

The Exchange Rate Pass-Through and the CEE countries Euro Admission within the Exchange Rate Political Economy

Jaromír Šindel

University of Economics, Prague, Faculty of Economics and Public Administrations, Department of Economic Policy

4, W. Churchill Sq., CZ – 130 67 Prague 3

Phone: 00 420 224 095 504, e-mail sindelji@vse.cz

Abstract

The exchange rate political economy explains different approaches within the integration process of the European monetary union. The changing character of exchange rate pass-through into the foreign trade prices changes not only the international economy paradigm, but also the attitude to the exchange rate political economy. First part of this article deals with the exchange rate political economy concept. Then we explore the different terms of trade development within the Central and East European countries together with the decomposition of external trade prices. The exchange rate regimes role is also discussed in this part of our analysis. The Czech exchange rate pass-through into export prices is compared with other transition economies of the Central and Eastern Europe. This issue is discussed within the integration process of the European monetary union, respectively with the Euro admission and the fulfilment of the Maastricht criteria.

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1. Introduction

The exchange rate political economy explains different approaches within the integration process of the European monetary union. The changing character of exchange rate pass-through into the foreign trade prices changes not only the international economy paradigm, but also the attitude to the exchange rate political economy. First part of this article deals with the exchange rate political economy concept. Then we explore the different terms of trade development within the Central and East European countries together with the decomposition of external trade prices. The exchange rate regimes role is also discussed in this part of our analysis.

Exchange rate political economy plays an important role within the integration process of the European monetary union as is confirmed by Frieden (1991, 2002), Eichengreen and Frieden (2000) or Šindel (2006). The changing character of exchange rate pass-through into the foreign trade prices changes not only the international economy paradigm, but also the attitude to the exchange rate political economy (see Engel 2000). The first part deals with the exchange rate political economy concept. Then we explore the terms of trade within the Central and East European countries, with the decomposition of external trade prices. The exchange rate regimes role is also discussed in this part of our analysis. The final part discusses the exchange rate pass-through in connection with the Czech terms of trade development.

The different external price development is not explicable clearly from the exchange rate regimes point of view (for example the structure of foreign trade plays an important role; see Campa, Goldberg (2002)). Although the Czech export and import price development corresponds with the appreciation of managed floating nominal Czech exchange rate and Slovenian substantial increase in foreign trade prices arises from the depreciating managed floating, some puzzles still remain. For example, Lithuanian exchange rate regime evokes substantially different foreign trade price development in comparison with the Estonian one, although both countries performed the currency board. The different currency basket management (due to the currency board regime is not control by the central bank and thus the currency basket is based endogenously) is behind this development. Which hypotheses are set by the different development of terms of trade? If the appreciated exchange rate caused the lower import price increase, the prices should be set by the producer (foreign) currency pricing (PCP) with the increased pressure to import-substituting competitiveness. However, the coexistence of Czech currency appreciation with the export prices has two different consequences. First one concerns the lower increase in comparison with the other observed countries export prices. And second one comes from the higher increase of export prices compared to the import prices development. However, if the appreciation of currency leads to export prices decrease in domestic currency, we deal with the local currency pricing (LCP) without pressure to lowering exporter's price competitiveness, but with the decreasing exporters mark-up.

The paper follows the mentioned hypothesis and tries to unveil the impact of exchange rate development on the exporter's price behaviour. Both the reasons and implications are rich. The influence of exchange rate development on the exporter's price behaviour can be distinguished from two points of view – the exchange rate trajectory and exchange rate volatility. Also exporter's price response to exchange rate development has also different implications. The first concerns the macroeconomic consequences in the expenditure switching way, as well as the implication for inflation development (so called the second stage exchange rate pass-through). The second arises from the industry level point of view. The mark-up behaviour is crucial within the mentioned expenditure switching buffer.

The Czech exchange rate pass-through into export prices is compared with other transition economies of the Central and Eastern Europe. This issue is discussed within the integration process of the European monetary union, respectively with the Euro admission and the fulfilment of the Maastricht criteria.

2. Exchange Rate Political Economy and the Exchange Rate Pass-through

Eichengreen and Frieden (1994) offer the overview of the political factors staying behind the monetary European integration – inter-state bargaining and domestic distribution. The first one (inter-state bargaining) is only partially applicable for the eurozone enlargement by the East European post-transition economies. The new future member countries have to agree to the generally accepted and unalterable entrance conditions, which are just the results of the previous inter-state bargaining. Second one has become more important for the future member countries. The domestic distribution of welfare rising from the common currency can be also understood as the within-state bargaining, also affecting inter-state bargaining or inter-government discussion. The domestic distribution can be analysed by the following diagram presented by Frieden (1991). This figure can offer the fundamental understanding of the preferences of economic sectors to the exchange rate

arrangements and through the magnitude of domestic distribution it forms the possible interest groups and within-state bargaining.

Figure 1

The possible preferences of economic sectors to national monetary policy

		Preferred degree of exchange rate flexibility and national monetary policy autonomy	
		High	Low
Preferred level of the exchange rate	Low	Import–competing producers of tradable goods for the domestic market	Export oriented producers of tradable goods
	High	Producers of nontradable goods and services	International traders and investors

Source: Frieden, J. (1991), p. 445.

