



**Economics
Doctoral School**

COLLECTION OF THESES

of

Gábor Pellényi

Empirical analysis of the heterogeneity in sectoral price developments

Ph.D. dissertation

Supervisor:

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Professor

Budapest, 2012

Department of Economic Policy

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1 Motivation and previous research

The economy is characterized by heterogeneity. The behaviour of economic agents – households, firms – can be very diverse, based on their characteristics. The heterogeneous behaviour of economic agents can affect the conduct of economic policy as well. Decisions affecting the allocation of resources can have different welfare effects across sectors. For example, a tax on production can lead to different dead-weight losses depending on the price elasticity of supply and demand. Producer surplus may also change to a different degree across sectors – thus policies aimed at the reallocation of resources will inevitably have distributional effects as well. This redistribution can lead to rent-seeking by individual sectors, to the detriment of the welfare of other sectors and even the entire economy.

The three analyses are centred around the heterogeneity of price developments across products and industries, using panel econometric methods. My goal is to document the magnitude of heterogeneity, to reveal their causes (which are frequently unknown), and to draw policy-relevant conclusions.

The relationship between price and real convergence The first study assesses the long-term determinants of prices: price convergence across countries and the role of real convergence. Real convergence affects product categories differently; various explanations are proposed. Based on the estimates I calculate the equilibrium inflation differential between goods and services during the process of real convergence.

Several studies have investigated the Balassa-Samuelson effect – which offers an explanation for heterogeneous price developments in the traded and nontraded

sectors – in Central Eastern Europe. An exhaustive literature survey is offered by Égert et al. (2006). More recent papers find that the Balassa-Samuelson effect induces only 0-1 per cent extra inflation; the authors of these papers generally look for other explanations (e.g. product quality, regulated prices) to explain price convergence.

Economic growth also coincides with improvements in the quality of consumed products. Better quality means higher consumer utility, which can translate into higher prices. Due to the limitations of price statistics, quality changes are mostly accounted for as price increases. Filer and Hanousek (2002) and Filer and Hanousek (2003) use Romanian and Czech survey data to estimate that half of the observed inflation in the 1990s might have been attributed to quality changes. Backé et al. (2003), és Cincibuch and Podpiera (2006) argue that quality improvements led to improving terms of trade (in other words, increasing traded prices) in Central Eastern Europe.

Product quality is not determined by technology only. It also depends on the income of consumers. If the price elasticity of demand differs across countries, profit-maximizing oligopolists can apply third-degree price discrimination just as a monopolist would do (Neven and Philips (1985), Holmes (1989)). Price discrimination could be of particular relevance in explaining price differences between rich and poor countries.

Pricing strategies can also affect price convergence in sectors where consumers face switching costs (e.g. telecommunication, finance). Farrell and Klemperer (2007) show that prices can be lower in fast-growing markets. Firms set low initial prices to lure more consumers. Later, they can charge higher prices because

switching costs "capture" consumers. Thus, in fast-growing economies where market penetration is still low, prices can be temporarily lower than in more mature markets.

Consumer preferences also play a role in price convergence. In the model of Bergstrand (1991) a minimum amount of traded and nontraded products must be consumed by households (e.g. for subsistence). With such a utility function the relative demand of traded and nontraded products will be a function of income. If the share of non-tradables rises with the income level (i.e. they are luxury products), then richer countries will have higher price levels. The situation of Central Eastern European economies may be the exact opposite: as living standards improve, consumers may first satisfy their demand for industrial products, as they aim to copy Western European consumption patterns and build up their stock of durables (e.g. household appliances, cars); see e.g. García-Solanes et al. (2007).

Price developments in post-socialist economies are strongly influenced by regulated prices. In the socialist system many basic services (e.g. energy) were supplied at artificially low prices. Liberalization during the transition process raised the cost of these services (at least until "realistic" cost levels), which transmitted into other products' prices, because items falling under price control are often used as inputs in production (e.g. energy). MacDonald and Wójcik (2004) argue that regulated prices had a more profound effect on real exchange rates in Central Eastern Europe than the Balassa-Samuelson effect.

