

Price Convergence in the New EU Member States – Selected Aspects and Implications

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Outline of presentation

1. Introduction
2. Convergence process and its impact on price level
3. Determinants of price convergence and empirical results
4. Some implications and aspects for the future
5. Conclusions



Main challenges for the new EU Member States

The new EU Member States and euro adoption – possible caveats:

- Convergence of prices (\Rightarrow importance of Harrod-Balassa-Samuelson effect on annual inflation, influence of administered prices, taxation, etc.);
- Convergence of other nominal values (wages, pensions, etc.);
- Exchange rate fluctuations (ERM II parity);
- „Impossible Trinity“ (ER, convergence of prices and capital flows);

Focus on the new EU Member States without Cyprus, Malta and Slovenia.



Key terms

ECP (European Comparison Programme) – part of the world programme (ICP), based on ESA 1995 (SNA 1993) methodology. (Last round of ECP in 2005. Results have not been published yet.)

PPS (Purchasing Power Standard) – is a currency conversion rate that equalises the level of prices in a country with the level of prices in another benchmark country. prices that are compared and PPS that results from the comparison may refer to individual products or to groups of goods, broader aggregates or total GDP (see Eurostat).

CPL (Comparative Price Level) – is defined as the ratio of PPS for given level of GDP to exchange rate.

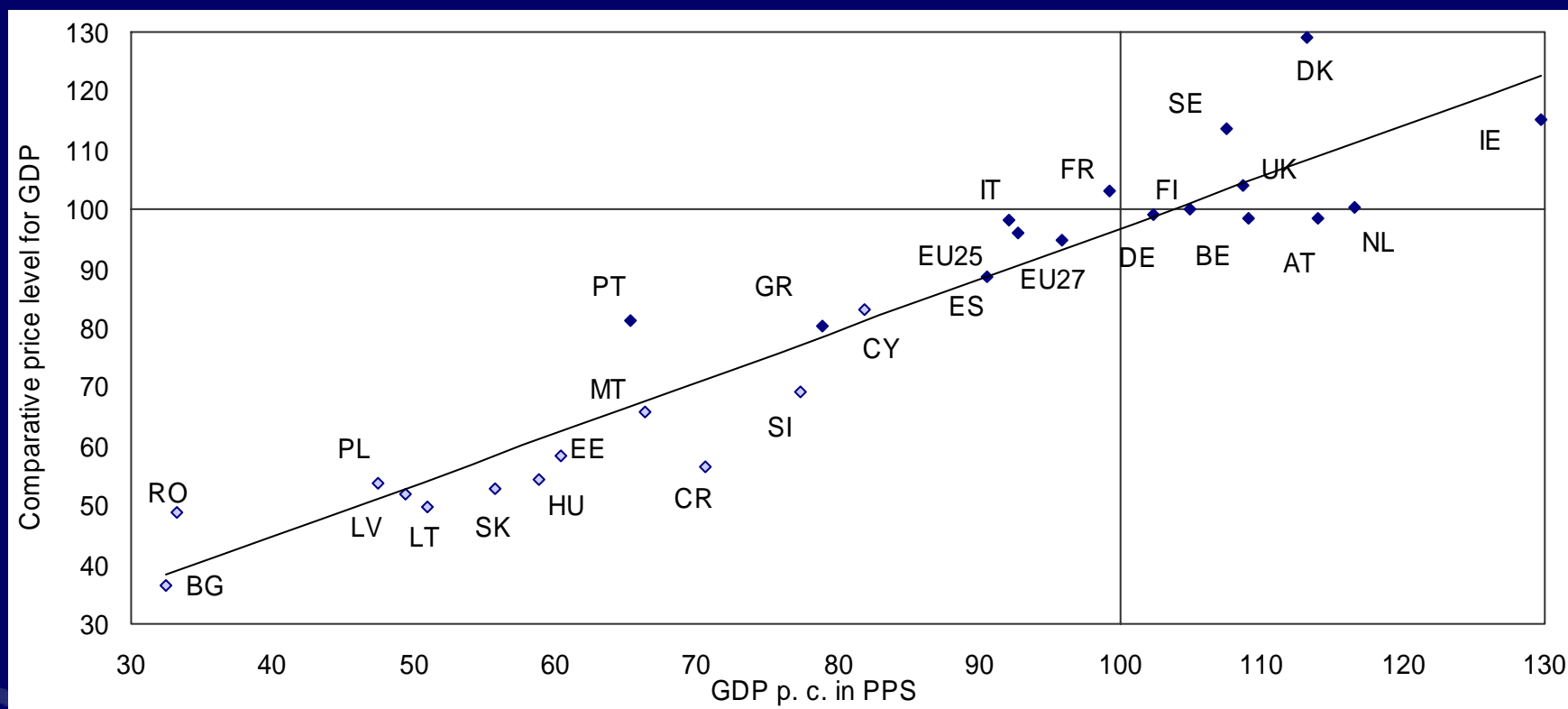
PPP (Purchasing power parities) are the rates of currency conversion that eliminate the differences in price levels between countries. Per capita volume indices based on PPP converted data reflect only differences in the volume of goods and services produced. Comparative price levels are defined as the ratios of PPPs to exchange rates. They provide measures of the differences in price levels between countries. The PPPs are given in national currency units per US dollar. The price levels and volume indices derived using these PPPs have been rebased on the OECD average (see OECD).