A figure below offers an overview of preferences to the exchange rate policy, whereas the exchange rate (monetary) policy is discussed from the two points of view. The first one is the exchange rate level (undervalued or overvalued level), which can be perceived as appreciation or depreciation trend from the time perspective. Second point of view deals with the flexibility of exchange rate policy, which contains the autonomy of national monetary policy and its influence on economic activity on the one hand and exchange rate volatility on the other hand. Higher autonomy of the monetary policy is preferred by producers of nontradable goods and services and locally oriented producers that put more emphasis on flexible monetary policy and its expected positive influence on macroeconomic factors (economic growth, domestic absorption,). This factor is partly decreased by higher marginal propensity to import depending on the development of absorption – hence characteristic phenomenon of transitory economies. On the contrary, the exchange rate volatility is more significant factor from the view of monetary policy autonomy in the case of industries that are directly integrated into international trade and investment. We shall distinguish between two impacts of the exchange rate volatility – exchange rate risk that can be eliminated by the exchange rate hedging (of which chances arise with the development of financial markets in transitory economies), and the uncertainty of the exchange rate trajectory (if a development of the exchange rate does not correspond with fundamental factors), of which impact lies in deferment of investment and trade decisions. From the view of price competitiveness, the preferences to the level or changes in the exchange rate are evident at imports competing with domestic producers and at export industries.¹ The range of import intensity of the export or permeability of the nominal exchange rate fluctuation into the price development plays a major role here. Preferences of the producers of nontradable goods and services towards the appreciation level of the exchange rate arise from increasing purchase effective demand along with exchange rate appreciation. Exchange rate

¹ Indicated influences of the exchange rate certainly depend on the price development, thus real exchange rate development.

appreciation of the target country brings an appreciation of the investment for foreign investors.²

Within the Visegrad group, we can state on the basis of Frieden's diagram following redistribution effects resulting from a given exchange rate policy, or better say from the real exchange rate development. Preferences of export industries and import competing industries (import industries and import industries markets) were in accordance with a development of real exchange rate only in case of Hungary during the transformation period. The preferences towards the real exchange rate development were in accordance with industries of nontradable production and services, business services in rest of the Visegrad group countries – Czech Republic, Slovakia and Poland and primarily in an industry of locally oriented production in case of Poland. Change in exchange rate policy was reflected into change in real exchange rate development in an unambiguous way only in a case of Hungary.³ A significant appreciation trend of the real exchange rate occurred after minor extent of devaluations since 1999 that were concluded with pegging against the euro in September 2001. Such a development caused redistribution effects from the point of view of Frieden's diagram, since the preferences towards a level of the real exchange rate are in accordance with its development in case of industries of nontradable production and services and business services. Preferences of Hungarian export industries and import competing industries (import industry markets) are not in accordance with the real exchange rate development in the post-transformation period.⁴

But this approach is modified if the new open economy macroeconomics attitude is involved. For example both the exchange rate volatility and exchange rate level/development impacts are different, if the local currency prices are used for the import or export price setting. That is why the given Frieden's diagram is fully appropriate for the analysis only if international trade operates under the producer currency price setting. In such a situation the exchange rate pass-through issue seems to be very suitable to analyse and incorporate into the exchange rate political economy framework (see chapter 6).

3. Exchange rate and terms of trade in the CEE countries

Figure 2 reviews the development of effective exchange rates vis-à-vis countries of the enlarged European Union (EU25) between 1994 and 2005. Exchange

² We can class the government sector as well into the mentioned scheme, as a subject which budget constraint is influenced by and influences the exchange rate development. Its location in the scheme depends on the position, in which the government sector is. If a privatization of the government share to foreign investors were anticipated, a weakened exchange rate would contribute to increase the collection from the transaction in a domestic currency. Consequent conversion admittedly creates appreciation pressures connected with redistribution effect. On the other hand, if the government approaches the fiduciary issue of bonds in foreign currency, then the exchange rate appreciation leads to a decrease of its liabilities in the domestic currency against abroad, so it leads to a relative decrease of the government debt level. Confront the agreement of the government of the Czech Republic with Czech National Bank about gradual conversion of the privatization incomes that also embodied temporary blockade of the issue of government foreign bonds. This view can be terminated with general influence of the exchange rate on performance of given sector with respect to budget constraints, which assets and liabilities are denominated in foreign currency.

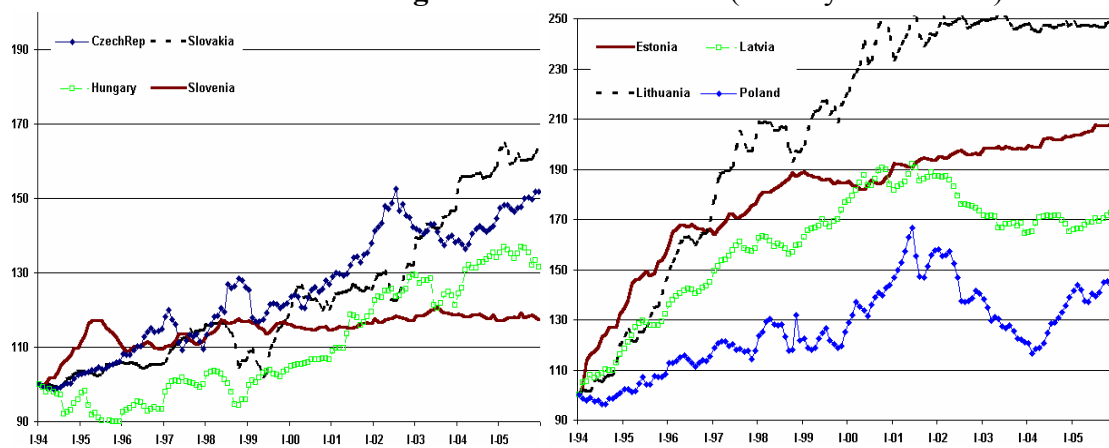
³ The change in Hungarian exchange rate policy was compensated in a form of a decrease in taxes lowered by subsidies on production in connection with a decrease of export performance and increase of import penetration.

