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How different is the exchange rate pass-through in new member states of the EU? Some potential explanatory factors

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HOW DIFFERENT IS EXCHANGE RATE PASS-THROUGH IN NEW MEMBER STATES OF THE EU?: SOME POTENTIAL EXPLANATORY FACTORS[*]

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Abstract

This paper uses data on import unit values for nine different product categories and bilateral imports to study the pass-through of exchange rate changes into the prices of imports that originated inside the Euro Area made by some New Member States (NMSs) of the European Union and one candidate country (Turkey). I estimate industry-specific rates of pass-through across and within countries using the methodological approach proposed by de Bandt, Banerjee and Kozluk (2008). I did not find evidence in favour of the hypothesis of Local Currency Pricing (zero pass-through) and the hypothesis of Producer Currency Pricing (complete pass-through) could be accepted in some countries for different industries. My results also show that there is a clear positive relationship between exchange rate pass-through and average inflation in these countries. I do find a slightly positive pattern for the relationship between exchange rate pass-through and *openness*. With reference to the relationship between exchange rate pass-through and the type of exchange rate regime I observe that a less volatile exchange rate implies a less degree of exchange rate pass-through. In industries I obtain a less degree of exchange rate pass-through in differentiated manufactured products. By including possible statistical break-dates in the estimation process I observe that some NMSs have decreased the exchange rate pass-through in recent years. Some of the breaks are close to the dates of some major institutional changes in these countries (changes in monetary policy and exchange rate regimes and the starting up of the EU membership).

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

JEL classification numbers: F31, F36, F42, C23

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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 in the economic literature as the degree of exchange rate pass-through (ERPT henceforth). As imported goods are made up of a heterogeneous range of products and commodities, the pass-through may vary considerably across the different types of imports. For instance, where the law of one price may hold, one might expect a higher degree of pass-through for more homogeneous and widely traded goods and commodities, such as oil or raw materials than for highly differentiated manufactured products. In economic literature, where the law of one price holds and with a perfect pass-through, the pricing of imports goods is assumed to be governed by Producer Currency Pricing (PCP). By contrast, a Local Currency Pricing (LCP) could exist, where the pass-through used to be zero in the short-run.

Several complementary explanations have tried to account for the size in the ERPT and cross-country differences over time. Among the main ones there are *macro* factors, as suggested by Taylor (2001) who links the size in the ERPT to the average inflation that has been observed over the past decades in many countries. According to his argument, 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. So, a lower persistence of exchange rate shocks could have contributed to the fall in the ERPT. This lower inflation environment is likely to be a result of changes in monetary policy (*inflation targeting* adoption) and these changes could have contributed to the decline in the ERPT by ensuring a lower price increase and by making sure that exchange rate fluctuations do not endanger price stability. Another important *macro* factor is the nature of a *de facto* exchange rate regime. Some authors

assert that a more stable exchange rate regime is indeed likely to induce more LCP and a pass-through decrease for import prices. With reference to the relationship between ERPT and openness, there is no clear consensus in the economic literature although a priori a positive relationship is expected. The more open a country is, the more movements in exchange rate are transmitted via import prices into CPI changes. However, we must not forget that inflation could be negatively correlated with openness, as was found by Romer (1993), and could imply the existence of an indirect channel which goes in the opposite direction.

Further potential factors affecting the size of the ERPT could be microeconomic factors, such as the composition of the import bundle (high pass-through goods such as energy and raw materials mixed with lower pass-through items such as manufactured goods), the degree of trade integration (see Gust, Leduc and Vigfusson, 2006) or the share of imports denominated in the home currency (see Campa, Golberg and González-Mínguez, 2005).

Finally, some major institutional changes could have influenced the size of ERPT. For a large majority of these countries, the perspective of EU membership became a reality on May 2004 (Czech Republic, Poland, Hungary, Slovenia, Slovakia, Latvia, Estonia, Lithuania, Malta and Cyprus) and January 2007 (Romania and Bulgaria), and some of them have even recently adopted the Euro as currency (Slovenia, Malta and Cyprus). There are many economic policy issues such as pricing strategies of foreign exporting firms and the persistence of inflation. Also, the impact of entering into a monetary union could influence the determination of the rate of ERPT to prices and its evolution in different time horizons and sectors. All these countries have developed structural reforms and implemented macroeconomic stabilisation programs which give a great diversity in monetary policy frameworks and exchange rate regimes. Such factors

could affect the size of ERPT of foreign to domestic prices which make it important to study these economies. Likewise, these countries have to pass an inflation criterion as set out in the Maastricht Treaty as well as their inflation performances which could be influenced by the ERPT. Once they belong to the Euro Area we should not forget about the effect of different rates of ERPT which could contribute to national inflation differentials.

Over the last twenty years, the majority of empirical studies (see, for instance, Campa and González-Mínguez, 2006; Campa, Goldberg and González-Mínguez, 2005; Frankel, Parsley and Wei, 2005; Marazzi et al., 2005) on ERPT have been focusing on the United States and countries inside the Euro Area, in response to changes in institutional arrangements (such as the arrival of the euro currency) and to shocks to the monetary system (ERM crisis in 1992) [1].

A number of the above-mentioned empirical studies have explored changes in the ERPT and cross-sectional differences at the level of developing economies, the Euro Area and the US. Campa, Goldberg and González-Mínguez (2005) investigated changes in the pass-through to import prices in Euro Area member countries based on data going up to 2004. They detected declines in the size of ERPT on import prices in around two thirds of the industries in their sample, although most of this evidence was not statistically significant. Nevertheless, they found statistically significant effects in manufacturing industries. Sekine (2006) obtained evidence of changes in the ERPT over time on both import and consumer prices for several developed economies, including Germany, France, Italy, the UK, Japan and the US. Olivei (2002) and Marazzi et al.

[1] Menon (1995) reviews 43 empirical papers about exchange rate pass-through and indicates that most of the heterogeneity in the results is driven by different estimation techniques and different data coverage.

(2005) suggested declines in the ERPT on US import prices. Otani et al. (2006) confirmed evidence of a decline in the ERPT to Japanese import prices. In contrast to these studies, de Bandt, Banerjee and Kozluk (2008) found evidence of the opposite in the change of the pass-through in some Euro Area countries like Italy, Portugal and Spain and Thomas and Marquez (2006) derive less evidence of a change in the ERPT to US import prices. They observe how robust are the results derived through Campa and González-Mínguez (2006) which estimate the short- and long-run pass through elasticities where long-run elasticities are defined as the sum of the pass-through coefficients for the contemporaneous exchange rate and its first four lags. McCarthy (2000) finds that ERPT is larger in countries with a larger import share (there is a positive relationship between exchange rate pass-through and openness) in some industrialised economies.

With reference to New Member States (NMSs henceforth) and candidate countries, Ca'Zorzi, Hahn and Sánchez (2007) examine the degree of ERPT in emerging markets in Central and Eastern Europe by considering Hungary, Poland, Czech Republic and Turkey in their sample. Darvas (2001) and Coricelli et al. (2006) also cover in their studies ERPT issues adopting an error correction model but they do not consider a sectorial analysis. María-Dolores (2009b) uses a VAR approach and examines the relationship between the degree of ERPT and inflation and openness, deriving a positive relationship for both variables. In another recent contribution, María-Dolores (2009a) has found no evidence either in favour of the hypothesis of Local Currency Pricing (zero pass-through) or the hypothesis of Producer Currency Pricing (complete pass-through) for any of these countries except for Slovenia and Cyprus using Campa and González-Mínguez (2006)'s methodology.