2. Nominal convergence

1. Price convergence (narrow, e.g. see López-Salido, Quirós, 2006[1]);
2. Convergence of all nominal values (broad, e.g. see Vintrova, 2002[2]);
3. Maastricht convergence criteria (the most common view, see EC, 2006[3], CNB, 2006[4], Schadler et al., 2005[5], Dobrinsky 2006[6], Vávra, 1999[7]).

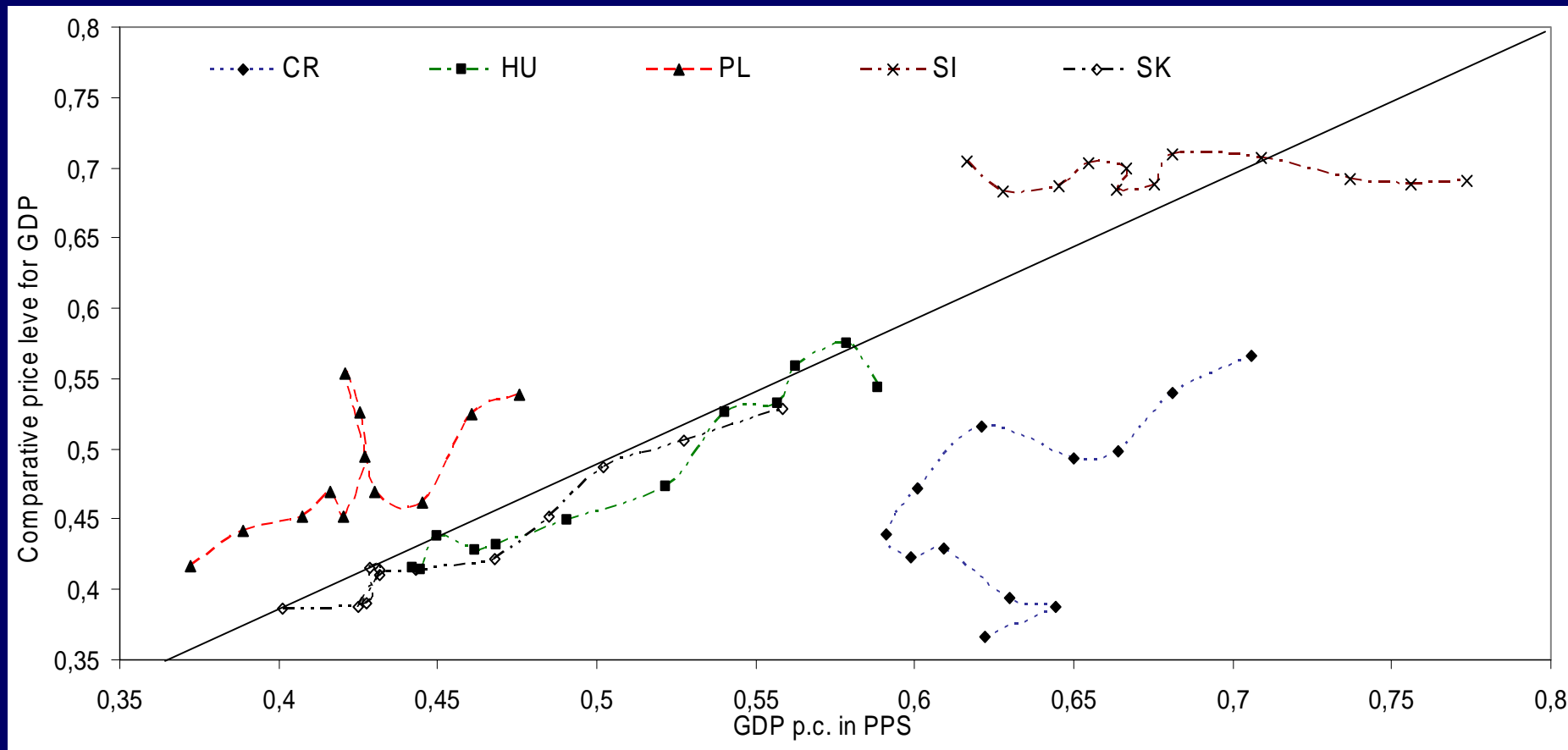
- [1] López-Salido, J. D., Quirós, G. P.: Comparative analysis: real convergence, cyclical synchrony and inflation differentials. In: The analysis of the Spanish economy: data, instruments and procedures. Bank of Spain, 2006;
- [2] Social and Economic Consequences of the Czech Republic's Integration into the European Union, Prague, 2002;
- [3] Enlargements, Two Years After: An Economic Evaluation. Occasional Paper No. 24, May 2006. EC, 2006;
- [4] Convergence report, October 2006;
- [5] Adopting the Euro in Central Europe. Challenges of the Next Step in European Integration. IMF Occasional Paper, No. 234, 2005;
- [6] Nominal versus Real Convergence: The Balancing Act for New EU Entrants, March 2006;
- [7] Nominal versus real convergence in a CEE transition country: Do the Maastricht criteria make sense for the Czech republic? Prague: CERGE-EI, 1999, (Discussion Paper Series, No. 16).