⁴ See Šindel (2006) for detailed analysis.

rate regimes in studied economies not only differ in a relative rate of the fixation of a nominal effective exchange rate, but in the fixation period primarily. Based on this observation, we can state, that only two countries de facto preserved in principal invariable level of the real effective exchange rate (an accommodative exchange rate policy) – Hungary through crawling peg arrangement of its Forint till 2001 and Slovenia with the aid of managed floating arrangement of its Tolar till the ERM-II accession.⁵ Comparing a development of the real effective exchange rate index in Figure 4 confirms a heterogeneous appreciation development of the real effective exchange rate and exchange rate policy in these EU New Member States. Lithuania reached the highest appreciation level of real effective exchange rate as the beginning 2005, almost 250 % compared with January 1994. Lithuania was followed by Estonia (almost 210 %) and Latvia (over 170 %, with the highest appreciation level during 2000 and 2001 at the level of 190 %). Then Slovakia (about 160 %), Czech Republic (about 150 %), Poland (less than 150 %) and Hungary (over 130 %) follow, and Slovenia (about 120 %) is the last, as it corresponds with implemented exchange rate arrangement.

Figure 2

Index of real effective exchange rate vis-à-vis EU-25 (January 1994 = 100)

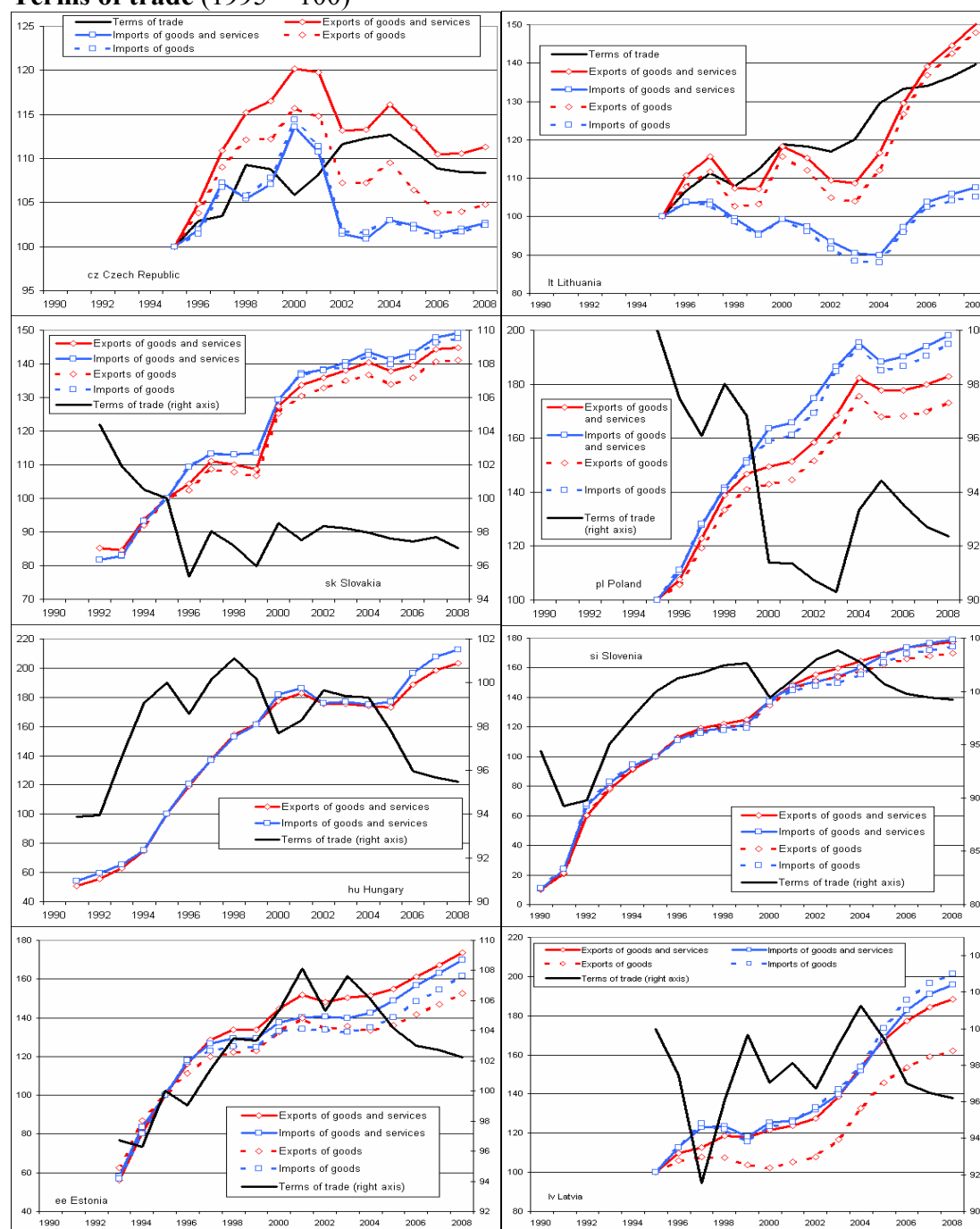


Source: European Commission, author's arrangement.

The Czech Republic exhibits the lowest increase of export and import prices in comparison with other CEE countries since 1995. However, Czech economy reached the terms of trade increase. Lithuania achieved similar development, what is presented in the figure 3. However, the increase in terms of trade was substantially higher than in the Czech case, what is the result of non-accommodative behaviour of exchange rate as the monetary policy tool. This difference results from the considerably higher increase in the export prices in comparison with the import price development. Other countries achieved substantially higher price increase both in export prices and in the import ones. On the other hand, these countries reached it without the noticeable terms of trade increase.