In this paper I study the ERPT of foreign to domestic prices using data on import unit values (IUVs) for nine different product categories in some NMSs of the European Union (Cyprus, Hungary, Latvia, Poland, Czech Republic, Slovakia, Slovenia and Romania) and one candidate country (Turkey) from 2000 to 2006 using monthly data[2].

The contribution of this paper is twofold. First, this paper employs de Bandt, Banerjee and Kozluk (2008)'s methodology which suggests a long-run Engle and Granger (1987) cointegrating relationship and the possibility of structural breaks to restore the long-run in order to estimate long-run ERPT coefficients in NMSs. This is important because theoretical considerations suggest a cointegrating relationship between import unit values, the exchange rate and foreign prices, which is typically ignored in existing empirical studies. Second, the paper contributes to the empirical literature by studying ERPT that originates inside the Euro Area in NMSs, taking into consideration a division by category of import products, and observes how some potential factors such as openness, average inflation, exchange rate regimes and some major institutional changes like the above-mentioned could have influenced the size of ERPT.

By applying de Bandt, Banerjee and Kozluz (2008)'s methodology, my results show that there is a clear positive relationship between ERPT and average inflation in these countries. I do find a slightly positive pattern for the relationship between ERPT and openness. With reference to the relationship between ERPT and exchange rate regime, I observe that a less volatile exchange rate implies a less degree of ERPT. In industries I obtain a less degree of ERPT in the differentiated manufactured products. By including

[2] I finish the sample period in 2006 because Slovenia adopted the euro in January, 2007

possible statistical break-dates in the estimation process, I observe that some NMSs have decreased the ERPT in recent years after its EU membership and some of the breaks are close to the dates of some major institutional changes in these countries (changes in monetary policy and exchange rate regimes, admission into the EU, etc).

The paper is organised as follows: in section 2 I describe and take into account the data used in the empirical analysis. In section 3 I present the ERPT equation and the different definitions of short- and long-run ERPT assumed by the empirical literature mentioned above. In section 4 I offer the main results derived for the different countries and industries and study the relationship between the size of ERPT and some potential explanatory factors. Finally, in section 5 I provide the main conclusions of my analysis.

2. SOME RELEVANT POTENTIAL FACTORS AFFECTING THE DEGREE OF EXCHANGE RATE PASS-THROUGH

In this paper I consider import prices of imports stemming from inside the euro zone into the NMSs and Turkey. I use time-series data on import unit values for nine different product categories for each country. I focus my analysis on imports inside the Euro Area, considering that the most important part of the total trade of the countries to be continually exposed to exchange rate fluctuations. The database that I use in this paper includes a monthly time series of unit values of imports (IUVs) from Euro Area countries for nine product categories defined at the one-digit SITC level of aggregation, and it is extracted from the Eurostat-Comext. As Campa and González-Mínguez (2006) point out, this database has the advantage of focusing explicitly on the product composition of imports into the country and can thus account for different rates of pass-through among different product categories for any given country. As I mentioned in the introduction, accounting for these divergence is important for any meaningful

analysis of differences in pass-through rates across and within countries. As differences arise from the product composition of imports exposed to exchange rate fluctuations, we can also account for a significant amount of the aggregate differences of import price pass-through across countries[3]. As de Bandt et al.(2008) point out, the IUV indicator has a series of caveats. First, unit values, as provided by Eurostat are values of kilograms of a certain group. Second, using IUVs means the goods we speak of are not well defined goods as such, they are bundles of goods and their composition may vary from month to month. Finally, this composition may change precisely because of changes in the exchange rate, as the demand (and supply) and thus the pricing strategy of some specific category goods may be very different especially within categories. Nevertheless, the lack of alternative measures (especially at a sectorial level) forces us to use what is available.

I focus my analysis on imports inside the Euro Area considering that the most important part of the total trade of the countries is continually exposed to exchange rate fluctuations. Its size is very important as we will see later. So, I centre on looking at the integrated market specification, although analogous results may be derived under 'segmented' markets, where the index of world price (or unit values) is constructed as a weighted average by trade shares of prices of each country's five largest trading partners.

[3] Campa and Gonzalez-Mínguez (2006) point out that import price data has several limitations for the analysis of pass-through behaviour because it is an index based on unit values rather than prices, which create some problems concerning the comparability of goods over time. This index is not capable of measuring either changes in quality, changes in relative demand of similar goods or changes in the composition of imports by country of origin.

With reference to some potential factors determining the ERPT, I should emphasize that the inclusion of these countries in EU could have influenced the shares of different products subject to exchange rate fluctuations. Figure 1 shows, for each country (except Turkey), total imports as a percentage of GDP in 2000 and 2006. The majority of them have considerably increased the grade of *openness* although there is a large divergence among them. The highest value for imports as a percentage of GDP in 2006 is in the Slovak Republic (83,03%) and the lowest in Poland (36,62%). Figure 2 illustrates the import of goods from inside the Euro Area in 2000 and 2006. Slovenia is the country with the highest share of imports inside the Euro Area as a percentage of GDP, 65.34%, in 2006. These results indicate the importance of the trade with the Euro Area for these countries[4].

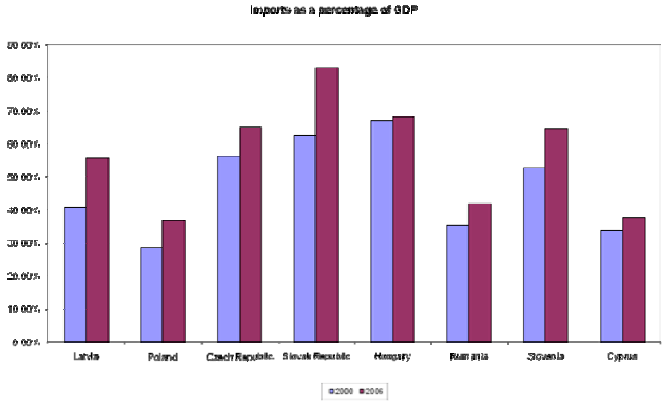

Figure 1: Imports as a percentage of GDP

[4] There are no similar available data for Turkey.

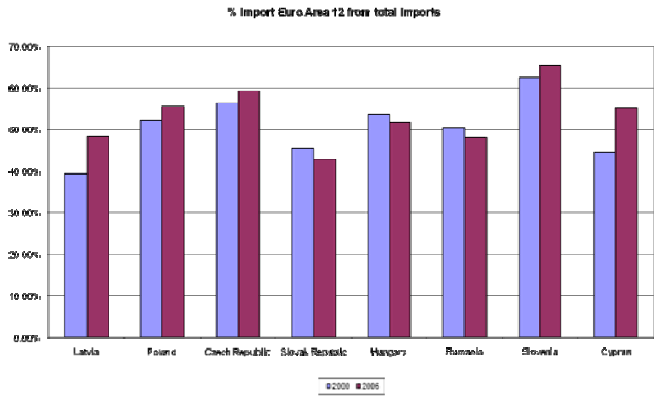

Figure 2: Imports of Euro Area 12 from total imports

Another interesting issue is to observe the distribution of these imports (*micro* factor). Figure 3 shows the distribution of Euro Area imports. This distribution also varies widely across different product categories. *Vehicles and Transport Equipment* is the most important category (46,43%) as a consequence of the outsourcing phenomena in Europe from western to central and eastern countries, followed by *Basic Manufactures* (17,84%), *Chemicals* (11,47%) and *Manufactured Goods* (10,81%). Nevertheless, there is a large degree of heterogeneity. For instance, in *Vehicles and Transport Equipment*, Hungary and Slovak Republic present the largest values, 56,61% and 52,49%, respectively. By contrast, in Slovenia this category is situated around 40%. Another important example is the *Chemicals* sector where the highest percentage is in Poland (15,88%). The less important sectors are *Beverages and Tobacco* and *Animal, Vegetable Oil and Fat.*

