

Euro and Prices

The effect of entering in the EMU on
the comparative price level

Przemysław Woźniak

Center for Social and Economic Research



Warsaw, Poland

1. Introduction
2. Price convergence
(methodological issues)
3. Determinants of the price level
4. The CPL model – variables and estimation results
5. Conclusions

1. Introduction

- Purchasing Power Parity (PPP) lies at the center of cross-country comparison of prices levels
- The Law of One Price - guarantees convergence
- In practice many obstacles: trade barriers (formal and informal), transaction costs, transportation costs, different tax systems, consumer preferences....
- These factors distort arbitrage conditions making it possible for firms to segment markets and charge different prices in different markets

1. Introduction (cont.)

- Well documented regularity – prices are higher in wealthier countries
- Key role of domestic factors in cross-country price levels
- The dynamics of this process is best described by the Balassa-Samuleson effect (supply side) and the Linder/Bergstrand effect (demand side)
- Cross-country price level differences can also be caused by a variety of other factors related to competition in markets, macroeconomic and legal conditions.

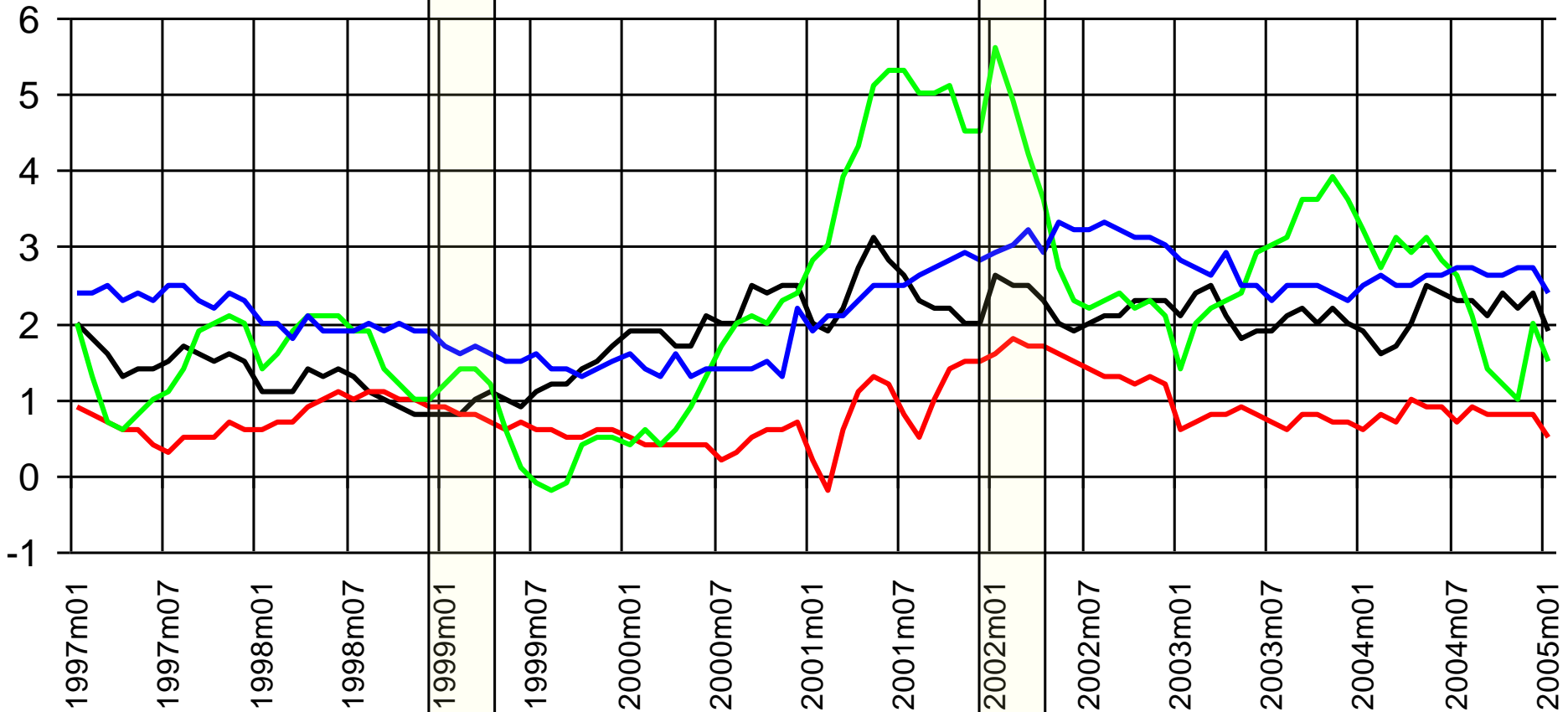
Prices and the Euro

- Effects on inflation (if any) should be temporary and unlikely to be reflected in CPL
- Arguments for the upward shock
 - > mostly psychological; exploiting market inefficiencies
 - > withholding adjustments due to menu costs
- Arguments for the downward shock
 - > no ER risk → higher trade → higher competition
 - > economies of scale
 - > greater price transparency

HICP inflation in the EA (yoy, in %)

Fixing of domestic exchange rates

Introduction of the euro banknotes



— cp00 All-items HICP

— igoodsxe Non-energy industrial goods

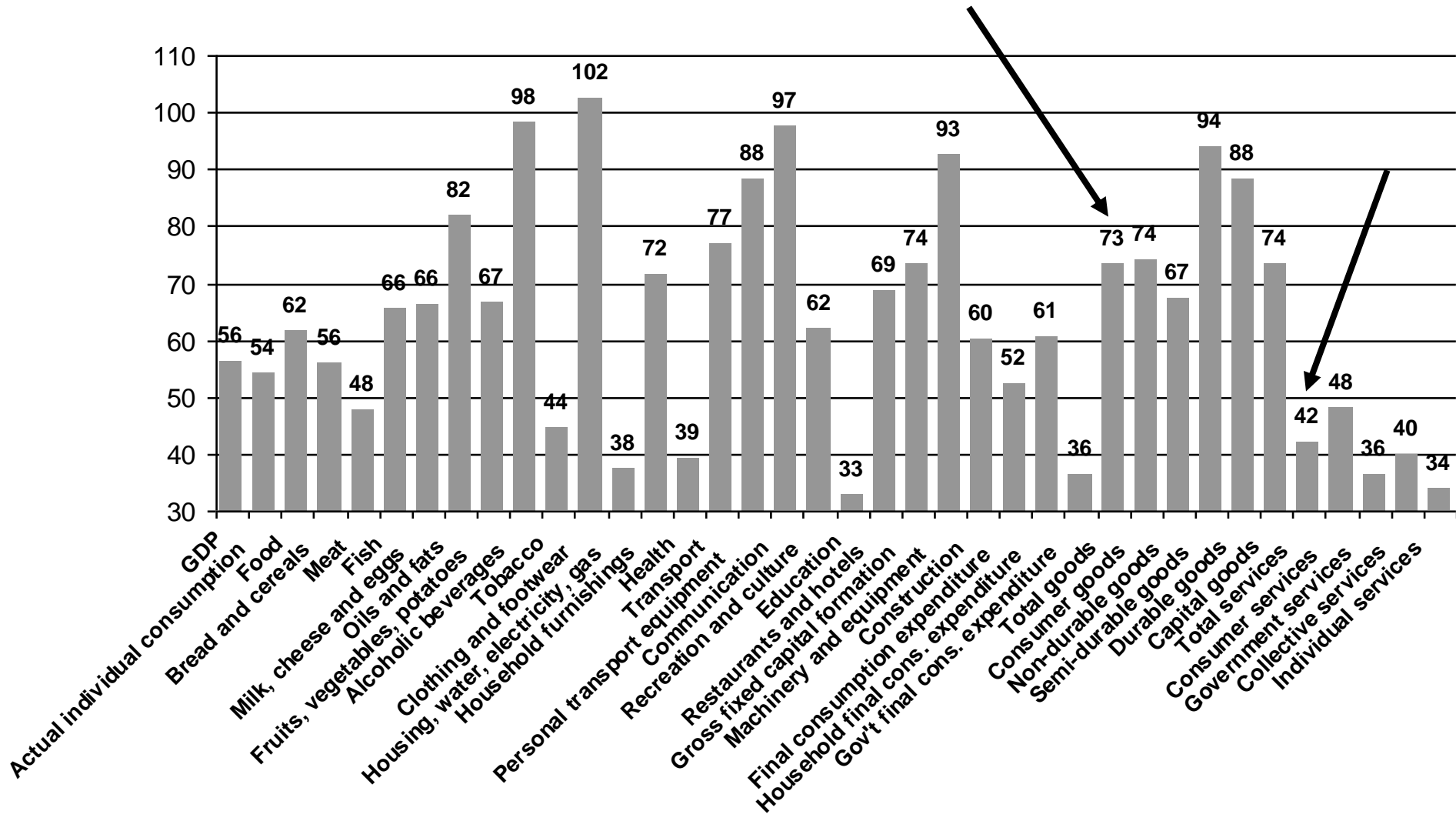
— food Food including alcohol and tobacco