2. Nominal convergence – Comparative Price Level for GDP vs. GDP in PPS, 2006 (EU-15 = 100)



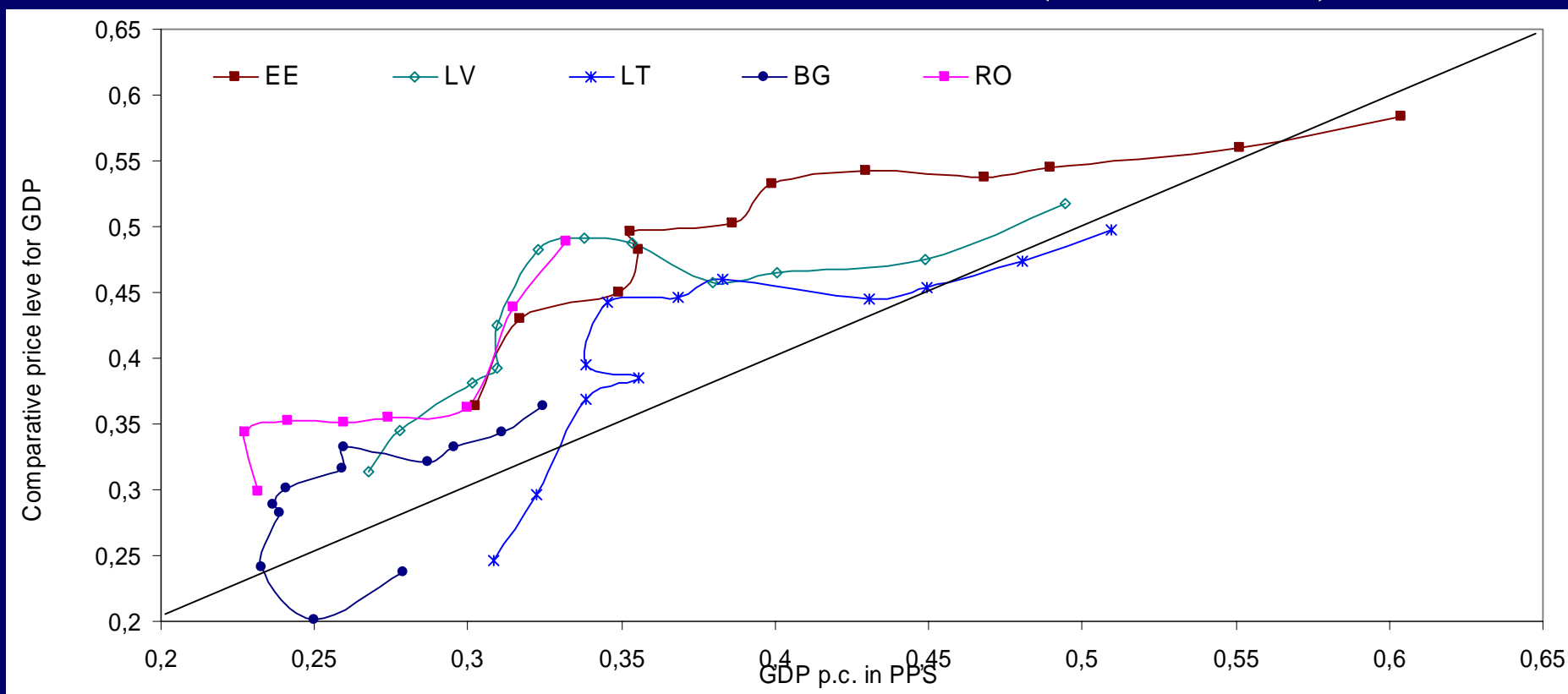
Notes: Luxemburg omitted. Source: Eurostat (2007), own calculations.

2. Nominal convergence (transition dynamics) – changes of Comparative Price Level for GDP and GDP in PPS, selected countries EU-27, 1995–2006 (EU-15 = 1)



Source: Eurostat (2007), own calculations.

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Source: Eurostat (2007), own calculations.

2. Nominal convergence – Comparative Price Level for GDP vs. GDP in PPS (EU-26 countries, 2002)

Dependent variable (CPL)	1	2	3	4
Constant	10,764** (3,900)	19,796** (9,060)	10,894** (4,811)	20,356** (10,082)
Real GDP	0,876*** (0,047)	0,790*** (0,091)	0,874*** (0,056)	0,784*** (0,102)
Dummy	–	-6,217 (5,634)	–	-6,316 (5,920)
Adj. R²	93,5	90,1	91,7	88,1
F-test	345,75	175,05	243,34	123,01
DW	1,82	1,78	1,85	1,88
N	26	26	24	24

Note: *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. S.E. in parentheses. Dummy = 0, 1. Luxemburg omitted. Source: OECD (2005), own calculations

3. Price level determinants – review

Influences on price level in economy can be listed (see Skořepa, 2001; Čihák, Holub, 2003; Dobrinsky, 2003; Égert, 2003, 2006):

- Devaluation of domestic currency at the onset of the transformation process;
- Existence of monopolist competition on markets with tradable goods (sophisticated products with emphasis on their quality rather than price);
- Prices of food have not been influenced by the EU agricultural policy (CAP) – (minimum prices, volume regulation, *etc.*) but instead may have been influenced by a strong pressure of retail chains over the last few years;
- Price relations and their distortion from the previous regime;
- Impact of direct and indirect taxes;
- Speed and cost of arbitration, *i.e.* not a temporary price difference (relate to obstacles to arbitration between countries);
- Share of a sector producing non-tradable goods and services;
- Statistical illusion (associated with international comparisons where completely identical items may not exist in the compared countries, in particular clothing or foodstuff can be used as a good example of this phenomenon).
- Lower quality of products would lead to compensatory pressure on export prices depending on demand elasticity.