⁵ Lavrač (1999, p. 3) mentions a period of the Slovenian Tolar "...nominal exchange rate stayed almost unchanged for about half a year, which led to substantial short-term appreciation of the real exchange rates, and claims of exporters to do something about the exchange rate, ...".

Figure 3
Terms of trade (1995 = 100)



Note: Price index, 1995=100, based on national currency.

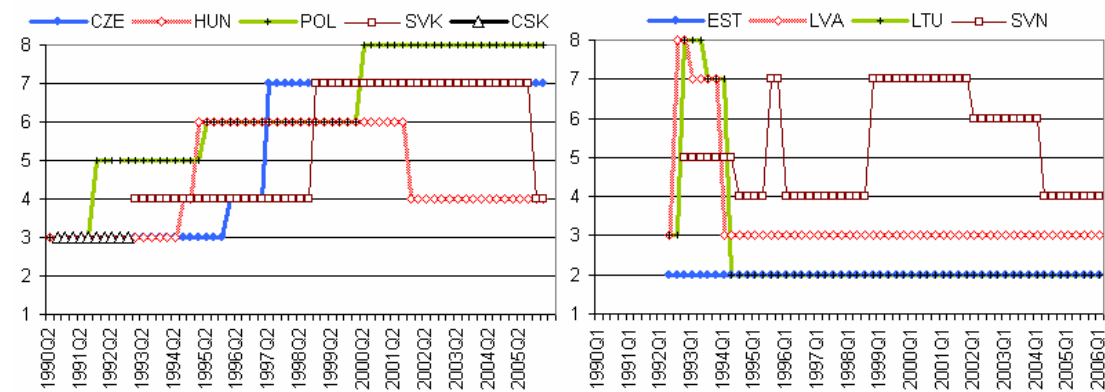
Source: Eurostat - Exports and imports by the EU countries and by third countries - Price indices, author's arrangement.

The different external price development is not explicable clearly from the exchange rate regimes point of view (for example the structure of foreign trade plays an important role; see Campa, Goldberg (2002)). Although the Czech export and import price development corresponds with the appreciation of managed floating nominal Czech exchange rate and Slovenian substantial increase in foreign trade prices arises from the depreciating managed floating, some puzzles still remain. For example, Lithuanian exchange rate regime evokes substantially different foreign trade

price development in comparison with the Estonian one, although both countries performed the currency board. The different currency basket management (due to the currency board regime is not control by the central bank and thus the currency basket is based endogenously) is behind this development. Which hypotheses are set by the different development of terms of trade? If the appreciated exchange rate caused the lower import price increase (or directly import price decrease), the prices should be set by the producer (foreign) currency pricing (PCP) with the increased pressure to import-substituting competitiveness. However, the coexistence of currency appreciation with the export prices has two different consequences. First one concerns the lower increase in comparison with the other observed countries export prices. And second one comes from the higher increase of export prices compared to the import prices development. However, if the appreciation of currency leads to export prices decrease in domestic currency, we deal with the local currency pricing (LCP).

Figure 4

Exchange Rate Regimes in Catching-Up Central and East European Countries in 1990-2005



Note: 1 - Exchange arrangement with no separate legal tender, 2 - Currency board arrangement, 3 - Conventional pegged arrangement, 4 - Pegged exchange rate within horizontal bands, 5 - Crawling peg, 6 - Crawling band, 7 - Managed floating with no predetermined path for the exchange rate, 8 - Independently floating.

Source: IMF (2006), author's arrangement.

4. Exchange Rate Pass-through into Terms of Trade

Firstly, we define the exchange rate pass-through into the prices of foreign traded goods and services and at the same time we discuss selected exchange rate pass-through literature and consequences, where also Campa, Goldberg (2002), Bacchetta, van Wincoop (2001), Goldber, Knetter (1997) and Knetter (1992) are the nicely comprehensive resources for that purpose. It should hold $P_F = E \cdot P_F^*$ under the law of one price, where P_F is the exporter foreign price, P_F^* is the exporter price for her domestic production and E is the nominal exchange rate. This relationship is understood as the producer-currency-pricing (PCP) and imposes the foreign price differential from home price as a result of nominal exchange rate. Then we can observe the pass-through into the foreign price as the function of the exchange rate, which can be stated in a logarithm level form as $p_F = \gamma e + \varepsilon$, where γ is exchange rate pass through coefficient and ε white noise error term. If the γ equals to 1, there is the full pass-through and price setting corresponds to the PCP. If that is not a case,

there is a lower pass-through and the PCP and the law of one price do not hold. However, the relationship is tested in the first difference form due to the stationary time series. Then we get $\dot{p}_F = \gamma \dot{e} + \varepsilon$. This parameter determines the strength of exchange rate pass-through and the own price, which is set by a producer (producer-currency pricing - PCP) or with the respect to the market (local-currency pricing - LCP, pricing to market - PTM).⁶

Then if the law of one price (respectively PCP) does not hold, we should analyse the causes and discuss the implications. The primarily discussed causes are the transaction costs⁷ and trade barriers. If they do not change, the wedge of foreign and home price indices remains stable, as Goldberg, Knetter (1997) and Campa, Goldberg (2002) discussed. Then the relative law of one price holds. The exchange rate volatility or the temporary exchange rate change is one of the possible explanations. Goldberg, Knetter (1997) present the delay of price (mark-up) adjustment in foreign currency lasting less than one year. If there is the temporary exchange rate change, the LCP is possible without any cost or mark-up adjustment.