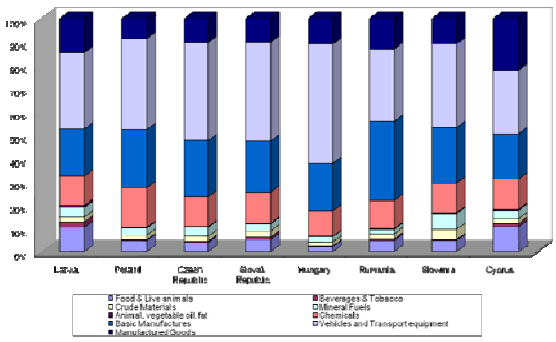

Figure 3: Distribution of Euro Area Imports

In regard to other potential *macro* factors that could have an influence on the size of the ERPT, I proceed to comment on the different exchange rate regimes existing in the

different countries and the date of adoption of *inflation targeting* in some countries. Following some authors, a more stable regime is likely to induce more LCP and a pass-through decrease. The majority of countries which have adopted *inflation targeting* in their monetary policy have a *flexible exchange rate*. For instance, Hungary had a *crawling band exchange rate regime* from 1995 to 2000 and changed its regime to a more flexible system (*managed float*) in 2000. The Czech case is very similar to Hungary. It went from a *crawling band system* in 1996 to a *managed float* during the 1997-2000 period; it decided to adopt an *independent float* exchange rate from 2001 to 2002, and then turned back to a *managed float* in 2003. Poland had a *crawling band* exchange rate system from 1995 to 1999 and adopted an *independent float* regime in 2000[5]. Cyprus had a *fixed pegs system* during the 1991-99 period and adopted a *horizontal bands system* in 2001. With reference to the Slovakia case, a *crawling band exchange system* was implemented for the 1996-97 period and a *managed float regime* after 1997. Slovenia was the first country in this group to adopt the Euro (January, 2007); it had previously changed from a flexible exchange rate system (*managed float*) to a less flexible one (*pegged within horizontal bands*). In Latvia, the main objective of its monetary policy is to maintain a fixed parity against a basket of currencies (*a conventional fixed pegs*). Romania moved from an exchange rate with *crawling bands* to a *managed float* in 2004. Finally, among the countries candidate group, Turkey has owned an explicit *inflation targeting* from May 2001 and an *independent floating* exchange rate. Table 1 shows the different exchange rate regimes for the NMSs and Turkey from 2000 to 2006 offered by the IMF.

[5] The dates of adoption of inflation targeting for Czech Republic, Hungary and Poland are January 1998, June 2001 and October 1998, respectively.

Table 1: Exchange rate regimes in the NMSs of the EU and candidate countries

Country	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*
Poland	8	8	8	8	8	8	8
Hungary	6	7	7	4	4	4	4
Slovenia	7	7	7	6	4	4	4
Slovak R.	7	7	7	7	7	4	4
Romania	6	6	6	6	7	7	7
Turkey	8	8	8	8	8	8	8
Czech R.	7	8	8	7	7	7	7
Latvia	3	3	3	3	3	3	3
Cyprus	3	4	4	4	4	4	4

1.Exchange rate arrangements with no separate legal tender; 2. Currency board; 3. Other conventional fixed pegs; 4. Pegged with horizontal bands; 5. Crawling pegs; 6. Exchange rate with crawling bands; 7. Managed floating; 8. Independent floating. Source: IMF

In order to analyse the ERPT, there are two essential parts to the analysis: the nominal exchange rates and the marginal cost, or foreign price *proxy*. To establish an accurate definition of these variables, I take into account the relevant international market for the product. If there is possible integration in the world market, there exists only a single international market for the product, regardless of product origin, destination market or currency denomination. In this case, measuring the world price should be the same when expressed in a common currency. I use the world price in a common currency to establish an appropriate measure of the foreign price and the exchange rate, and I also include the bilateral exchange rate between the currency in which the foreign price is denominated and the home currency. When studying this case, the world price will be expressed in euros and we will use, for a given product, the euro price of imports coming from a Euro Area as our *proxy* for the foreign price, and bilateral exchange rate between the domestic currency and the euro as our exchange rate measure. This hypothesis is not preposterous if we look at Figure 2 where there is a huge amount of imports proceeding from the Euro Area in these countries[6].

[6] Campa and González-Mínguez (2006) perfomed J_{A}-tests to determine which specification of market structure (integrated or segmented) for the euro area countries originating outside the area is more appropiate and they obtained that the best option is the one integrated.

3. ESTIMATION OF EXCHANGE RATE PASS-THROUGH INTO IMPORT PRICES

By definition, import prices for any type of goods j, MP_t^j are a transformation of export prices of a country's trading partners XP_t^j using the bilateral exchange rate ER_t [7]. So, we have:

$$MP_t^j = ER_t * XP_t^j \qquad (1)$$

Taking logs we obtain:

$$mp_t^j = er_t + xp_t^j \qquad (2)$$

where the export price consists of the exporters' marginal cost and a markup:

$$XP_t^j = FMC_t^j * FMKUP_t^j \qquad (3)$$

So, we obtain:

$$xp_t^j = fmc_t^j + fmkup_t^j \qquad (4)$$

Substituting (4) into (2) yields:

$$mp_t^j = er_t + fmc_t^j + fmkup_t^j \qquad (5)$$

Expression (5) offers us the three main determinants of the ERPT: (i) effects of the exchange rate movement, (ii) marginal cost effects attributable or not to the exchange rate movements, and (iii) markup responses; assuming unity translation of exchange rate movements.

[7] I base this section on Campa, Goldberg and González-Mínguez (2005) and de Bandt, Banerjee and Kozluk (2008).

With reference to the markup factor, this implicitly depends on the market share of domestic producers relative to foreign producers, the form of competition that exists in the market for the industry, and the existence of price discrimination. When a high ERPT is predicted: there is a large share of imports in total industry supply, a high degree of price discrimination or a larger share of imported inputs in the production in the destination country. On the other hand, ERPT could be higher if the ratio of exporters relative to local competitors is high, and lower if the exporters compete for a market share and depends on the currency denomination of exports, structure and importance of intermediate goods markets.

Nevertheless, exporters can decide to absorb some of the exchange rate variations instead of passing them through the price in the importing country currency. If the PCP holds the pass-through is complete and markup does not respond to fluctuations of exchange rates. At the other extreme, if LCP holds exporters can decide not to vary prices in the target country currency and assume fluctuations within the markup. So, the markup in each industry has two components: (i) a specific industry component, and (ii) a reaction to exchange rate movements:

$$fmkup_t^j = \alpha^j + \Phi er_t \qquad (6)$$

In regard to the marginal cost, which is a function of demand that conditions in the importing country, it is also important to look at the marginal costs of production (wages) in the exporting country and the commodity prices denominated in foreign currency:

$$fmc_t^j = \eta_0 y_t + \eta_1 fw_t + \eta_2 er_t + \eta_3 fcp_t + \varepsilon_t \qquad (7)$$

where y_t is the income in the importing country, fw_t is the wage and fcp_t is the commodity price index in foreign currency.