In search for explanatory variables:

A large number of studies have pointed out these variables (Kravis, Heston, Summers, 1982; Kravis, Lipsey, 1982; Clague, 1986; Kleinman 1993; Čihák, Holub, 2003; Nestić, 2005):

- Real GDP;
- Labour productivity;
- Tax burden;
- Government expenditure;
- Openness of the economy;
- Exchange rate;
- Population size;

Problems with empirical analysis:

- availability of dataset for the new EU Member States (ECP rounds, between them only approximations, methodological changes over time);
- comparability of data;

3. Empirical part – in search for explanation (EU-26, 2002)

Dependent variable (CPL)	1	2	3	4	5
Constant	-2,138 (5,087)	6,785 (8,473)	4,099 (9,439)	12,201 (10,537)	8,355 (7,401)
GDP	0,755*** (0,054)	0,671*** (0,084)	0,855*** (0,055)	0,707*** (0,109)	–
Tax burden	0,883* (0,267)	0,881 (0,263)	–	–	–
Government expenditure	–	–	0,441 (0,571)	0,808 (0,602)	–
Labour productivity	–	–	–	–	0,895*** (0,090)
Dummy	–	-6,123 (4,689)	–	-9,368 (6,024)	–
Adj. R ²	91,8	88,2	89,9	86,8	81,0
F-test	250,11	172,42	170,40	121,39	98,14
DW	1,98	2,00	1,96	1,86	1,82

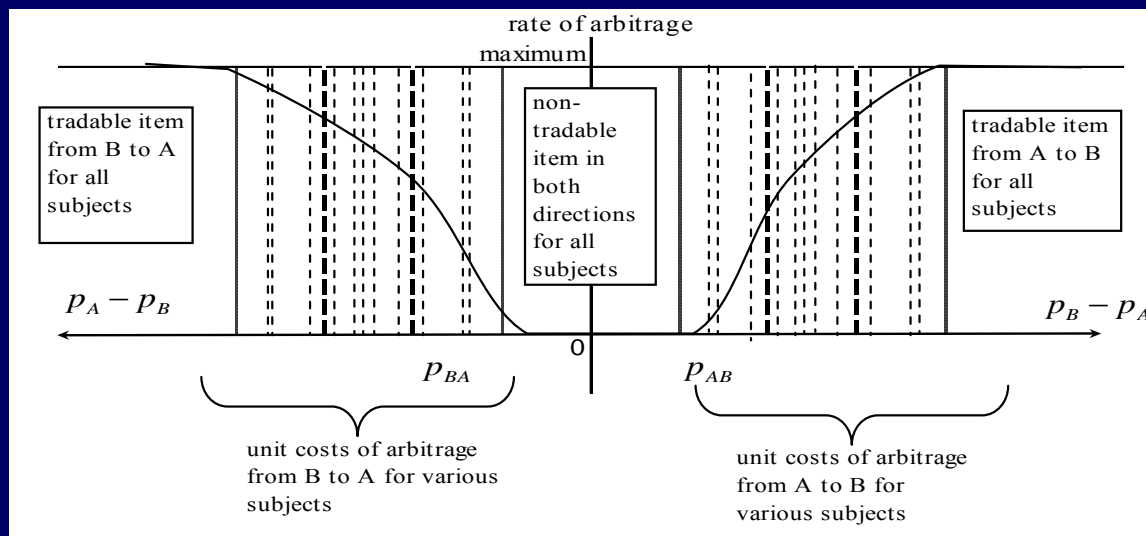
Note: *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level.
 Dummy = 0, 1. Luxemburg omitted. Source: OECD (2005); EUROSTAT (2007); EUROSTAT (2007a); EUROSTAT (2007b); own calculations

4. Implications and problems

Selected problems with empirical analysis:

- Issue of tradability;
- Tradable and non-tradable goods (Harrod-Balassa-Samuelson effect);
- Price convergence (aggregated vs. disaggregated view);
- Tax burden (prices with and without tax);
- Changes of regulated (administered) prices

4. Implications and problems



Source: Skořepa (2001), own adaptation.

