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Abstract

This paper provides a comprehensive review of the factors that can cause price levels to diverge and which are at the root of different inflation rates in Europe including the EU-27. Among others, we study the structural and cyclical factors influencing market and non-market-based service, house and goods prices, and we summarise some stylised facts emerging from descriptive statistics. Subsequently, we set out the possible mismatches between price level convergence and inflation rates. Having described in detail the underlying economic factors, we proceed to demonstrate the relative importance of these factors on observed inflation rates first in an accounting framework and then by relying on panel estimations. Our estimation results provide the obituary notice for the Balassa-Samuelson effect. Nevertheless, we show that other factors related to economic convergence may push up inflation rates in transition economies. Cyclical effects and regulated prices are found to be important drivers of inflation rates in an enlarged Europe. House prices matter to some extent in the euro area, whereas the exchange rate plays a prominent (but declining) role in transition economies.

Keywords: price level, inflation, Balassa-Samuelson, tradables, house prices, regulated prices, Europe, transition

JEL: E43, E50, E52, C22, G21, O52

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1. Introduction

In a monetary union, the level of price dispersion and if it is high, whether it tends to decrease (see e.g. Rogers, 2001, 2002 and Engel and Rogers, 2004), is of great importance. In this context, the question of what the structural and cyclical factors behind different inflation rates are arises. Lane and Honohen (2004) showed recently that besides non-euro area openness and the output gap, price level convergence did effect the inflation differential for the euro area from 1999 to 2001.[1] Rogers (2001, 2002) points out using the EIU CityData that factors related to price level convergence play no role in inflation differentials, while factors such as GDP growth, non-euro-area openness and oil prices are important determinants of inflation differentials.

The driving forces of price level convergence and the causes of inflation differentials in the new EU member states of Central and Eastern Europe recently attracted much attention both in academic and policy circles. The reason for this is that these countries are obliged to adopt the euro at some point in the future. Hence, the question arises whether the lower initial price levels and the ongoing catching-up process will lead to substantially higher inflation rates in the longer run by increasing inflation dispersion within the euro area.

While different aspects of price level convergence and inflation differentials have already been studied for the transition economies of Central and Eastern Europe, no study to our knowledge has tried thus far to summarise comprehensively all the relevant aspects relating to both price level convergence and inflation differentials.[2] With this as a background, this study has a twofold objective. First, we discuss the possible causes of different price levels and inflation differentials between the old and the new EU member states (and acceding and candidate countries), and provide ample empirical data to underpin the functioning of each factor. We also outline possible mismatches between price level convergence and inflation rates. Second, we use a simple accounting framework and panel estimates to disentangle the relative importance of the different factors on observed inflation rates in Europe.

The remainder of this study is structured as follows. Section 2 provides some stylised facts about price levels and inflation rates in Europe. Sections 3, 4, 5 and 6 deal with the prices of market-based services, non-market based services and goods, house prices and the prices of goods, respectively. Section 7 sketches out the importance of external factors and similarities in economic structures. Section 8 aims to explain the possible mismatch between price level convergence and inflation rates. Subsequently, section 9 assesses the relative importance of the different structural and cyclical factors on the observed inflation rates drawing first on a simple accounting framework and then using the results of panel estimates. Finally, Section 10 summarises the main findings of the paper.

2. Price Levels and Inflation Rates: Some Stylised Facts

Let us start by reviewing the main stylised facts pertaining to relative price levels. The absolute price level of countries hat are less developed in terms of GDP per capita seems to be well below the euro area average (see Table 1). This observation holds true for the transition economies of Central and Eastern Europe, whose price levels range from 40 percent (Bulgaria) to 70 percent (Slovenia) of the euro area average. It also holds true for the cohesion countries (Greece, Portugal and Spain). However, a significant reduction in these differences was observed for most of these countries from the mid-1990s up to the present, perhaps with the exception of Slovenia (which displays more moderate differences than the other Central and Eastern European countries). At the same time, as a result of successful disinflation during the last 10 years or so, high inflation rates were brought down during to late 1990s to low one-digit inflation rates by 2006. For instance, inflation rates are very close to euro

[1] See also ECB(2003a) for a discussion on the potential causes of inflation differentials in the euro area.