The effectiveness and expenditure switching of domestic monetary policy is the most prevalent approach to exchange rate pass-through analysis. Engel (2000, 2002) stresses the importance of including the growing LCP evidence into the exchange rate expenditure switching discussion, both into the classic Friedman case and also into its Feldstein ongoing argumentation of the Euro pounding in the real exchange rate adjustment. Goldberg and Knetter (1997) present the Feenstra's symmetry of import price response to the exchange rate and to the tariffs change at the industry level.⁸

The endogeneity of the pass-through into the imported price related to the country's monetary stability is also discussed. Then, the use of import prices is appropriate for this purpose. For example Sekine (2006) explored the declined exchange rate pass through in the environment of stable inflation in the G-6 countries within higher fluctuation of their currencies in last years. The first-stage pass-through (exchange rate into import prices) and second-stage pass-through (import prices into consumer prices) is distinguished in this analysis.⁹ So the final impact of the exchange rate movement on consumer prices depends also on the home bias (α) and the rate of substitution of home and foreign production (ρ). We get the price index for tradable

home goods price as $P_T = \left[\alpha \cdot P_H^{1-\rho} + (1-\alpha) \cdot P_{F,f(P_F^*, E, \gamma)}^{1-\rho} \right]^{\frac{1}{1-\rho}}$. The overall exchange rate pass-through into import prices for three of the Visegrad countries are in the table 1. We are witnesses of relatively high pass-through into import prices in Czech Republic. Moreover, Dabušinkas (2003) unveiled the relatively high exchange rate pass-through into import prices also within the Estonian currency board. Also the

⁶ Goldberg, Knetter (1997) present the comprehensive and fine distinguish among law of one price, PCP, exchange rate pass-through and PTM.

⁷ Goldberg, Knetter (1997) define the segmented markets as these that are without price arbitrage due to the transaction costs being behind the marginal transportation costs.

⁸ It is important information from the exchange rate political economy point of view, because the exchange rate and tariff pass-through are the same. Then if it is impossible to use the trade policy it can be compensated by the exchange rate policy and reversely.

Feenstra, R.C (1989): Symmetric Pass-Through of Tariffs and Exchange Rates Under Imperfect Competition: An Empirical Test. *Journal of International Economics*, August 1989, 27 (1, 2), pp. 25-45.

⁹ If the first-stage and second-stage pass-through is distinguished, we proposed to call the impact of exchange rate into the consumer prices as an indirect pass-through. Also the exchange rate pass-through can be further marked as the ERPT.

higher pass-through was reached within the commodity type imports, textiles and chemicals products.

Table 1

Exchange Rate Pass-through Elasticities into Import and Consumer Price Indices

Country	Pass-Through on Import Prices	Pass-Through on Consumer Prices
Czech Rep	0,60*	0,60*+
Hungary	0,78*	0,42*+
Poland	0,78*	0,59*+
OECD avg	0,64	0,17
Germany	0,80*	0,07+
Austria	0,10	-0,09

Note: * (+) indicates ERPT significantly different from zero (one) at a 5 percent confidence level. The analysed time series are quarterly for 1975 to 2003 if available.
Source: Campa, Goldberg (2006), p. 6, author's arrangement.

The other approach is the incorporation of the exchange rate risk premium into the price of foreign traded goods, what influences the scope of trade flows (see Bacchetta, van Wincoop 2001). Also, if the economy is a member of the monetary union, it also relies on the external openness of the economy outside the monetary union.¹⁰

The analysis perspective can be also divided into macroeconomic and microeconomic approach, where the import industry composition gives the important explanation of the different exchange rate pass-through results among OECD countries (Campa, Goldberg 2002). Two factors influence the final pass-through: 1) the structural change in foreign trade and 2) the change of the industry pass-through. The second factor is visible in table 2, where the pass-through increased within all Hungarian industry imports.

Table 2

Change over time in Disaggregated Import Price Pass-Through Elasticities (1999 to 1989)

	Food		Energy		Raw materials		Manufacturing		Nonmanufacturing	
	S-run	L-run	S-run	L-run	S-run	L-run	S-run	L-run	S-run	L-run
Czech Rep.	0,232	-1,673	1,658	0,917	-0,848	-0,697	0,083	0,120	-0,849	0,038
Hungary	0,143	0,293	0,483	0,709	0,295	0,207	0,657	1,021	0,329	0,462
Poland	0,018	-0,078	0,015	-0,189	0,030	0,015	-0,444	-0,120	0,056	-0,069
OECD avg.	0,024	-0,077	0,061	-0,279	0,000	0,009	-0,002	0,036	-0,023	-0,156
Germany	-0,001	-0,193	-0,435	-1,597	-0,265	-0,471	-0,097	-0,183	-0,295	-1,059
Austria	0,360	0,343	-0,813	-1,659	-0,187	-0,180	-0,023	-0,013	-0,533	-1,054

Note: S-run = Short Run; L-run = Long Run. Food – SITC 0,1; Energy – SITC 3; Raw materials – SITC 3, 4; Manufacturing – SITC 5-8; Nonmanufacturing – SITC 9.
Source: Campa, Goldberg (2002), p. 33, author's arrangement.

5. Exchange rate pass-through into Czech export prices

¹⁰ Not only on the openness of the economy as a whole.

Let us focus our analysis on the relationship between exchange rate movements and export price behaviour. Here we analyse the price discrimination between home and foreign customers¹¹ and at the same time within foreign customers, what depends on the market segmentation, and market power.¹² If the role of mark-up and foreign exporter costs as the absorber of exchange rate movement are included, the import price of the monopolistic exporter is extended to $P_F = \mu_t \cdot C_t^* \cdot E_t$, where μ_t is the exporter mark-up¹³ and C_t^* is the foreign exporter marginal cost.¹⁴

The results from table 1 are probably conflicting with presumable ERPT into export prices. We use the invoice strategy point of view for this purpose. Only around 9-10 % of the Czech exports and 7-9 % of the Czech imports are invoiced in the Czech currency, so the LCP should prevail on the export side and the PCP on the import price.¹⁵ In such a situation, we then suppose that the German imports are substantially invoiced in their local currency. So their import prices are set probably by LCP conversely, what should lead to lower ERPT into import prices than in Czech case. These prepositions lead to low exchange rate pass-through into import prices, but German import prices show higher pass-through than the Czech ones.¹⁶ The possible explanations are the following. The first explanation corresponds with frequent changes in German import invoice terms (prices). The second one comes from different exchange rate development between the Czech and German currency as well as from longer time-series used for German pass-through analysis.

