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EXCHANGE RATE PASS-THROUGH IN THE NEW MEMBER STATES OF THE EUROPEAN UNION. SOME EXPLANATORY FACTORS

Summary: In this paper, we study the extent of exchange rate pass-through (ERPT) of foreign to domestic prices, for the imports from the euro area of five New Member States of the European Union (i.e., Hungary, Poland, Czech Republic, Slovak Republic, and Romania). To that end, we use data on import unit values for nine different product categories, from 2000 to 2007. In addition, we also examine the influence on ERPT of several macroeconomic factors (average inflation, the exchange rate regime, or the degree of openness of the countries).

Keywords: exchange rates, pass-through, monetary union, panel cointegration.

1. Introduction

The extent to which exchange rate changes are eventually reflected in import prices, expressed in the currency of the importing country, is commonly referred to as the degree of exchange rate pass-through (ERPT). Provided that the law of one price holds and under a perfect pass-through, the pricing of imports is assumed to be dominated by Producer Currency Pricing (PCP). Otherwise, Local Currency Pricing (LCP) would exist if the pass-through tends to be zero in the short-run.

Several explanations have been offered when accounting for the size of ERPT and cross-country differences over time. On the one hand, we can mention macroeconomic factors such as average inflation, the exchange rate regime or the degree of openness of the countries. On the other hand, there are also some microeconomic factors such as the shifts in the composition of the import bundle, the degree of trade integration, or the share of imports denominated in the home currency.

Most of the studies on ERPT analyze the case of the United States, the OECD or the euro area countries, but there are not many studies dealing with the case of the New Member States (NMS) of the European Union (EU). In this paper, we try to investigate the influence of several macroeconomic factors on ERPT. To this aim, we

will use data on import unit values for nine different product categories in five NMS of the EU (namely, Hungary, Poland, Czech Republic, Slovak Republic, and Romania) from 2000 to 2007, using monthly data. We will follow De Bandt, Banerjee and Koźluk's [2008] methodology, which suggests a long-run Engle and Granger [1987] cointegrating relationship. In this way, we will analyze the cointegrating relationship between import unit values, the exchange rate and foreign prices, which is typically ignored in the empirical studies available. Second, the paper contributes to the empirical literature by studying ERPT for the case of the NMS, taking into consideration a division by categories of import goods.

2. Theoretical framework

By definition, import prices for any type of goods j, MP_t^j, are a transformation of export prices of the country's trading partners, XP_t^j, using the bilateral exchange rate, ER_t:

$$MP_t^j = ER_t \cdot XP_t^j$$

which, taking logs, becomes:

$$mp_t^j = er_t + xp_t^j \tag{1}$$

Export prices, in turn, are the result of applying a markup, $fmkup_t^j$, on marginal costs, fmc_t^j:

$$xp_t^j = fmkup_t^j + fmc_t^j \tag{2}$$

so that, replacing (2) in (1):

$$mp_t^j = er_t + fmkup_t^j + fmc_t^j \tag{3}$$

On the other hand, exporters can decide to absorb into the markup some of the exchange rate variations, instead of passing them through prices measured in the importing country's currency. If PCP holds, pass-through is complete and the markup does not respond to fluctuations in exchange rates. At the other extreme, if LCP holds, exporters can decide not to change prices in the importing country's currency and incorporate exchange rate fluctuations into the markup. Accordingly, the markup in each industry has two components: (i) a specific-industry component, α^j; and (ii) its reaction to exchange rate fluctuations:

$$fmkup_t^j = \alpha^j - \Phi er_t \tag{4}$$

Finally, after replacing (4) in (3), and assuming that the marginal cost moves with foreign prices (i.e., the world price of the corresponding product category), fp_t, the equation to estimate will be:

$$mp_t^j = \alpha^j + \beta er_t + \gamma fp_t + \varepsilon_t \tag{5}$$

where $\beta = 1 - \Phi$ captures the pass-through elasticity, and ε_t is an error term.

3. Empirical results

In this section, we present the main results of testing for ERPT, for the cases of the Czech Republic, Hungary, Poland, the Slovak Republic, and Romania. We use monthly data from 2000:01 to 2008:12, taken from the database COMEXT published by Eurostat, on the following variables:

- Import prices: unit value indices of imports from the euro area countries, for nine product categories at the one-digit SITC level (i.e., categories 0 to 8, namely, food and live animals; beverages and tobacco; crude materials; mineral fuels; animal, vegetable oil, fat; chemicals; basic manufactures; vehicles and transport equipment; manufactured goods).
- Exchange rates: exchange rate indices (period averages), defined as units of domestic currency per unit of foreign currency.
- Foreign prices: price in euro of the unit value index of imports of that product category.