Substituting (7) and (6) into (5), we derive:

$$mp_t^j = \alpha^j + (1 + \Phi + \eta_2)er_t + \eta_0 y_t + \eta_1 fw_t + \eta_3 fcp_t^j \qquad (8)$$

This equation can be written as:

$$mp_t^j = \alpha^j + \beta er_t + \gamma fp_t + \varepsilon_t \qquad (9)$$

where β captures the pass-through elasticity and $\eta_0 y_t + \eta_1 fw_t + \eta_3 fcp_t^j$ is considered independent of the exchange rate and is reflected in the world price of the product, fp_t, in the world currency. Likewise, it also gives us in the long run a connection between the import price, the exchange rate and a measure of the foreign price.

As de Bandt, Banerjee and Kozluk (2008) pointed out, if the cointegrated equilibrium relationship were to exist, equation (9) would be misspecified and the estimated equation should contain an error correction term (ECM), as in Engle and Granger (1987) and thus would take the following form:

$$\Delta mp_t^j = \alpha^j + \sum_{k=0}^{K_1} \beta_k \Delta er_{t-k} + \sum_{k=0}^{K_2} \gamma_k \Delta fp_{t-k} + \lambda(mp_{t-1}^j - \hat{\alpha} - \hat{\beta} er_{t-1} - \hat{\gamma} fp_{t-1}) + u_t \quad (10)$$

The estimations provided by Campa and González-Mínguez (2006) or María-Dolores (2009a) calculate long-run ERPT by summing the estimated coefficients for the first five lags. This definition is somewhat arbitrary and does not take into account the significance of the coefficients on the individual lags. By applying its methodology

could have failed to find a cointegrating relationship in series by an inappropriate lag length selection or proper accounting for a structural break[8]

In order to determine the dates of structural breaks, I use two alternative versions of equation (9): (i) a break in the constant, and (ii) a break in all the cointegrating equation coefficients.

$$mp_t^j = \hat{\alpha} + \hat{\alpha}_1 d_s + \hat{\beta} er_{t-1} + \hat{\gamma}\ fp_{t-1} + \varepsilon_t \qquad (11)$$

$$mp_t^j = \hat{\alpha} + \hat{\alpha}_1 d_s + \hat{\beta} er_{t-1} + \hat{\beta}_1 \hat{er}_{t-1} d_s + \hat{\gamma}\ fp_{t-1} + \hat{\gamma}_1\ fp_{t-1} d_s + \varepsilon_t \quad (12)$$

where d_s is a dummy variable equal to 0 if t<s and equal to 1 otherwise.

4. ESTIMATION RESULTS

In this section, I offer the main results for the estimated ERPT in some NMSs and Turkey using the methodological approach indicated in the previous section. I finally analyse ERPT in Czech Republic, Poland, Hungary, Latvia, Slovakia, Slovenia, Cyprus, Romania and Turkey[9].

If we do simple ADF tests for cointegration on the errors from the OLS regression of the long-run equation (9) for individual country/industry combinations, we obtain a rejection of the null of no cointegration for over 11% of the series (at 5% level). Then,

[8] These authors point out that almost all the theories contain a long-run or steady-state relationship in the levels of a measure of import unit values, the exchange rate and a measure of foreign prices, and this long run is disregarded in most of the empirical implementations.

[9] I drop Estonia, Malta, Lithuania and Bulgaria out of the sample because bilateral exchange rate variations were null during the majority of the sample period.

there is evidence that in the long run, the relationship levels, in the Engle and Granger (1987) sense exist between these variables[10].

4.1.Estimated Long-run ERPT without structural-breaks

I have proved that in doing a ADF test for individual country/industry combinations considering specifications without or with a structural change that the rejection of the null of no cointegration is very probable. Thus, if the cointegrated equilibrium relationship were to exist, the estimated equation should contain an error correction term (ECM). De Bandt, Banerjee and Kozluk (2008) proposed looking at the evidence from all countries and sectors together for the Euro Area. In our case, the number of sectors was nine and the number of countries also nine[11]. So, a panel-based estimation could use up to 9 x 9 x 84 observations allowing for heterogeneity. With this approach we should in principle obtain a clear idea of the common trends underlying the series, and hence the existence of the long run allowing for structural change.

To build the panel, I consider a pool panel in which every country and industry combination constitutes a separate unit. I use the Pedroni (1999) test for the existence of a cointegrating relationship, assuming no cross-unit interdependence. The statistics for the Pedroni (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). Table 2 offers the long-run ERPT coefficients without allowing a break in constant and slope (equation (9)).

Looking at Table 2, we see that the hypothesis of LCP (zero pass-through) is not accepted in the long-run and the hypothesis of PCP (complete pass-through) could be

[10] I do not offer the results of the ADF tests to save space. They are available upon request.

[11] There are not available data for SITC_3 in Cyprus and SITC_4 in Cyprus and Latvia.

accepted for the *Food and Live Animals* industry in Czech Republic and Slovakia, *Beverages and Tobacco* in Czech Republic and Latvia, *Animal, Vegetable Oil and Fat* in Romania, *Chemicals* in Cyprus. In manufacturing industries only appears in *Basic Manufactures* in Latvia, Hungary and Romania and for *Manufactured Goods* in Cyprus and Slovenia.

In order to analyse the relationship between ERPT and some macro factors, we can obtain a measure of total ERPT for each country by averaging individual ERPT by industries, taking into account the different weights for the sample period 2000-2006 (see Figure 3). Table 3 offers us a summary of the average macroeconomic conditions in these countries over the sample period for which data is available. Average inflation is greater in Romania and Turkey than in the rest of the countries. In the case of Turkey and Romania, there is a strong inflationary pressure together with a high exchange rate volatility. In contrast, Czech Republic, Cyprus and Poland own a low inflation average and exchange rate volatility. The more open countries are Slovak Republic, Hungary and Czech Republic.