We analyse the exchange rate pass-through into the Czech export prices in the foreign currency via the following form $P_{CZ\exp}^{FC} = c - \alpha_t ER_t + \beta_t P_{imp}^f + \gamma_t \psi_t^f + \delta_t eu + \lambda_t \Phi$. The exchange rate negative sign results from the relationship of export price and the exchange rate direct record. The variables are explained in the following table 3. If the variable obtains “ t ”, the lag and the differentiation of the short-run and long-run effect¹⁷ is observed. The variable levels are transformed to the first difference due to the stationary of the time series. The final form of investigated relationship is $p_{CZ\exp}^{FC} = c - \alpha_t \Delta ER_t + \beta_t \Delta P_{imp}^f + \gamma_t \Delta \psi_t^f + \delta_t eu + \lambda_t \Delta \Phi$.

¹¹ The ratio of export to domestic prices of identical goods is the suitable control of the price discrimination between home and foreign customers.

¹² Goldberg, Knetter (1997) present the comprehensive discussion about the market segmentation and integration as well as the market power.

¹³ It is derived from the price elasticity of demand (η) as $\eta/(\eta - 1)$.

¹⁴ The foreign exporter marginal costs step in the first-stage pass-through specification in a form of foreign prices in foreign currency. It is obtained as the weighted CPI or ULC [Campa, Goldber (2002, 2006)] of main trade partners. For example Campa and Goldberg (2002, 2006) constructed the proxy for the weighted export partner (x) costs of a country (j) as $W_t^{x,j} = ne_t^j \cdot P_t^j / re_t^j$, where ne_t^j is nominal effective exchange rate and re_t^j is real effective exchange rate. If re_t^j corresponds to $ne_t^j \cdot P_t^j / P_t^{x,j}$, then $W_t^{x,j} = P_t^{x,j} = ne_t^j \cdot P_t^j / re_t^j$. It is necessary to take into account that effective exchange rates are in the indirect record (foreign currency per national currency).

¹⁵ The source of data is the Czech Ministry of Industry and Trade. Data concern the years 2000 and 2002.

¹⁶ See Engel (2000) for detailed LCP analysis in the euro zone countries.

¹⁷ The long-run effect is understood as the accumulation of effects within one year, so L-R corresponds to $\sum_{t=1}^{12} \alpha_{i,t}$. The long run effect in the cointegration form is not observed.

Table 3

Variable explanation (levels, the indices are in parenthesis)

<u>Formal abbreviations</u>	<u>Used abbreviations</u>	<u>ADF test</u>	<u>Explanation</u>
$P_{CZ\exp}^{FC}$ ($p_{CZ\exp}^{FC}$)	E111- E800	I(1)	the Czech export price in foreign currency
ER (ΔER)	CZKDEM, NE34	I(1)	the exchange rate as the pass-through variable
$\Phi = P_{CZ\exp}^{FC} / P_{imp}^f$ ($\Delta \Phi$)	L_PCZDET	I(1)	P_{exp}^{CZ} increase corresponds with the price gap closing
P_{imp}^f (p_{imp}^f)	L_PDMWT	I(1)	the foreign price control variable
Ψ^f ($\Delta \Psi^f$)	kgDMWT	I(1)	the GDP growth in foreign country (foreign country import from the world)
eu	eu		the EU entry dummy from the January till August 2004

Note: L_PDMWT, L_PCZDET and kgDMWT are available only for total range.

Now we incorporate the monthly COMEXT data of Czech foreign trade in the Broad Economic Classification (BEC) classification and exchange rate development of the Czech currency for the 1999M1-2006M6. The utilisation of BEC is not standard in exchange rate pass-through analysis. Its advantage consists of the consumer, intermediate and capital purpose differentiation. Also the explicitly given destination country is available, what is suitable for the price discrimination analysis to the foreign customers. The Czech export price corresponds with the unit value (100 kg) in BEC dataset. Both are against the Germany, the main export partner. Each time series was transformed into the logarithm. Then we run the ADF test due to the time series stationarity. The results are in the table 3. The relationship between exchange rate change and the export prices is statistically important only in few cases (310, 410, 530, 610). However, the results are not robust due to the time series length and the number of variables. This analysis result is that the BEC dataset with unit value price is not appropriate to exchange rate pass-through analysis.

As the BEC classification does not provide sufficient results, we skip over the price discrimination analysis within the particular foreign country. Now we incorporate the prices of foreign trade in HS classification (Harmonised System nomenclature – 18 levels) for the 1998M01-2006M10. The ECFIN nominal effective exchange rate against 40 countries¹⁸ is the exchange rate variable. As the control variable for the foreign costs development we followed the Campa and Goldberg (2002, 2006) approach (see note 14). Figure 5 presents these variables. We compose the equation $p_{CZ\exp}^{FC} = c + \alpha_i \Delta NER_t + \beta_i \Delta P_{imp}^f + \gamma_i \Delta \psi_t^f + \delta_i eu$. Then we run the ADF test due to the time series stationarity. The results are in the table 4.