However, real convergence can also reduce prices through various channels. The theoretical and empirical literature broadly shares the view that stronger compet-

ition raises productivity (at incumbents, Caves (1992)), enhances the productivity growth of new entrants (Nickell (1996)), which allows firms to reduce their prices. Network industries play a prominent role. Boylaud and Nicoletti (2001) find that liberalization in the telecommunication sector led to higher productivity and quality, as well as lower prices. Furthermore, even the prospect of stronger competition had a significant effect on prices. A study by ECB (2001) finds that the liberalization and deregulation of telecommunication and electricity supply (until 2001) contributed to lower prices across the economy due to input-output linkages.

The productivity of wholesale and retail trade plays an important part because the markup of retailers can exceed 40 per cent of final producer prices. Thus, the efficiency and competitiveness of this sector can have a strong impact on consumer prices. Basker (2005) finds that the entry of low-cost Wal-Mart stores can reduce prices in the U.S. by 1.5-3 per cent in the short term, and by as much as 10 per cent in the longer term.

The price effects of EU enlargement The second study quantifies the impact of a single event, the 2004 EU enlargement on prices with panel econometric techniques. Several manufacturing subsectors in the new EU member states experienced significant price drops before EU accession. Many authors find that free trade agreements boost trade through the reduction of transaction costs. Nahuis (2004) finds that trade between EU members exceeds by 33-73 per cent the trade flows with comparable non-EU countries. He estimates that EU accession reduces trade costs with EU members by as much as 10 per cent. The effects of integration on trade flows appear even larger if the endogeneity of trade agreements is accounted for. As Baier et al. (2008) show, trade flows can rise by as much as 127-146

per cent 10-15 years after EU accession. Such increases in trade flows can have a significant effect on prices through the rise in competitive pressure from imports.

A number of papers find evidence that trade liberalization enhances domestic productivity, reduces markups and prices. Pavcnik (2004) or Amiti and Konings (2007) demonstrate the productivity effects of liberalization on firm-level data. Álvarez and López (2008) uses industry-level data from 46 countries to show that markups fall for three years after trade liberalization. Chen et al. (2009) find a significant (although small) negative effect of import competition on prices in Western European countries in the 1990s. On the other hand, Romalis (2007) demonstrates on product-level data that although NAFTA and CUSFTA significantly increased trade flows, their impact on prices was negligible. In some protected sectors, prices even rose as imports from third countries were limited.

In the case of the European Single Market, other mechanisms can also reduce prices. Besides the free movement of goods, the harmonization of product market regulation – a kind of non-tariff barrier – may contribute to stronger competition and lower market power of firms. Bottasso and Sembenelli (2001) find evidence for this channel among Italian firms. New EU members can be particularly affected by this channel. According to Marinov (2010), competition policy can have a downward effect on prices at least as strong as trade openness in the Central Eastern European region.

The 2004 enlargement of the European Union is an ideal natural experiment to test the price effects of the Single Market. However, the effects of the eastern enlargement have not been fully explored yet. Dreger et al. (2007) explained price convergence in the enlarged EU between 1999-2005 with real convergence and

rising import competition. In some countries import competition had significant explanatory power for the prices of durable and semi-durable goods.

The sectoral effects of monetary policy Monetary policy affects each sector differently.¹ This heterogeneity is important for the design of monetary policy, because its distributional effects can alter the transmission mechanism.