Table 2: Long-run exchange rate pass-through coefficients

Industry/Country	*PL*	*HU*	*SL*	*SK*	*RO*	*TK*	*CZ*	*LV*	*CY*
0. Food and Live animals	0.50*	0.35*	0.32*	0.75*	0.35*	0.20*	0.85*	0.51*	1.65*
	(0.10)	(0.06)	(0.10)	(0.15)	(0.15)	(0.05)	(0.13)	(0.11)	(0.52)
1. Beverages and Tobacco	0.57*	0.80*	0.20*	0.66*	0.68*	0.55*	0.90*	0.87*	0.71*
	(0.11)	(0.11)	(0.07)	(0.12)	(0.11)	(0.20)	(0.13)	(0.10)	(0.32)
2. Crude Materials	0.51*	0.52*	0.75*	0.40*	0.72*	0.53*	0.60*	0.87*	0.72*
	(0.10)	(0.12)	(0.12)	(0.11)	(0.12)	(0.11)	(0.12)	(0.12)	(0.11)
3. Mineral Fuels	0.11*	0.45*	0.68*	0.35*	0.75*	0.63*	0.15*	0.84*	-
	(0.06)	(0.01)	(0.10)	(0.11)	(0.10)	(0.09)	(0.07)	(0.13)	
4. Animal, Vegetable Oil and Fat	0.20*	0.43*	0.65*	0.66*	1.20*	0.52*	0.55*		
	(0.07)	(0.09)	(0.09)	(0.12)	(0.13)	(0.09)	(0.12)		
5. Chemicals	0.31*	0.54*	0.52*	0.26*	0.52*	0.89*	0.30*	0.70*	1.00*
	(0.07)	(0.10)	(0.11)	(0.09)	(0.10)	(0.12)	(0.10)	(0.12)	(0.12)
6. Basic Manufactures	0.55*	0.86*	0.60*	0.55*	0.72*	0.31*	0.52*	0.77*	0.64*
	(0.10)	(0.12)	(0.11)	(0.12)	(0.12)	(0.09)	(0.11)	(0.15)	(0.14)
7. Vehicles and Transport Equipment	0.70*	0.30*	0.63*	0.56*	0.75*	0.65*	0.55*	0.80*	0.69*
	(0.10)	(0.07)	(0.11)	(0.10)	(0.20)	(0.11)	(0.12)	(0.09)	(0.12)
8. Manudactured Goods	0.83*	0.55*	0.96*	0.70*	0.42*	0.51*	0.35*	0.65*	1.00*
	(012)	(0.10)	(0.09)	(0.11)	(0.08)	(0.09)	(0.08)	(0.12)	(0.15)

*, **, *** indicate whether it is significant at 1%, 5% and 10% level, respectively. CZ (Czech Republic), CY(Cyprus), LV(Latvia), HU(Hungary), PL(Poland), SK (Slovakia), RO(Romania), TK(Turkey), SL (Slovenia)

Table 3: Descriptive statistics (2000:01-2006:12)

Country	*Av.ERPT*	*Av. Inflation*	*Av. Depreciation*	*Imports (%GDP)*	*Std. Inflation*	*Std. Depreciation*	*Weight SIT_6 to SIT_8*
Poland	0.50	2.46	0.43	36.62	0.02	0.06	72.44
Hungary	0.75	5.38	3.40	68.19	0.02	0.08	82.21
Slovenia	0.59	4.91	3.32	64.55	0.02	0.02	70.52
Slovak R.	0.51	5.43	-2.91	83.03	0.02	0.04	74.20
Romania	0.68	18.00	-40.71	41.96	0.12	3.46	77.99
Turkey	-	22.09	28.93	-	0.16	3.46	77.99
Czech R.	0.50	1.99	-3.55	65.12	0.01	0.05	76.31
Latvia	0.74	4.39	-4.69	55.83	0.02	0.11	67.52
Cyprus	0.78	2.45	1.15	37.55	0.01	0.01	68.50

4.1.1.Testing Taylor (2001)'s hypothesis: the relationship between ERPT and Inflation

For testing Taylor (2001)'s hypothesis I explore the relationship between ERPT and average inflation. Figure 4 clearly shows a positive relationship. Inside our sample there are four countries with *inflation targeting* in their monetary policies: Czech Republic, Hungary, Poland and Turkey. So, I have evidence in favour of this hypothesis.

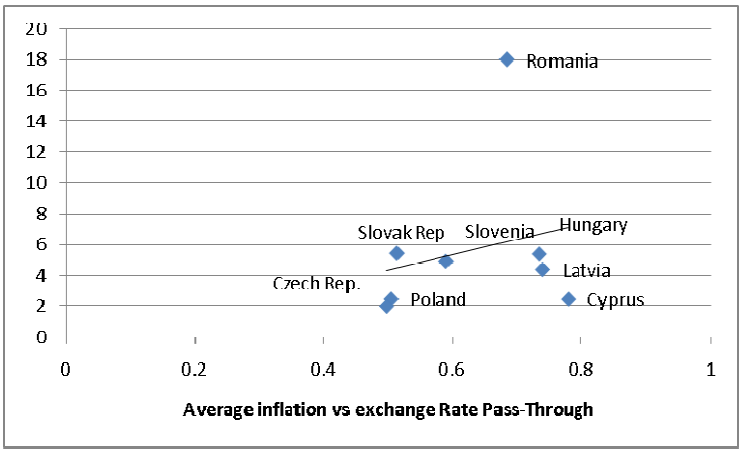

Figure 4: Average inflation (2000-06) versus ERPT

4.1.2.Testing the relationship between ERPT and openness

Another important relationship to study is the influence of the degree of *openness* in the size of the ERPT to import prices. The expected result is a positive relationship. The more open a country is, the more movements in exchange rate are transmitted via

import prices. However, we must not forget that inflation could be negatively correlated with openness and it could imply the existence of an indirect channel which goes in the opposite direction. There are other important theories that are another important theories that are based on the elasticities approach, explaining the size of the ERPT to import prices by means of the elasticities of the demand and supply of imports. These elasticities are strongly affected by the size of openness of a country. Figure 5 shows this relationship. There is a slightly positive relationship between openness (measured by imports as a percentage of GDP) and ERPT.

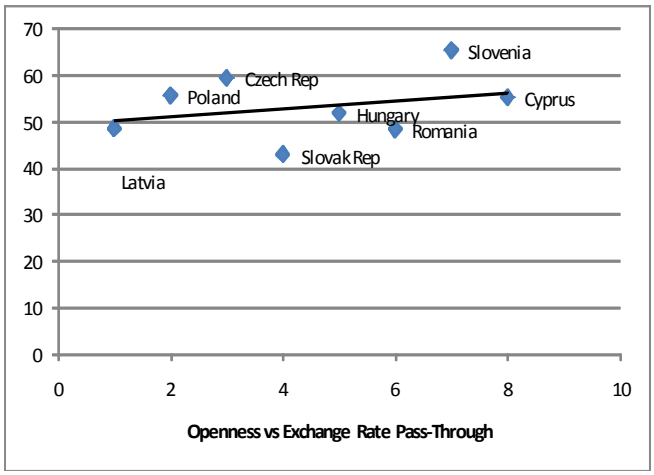

Figure 5: Openness and ERPT

4.1.3. Testing the relationship between ERPT and the exchange rate regime

Figure 6 shows the relation between the standard deviation of the depreciation and the ERPT derived in each country. We observe that there is a positive relationship: the less volatile the exchange rate, the smaller the size of ERPT as expected.

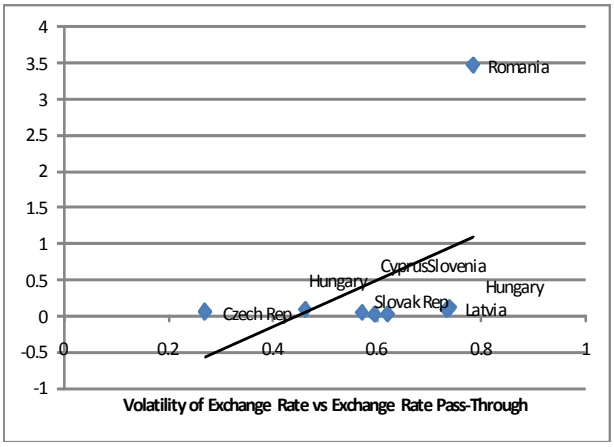

Figure 6: Volatility and ERPT

4.1.4. Differences in ERPT by industries

We usually expect higher ERPT for goods such as energy and raw materials than for manufactured goods (see Campa et al., 2005). Figure 7 shows the relationship between average ERPT and the weight of manufactured goods in total imports (from SITC_6 to SITC_8). This relationship is slightly negative. The larger the importance of differentiated manufactured goods in total imports the less ERPT is observed.