[2] Backé et al. (2002) analysed inflation dynamics in market-based and non-market based services. Cihák and Holub (2001, 2003 and 2005) looked at relative price adjustments using data from the international price comparison programme. Égert, Halpern and MacDonald (2006) surveyed the literature on the changes in (but not the level of) real exchange rates (the reciprocal of the relative price levels) in transition economies but did not address the sources of domestic inflation. Égert, Ritzberger-Grünwald and Silgoner (2004) provided an overview on the main factors driving inflation rates in Europe. Hammermann (2007) used panel data to understand the non-monetary determinants of inflation in Romania.

area inflation rates in the Czech Republic and Poland. This is a first indication that lower initial price levels and real catching-up do not necessarily imply higher inflation rates.

According to the conventional view, the price level in less developed economies is lower than in more developed countries because of the lower price level of services. The prices of goods should be comparable across countries if the absolute version of Purchasing Power Parity (PPP) is at work. This is something that can be indeed observed in the data (see Table 1), as price levels for both aggregate and consumer services are significantly lower in the new member states than in the old. This is particularly true of Bulgaria and Romania.

Nevertheless, lower market service prices are only one side of the coin, given that the other components of the price level are also substantially lower in the new EU member states of Central and Eastern Europe than in the euro area. For instance, the relative price level of non-market services (government and collective services) is very low in the transition economies compared with the euro area average. A similar pattern emerges for Greece, Portugal and Spain.

The PPP and equal prices for goods seem to be a fair assumption for the euro area, where the prices of durable and semi-durable goods turn out to be rather similar (Table 1). However, goods prices are lower in the cohesion countries than in the euro area by 10 to 20 percent, and they reach only between 60 percent and 90 percent of the euro area price in the CEE-8[3]. The price level of goods is even lower in Bulgaria and Romania than in the CEE-8. This ranking is in line with the ordering of the countries in terms of GDP per capita.[4] This suggests that there is a relationship between the price level of goods and the level of economic development and that product market competition is not a sufficient condition to bring about price level convergence for goods while large differences in wages exist across countries for a number of reasons. We develop these in more detail in the following sections.

In the remainder of the paper, we will spell out the main factors that contribute to lower market and non-market service prices, and to lower goods price levels in the new member states.

[3] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

[4] Rogers (2002) observed in the EIU CityData that the price level of tradables is very low in Central and Eastern Europe as compared to the EU-15, without providing any explanation for possible causes of this observation.