— serv Services (overall index excluding goods)

2. Price convergence

- Convergence has many levels and dimensions:
- Convergence in individual prices – most intuitive but difficult to investigate.
- Convergence in inflation rates - commonly checked but questionable methodologically
- Convergence in CPL aggregates

CPL for Poland in 2006 (EA=100)

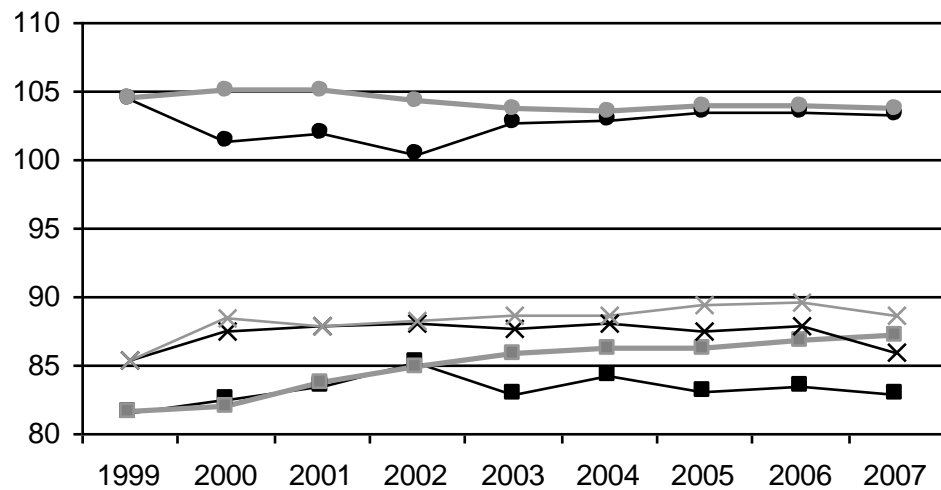
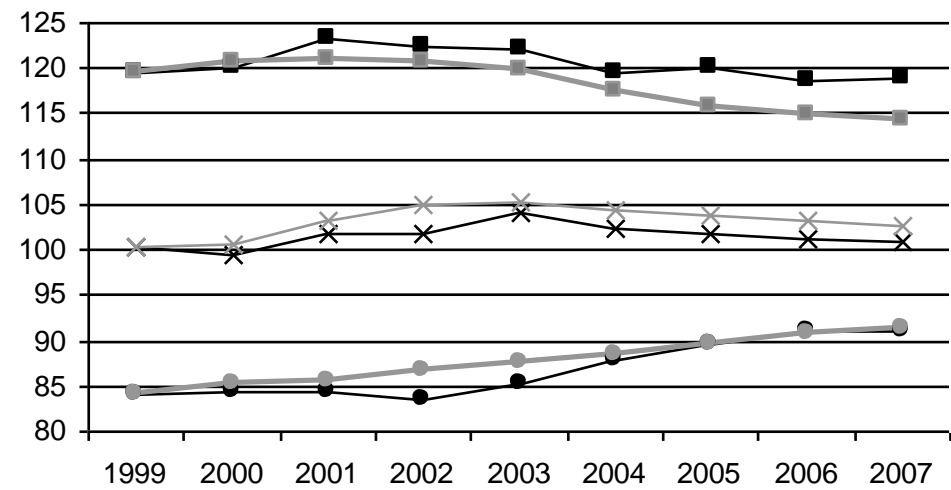
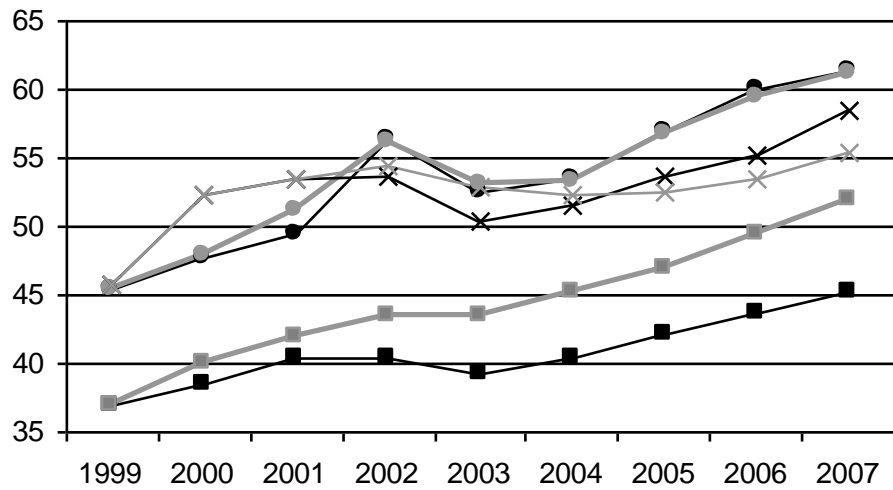
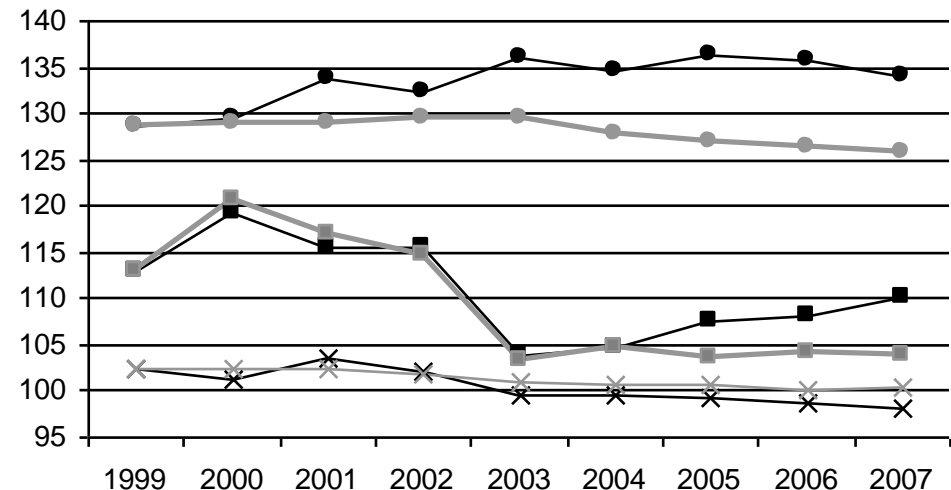