A number of authors have analyzed the sectoral differences in the impact of monetary policy. Leading explanations include sectoral differences in the degree nominal rigidities; input-output linkages across sectors; and the broad credit channel of monetary transmission. Model-based studies include Bouakez et al. (2009), who find a significant role for price stickiness and input-output linkages in a multi-sector dynamic stochastic general equilibrium model with sticky prices. Empirical analyses can employ firm-level data, e.g. Gaiotti and Secchi (2006); or VAR models with sectoral data, for example Barth and Ramey (2001), Dedola and Lippi (2005), Ganley and Salmon (1997), Hayo and Uhlenbrock (1999). In a related approach, Peersman and Smets (2005) construct a monetary shock variable in a VAR and use it to explain output fluctuations in a country/industry panel. The general conclusion from this literature is that heterogeneity across sectors is much larger than across countries. In particular, the sensitivity of demand to interest rates, and the working capital requirement of production are important determinants of the sectoral impact of monetary policy. The latter finding lends support to the cost channel of monetary policy: higher interest rates increase the financing costs of firms, driving up their sales prices in the short term. In addition, there is some

¹This chapter has been published in English (Pellényi (2012b)) and parts of it in Hungarian (Pellényi (2012a)).

evidence for the financial accelerator mechanism of Bernanke et al. (1996): more vulnerable corporate balance sheets can amplify the effects of monetary policy, especially in recessions.

2 Applied methods

The relationship between price and real convergence I perform my analysis on comparative price level data in the New Cronos database of Eurostat. The data are available for 1999-2010 for the 27 EU member states (and some additional countries) for national accounts aggregates and household consumption items based on the COICOP classification. I use 12 COICOP groups for 1999-2007. Thus, I exclude the global financial crisis and recession from the sample, because it might distort my analysis. Prices of each item are expressed as a percentage of the actual German price level of the item.

I first analyze the speed of price convergence for each product category. Based on the literature I hypothesize that differences in traded goods' prices diminish quickly.

I estimate the following dynamic panel for each ($j = 1, \dots, J$) product category:

$$\log \frac{P_{it}^{(j)}}{P_{DE,t}^{(j)}} = \mu^{(j)} + \rho^{(j)} \log \frac{P_{i,t-1}^{(j)}}{P_{DE,t-1}^{(j)}} + u_{it}^{(j)} \quad (1)$$

where $P_{it}^{(j)}$ is the price level of product j in country i in year t relative to the German price level (DE refers to Germany). In this model the relative price depends on its lagged value. Absent shocks, each product can have a different

relative price in equilibrium ($\mu^{(j)}$). This can be explained by different taxes and transport costs across products.

I then analyze the effect of real economic development on prices. Development is proxied by labour productivity in the private sector.

I estimate the following specifications to assess the impact of productivity (y_{it}) on prices (p_{ijt}):

$$p_{ijt} = \mu + \beta_j y_{it} + \theta m_{it} + \kappa pmr_{it} + u_{ijt} \quad (2a)$$

$$p_{ijt} = \mu + \beta_j \widehat{y}_{it}^* + \theta m_{it} + \kappa pmr_{it} + u_{ijt} \quad (2b)$$

$$y_{it}^* = \alpha + \phi educ_{it} + v_{it}$$

$$p_{ijt} = \lambda_i + \mu_j + \nu_t + \beta_j y_{it} + \theta m_{it} + \kappa pmr_{it} + u_{ijt} \quad (2c)$$

$$\Delta p_{ijt} = \lambda_i + \mu_j + \beta_j \Delta y_{it} + \theta \Delta m_{it} + \kappa \Delta pmr_{it} + u_{ijt} \quad (2d)$$

$$p_{ijt} = \mu_j + \nu_t + \beta_j \widehat{y}_{it}^* + \theta m_{it} + \kappa pmr_{it} + u_{ijt} \quad (2e)$$

$$y_{it}^* = \alpha + \phi educ_{it} + v_{it}$$

Equation 2a (OLS) controls for the endogeneity arising from the correlation between productivity and openness (m_{it}) as well as product market regulation (pmr_{it}). Equation 2b (IV) uses instrumental variables to tackle the possible reverse causality between productivity and prices. The instrument of productivity is the fraction of working age population with higher education ($educ_{it}$). Equation 2c (FE) controls for openness, product market regulation, as well as other, unspecified product-, country-, and year-level heterogeneity. Equation 2d (FD) is similar,

but is estimated in differences. If the data are nearly unit root, then the FD estimation is more efficient. Finally, equation 2e uses instrumental variables and also includes product and year fixed effects. Equations are estimated with OLS, while specifications with instrumental variables are estimated with 2SLS.