If the price of a commodity ranges within, arbitration is excluded (excessively high costs).^[1] Arbitration in the case of prices falling within the highlighted interval is viable for entities depending on their situation (i.e. selective arbitration). What's more, the arbitration process as such reduces the price difference for the relevant commodity and thus practically eliminates the potential opportunity for carrying out arbitration. This shows that determining an exact borderline between tradable and non-tradable items is virtually impossible.

^[1] Taylor and Taylor (2004) in this context mention the "iceberg effect" because certain commodities cease to be effectively tradable because they are transported and transaction costs are typically proportionate to the distance of transport in addition to the fixed costs of the transporting entity. Delays of deliveries between¹⁴ individual locations may represent yet another issue.

4. Implications ... – tradable vs. non-tradable (BS effect)



	open sector (tradable goods)	closed sector (non-tradable goods)
Coricelli, Jazbec (2001)	Industry + Construction	Rest, Agriculture excluded
De Broeck, Slot (2001)	Industry + Construction	Rest, Agriculture excluded
Égert et al. (2002)	Industry + Agriculture	Rest
Fischer (2002)	Industry + Agriculture	Rest
Halpern, Wyplosz (2001)	Manufacturing/Industry	Services, Agric. and constr. excluded
Lommatzsch, Tober (2002a)	Industry	Construction, trade, finance
Randveer, Rell (2002)	Agriculture, Manufacturing, Hotels, Transport	Rest (mining)
Rother (2000), Roseti (2002)	Manufacturing	Rest, Agriculture excluded
Sinn-Reutter (2001), Lojschová (2003)	Manufacturing + Agriculture	Construction, Energy, Services
Backé et al. (2002, 2003)	Manufacturing	Rest
Dobrinsky (2001)	Whole economy	
Égert (2001, 2002a,b,c, 2003)	Industry	Rest
Golinelli-Orsi (2001, 2002)	Industry	Rest
Kovács (2001), Simon, Kovács (1998)	Manufacturing	Services, Agric. and Pub. ser. are excl.
Mihaljek (2002), Mihaljek, Klau (2004)	Mining, Manufact., Hotels, Transport, Storage, Telecom	Rest, agriculture excluded
Nenovsky, Dimitrova (2002), Wagner et al. (2004)	Industry + Construction	All services, Agriculture excluded

Note: Industrial Classification of Economic Activities: A = agriculture, hunting, forestry, B = fishing, C = mining and quarrying, D = manufacturing, E = electricity, gas and water supply, F = construction, G = wholesale and retail trade, H = hotels and restaurants, I = transport, storage, telecommunication, J = financial intermediation, K = real estate, renting and business activities, L = public administration and defence, compulsory social security, M = education, N = health and social work, O = other community, social and personal services activities.

4. Implications ... – tradable vs. non-tradable: empirical examples (ECP 2002, EU-15 = 100)

	PT	GR	ES	IR		CZ	HU	PL	SK	SI
<i>Bread and cereals</i>	86	82	98	103		41	47	50	37	89
<i>Oils and fats</i>	65	69	84	124		86	86	93	78	132
<i>Clothing incl. repairs</i>	79	109	110	83		77	67	76	60	84
<i>Gross rentals</i>	29	72	78	146		25	23	22	18	52
<i>Maintenance, services for households</i>	47	45	53	129		37	30	36	18	48
<i>Household furnishing incl. repairs</i>	84	84	91	95		103	98	103	79	89
Health	71	58	76	102		36	34	43	31	56
<i>Personal transport equipment</i>	113	89	90	122		99	97	90	85	95
Communication	106	94	91	95		97	98	140	107	70
Recreation and culture	81	84	86	103		59	65	73	48	86
<i>Recreational equipment and repairs</i>	93	92	95	106		89	98	106	84	97
<i>Newspapers, books and stationery</i>	84	93	82	110		42	47	55	37	105
Gross fixed capital formation	72	79	88	103		64	67	64	63	68
Equipment	103	100	88	109		91	83	92	85	87
Construction	56	66	87	101		44	55	43	45	52