CPL methodology and its consequences

- Relative price levels – no info on absolute levels; important role of nominal ER
- Weighing means that price changes can be neutralized or magnified by shifting weights
- CPL may change even with constant prices – as a result of ER or weights changes

CPL and quality changes

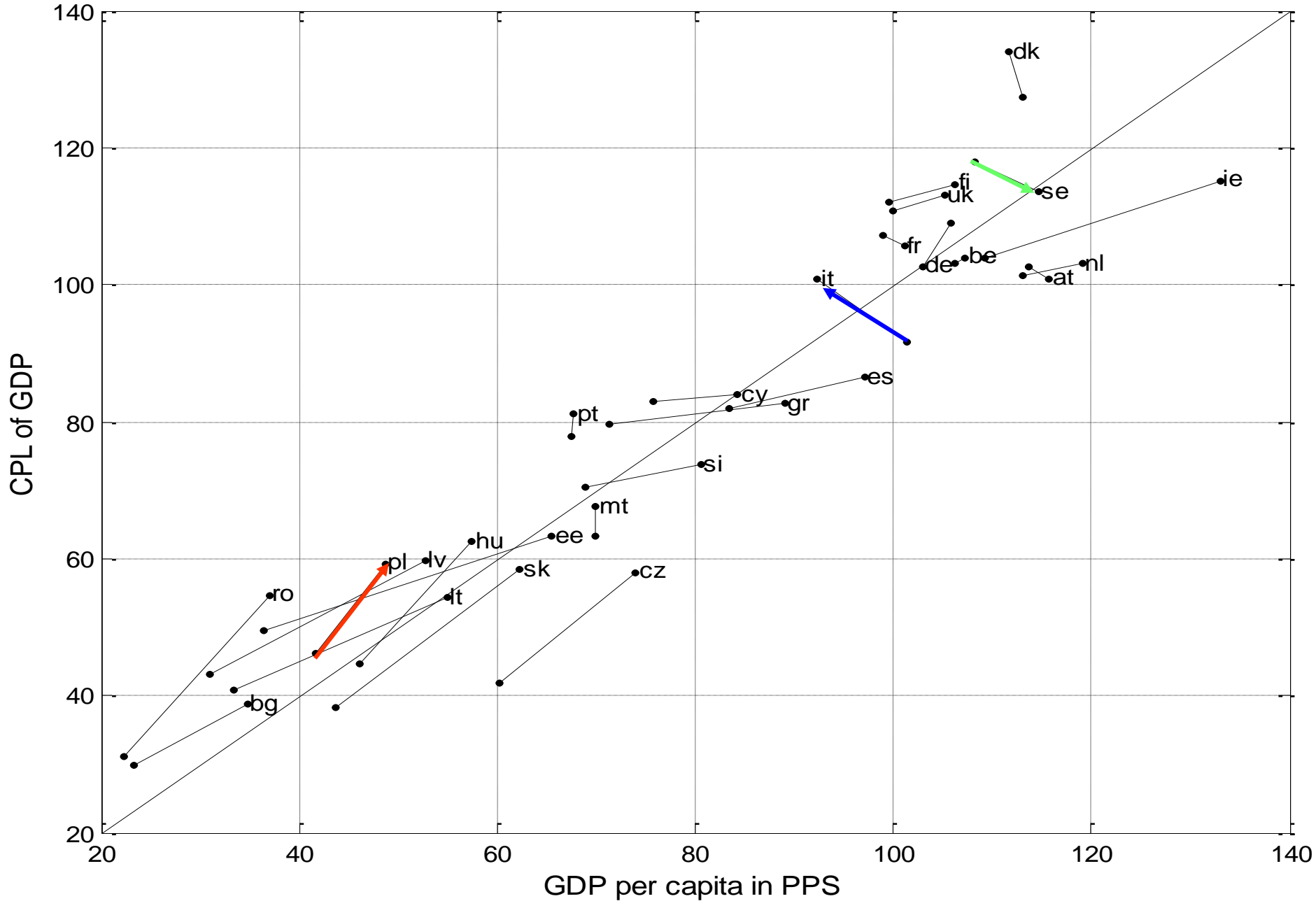
- CPL based on the basket of goods and services chosen to be both representative and comparable
- Implementing those guidelines particularly difficult for generic goods
- Measurement imperfections can lead to rising CPL in line with higher quality of the consumer basket
- Consequence: higher quality of goods → rising CPL → deviation of CPL and inflation – implied convergence

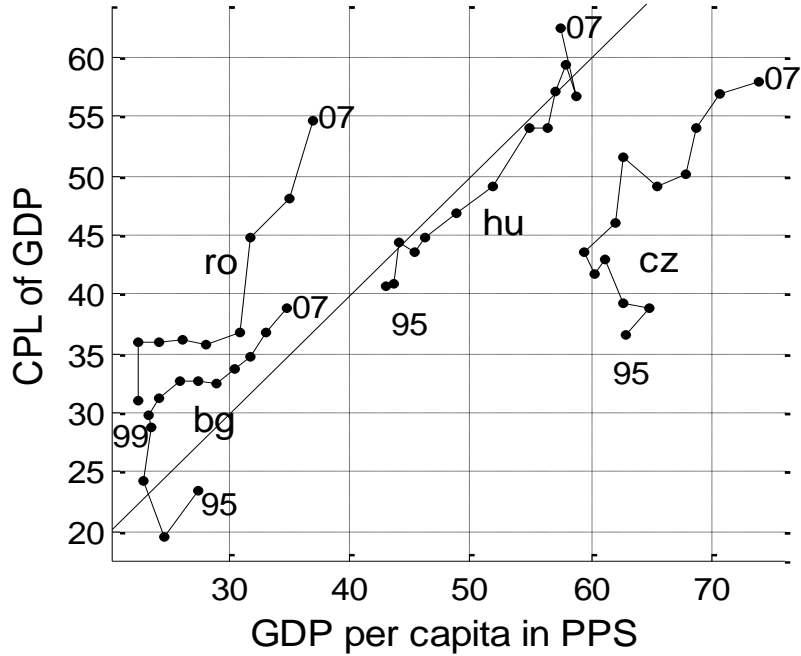


3. Price level determinants

- GDP per capita (wages, productivity)
- The most documented and most significant determinant of cross-country price level differences