The estimated parameters are then used for a simple simulation to assess the impact of real convergence on prices. I assume a scenario where the productivity of Hungary rises from 50 per cent of the German level to 75 per cent. I calculate the equilibrium inflation differential due to real convergence, and quantify relative price changes within Hungary.

The price effects of EU enlargement The purpose of my analysis is the identification of the effects of EU enlargement on producer prices. To answer this question, I need an estimable model which takes into account the main factors influencing firms' pricing behaviour. I use the framework of Bugamelli et al. (2010), where under imperfect competition, the optimal price is the sum of marginal cost and the markup. Thus the empirical analysis controls for changes in these factors.

Price data for NACE 2 industries were obtained from the New Cronos database of Eurostat. Control variables – wage cost ($nulc_{ijt}$), cost of capital (rir_{it}), intermediate input prices (P_{ijt}^{INT}), demand (cu_{ijt}), exchange rate (fx_{it}), product market competition (pmr_{it}) – were collected from Eurostat and the OECD STAN database.

I estimate the following model:

$$\Delta P_{ijt} = \sum_{k=2001}^{2006} (\delta_k D_{i,t-k}^{EU}) + \mu_{ij} + \beta_1 \Delta n_{ulc}_{ijt} + \beta_2 \Delta r_{ir}_{it} + \Delta P_{ijt}^{INT} + \gamma_1 \Delta c_{u}_{ijt} + \gamma_2 \Delta f_{x}_{it} + \gamma_3 \Delta imppen_{ijt} + \gamma_4 \Delta pmr_{it} + \varepsilon_{ijt} \quad (3)$$

EU integration could have led to falling prices through at least three channels:

- The reduction of trade barriers could have intensified trade, which may have led to productivity gains and lower markups. This channel can be captured by the import penetration variable.
- The adoption of product market regulation in the EU (part of the *acquis communautaire*) may have led to more intense competition as well. This effect can be captured by the product market regulation variable.
- Finally, both lower trade barriers and stronger competition could have contributed to lower input prices.

In order to assess the relative importance of these channels, I reestimate equation 3 omitting the three relevant variables ($imppen_{ijt}$, pmr_{it} , P_{ijt}^{INT}) one by one. If these variables capture a relevant explanation of falling prices, then the magnitude and significance of the estimated parameters of EU accession dummies (D_i^{EU}) should change. As a robustness check I also run regressions on sectoral profitability, measured either as the capital share (gross operating surplus per value added) or as the price-cost margin (gross sales/variable costs, where the variable costs include intermediate products and labour costs).

The sectoral effects of monetary policy This paper explores the sectoral heterogeneity of monetary transmission in Hungary, using a structural factor model, where aggregate shocks are identified using sign restrictions. The structural factor model of Forni et al. (2009) is a useful tool for this purpose. It is essentially data-driven, and can generate "stylized facts" without too many theoretic restrictions. It uses a large cross-section of easily available macroeconomic time series; and all impulse responses are estimated jointly.

I associate the industry-level impulse responses of the model with sector-specific characteristics. These sectoral indicators aim to capture the role of various channels of the monetary transmission mechanism.

3 Results of the thesis

The relationship between price and real convergence

- The average half-life across product categories is 7.6 years. The heterogeneity across products is significant. There is no convergence for alcohol and tobacco, possibly due to high and time-varying excise duties. The prices of household furnishings also converge slowly. On the other hand, clothes prices equalize rapidly. Similarly fast convergence is observed in postal and telecommunications services as well as education (although with large uncertainty in the last case). Other services are characterized by more persistent price differences. Food prices also show persistent differences across countries.