In the empirical application, we follow Pedroni [1999] and assume no cross-unit interdependence, so we consider a panel in which every country and industry combination makes a separate unit. Under this approach, we will try to capture the common trends underlying the series, as well as the existence of structural changes in the long-run.

Table 1 shows the long-run ERPT coefficients from the estimation of equation (5). The statistics for Pedroni's [1999] panel cointegration test show a strong rejection of the hypothesis of no cointegration even when the alternative does not allow for a break (pseudo p-value of -38.51). As can be seen, the hypothesis of LCP (zero pass-through) is always rejected in the long-run. In turn, the hypothesis of PCP (complete pass-through) would not be rejected in some cases, namely, food and live animals for the Czech Republic; beverages and tobacco for the Czech Republic; animal, vegetable oil, fat for Romania; and basic manufactures for Hungary and Romania.

In the remaining part of this section, we will examine the relationship between ERPT and some macroeconomic factors.

The association between ERPT and inflation is shown in Figure 1. According to Taylor [2000], lower inflation goes hand in hand with lower persistence of inflation and, if cost changes are perceived to be less persistent, the pass-through of these shocks will be lower as well. The positive relationship shown in Figure 1 would support Taylor's hypothesis.

Table 1. Long-run exchange rate pass-through coefficients

	Poland	Hungary	Slovak Republic	Romania	Czech Republic
0. Food and live animals	0.49* (0.19)	0.34* (0.07)	0.73* (0.16)	0.38* (0.14)	0.88* (0.15)
1. Beverages and tobacco	0.51* (0.10)	0.78* (0.10)	0.64* (0.14)	0.69* (0.10)	0.92* (0.14)
2. Crude materials	0.54* (0.08)	0.53* (0.13)	0.41* (0.12)	0.74* (0.11)	0.62* (0.11)
3. Mineral fuels	0.13* (0.06)	0.47* (0.02)	0.33* (0.13)	0.78* (0.13)	0.16* (0.09)
4. Animal, vegetable oil, fat	0.25* (0.08)	0.45* (0.10)	0.65* (0.15)	1.15* (0.16)	0.57* (0.13)
5. Chemicals	0.32* (0.05)	0.52* (0.11)	0.32* (0.08)	0.62* (0.15)	0.32* (0.12)
6. Basic manufactures	0.53* (0.10)	0.84* (0.10)	0.50* (0.11)	0.82* (0.14)	0.62* (0.12)
7. Vehicles and transport equipment	0.68* (0.09)	0.28* (0.06)	0.53* (0.12)	0.78* (0.21)	0.58* (0.10)
8. Manufactured goods	0.80* (0.11)	0.53* (0.12)	0.68* (0.10)	0.47* (0.09)	0.39* (0.09)
Total	0.53* (0.13)	0.47* (0.10)	0.54* (0.09)	0.68 (0.11)	0.43* (0.10)

Note: standard errors in parentheses; * denotes significance at the 1% level.

Source: authors' own study.
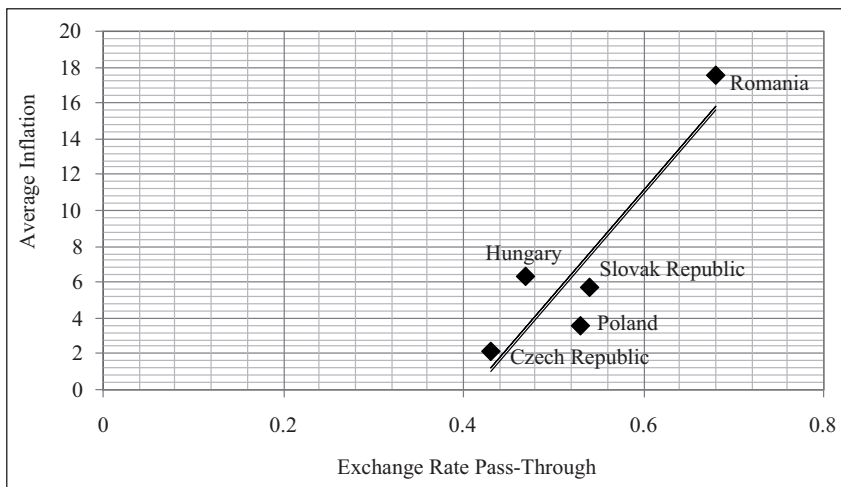
Fig. 1. Average inflation vs. exchange rate pass-through

Source: authors' own study.