GDP-CPL pairs for 1999 & 2007(country code)

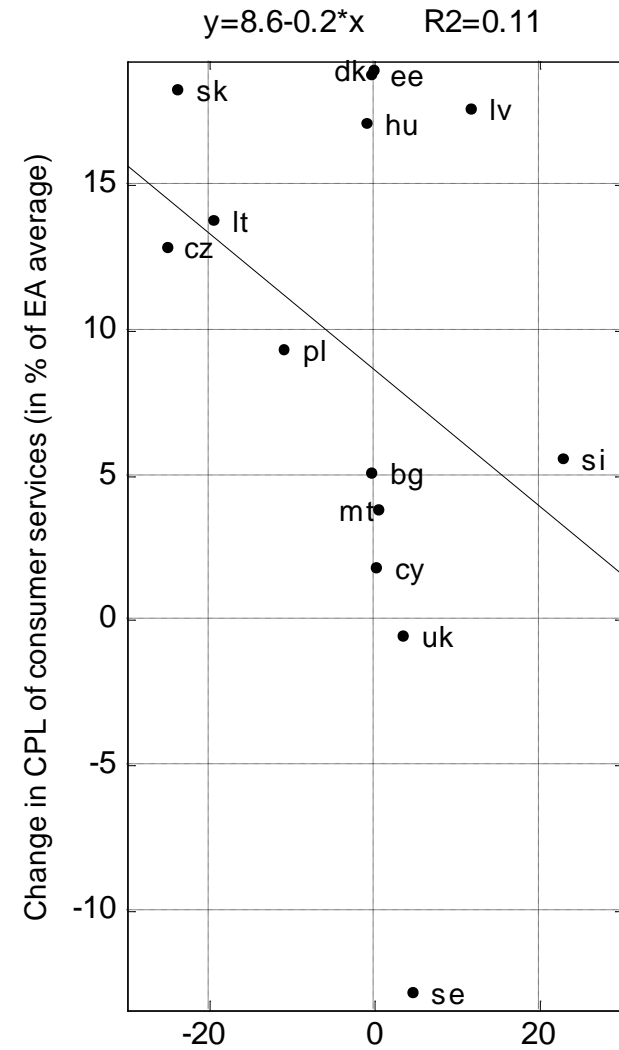