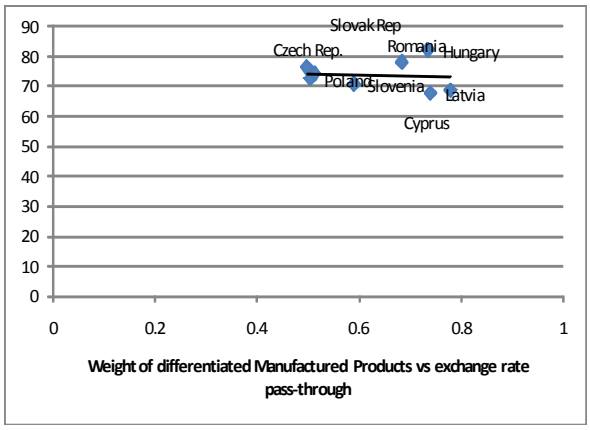

Figure 7: Share of differentiated manufactured goods and ERPT

4.2.Estimated Long-run ERPT allowing structural-breaks

Finally, a useful exercise is to allow for break-dates in the estimation process in order to capture changes in the behaviour of the ERPT. These changes could be associated with major institutional changes happening during our sample period. Tables 5 and 6

offer the Pedroni (1999) break-data estimates for equations (11) (break in constant) and (12) (break in both constant and slope). Some of them are very close to the date of entry into the EU (*Basic Manufactures* in Poland, *Food and Live animals, Crude Materials* in Slovenia), adoption of *inflation targeting* (*Manufactured goods* in Hungary, *Vehicles and Transport Equipment* in Turkey) or change in the exchange rate system (*Crude Materials* in Slovak Republic). The statistics for the Banerjee and Carrion-i-Silvestre (2006) panel cointegration tests indicate a strong rejection of the hypothesis of no cointegration considering the two types of long-run relationships ((11) and (12)) [12]. We obtain a pseudo-p of -48.34 and -48.37 for the models with break in constant and break in constant and slope, respectively.

This implementation is also very useful to explore changes in the ERPT and cross-sectional differences in these countries. Campa, Goldberg and González-Mínguez (2005) detected declines in the size of ERPT on import prices for manufacturing industries. In contrast, de Bandt, Banerjee and Kozluk (2008) find evidence of the opposite in the change of the pass-through in some Euro Area countries like Italy, Portugal and Spain.

My results are very similar to the latter in the sense that some NMSs like Cyprus, Poland and Romania could have clearly increased the size of ERPT. If we look carefully at the Cyprus case in Table 4, we observe that ERPT decreases only in the *Manufactured goods* industry and increases in four industries. Romania only decreases the size of ERPT in *Manufactured goods* and *Beverages and Tobacco*, and Poland in three industries: *Chemicals, Beverages and Tobacco* and *Animal, Vegetable Oil and Fat.*

[12] This test chooses the break-data which is consistent with strongest evidence against the null, and extracts the data breaks for each individual series and the cointegrating coefficients.

In contrast, I observe that Hungary experiences a decline in the size of ERPT in six industries. It only has an increase in ERPT in manufacturing industries and there is an important decrease in the rest. Many of the observed break-dates for the reduction coincide with the year of inflation targeting adoption, 2001 (*Food and Live Animals*, *Crude Materials* and *Chemicals*). Slovenia, Slovakia and Turkey also show a reduction in the degree of ERPT in industries like *Food and Live Animals*, *Beverages and Tobacco*, *Crude Materials* and *Mineral Fuels*. In the Slovenian case, some break-dates are situated next to the date of entry into EMU.

If we stay looking at Table 4, we see that the hypothesis of LCP (zero pass-through) continues to not be accepted in the long-run and that the hypothesis of PCP (complete pass-through) could be accepted in the *Food and Live Animals* industry in Czech Republic and Slovakia, *Beverages and Tobacco* in Czech Republic and Cyprus, *Animal, Vegetable Oil and Fat* in Romania, and *Chemicals* in Cyprus. In manufacturing industries only appears in *Basic Manufactures* in Latvia, Hungary and Slovakia and *Manufactured Goods* in Cyprus and Slovenia. I observe again how *inflation targeting* countries (Czech Republic, Hungary, Poland, Slovenia and Turkey) have a smaller size of ERPT. With industries there are many divergences. It is not clear a ERPT decrease in the manufacturing sector. I find clear evidence only for some industries in Cyprus, Latvia, Slovenia and Romania. Nevertheless it is easier to find evidence of ERPT decline in *Food & Live Animals*, *Beverages and Tobacco*, *Crude Materia*ls and *Mineral Fuels* industries.

With reference to other relevant factors mentioned in section 2, I observe that Hungary (among the *inflation targeting* countries in our sample) decreases the size of ERPT in the majority of its industries (except *Basic Manufactures*). Hungary also has had a *pegged within horizontal bands* exchange rate system since 2003. In Czech

Republic we observe a decrease in *Crude Materials*, *Animal, Vegetable Oil and Fat*, *Chemicals* and *Basic Manufactures*. This country owns a *managed floating system* and we would expect a larger decrease. In Poland there is only a ERPT decrease in *Food and Live Animals, Animal, Vegetable Oil and Fat* and *Manufactured Goods* but they have an *independent floating* exchange rate regime. Turkey also experiences a decline in the size of ERPT in their industries except in *Chemicals, Basic Manufactures* and *Manufactured goods*. It has owned a flexible exchange rate system and *inflation targeting* since May, 2001. Finally, Slovakia has reduced the degree of ERPT in five of its nine industries, probably due to the adoption of a *pegged system within horizontal bands* since 2005. So, it is difficult to derive a conclusive result about the joint influence of *inflation targeting* adoption and the type of exchange rate regime in the size of the ERPT, except for the Hungary case.

Table 5 offers the coefficients of the long-run ERPT considering a break in constant and slope. In some countries like Latvia and Cyprus the number of break-dates decreases and, generally, I obtain less evidence of a ERPT decline. Nevertheless, the *Food and Live Animals* coefficient has decreased in Poland and Turkey, *Beverages and Tobacco* in Hungary, Romania, Slovakia and Turkey and *Crude Materials* in Latvia and Slovakia.

These results are consistent with papers by Hellerstein et al. (2006) and Campa and Goldberg (2006) for OECD countries. Hellenstein et al. (2006) emphasize the role of intra-firm trade, as well as the commodity channel which creates a downward bias in the estimation of ERPT. Gopinath and Rigobon (2006) use micro data on US export and import prices for 1994-2005 and find evidence of LCP for US imports and PCP for US exports. This latter result implies higher levels of ERPT into import prices for US trading partners, in particular the European Union. Thus, it should be interesting to

analyse what happens with EU exports. If we have evidence in favour of the hypothesis of PCP for EU exports, we could expect a high level of ERPT for the NMSs.