Next, we examine the relationship between ERPT and openness. In principle, the expected result would be a positive influence of openness on the size of ERPT since the more open a country is, the more movements in exchange rate would be transmitted via import prices. However, according to Romer [1993], inflation might be negatively correlated with openness. Because an unanticipated monetary expansion leads to real exchange rate depreciation and because the harms of real depreciation are greater in more open economies, the benefits of an unanticipated expansion decrease in the degree of openness. Figure 2 shows this relationship. Since a negative association appears between openness (measured by imports as a percentage of GDP) and ERPT, the influence of the indirect channel noticed by Romer seems to be relevant.
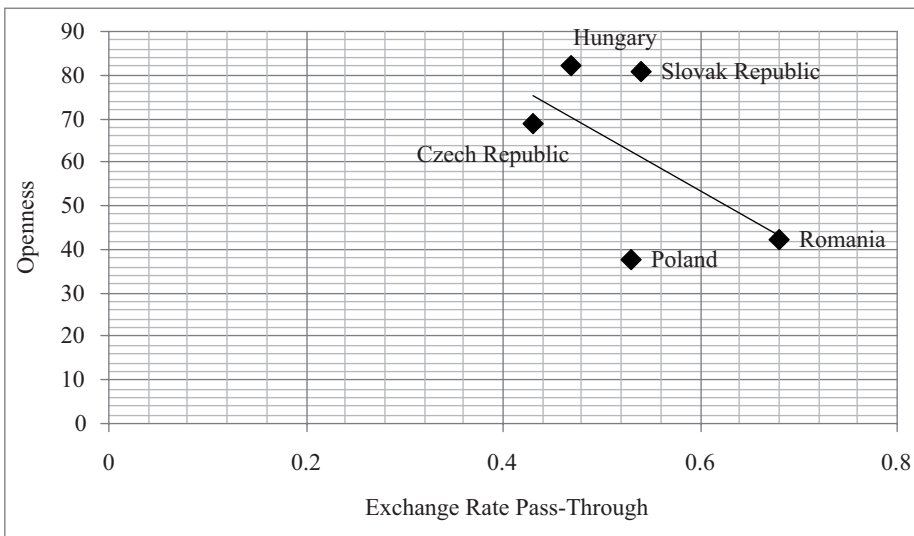

Fig. 2. Openness vs. exchange rate pass-through

Source: authors' own study.

Figure 3 shows the relation between ERPT and the standard deviation of the variation in the exchange rate (i.e., a proxy of exchange rate volatility). We can observe a positive association between both variables, so the less volatile the exchange rate, the smaller ERPT is obtained.