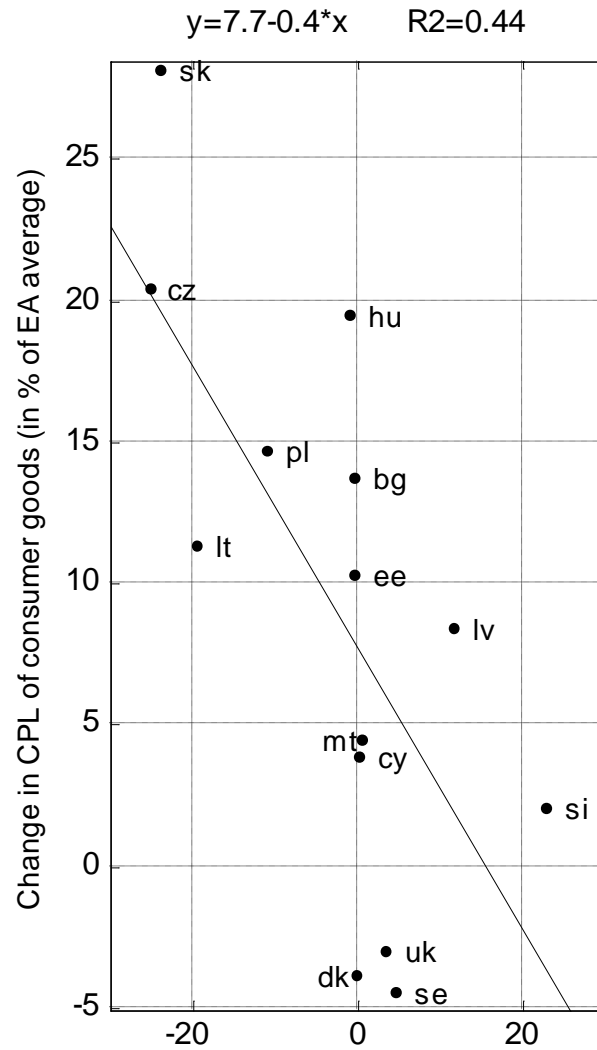
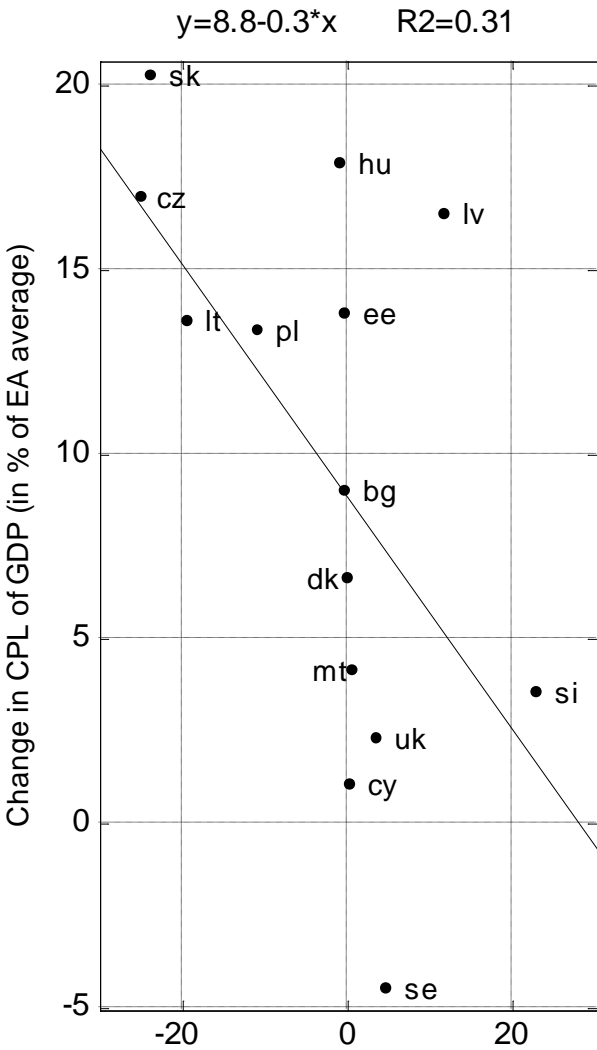