How can we interpret these 'apparently' contradictory results?. There could be several reasons. First, as de Bandt et al. (2008) point out, there is no reason why it would not be possible to observe even opposing movements in the short- and long-run ERPT. The inclusion in the EMU may take far longer effects than we are able to pick up in a sample of seven years (2000-06). Second, as I mentioned before, the effect of exchange rate volatility is often negative. In a volatile environment, PCP hypothesis is difficult to become a reality. In this case menu costs or costly pricing strategy reviews may lead to imported goods to the LCP hypothesis. In the NMSs, when there is a change in the exchange rate system, the amount of noise in exchange rate may have fallen; thus, actual changes in the exchange rate may have come to be no longer perceived as noisy temporary shocks but to be more of a somewhat permanent and macro-founded nature, which the foreign exporter may become more willing to pass-through into the price. Third, there is a possible asymmetric effect of the exchange rate developments on import prices. When the local currency is depreciating, imported goods (denominated in euros) would become more expensive if the exchange rate change were passed through into the price. In order to stay competitive, the foreign producers could have been expected to accommodate some part of the rise and ERPT is expected to be lower than if the PCP strategy were adopted. By contrast, if there is an appreciation goods with euro prices are cheaper now and producers could be trying to keep off the LCP strategy. By passing through more of their euro price, they would maintain their revenues in euros, but they find it easier to gain an edge in the market and compete with local products. So, obtaining a ERPT increase after a break-point could also be due to this asymmetric ERPT.

Table 4: Long-run exchange rate pass-through coefficients break in constant

Industry/Country	*Poland*			*Hungary*			*Slovenia*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.56* (0.11)	0.25 (0.45)	7/05	0.34* (0.07)	0.30* (0.07)	5/01	0.30* (0.07)	0.21* (0.07)	5/04
1. Beverages and Tobacco	0.66* (0.11)	0.67* (0.14)	1/02	0.81* (0.10)	0.63* (0.15)	5/05	0.18* (0.06)	0.03 (0.18)	5/05
2. Crude Materials	0.54* (0.10)	0.83* (0.21)	6/01	0.55* (0.10)	0.47* (0.11)	2/01	0.72* (0.11)	0.70* (0.22)	6/04
3. Mineral Fuels	0.11*** (0.06)	0.15 (0.27)	5/04	0.40* (0.09)	0.39* (0.11)	2/02	0.67* (0.21)	0.66* (0.15)	10/01
4. Animal, Vegetable Oil and Fat	0.25* (0.07)	0.23* (0.09)	10/02	0.41* (0.11)	0.31* (0.14)	10/03	0.60* (0.11)	1.11* (0.28)	7/05
5. Chemicals	0.28* (0.08)	0.43* (0.22)	9/04	0.51* (0.09)	0.42* (0.09)	3/01	0.49* (0.09)	0.52* (0.12)	7/01
6. Basic Manufactures	0.60* (0.10)	0.66* (0.12)	8/01	1.05* (0.11)	1.09* (0.21)	10/04	0.57* (0.11)	0.93* (0.25)	5/04
7. Vehicles and Transport Equipment	0.72* (0.12)	0.83* (0.23)	7/04	0.32* (0.08)	0.52* (0.15)	5/03	0.60* (0.11)	0.19 (0.39)	6/05
8. Manudactured Goods	0.86* (0.11)	0.77* (0.18)	4/04	0.53* (0.09)	-	-	0.93* (0.09)	1.31* (0.13)	4/04

Industry/Country	*Slovakia*			*Romania*			*Turkey*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.73* (0.13)	1.19* (0.29)	5/04	0.31* (0.13)	0.51* (0.09)	9/05	0.17* (0.06)	0.05 (0.12)	5/04
1. Beverages and Tobacco	0.64* (0.11)	0.54* (0.13)	3/02	0.62* (0.11)	0.40* (0.17)	3/04	0.50* (0.10)	0.36* (0.11)	8/02
2. Crude Materials	0.38* (0.11)	0.32* (0.19)	8/01	0.68* (0.11)	0.69* (0.13)	3/01	0.51* (0.10)	0.36* (0.12)	5/02
3. Mineral Fuels	0.33* (0.10)	0.29* (0.09)	10/05	0.72* (0.11)	0.77* (0.27)	8/04	0.61* (0.11)	-	-
4. Animal, Vegetable Oil and Fat	0.64* (0.11)	0.60* (0.12)	6/01	1.14* (0.11)	-	-	0.46* (0.09)	0.44* (0.13)	7/03
5. Chemicals	0.26* (0.07)	0.24* (0.08)	4/01	0.48* (0.10)	0.57* (0.26)	8/04	0.86* (0.12)	0.97* (0.17)	5/03
6. Basic Manufactures	0.55* (0.11)	0.94* (0.28)	8/04	0.69* (0.11)	0.98* (0.27)	5/04	0.25* (0.09)	0.42* (0.19)	5/04
7. Vehicles and Transport Equipment	0.54* (0.10)	0.65* (0.21)	3/04	0.71* (0.12)	-	-	0.62* (0.11)	0.52* (0.12)	2/03
8. Manudactured Goods	0.67* (0.11)	0.89* (0.35)	5/05	0.37* (0.08)	0.30** (0.16) (0.16)	5/05	0.47* (0.09)	0.51* (0.11)	9/01

Industry/Country	*Czech Republic*			*Latvia*			*Cyprus*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.82* (0.12)	0.94* (0.17)	2/03	0.46* (0.10)	0.87* (0.23)	6/04	1.63* (0.63)	-	-
1. Beverages and Tobacco	0.88* (0.12)	1.16* (0.25)	6/04	0.85* (0.11)	0.80* (0.12)	4/01	0.69* (0.34)	1.02* (0.18)	1/03
2. Crude Materials	0.56* (0.11)	0.48* (0.25)	5/05	0.85* (0.11)	0.74* (0.18)	11/04	0.74* (0.11)	0.75* (0.13)	2/01
3. Mineral Fuels	0.13* (0.07)	0.24 (0.18)	5/04	0.84* (0.12)	1.51* (0.53)	11/05	-	-	-
4. Animal, Vegetable Oil and Fat	0.51* (0.10)	0.27 (0.16)	4/05	-	-	-	-	-	-
5. Chemicals	0.26* (0.09)	0.09 (0.16)	10/04	0.69* (0.11)	-	-	1.02* (0.11)	-	-
6. Basic Manufactures	0.49* (0.09)	0.28 (0.18)	8/04	0.75* (0.12)	0.98* (0.15)	2/02	0.64* (0.11)	0.69* (0.13)	5/05
7. Vehicles and Transport Equipment	0.50* (0.10)	0.57* (0.18)	8/03	0.81* (0.12)	0.46 (0.39)	10/04	0.69* (0.12)	0.75* (0.22)	5/04
8. Manufactured Goods	0.28* (0.08)	0.47* (0.17)	11/03	0.67* (0.11)	0.78** (0.48)	6/05	1.18* (0.11)	1.16* (0.14)	4/02

*, **, *** indicate whether it is significant at 1%, 5% and 10% level, respectively.