Table 1. Relative GDP per Capita, Inflation and Relative Price Levels in Europe

	Relative GDP per Capita		Inflation HICP		Relative price levels (euro area=1)										
					Overall Price level		Services prices					Goods prices			
							Total	Consump-tion	Gov't cons	Collective cons	Individual cons	Total	Non durable	Semi durable	Durable
	´96	´05	´97-´05	´05	´95	´05	´04	´04	´04	´04	´04	´04	´04	´04	´04
Euro area	1.00	1.00	1.9%	2.1%	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AT	1.16	1.15	1.5%	2.1%	1.10	1.01	1.02	0.99	1.07	1.02	1.11	1.02	1.02	1.08	1.01
BE	1.08	1.11	1.8%	2.6%	1.07	1.01	1.04	1.03	1.05	1.04	1.06	0.99	0.98	1.04	1.01
DE	1.08	1.03	1.4%	1.9%	1.19	1.03	1.13	1.08	1.20	1.14	1.26	1.02	0.98	1.02	1.03
ES	0.80	0.93	2.8%	3.4%	0.80	0.88	0.81	0.84	0.80	0.81	0.79	0.91	0.98	0.97	0.81
FI	0.95	1.07	1.5%	0.8%	1.13	1.10	1.19	1.26	1.11	1.08	1.14	1.03	1.16	1.07	1.16
FR	1.03	1.02	1.6%	1.9%	1.07	1.04	1.02	1.11	0.94	0.99	0.90	1.06	0.98	0.95	1.03
GR	0.64	0.77	3.6%	3.5%	0.72	0.83	0.73	0.79	0.67	0.72	0.63	0.87	0.97	0.96	0.83
IE	0.93	1.29	3.1%	2.1%	0.87	1.18	1.19	1.23	1.15	1.13	1.16	1.19	1.12	0.98	1.23
IT	1.06	0.97	2.3%	2.2%	0.78	0.98	0.96	0.94	1.00	0.99	1.02	0.98	1.04	1.05	1.08
NL	1.09	1.17	2.5%	1.5%	1.05	1.04	1.03	1.05	1.01	1.05	0.99	1.06	1.05	0.92	1.02
PT	0.69	0.67	2.8%	2.1%	0.69	0.82	0.77	0.76	0.79	0.74	0.83	0.85	1.05	0.89	0.90
DK	1.13	1.17	1.9%	1.7%	1.30	1.29	1.35	1.35	1.35	1.32	1.36	1.26	1.41	1.15	1.35
SE	1.06	1.08	1.5%	0.8%	1.12	1.16	1.17	1.21	1.12	1.09	1.14	1.16	1.09	1.13	1.19
UK	1.00	1.10	1.4%	2.0%	0.83	1.06	1.04	1.02	1.08	1.03	1.11	1.07	1.06	0.96	1.09
CY	0.73	0.78	2.7%	2.0%	0.80	0.88	0.83	0.82	0.87	0.83	0.92	0.91	1.09	0.98	0.99
MT	0.71*	0.65	2.8%	2.6%	0.64*	0.67	0.56	0.60	0.53	0.52	0.54	0.79	1.11	0.85	0.83
CZ	0.65	0.69	3.7%	1.6%	0.36	0.55	0.39	0.40	0.38	0.42	0.36	0.67	0.83	0.88	0.63
EE	0.32	0.54	4.8%	4.2%	0.36	0.57	0.43	0.54	0.34	0.37	0.31	0.73	0.82	0.85	0.65
HU	0.44	0.57	9.1%	3.5%	0.41	0.60	0.44	0.48	0.41	0.46	0.38	0.74	0.84	0.84	0.69
LT	0.32	0.49	2.5%	2.7%	0.24	0.48	0.33	0.41	0.27	0.31	0.24	0.66	0.80	0.80	0.59
LV	0.28	0.44	4.2%	7.0%	0.31	0.49	0.37	0.46	0.29	0.32	0.26	0.65	0.83	0.80	0.59
PL	0.39	0.47	6.4%	2.1%	0.41	0.53	0.36	0.42	0.31	0.34	0.29	0.60	0.76	0.69	0.58
SI	0.63	0.75	6.6%	2.5%	0.69	0.71	0.65	0.66	0.65	0.69	0.63	0.78	0.86	0.91	0.80
SK	0.42	0.52	7.2%	2.8%	0.38	0.54	0.35	0.39	0.32	0.36	0.29	0.71	0.85	0.80	0.66
BG	0.25	0.30	7.3%	5.0%	0.23	0.36	0.24	0.31	0.18	0.20	0.17	0.56	0.73	0.57	0.55
RO	0.23*	0.33	44.4%	9.1%	0.33	0.44	0.27	0.34	0.20	0.22	0.19	0.52	0.74	0.55	0.47
HR	0.36	0.46	n.a.	n.a.	0.51	0.59	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TR	0.28	0.29	47.6%	8.1%	0.43	0.55	0.38	0.41	0.34	0.36	0.32	0.66	0.93	0.69	0.70

Source: Author's calculations based on data drawn from NewCronos/Eurostat

Note: GDP per capita figures are relative to the euro area average. GDP per capita figures converted using the PPP conversion rate vis-à-vis the euro area. Inflation rates are harmonised average annual inflation rates published by Eurostat. The relative price level is based on GDP price levels. Note that data based on final consumption looks very similar. The relative price level of services and goods are based on ESA95 aggregates. Total stands for the overall price level of services and goods. Consumption, gov't cons, collective cons and individual cons indicate the relative price level of consumer, government, collective and individual services. AT=Austria, BE=Belgium, DE=Germany, ES=Spain, FI=Finland, FR=France, GR=Greece, IE=Ireland, IT=Italy, NL=Netherlands, PT=Portugal, DK=Denmark, SE=Sweden, UK=United Kingdom, CY=Cyprus, MT=Malta, CZ=Czech Republic, EE=Estonia, HU=Hungary, LT=Lithuania, LV=Latvia, PL=Poland, SI=Slovenia, SK=Slovakia, BG=Bulgaria, RO=Romania, HR=Croatia, TR=Turkey

* indicates that the data refer to 1999 and not to 1996 for Malta and Romania.