Nominal exchange rate

- CPL calculated as a ratio of nominal prices to ER
- If prices were perfectly flexible – no effect
- In reality exchange rate → price pass-through is not perfect
- Hence - room for the impact of NER movements on prices

Change in NER (x axis) vs. change in CPL (y axis) during 1999 - 2007



Change in the nominal EUR exchange rate change 1999-2007 (in percent)

Other determinants

- Competition (openness for trade)
- Tax levels
- Structure of the economy (size of the controlled sector, size of the economy, etc)
- EURO ?

4. The model

$$CPL_{it} = \beta_1 gdp_{it} + \beta_2 neer_{it} + \beta_3 opn_{it} + \beta_4 tax_{it} + \beta_5 emu_{it} + \lambda_t + \eta_i + \varepsilon_{it}$$

where

- t is a time subscript
- i is a country subscript
- gdp is the GDP per capita in PPS
- $neer$ is nominal effective exchange rate
- opn is the measure of openness to trade
- tax is the indicator of the tax burden
- emu is the EMU participation dummy
- λ_t and η_i are time and country-specific fixed effects, respectively

The effect of EMU on prices

- Simultaneous use of EMU1999 and EMU2007
- EMU1999 to check the effect of the irrevocable fix of domestic currencies
- EMU2002 to check the effect of the introduction of the euro banknotes
- All variables in reference to Switzerland's
- Annual data 1995-2007
- Unbalanced panel (GMM estimation in OX)