Table 5: Long-run exchange rate pass-through coefficients break in constant and slope

Industry/Country	*Poland*			*Hungary*			*Slovenia*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.44* (0.10)	0.24** (0.13)	6/03	0.39* (0.08)	-	-	0.35* (0.10)	0.62* (0.23)	5/04
1. Beverages and Tobacco	0.53* (0.10)	-	-	0.81* (0.11)	0.62* (0.15)	5/05	0.35* (0.07)	0.42* (0.20)	5/05
2. Crude Materials	0.52* (0.10)	0.84* (0.22)	6/01	0.51* (0.10)	0.49* (0.11)	5/01	0.87* (0.11)	0.69* (0.20)	6/04
3. Mineral Fuels	0.11* (0.06)	0.24* (0.12)	5/04	0.46* (0.09)	0.42* (0.11)	2/02	0.84* (0.21)	0.91* (0.15)	10/01
4. Animal, Vegetable Oil and Fat	0.18* (0.07)	0.76* (0.32)	1/06	0.84* (0.11)	0.88* (0.14)	10/03	0.70* (0.12)	1.17* (0.22)	9/04
5. Chemicals	0.31* (0.08)	0.38* (0.13)	4/03	0.48* (0.09)	0.44* (0.09)	8/01	0.40* (0.09)	0.39* (0.10)	1/01
6. Basic Manufactures	0.49* (0.10)	1.17* (0.78)	4/06	1.11* (0.11)	1.21* (0.23)	10/04	0.62* (0.11)	0.63* (0.13)	10/01
7. Vehicles and Transport Equipment	0.71* (0.12)	0.86* (0.24)	7/04	0.33* (0.09)	0.41* (0.11)	7/01	0.78* (0.12)	0.54* (0.34)	4/05
8. Manufactured Goods	0.81* (0.11)	-	-	0.59* (0.09)	-	-	0.82* (0.15)	1.31* (0.27)	3/05

Industry/Country	*Slovakia*			*Romania*			*Turkey*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.67* (0.11)	0.82* (0.20)	9/02	0.29* (0.13)	-	-	0.31* (0.09)	0.21 (0.18)	5/04
1. Beverages and Tobacco	0.56* (0.11)	0.48* (0.20)	5/04	0.70* (0.11)	0.59* (0.12)	3/04	0.51* (0.11)	0.38* (0.12)	8/02
2. Crude Materials	0.43* (0.11)	0.39* (0.11)	1/02	0.65* (0.10)	0.69* (0.09)	3/01	0.42* (0.09)	1.84* (0.32)	3/06
3. Mineral Fuels	0.33* (0.09)	0.35 (0.33)	2/01	0.74* (0.10)	1.04* (0.11)	8/04	0.61* (0.11)	-	-
4. Animal, Vegetable Oil and Fat	0.75* (0.10)	0.82* (0.44)	6/05	0.09 (0.12)	-	-	0.43* (0.09)	0.76* (0.39)	4/06
5. Chemicals	0.26* (0.07)	0.25* (0.08)	3/01	0.40* (0.09)	0.76* (0.10)	8/04	0.94* (0.13)	1.26* (0.17)	5/03
6. Basic Manufactures	0.64* (0.12)	1.59* (0.31)	5/04	0.91* (0.11)	1.64* (0.11)	3/06	0.34* (0.10)	0.43* (0.21)	5/04
7. Vehicles and Transport Equipment	0.63* (0.11)	0.81* (0.23)	1/05	0.75* (0.12)	-	-	0.51* (0.09)	0.99* (0.16)	6/01
8. Manufactured Goods	0.48* (0.10)	0.79* (0.18)	2/03	0.40* (0.08)	0.38** (0.18)	5/05	0.66* (0.12)	-	-

Industry/Country	*Czech Republic*			*Latvia*			*Cyprus*		
	Before	After	Break	Before	After	Break	Before	After	Break
0. Food and Live animals	0.56* (0.12)	0.78* (0.22)	1/03	0.64* (0.11)	0.65* (0.14)	9/02	0.77* (0.11)	-	-
1. Beverages and Tobacco	0.92* (0.12)	-	-	0.75* (0.11)	-	-	0.84* (0.11)	-	-
2. Crude Materials	0.10* (0.05)	0.50* (0.26)	5/05	0.72* (0.13)	0.22 (0.62)	10/05	0.38* (0.09)	0.57* (0.16)	3/06
3. Mineral Fuels	0.11* (0.07)	0.18 (0.17)	5/04	0.76* (0.11)	-	-	-	-	-
4. Animal, Vegetable Oil and Fat	0.36* (0.09)	0.59** (0.39)	2/05	-	-	-	-	-	-
5. Chemicals	0.28* (0.08)	0.36** (0.20)	10/04	0.68* (0.11)	-	-	1.03* (0.11)	-	-
6. Basic Manufactures	0.21* (0.07)	0.94* (0.42)	8/04	0.80* (0.12)	1.00* (0.16)	1/02	0.47* (0.10)	0.45* (0.13)	8/04
7. Vehicles and Transport Equipment	0.62* (0.11)	1.03* (0.20)	8/03	0.68* (0.11)	-	-	0.65* (0.09)	-	-
8. Manudactured Goods	0.76* (0.12)	0.64* (0.20)	11/03	0.61* (0.10)	-	-	1.04* (0.11)	-	-

*, **, *** indicate whether it is significant at 1%, 5% and 10% level, respectively.

5. CONCLUSIONS

In this paper, I have studied the ERPT changes in the prices of imports made by some New Member States (NMSs) of the European Union and one candidate country, Turkey, originating inside the Euro Area. I have used data on import unit values for nine different product categories for each country, and I have estimated industry-specific rates of pass-through across and within countries using the methodological approach by de Bandt, Banerjee and Tomasz Kozluk (2008), which suggests a long-run Engle and Granger (1987) cointegrating relationship and the possibility of structural breaks to restore the long-run in the estimation.

The hypothesis of LCP (zero pass-through) is not accepted in the long-run, and the hypothesis of PCP (complete pass-through) could be accepted in the *Food and Live Animals* industry in Czech Republic and Slovak Republic, *Beverages and Tobacco* in Czech Republic and Cyprus, *Animal, Vegetable Oil and Fat* in Romania, and *Chemicals* in Cyprus. In manufactures industries only appears in *Basic Manufactures* in Latvia, Hungary and Slovakia and *Manufactured Goods* in Cyprus and Slovenia.

My results show evidence in favour of Taylor (2001)'s hypothesis (a positive relationship between ERPT and inflation in these countries). I do find a slightly positive pattern for the relationship between ERPT and *openness*. With reference to the relationship between ERPT and the exchange rate regime, I observe that a less volatile exchange rate implies a less degree of ERPT. In industries I obtain a less degree of ERPT in differentiated manufactured products.

By including possible statistical break-dates in the estimation process, I observe that some NMSs have decreased the ERPT in recent years. Some of the breaks are close to the dates of some major institutional changes in these countries (changes in monetary

policy and exchange rate regime and the starting up of EU membership). I also derive results very similar to those of de Bandt, Banerjee and Kozluk (2008), in the sense that some NMSs like Poland could have clearly increased the size of ERPT. With industries there are many divergences and it is not completely clear that there has been a ERPT decrease in the manufacturing sector. I found clear evidence only for some industries in Cyprus, Latvia, Slovenia and Romania. Nevertheless, it was easier to find evidence of ERPT decline in the Food *and Live Animals, Beverages and Tobacco, Crude Materials* and *Mineral Fuels* industries.

My further research will be centred on analysing the ERPT by using alternative methodologies. For instance, Den Haan (2000) suggested a procedure for analyzing the comovement between output and prices, based on correlations of the corresponding VAR forecast errors at alternative forecast horizons, which could be easily applied in this context. I could also test the possible asymmetric effect of the exchange rate developments on import prices. Another interesting topic would be to study more directly the role played by those *micro* and *macro* factors pointed out in section 2, taking into account other factors such as distribution costs, transportation charges and taxes and the margins of distributors. Finally, I would also try to explain the observed degree of pass-through and study its structural determinants through a small open economy DSGE model featuring a number of characteristics likely to influence the response of domestic prices to changes in exchange rates and estimating a VAR for each country.

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