3. The Prices of Market-Based Services

3.1. The Usual Suspect: Balassa-Samuelson from the Supply Side

3.1.1.. The Level Effect

The well-known proposition put forth by Balassa (1964) and Samuelson (1964) is widely used in the economic profession to explain cheaper services in less developed countries. Let us recall briefly their argument. It is assumed that an economy is split into two sectors, producing tradable and non-tradable goods and that market forces are at work in both sectors. This has important implications, because in the public and other regulated sectors, wages and prices will not behave as they would in market-based sectors (see next section for more discussion on price regulation). One of the key assumptions is that PPP holds for the tradable sector, i.e. prices in the domestic and foreign economies are the same once they are converted to the same currency unit. Another important assumption is that wages are linked to the level of productivity in the open sector and that wages tend to equalise across sectors so that the wage level in the closed sector equals that in the open sector.

Let us assume that the home country is a developing country with low productivity levels in the open sector. Given that tradable prices are given by PPP, low productivity in the open sector implies low wages in the same sector.[5] This in turn means low wages and low prices in the market-based closed sector. Given that the actual nominal exchange rate is determined by PPP in the open sector, the prices of non-tradable goods, expressed in the same currency, will cost less in the home country than in the foreign country. As a result of lower non-tradable prices, the overall price level in the home country will be below that of the foreign country.

3.1.2. The Dynamic Effect

If productivity improves faster in the open sector than in the market-based sheltered sector, market-determined non-tradable prices are expected to rise because of the wage spill-over from tradables to non-tradables. This in turn gives rise to an increase in the overall price level. If the home country's productivity differential between the open and the market-based sheltered sector exceeds that of the foreign country, the price level will rise faster in the home country because of a positive inflation differential.[6]

The relationship between productivity growth and non-tradable inflation can be derived formally based on a two-sector neoclassical framework with perfect capital mobility and with the interest rate being exogenous:

$$\hat{p}^{NT} - \hat{p}^{T} = \frac{\delta}{\gamma}\hat{a}^{T} - \hat{a}^{NT} \qquad (1)$$

where small letters indicate log-transformed variables, circumflexes (^) denote growth rates, δ and γ denote the share of labour in the sheltered and open sectors, respectively. $\hat{p}^{NT} - \hat{p}^{T}$ represents the growth rate of the relative price of non-tradable goods and $\hat{a}^{T} - \hat{a}^{NT}$ is the growth rate of dual total factor productivity.

[5] Low productivity means that fewer goods can be produced using the same amount of inputs, i.e. labour and capital, so that the inputs' remuneration should be low (i.e. lower wages) without putting competitiveness at risk (as prices are determined by PPP).

[6] This framework assumes that each country produces and exports tradable goods. In parallel, one could argue that a country could also export its people. In such a case, a decrease in labour supply would lead to an increase in wages, which would imply a rise in the relative prices of non-tradable goods. While the tradable sector may suffer from competitiveness losses, remittances may compensate for higher trade deficits. (I thank Jakob von Weizsäcker for pointing this out). Nevertheless, while exporting people is probably viable in the medium term, it is more difficult to think of this option as a solid basis for sustainable catching-up (as opposed to the productivity driven B-S effect) because remittances usually do not help restructuring and upgrading the production capacities of a given country, and because inflows due to remittances may dry out if "exported" people stay and integrate in the recipient countries (second and third generations).

However, it is also possible to derive a relationship for the level of average labour productivity (as opposed to growth rates of total factor productivity) exploiting a well-known feature of Cobb-Douglas production functions that marginal productivity equals average productivity, which yields:[7]

$$\frac{P^{NT}}{P^{T}} = \frac{\gamma}{\delta} \cdot \frac{Y^{T}/L^{T}}{Y^{NT}/L^{NT}} \qquad (2a)$$

where Y and L denote output and labour and Y/L is the average labour productivity. Transforming equation (2a) into logarithms leads to:

$$p^{NT} - p^{T} = const + (prod^{T} - prod^{NT}) \qquad (2b)$$

where $const$ is a constant term containing $\log(\gamma)$ and $\log(\delta)$ and $prod$ is average labour productivity.