Full sample – 26 EU countries

Explanatory Variables	Dependent Variable					
	CPL of GDP		CPL of consumer goods		CPL of consumer services	
	coeff	p-value	coeff	p-value	coeff	p-value
GDP per capita*	0.904	0.00	0.685	0.00	0.864	0.00
Nominal effective exchange rate ^a	0.140	0.00	0.271	0.00	0.175	0.00
Openness to trade* ^b	-0.006	0.67	-0.040	0.09	0.003	0.89
Taxes as % of GDP* ^c	0.032	0.23	0.018	0.06	0.059	0.04
<i>EMU1999 Dummy^d</i>	-1.231	0.03	-1.813	0.07	-1.239	0.20
<i>EMU2002 Dummy^d</i>	0.170	0.70	0.162	0.86	-0.620	0.26
Wald Test (joint)	325.1	0.00	207.7	0.00	162.1	0.00
No. of observations	271		259		244	

- Significant GDP, NEER (all) & openness and taxes in selected equations
- EMU1999 – significant and negative !

EU 17 (OMS, SL, MT and CY)

Explanatory Variables	Dependent Variable											
	CPL of GDP*				CPL of consumer goods*				CPL of consumer services*			
	coeff	p-value	coeff	p-value	coeff	p-value	coeff	p-value	coeff	p-value	coeff	p-value
GDP per capita*	0.853	0.00	0.856	0.00	0.627	0.00	0.657	0.00	0.799	0.00	0.818	0.00
Nominal exchange rate ^a	0.072	0.35	0.068	0.37	0.193	0.03	0.197	0.01	0.264	0.01	0.156	0.18
Openess to trade ^{*b}	-0.009	0.67	-0.011	0.59	-0.042	0.02	-0.046	0.00	0.064	0.08	0.010	0.77
Taxes ^{*c}	0.024	0.52	0.023	0.55	-0.073	0.11	0.057	0.13	0.110	0.01	0.074	0.07
<i>EMU1999 Dummy^d</i>	-0.898	0.07	-0.983	0.07	-2.030	0.02	-1.146	0.14	-0.948	0.37	-1.305	0.18
<i>EMU2002 Dummy^d</i>	0.322	0.48	0.451	0.36	0.089	0.91	0.386	0.55	-0.820	0.41	0.115	0.87
<i>EMU1999 x EU4^e Dummy</i>			0.345	0.65			-2.407	0.01			0.466	0.75
<i>EMU2002 x EU4^e Dummy</i>			-0.530	0.39			-2.023	0.22			-1.782	0.16
Wald Test	104.50	0.00	125.90	0.00	106.10	0.00	149.90	0.00	260.80	0.00	185.80	0.00
No. of observation	181		181		174		174		174		174	

- EU4 (GR, PT, ES, SL)
- Augmented by the EMU*EU4 interaction dummy
- EMU1999 significance disappears in equations with the interaction dummy

EU9 (NMS except SL, MT and CY)

Explanatory Variables	Dependent Variable					
	CPL of GDP		CPL of consumer goods		CPL of consumer Services	
	coefficient	p-value	coefficient	p-value	coefficient	p-value
GDP per capita*	1.108	0.00	1.085	0.04	0.716	0.00
Nominal exchange rate ^a	0.105	0.00	0.195	0.00	0.107	0.00
Openess to trade ^{*b}	-0.018	0.11	-0.050	0.02	-0.053	0.01
Taxes ^{*c}	0.120	0.03	0.231	0.02	0.116	0.00
Wald Test	113.6	0.000	104.9	0.000	184.2	0.000
No. of observation	90		70		70	

- Stronger effect of real convergence, taxes and openness !

Conclusions 1

- Developments in CPL largely follow a standard path – move in line with income, openness and taxes
- No evidence found for the upward euro-related shock
- Clear evidence for the downward shock of fixing the currencies in 1999

Conclusions 2

- Introduction of euro banknotes had no impact on long-term comparative price levels of the emu countries
- Downward shock related to the currency fix in 1999 is significant and suggests positive effects of exchange rate stability.
- This effect occurred in poorer EU countries

Conclusions for Poland

- Prices will continue to be strongly affected by real convergence, openness and taxes
- Entering the EMU is very likely to have a price dampening effect on consumer prices and the price level of the entire GDP.
- However, the joint effect is hard to identify as there will be many other factors at play (real convergence, intensified trade, etc)
- Worries about price shocks – unsubstantiated !