- Real convergence has a different effect on prices across product categories. The strongest effect appears for housing, education and health services. The Balassa-Samuelson effect and price controls can play a prominent role in these sectors. Most industrial goods are weakly affected by real convergence, although the coefficients are significantly different from zero (in contrast with the law of one price). The weakest effect appears for post and telecommunications, which might be a result of earlier liberalization in more developed countries.
- I quantify the equilibrium inflation differential based on the estimates. A 1 percentage real convergence can lead to 0.25-0.5 percentage points higher inflation per year.
- I also simulate the relative price change of goods and services. Along the convergence path described above, the difference between the inflation rate of services and traded goods can by approx. 0.3 percentage points higher than in Germany.

The price effects of EU enlargement

- A wide range of industries experienced significant price decreases in the new EU member states in the years before enlargement. Most of the price reduction occurred in 2002, just as most new EU members had completed the adoption of EU law. This suggests that falling prices were not related to the act of EU accession, but to trade integration, most of which had taken place before 2004.

- The price reduction remains significant if import penetration and product market regulation are controlled for. However, if changes of intermediate product prices are also taken into account, the parameters of the EU accession dummies become insignificant. This result suggests that access to cheap inputs played a major role in falling prices. The importance of intermediate product prices remains if its measurement error or the possibility of reverse causality between output and input prices are taken care of.
- Finally, sectoral profitability fell substantially during EU accession. In addition to falling input prices, stronger competition may have also contributed to falling producer prices. Foreign competition was not necessarily posed by old EU members however; competitive pressure from emerging Asian economies (especially China) could have also increased during the time of EU accession.

The sectoral effects of monetary policy

- The estimated model provides a reasonable description of monetary transmission, and the role of aggregate disturbances in the Hungarian economy.
- The results strongly suggest that each sector reacts differently to monetary shocks. The output response of industry, construction and trade are particularly strong.
- Within manufacturing, subsectors producing durable goods respond more to a monetary expansion. This suggests that the interest sensitivity of demand can differ across sectors.

- Furthermore, industries with a stronger reliance on external financing also benefit more from a monetary expansion.
- Prices increase less in sectors using more credit and with stronger balance sheets, thanks to their falling borrowing costs. This "cost channel" works against other transmission channels of monetary policy because it reduces prices after a monetary expansion (making it a plausible explanation for the "price puzzle" of monetary VARs).
- Finally, the response of sectoral output and prices is negatively correlated, which hints at different degrees of price rigidity across industries.

4 Publications in the topic of the thesis by the candidate

- A monetáris politika hatása a magyar gazdaságra: elemzés strukturális, dinamikus faktormodellel. *Közgazdasági Szemle*, 59 (3), 263-284 (2012. március).
- The Sectoral Impact of Monetary Policy in Hungary: A Structural Factor Analysis. *MNB Working Papers*, 2012/1, Magyar Nemzeti Bank.
- Price Effects of the Internal Market, Magyar Közgazdaságtudományi Egyesület konferencia, Budapest, 2008. december 18-19.
(<http://www.mktudegy.hu/files/PellenyiG.pdf>)
- The Relationship between Relative Productivity and Price Levels in Europe, *ICEG EC Working Papers* No. 36 (December 2007), ICEG European Center.
(<http://www.icegec.hu/download/publications/wp36.pdf>)
- A reappraisal of the relationship between relative productivity and price levels, Oxford Business and Economics Conference (OBEC), St. Hugh's College, Oxford, UK, June 24-26, 2007.
(http://www.gcbe.us/2007_OBEC/data/Gabor%20Pellenyi.doc)

