has higher returns on investment which attracts investors from countries which are relatively abundant in capital. Nevertheless up until seventies empirical studies suggested that there is a high level of correlation between savings and investments within OECD countries (Feldstein and Horioka 1980). Since than 'The Horioka Feldstein puzzle' represented the fact that saving rates and investment rates within the countries remained correlated even after the liberalization of capital accounts in the 70-ies.

Recently, within the framework of EU integration, several authors managed to prove that the strength of correlation between savings and investments is negatively correlated with the strength of integration between the analyzed countries. Blanchard and Giavazzi (2002) have managed to find prove against the Horioka Feldstein puzzle in Portugal and Greece during the EU integration process, Giannone i Lenza (2002) proved that correlation between savings and investments has became insignificant in the 90-ties, and Fischer (2002) offered similar explanation and empirical proofs for the appreciation of transitional countries.

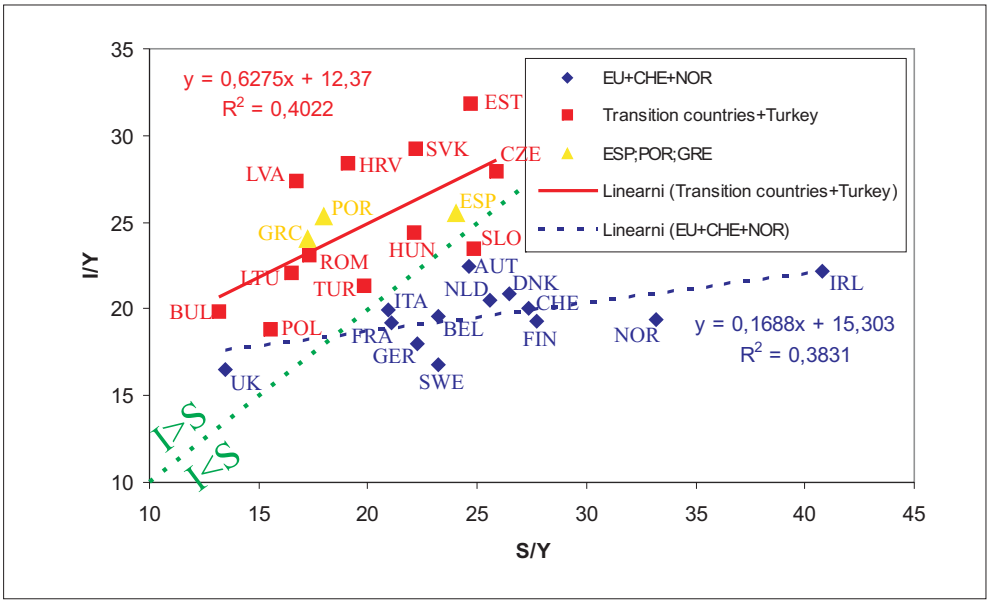
According to Fischer (2002), appreciation of real exchange rate in transition countries is consequence of relatively high investments demand. The EU integration is increasing international mobility of capital which at the end creates situation in which international investors are creating excess of demand for local currencies in transitional countries.

Although the theory of investment demand and international mobility of capital probably describes exchange rate movements in most reliable way, the HBS theory has received majority of attention of the researchers. Research on portfolio balance models in transition countries is quite scarce and studies on interest parity conditions, market efficiencies, the role of risk premium and EU integration are quite rare.

Nevertheless, quite simple empirical studies can quite consistently indicate major styled facts related to the Horioka Feldstein puzzle. According to the theory, in the open economics with perfect capital mobility, investment rates should be completely uncorrelated with saving rates in cross country sample. In the opposite extreme, in the closed countries with zero capital mobility, the correlation between two variables should be equal to one.

Empirical comparison of the relationship between savings and investment in the European countries in 2002, confirms quite strongly fundamental implication of the theory. In the more developed and opened countries which are members of EU (as well as Norway and Switzerland) it is more than obvious that there is not any significant relationship between saving and investments. On the other side, transition countries have much steeper relationship between savings and investments. Furthermore, more developed countries of EU-15 together with Norway and Switzerland are in the area in which saving is higher than investments, while transition countries are in the area where investment is higher than saving. It is more than clear that developed countries export capital, while less developed countries of EU and countries candidates import capital (Figure 4).

Figure 4: Horioka Feldstein puzzle in EU-15, accession countries and candidate countries in 2002



Source: WDI 2005

Conclusion

Several conclusions can be drawn from our analysis. First, it is more than obvious that standard exchange rate economics is inadequate in explaining real exchange rate movements in transition countries. Second, transition specific research on exchange rate movements has been extremely fruitful and it has resulted with strong empirical evidence on transition specific theories. Third, due to the large number of research it is more than necessary to start with surveying and classification of transition specific exchange rate theories. Fourth, although the HBS theory and theory of initial depreciation are most represented within the empirical studies, it is more than reasonable, based on our findings to expect that focus of research will slowly shift toward investment demand theories, market efficiency theories, and covered and uncovered interest parities.

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