Finally, in Figure 4 we present the relationship between ERPT and the share of manufactured goods (i.e., those in categories SITC_6 to SITC_8) on total imports. In principle, we would expect a higher ERPT for goods such as energy and raw materials rather than for manufactured products [Campa, Goldberg, González-Mínguez 2005]. As can be seen, the association between both variables is negative, so the larger the share on total imports of manufactured goods, the lower ERPT is observed.
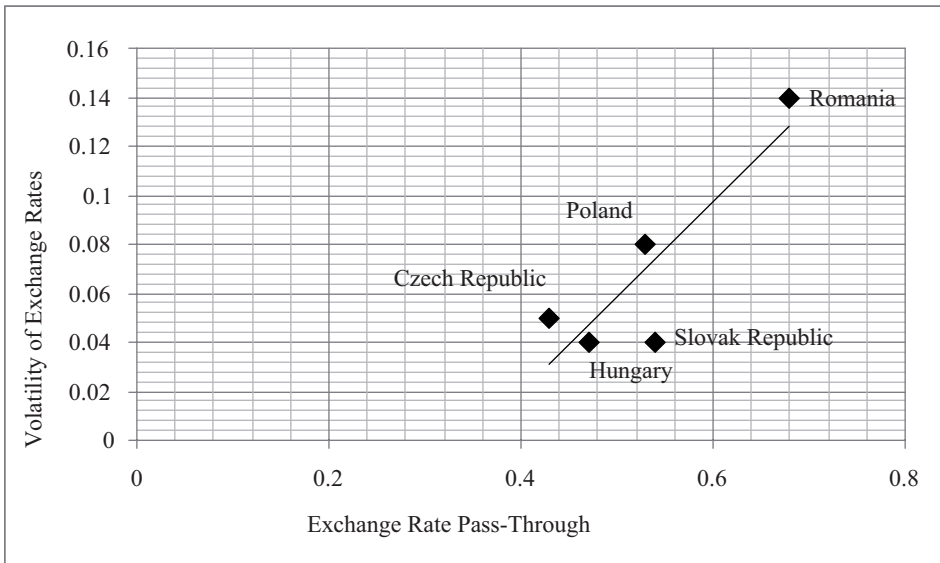
Fig. 3. Volatility of exchange rates vs. exchange rate pass-through
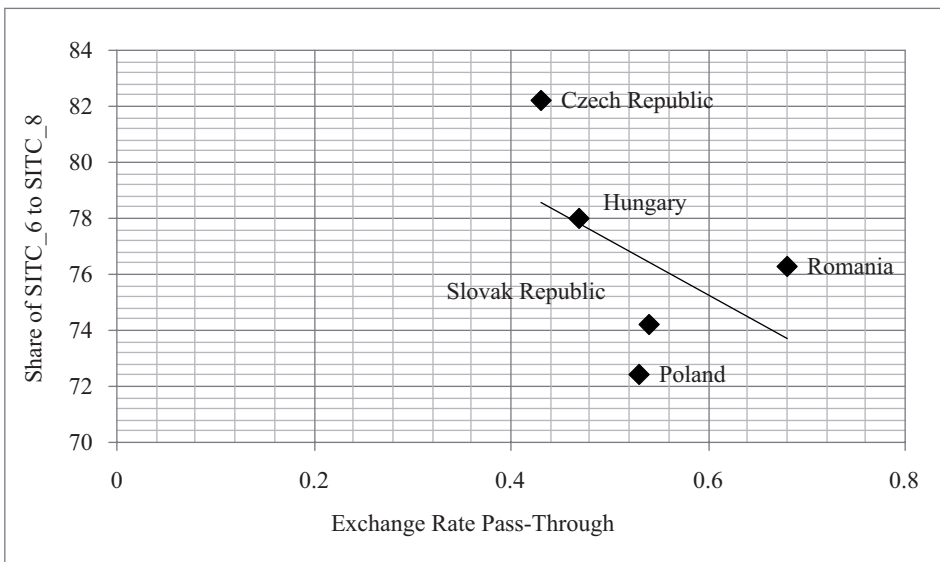
Source: authors' own study.

Fig. 4. Share of manufactured products vs. exchange rate pass-through

Source: authors' own study.

4. Conclusions

In this paper, we have analyzed the extent of ERPT on the prices of imports from the euro area, for the case of five NMS of the EU. We have used the data on import unit values for nine different product categories for each country and estimated industry-specific rates of pass-through, using the methodological approach of De Bandt, Banerjee, Koźluk [2008].

The hypothesis of LCP (zero pass-through) is always rejected in the long-run, but the hypothesis of PCP (complete pass-through) would not be rejected in some cases; namely, food and live animals for the Czech Republic; beverages and tobacco for the Czech Republic; animal, vegetable oil, fat for Romania; and basic manufactures for Hungary and Romania.

Finally, when examining the influence on ERPT of several macroeconomic factors, the results show a positive association of ERPT with inflation and exchange rate volatility, together with a negative association with openness and the share in the imports of manufactured products.

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KURS WALUTOWY A INFLACJA W KRAJACH EUROPY ŚRODKOWO-WSCHODNIEJ. ANALIZA EMPIRYCZNA

Streszczenie: W artykule poddano empirycznej weryfikacji proces oddziaływania kursu walutowego na inflację (*exchange rate pass-through* – ERPT). Badanie zostało przeprowadzone na próbie pięciu nowych krajów członkowskich (Węgier, Polski, Czech, Słowacji oraz Rumunii). Analizie podlegał import towarów i usług tych krajów z Unii Europejskiej w latach 2000-2007, a szczegółowe dane o wielkości importu obejmowały dziewięć kategorii produktowych. Dodatkowo zbadane zostały makroekonomiczne determinanty efektu ERPT (średnia inflacja, reżim kursowy, stopień otwartości gospodarki).