Table 4

Variable explanation (levels, the indices are in parenthesis)

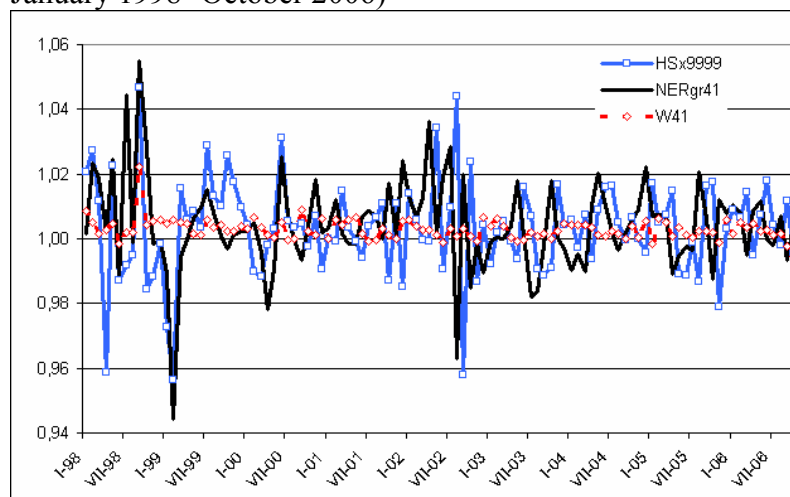
<u>Formal abbreviations</u>	<u>Used abbreviations</u>	<u>ADF test</u>	<u>Explanation</u>
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¹⁸ The broad group of 41 countries consists of EU25 with Australia, the USA, Japan, Mexico, Canada, Switzerland, Norway, New Zealand, Turkey, Bulgaria, Romania, Russia, China, Korea and Hong-Kong.

$P_{CZ\ exp}^{FC} (p_{CZ\ exp}^{FC})$	HSx....	I(1)	the Czech export price in foreign currency
$NER (\Delta ER)$	NER41	I(1)	the effective exchange rate as the pass-through variable, expected inverse sign in comparison with ER effect
$P_{imp}^f (p_{imp}^f)$	W41	I(1)	the foreign price control variable
$\Psi^f (\Delta \Psi^f)$	OECDRimp	I(1)	the GDP growth in foreign country (foreign country import from the world)
eu	eu		the EU entry dummy from the January till August 2004

Figure 5

Czech export prices in foreign currency, nominal effective exchange rate development and proxy for foreign costs development (month to month changes, January 1998- October 2006)



Note: Prices in foreign trade and CPI consist of two methodologies. The break point is in January 2001.

Source: ČNB (Prices in foreign trade, CPI), ECFIN (Nominal Effective Exchange rate), author's calculation.

The single-equation dynamic model results suggest the relatively high short term exchange rate pass-through around 0.5 - 0.7,¹⁹ what is closer to PCP strategy (stable producer prices), respectively to impossibility of PTM strategy within the competitive market, where is not possible to exploit the exporter's mark-up. Our results are not in accordance with the proposition of invoice currency. The lags of the effective exchange rate changes are not statistically important. However, Podpiera and Raková (2006) reached the similar results, when their PTM effect was around 0.455. We have to note, that their relationship was between the producer export prices in domestic currency and the exchange rate change. Then their result means that more than half of change in Czech crown exchange rate is not accompanied with the change in producer export prices, so more than half of exchange rate change will influence the export price in foreign currency. Their research also confirmed the positive relationship between the PTM strategy (lower exchange rate pass-through) and market

¹⁹ The results were comparable among technology export and manual intensive exports.

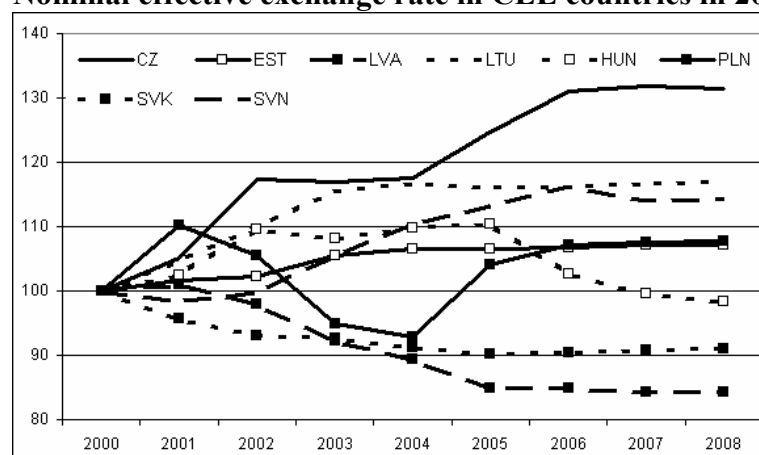
power, respectively the magnitude of an exporter's mark-up. And just the diminishing exporter's mark-up is the important variable besides the productivity increase within discussion of the exchange rate appreciation trend misalignment.

6. Exchange rate pass-through within the exchange rate political economy framework - discussion related to exchange rate appreciation within the pre-euro adoption period

All currencies in CEE countries (with Hungarian exception) will achieve more appreciated position of the exchange rate as visible from figure 6. We will discuss the consequences of the appreciation trend within the political economy framework.