4. Implications and problems – structural view

Development of price convergence in the economy can also be examined by employing some measures, for example price variation coefficient.

This coefficient strives to reflect the fact that while the overall price level may be comparable (for example the above comparison against Germany), the structure of relative prices (for example the price of bread compared to the price of a book) may be very different from that in advanced economies.

The calculation is carried out according to a formula defined as a weighted percentage standard deviation in comparable price levels in the relevant economy in relation to the overall price level

$$\varphi = \frac{1}{\omega^C} \cdot \sqrt{\sum_{i=1}^n w_i \cdot (P_i^C - \omega^C)^2},$$

where w_i are weights of commodities, P_i^C is the given average price level and the following condition is satisfied:

$$\omega^C = \sum_{i=1}^n w_i \cdot P_i^C.$$

4. Implications and problems – structural view

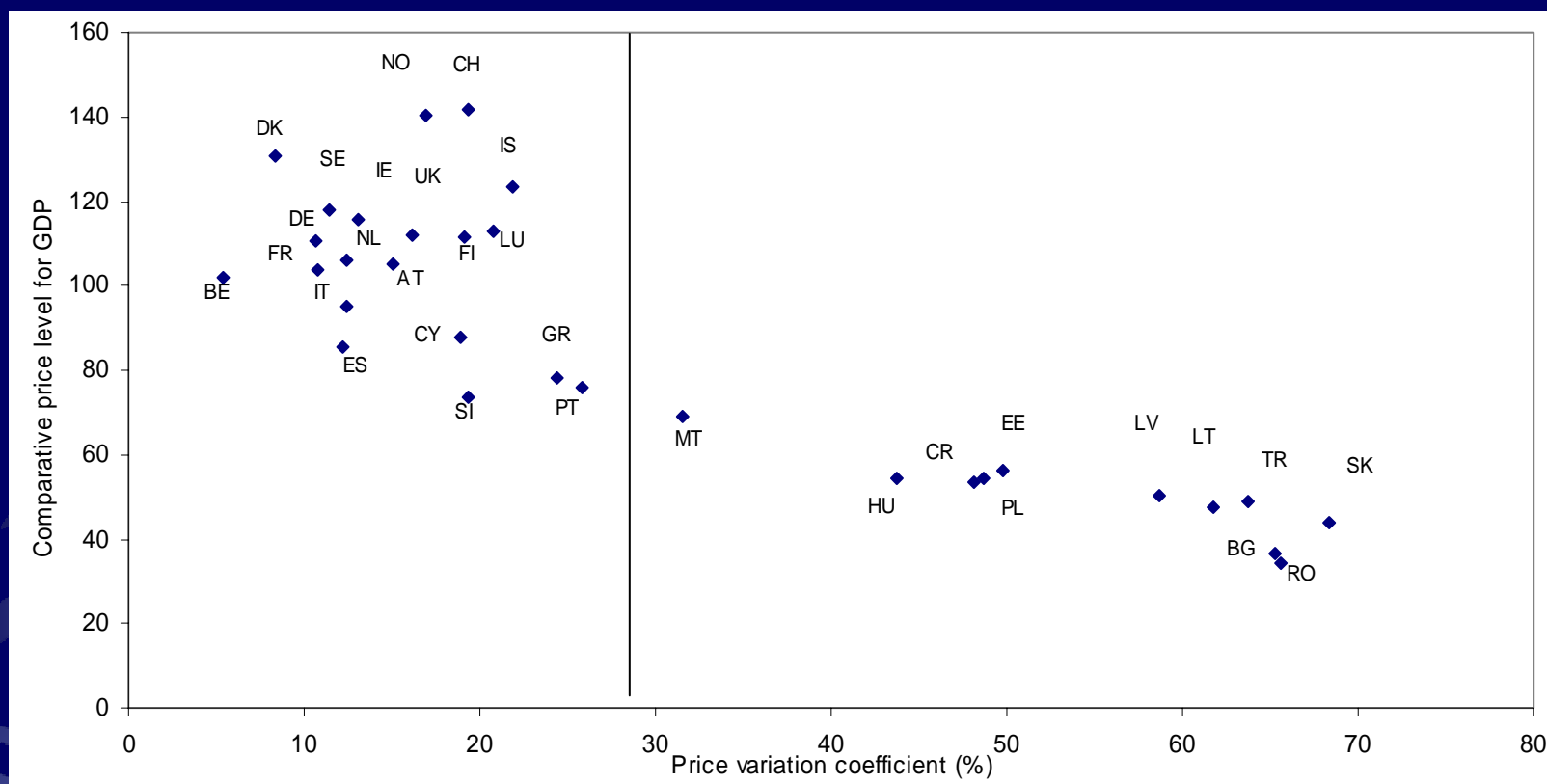
Price variability for the main levels of goods and services, 2002 (EU-15 = 100)