References

- ÁLVAREZ, R. and R. A. LÓPEZ (2008), “Trade Liberalization and Industry Dynamics: A Difference in Difference Approach”, *Working Paper 470*, Central Bank of Chile.
- AMITI, M. and J. KONINGS (2007), “Trade Liberalization, Intermediate Inputs and Productivity”, *American Economic Review*, vol. 97, no. 5, pp. 1611–1638.
- BACKÉ, P., J. FIDRMUC, T. REININGER and F. SCHARDAX (2003), “Price Dynamics in Central and Eastern European EU Accession Countries”, *Emerging Markets Finance and Trade*, vol. 39, no. 3, pp. 42–78.
- BAIER, S. L., J. H. BERGSTRAND, P. EGGER and P. A. MACLAUGHLIN (2008), “Do Economic Integration Agreements Actually Work? Issues in Understanding the Causes and Consequences of the Growth of Regionalism”, *The World Economy*, vol. 31, no. 4, pp. 461–497.
- BARTH, M. J. and V. A. RAMEY (2001), “The Cost Channel of Monetary Transmission”, in: B. S. Bernanke and K. Rogoff (eds.), *NBER Macroeconomics Annual 2001*, pp. 199–239, MIT Press, Cambridge, MA.
- BASKER, E. (2005), “Selling A Cheaper Mousetrap: Wal-Mart’s Effect on Retail Prices”, *Journal of Urban Economics*, vol. 58, no. 2, pp. 203–229.
- BERGSTRAND, J. H. (1991), “Structural Determinants of Real Exchange Rates and National Price Levels: Some Empirical Evidence”, *American Economic Review*, vol. 81, no. 1, pp. 325–334.

- BERNANKE, B. S., M. GERTLER and S. GILCHRIST (1996), “The Financial Accelerator and the Flight to Quality”, *Review of Economics and Statistics*, vol. 78, no. 1, pp. 1–15.
- BOTTASSO, A. and A. SEMBENELLI (2001), “Market Power, Productivity and the EU Single Market Program: Evidence from a Panel of Italian Firms”, *European Economic Review*, vol. 45, no. 1, pp. 167–186.
- BOUAKEZ, H., E. CARDIA and F. J. RUGE-MURCIA (2009), “The Transmission of Monetary Policy in a Multisector Economy”, *International Economic Review*, vol. 50, no. 4, pp. 1243–1266.
- BOYLAUD, O. and G. NICOLETTI (2001), “Regulation, Market Structure and Performance in Telecommunications”, *OECD Economic Studies 32*, Organization for Economic Cooperation and Development.
- BUGAMELLI, M., S. FABIANI and E. SETTE (2010), “The Pro-Competitive Effect of Imports from China: An Analysis of Firm-Level Price Data”, *Working Paper 737*, Banca d’Italia.
- CAVES, R. E. (1992), *Industrial Efficiency in Six Nations*, MIT Press, Cambridge, MA - London.
- CHEN, N., J. IMBS and A. SCOTT (2009), “The Dynamics of Trade and Competition”, *Journal of International Economics*, vol. 77, no. 1, pp. 50–62.
- CINCIBUCH, M. and J. PODPIERA (2006), “Beyond Balassa-Samuelson: Real Appreciation in Tradables in Transition Countries”, *Economics of Transition*, vol. 14, no. 3, pp. 547–573.

- DEDOLA, L. and F. LIPPI (2005), “The Monetary Transmission Mechanism: Evidence from the Industries of Five OECD Countries”, *European Economic Review*, vol. 49, no. 6, pp. 1543–1569.
- DREGER, C., K. KHOLODILIN, K. LOMMATZSCH, J. SLACALEK and P. WOZNIAK (2007), “Price Convergence in the Enlarged Internal Market”, *Eastern European Economics*, vol. 46, no. 5, pp. 57–68.
- ECB (2001), *Price Effects of Regulatory Reform in Selected Network Industries*, European Central Bank.
- ÉGERT, B., L. HALPERN and R. MACDONALD (2006), “Equilibrium Exchange Rates in Transition Economies: Taking Stock of the Issues”, *Journal of Economic Surveys*, vol. 20, no. 2, pp. 257–324.
- FARRELL, J. and P. KLEMPERER (2007), “Coordination and Lock-In: Competition with Switching Costs and Network Effects”, in: M. Armstrong and R. H. Porter (eds.), *Handbook of Industrial Organization*, vol. 3, pp. 1967–2072, North-Holland.
- FILER, R. K. and J. HANOUSEK (2002), “Survey-Based Estimates of Biases in Consumer Price Indices during Transition: Evidence from Romania”, *Journal of Comparative Economics*, vol. 30, no. 3, pp. 476–487.
- FILER, R. K. and J. HANOUSEK (2003), “Inflationary Bias in Middle to Late Transition Czech Republic”, *Economic Systems*, vol. 27, no. 4, pp. 367–376.