Figure 6

Nominal effective exchange rate in CEE countries in 2000-2008 (2000 = 100)



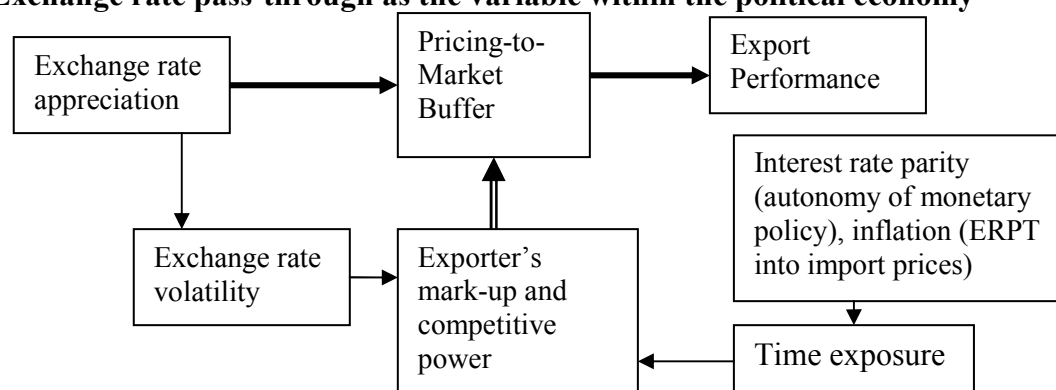
Note: 2007 and 2008 are the European Commission's forecasts. The exchange rate is effective to the rest of 35 industrial countries.

Source: European Commission (2007), author's arrangement.

If we return to figure 1 - the Frieden diagram of exchange rate political economy and incorporate the exchange rate pass-through into the export and import price behaviour, we can transform the sectoral interest into the following form. Figure 7 unveil the common interest of exporters and the other sectors in the economy - the shortest time of exposure to quasi autonomy national monetary policy.

Figure 7

Exchange rate pass-through as the variable within the political economy



The quasi autonomy of national monetary policy arises from the nominal convergence process (nature inflation pressure - see table 5) with the interest rate parity consequences (see table 6). The latest example is the Slovakia crown, where the national bank was jockeyed into the interest rate cut by the surge in currency appreciation, which has lead to better results in inflation performance. However, not only the positive interest rate is the factor leading to currency appreciation in CEE countries. For example the positive expectations of current fundamentals in Czech Republic lead to appreciation as carry trade currency.

Table 5

Harmonized price indexes in CEE countries in 1997-2006 (annual change)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Czech Republic	8.0	9.7	1.8	3.9	4.5	1.4	-0.1	2.6	1.6	2.1
Estonia	9.3	8.8	3.1	3.9	5.6	3.6	1.4	3.0	4.1	4.4
Latvia	8.1	4.3	2.1	2.6	2.5	2.0	2.9	6.2	6.9	6.6
Lithuania	10.3	5.4	1.5	1.1	1.6	0.3	-1.1	1.2	2.7	3.8
Hungary	18.5	14.2	10.0	100	9.1	5.2	4.7	6.8	3.5	4.0
Poland	15.0	11.8	7.2	10.1	5.3	1.9	0.7	3.6	2.2	1.3
Slovenia	8.3	7.9	6.1	8.9	8.6	7.5	5.7	3.7	2.5	2.5
Slovakia	6.0	6.7	10.4	12.2	7.2	3.5	8.4	7.5	2.8	4.3
European Union	1.7	1.3	1.2	1.9	2.2	2.1	2.0	2.0	2.2	2.2

Note: Bolded number in 2006 exceeded the reference value - 2.8 which refers to the period November 2005 to October 2006 for HICP inflation as in the latest Convergence Report 2006 (ECB (2006)).

Source: Eurostat, author's arrangement.

Table 6

3-month interest rates in CEE in selected month at the end 2006

	2006m03	2006m06	2006m09	2006m12	2007m01	2007m02
Euro area	2.72	2.99	3.34	3.68	3.75	3.82
EU (15 countries)	3.04	3.28	3.62	3.96	4.07	4.14
Czech Republic	2.08	2.16	2.49	2.56	2.58	2.59
Estonia	2.87	3.06	3.40	:	3.90	3.94
Latvia	3.97	4.16	4.84	4.21	3.82	5.61
Lithuania	2.75	3.00	3.38	3.72	3.79	3.87
Hungary	:	:	7.88	8.20	8.15	:
Poland	4.12	4.17	4.21	:	4.20	4.20
Slovenia	3.53	3.38	3.55	3.67	:	:
Slovakia	3.75	4.20	4.95	4.82	4.50	4.60

Note: Bolded country marks the considerable (more than 100 pts) positive slope of yield curve during a year 2006 (long-term rates > short-term rates) and italic conversely.

Source: Eurostat (3-month interest rates - Monthly average), European Commission (2007), author's arrangement.

7. Conclusion

Frieden diagram of exchange rate political economy can be used as an enhancement of the view on a performed exchange rate policy with respect to interests of particular industries. At the same time it brings partial explanation of hypothesis on heterogeneous exchange rate policy during the transformation and post-transformation period. But this approach is modified if the new open economy macroeconomics attitude is involved. This leads to additional important variables which influence the

possible pricing-to-market buffer between the appreciation trend and the foreign trade performance.

The Czech Republic exhibits the lowest increase of export and import prices in comparison with the other CEE countries since 1995. The import price lower increase as the result of the exchange rate appreciation confirms relatively high pass-through. However, the results of exchange rate pass-through into export prices are not in accordance with the hypothesis of the LCP set export prices (from invoice strategy). The exchange rate pass-through has rather different consequences on import prices and on the export ones. Not only the mark-up factor influences the pass-through into export prices, but it is also impacted by the contract terms and consequential payment terms.

However our results confirm relatively high exchange rate pass-through into export prices in Czech Republic, what is closer to PCP strategy (stable producer prices) with influence on exported volume. However the PCP strategy is eliminated with pricing to market in industries with sufficient mark-up and export power. This particularly explains the existence of growing export prices. Nevertheless the pricing-to-market buffer is diminishing with the ongoing appreciation trend.

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