	EU-12	Var.	EU-10	Var.	EU-8	Var.	EU-5	Var.
GDP	97	0,130	57	0,218	52	0,152	54	0,173
Household final cons. exp.	98	0,138	61	0,201	56	0,14	56	0,172
Food and non-alcoh. bev.	99	0,105	69	0,202	64	0,155	63	0,190
Alcoh. bev., tob. and nar.	96	0,302	70	0,277	61	0,098	60	0,124
Clothing and footwear	104	0,108	79	0,092	77	0,083	77	0,094
Hous., water, elect., gas	100	0,270	42	0,308	40	0,287	41	0,324
Housh. furnishing, equip.	97	0,092	70	0,139	65	0,041	65	0,047
Health	96	0,178	53	0,353	46	0,205	48	0,223
Transport	96	0,127	70	0,128	67	0,102	70	0,113
Communication	98	0,107	99	0,278	100	0,25	93	0,220
Recreation and culture	98	0,103	71	0,194	66	0,158	65	0,194
Education	112	0,318	41	0,622	29	0,428	33	0,433
Restaurants and hotels	99	0,146	65	0,287	58	0,202	54	0,237
Govern. final cons. exp.	98	0,200	42	0,451	35	0,352	39	0,340
Gross fixed cap. form.	96	0,129	71	0,058	70	0,058	69	0,029
Equipment	101	0,062	91	0,053	89	0,035	89	0,041
Construction	94	0,218	56	0,132	55	0,141	53	0,100

Note: average of the EU-15 countries = 100. HPISH – non-profit institutions serving households. EU-10 excluding Bulgaria and Romania. EU-8 = EU-10 excluding Cyprus and Malta. EU-5 = CR, HU, PL, SI a SK; var. = coefficient of variance. Source: OECD (2005), own calculations.

4. Implications and problems – structural view

Comparative price level for GDP and coefficients of price variation, 2002 (Germany = 100)



Note: approximate boarder between old and new members of the EU is depicted by the full line.

Source: OECD (2005), own calculations.

5. Conclusions

The real convergence has been successful in the new EU Member States. However, the nominal convergence poses some risks for some countries in the future.

Main determinants of national price level:

- real income;
- labour productivity.

Some open issues:

- nominal and real convergence *versus* Maastricht convergence criteria;
- Harrod-Balassa-Samuelson effect and its influence on inflation and exchange rate in the new EU Member States;
- influence of tradable and non-tradable goods;
- administrative and regulated prices;
- prices of public services;
- speed of nominal convergence and its impacts after abolishing national currency.

Future directions for empirical analysis:

- a) panel data approach;
- b) new variables.

Thank you for your attention

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