- FORNI, M., D. GIANNONE, M. LIPPI and L. REICHLIN (2009), “Opening the Black Box: Structural Factor Models with Large Cross Sections”, *Econometric Theory*, vol. 25, no. 5, pp. 1319–1347.
- GAJOTTI, E. and A. SECCHI (2006), “Is There a Cost Channel of Monetary Policy Transmission? An Investigation into the Pricing Behavior of 2,000 Firms”, *Journal of Money, Credit and Banking*, vol. 38, no. 8, pp. 2013–2037.
- GANLEY, J. and C. SALMON (1997), “The Industrial Impact of Monetary Policy Shocks: Some Stylised Facts”, *Bank of England Working Paper 68*, Bank of England.
- GARCÍA-SOLANES, J., F. I. SANCHO-PORTERO and F. TORREJÓN-FLORES (2007), “Beyond the Balassa-Samuelson Effect in Some New Member States of the European Union”, *Working Paper 1886*, CESifo.
- HAYO, B. and B. UHLENBROCK (1999), “Industry Effects of Monetary Policy in Germany”, *Working Paper B99-14*, Center for European Integration Studies (ZEI).
- HOLMES, T. J. (1989), “The Effects of Third-Degree Price Discrimination in Oligopoly”, *American Economic Review*, vol. 79, no. 1, pp. 244–250.
- MACDONALD, R. and C. WÓJCIK (2004), “Catching Up: The Role of Demand, Supply and Regulated Price Effects on the Real Exchange Rates of Four Accession Countries”, *Economics of Transition*, vol. 12, no. 1, pp. 153–179.

- MARINOV, R. (2010), “Competitive Pressure in Transition: A Role for Trade and Competition Policies?”, *Journal of Industry, Competition and Trade*, vol. 10, no. 1, pp. 1–31.
- NAHUIS, R. (2004), “One Size Fits All? Accession to the Internal Market: An Industry-Level Assessment of EU Enlargement”, *Journal of Policy Modeling*, vol. 26, no. 5, pp. 571–586.
- NEVEN, D. and L. PHILIPS (1985), “Discriminating Oligopolists and Common Markets”, *Journal of Industrial Economics*, vol. 34, no. 2, pp. 133–149.
- NICKELL, S. J. (1996), “Competition and Corporate Performance”, *Journal of Political Economy*, vol. 104, no. 4, pp. 724–746.
- PAVCNIK, N. (2004), “Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants”, *Review of Economic Studies*, vol. 69, no. 1, pp. 245–276.
- PEERSMAN, G. and F. SMETS (2005), “The Industry Effects of Monetary Policy in the Euro Area”, *The Economic Journal*, vol. 115, no. 503, pp. 319–342.
- PELLÉNYI, G. (2012a), “A monetáris politika a magyar gazdaságra: elemzés strukturális, dinamikus faktormodellel”, *Közgazdasági Szemle*, vol. 59, no. 3, pp. 263–284.
- PELLÉNYI, G. (2012b), “The Sectoral Effects of Monetary Policy in Hungary: A Structural Factor Analysis”, *MNB Working Papers 2012/1*, Magyar Nemzeti Bank (The Central Bank of Hungary).

ROMALIS, J. (2007), “NAFTA’s and CUSFTA’s Impact on International Trade”, *Review of Economics and Statistics*, vol. 89, no. 3, pp. 416–435.