3.2. The Role of Factor Endowments

In an attempt to provide an alternative explanation to the observation that service prices are lower in poorer countries than in more developed economies, Bhagwati (1984) argues that the primary reason for lower service prices in poorer countries is closely related to lower capital-labour ratios in those countries. It can be shown in a general equilibrium framework that countries with lower capital-labour ratios will specialise in labour intensive production while countries with higher capital-labour ratios will produce capital-intensive goods. The wage level in the open sector is lower in the poorer country because lower capital-labour ratios imply lower labour productivity levels. The consequence of this is the lower wage level and the ensuing lower price level in the services sector. This framework implies that capital deepening, i.e. a rise in the capital-labour ratio of the open sector, and a shift towards the production of more capital-intensive goods, leads to an increase in the relative price of non-tradables.

3.3. Demand-Side Explanations

Yet another extension of the traditional Balassa-Samuelson framework is the inclusion of demand side factors. In this spirit, Bergstrand (1991) shows that the relative price of non-tradables depends not only on relative productivity and on the capital-labour ratio, but is also crucially influenced by demand-side factors. In a general equilibrium framework, the demand for, and supply of, non-tradable goods relative to tradable goods can be solved for the relative price of non-tradables:

$$\hat{p}^{NT} - \hat{p}^{T} = \phi_1 \cdot (\hat{a}^{T} - \hat{a}^{NT}) + \phi_2 \cdot \hat{k} + \phi_3 \cdot \hat{y} \qquad (3)$$

where $\hat{k}$ and $\hat{y}$ are changes in the capital-labour ratio and in per capita income, respectively. GDP per capita could well capture demand-side pressures linked to government and private consumption. An increase in GDP per capita levels, implying higher private consumption, may result in a rise in the demand for non-tradable goods because of the high income elasticity of demand for non-tradable goods. The wealthier that households are, the higher the proportion of non-tradables in their consumption basket will be.

Fischer (2004) demonstrates in a three-sector four-input model, as opposed to the two-sector, two-input standard Balassa-Samuelson model, that there is a positive relationship between investment demand and the relative price of non-tradable goods.

3.4. Empirical Validation

In this section, we seek to analyse the empirical evidence regarding the above-developed explanations for non-tradable price inflation. We limit ourselves to the study of the inflation rates implied by the Balassa-Samuelson effect and look at final household consumption in order to disentangle possible demand-side effects. But we leave aside the issue of capital deepening because of the lack of comparable data.

3.4.1. Methodological Notes

Starting with the Balassa-Samuelson (B-S) effect, three approaches are used in the empirical literature to derive the size of the inflation rate imputable to productivity gains. The simplest approach relies on

[7] See e.g. Égert, Halpern and MacDonald (2006) for more details.

a simple accounting framework (see e.g. Kovács, 2002). This assumes that the impact of market non-tradable inflation in excess of tradable inflation is determined by the share of market non-tradables in the inflation basket, so that $\Delta p = (1-\alpha)(\Delta p^{NT} - \Delta p^{T})$ with $(1-\alpha)$ being the share of non-tradables, and that, importantly, any change in the growth of the productivity differential will cause a proportionate change in the relative price of non-tradables ($p^{NT} - p^{T} = \beta(prod^{T} - prod^{NT})$ with $\beta = 1$). Hence, the inflation rate attributable to productivity gains ($p^{B\text{-}S}$) can be written as the share of market non-tradable goods in the CPI basket $(1-\alpha)$ multiplied by the growth rate of the productivity differential:

$$\Delta p^{B\text{-}S} = (1-\alpha)(\Delta prod^{T} - \Delta prod^{NT}) \quad (4)$$

Where Δ denotes average annual changes. The approach what we may call the hybrid approach uses the coefficient estimate linking the relative price of market non-tradables and productivity (β), and applies it to the accounting framework in the following way (see e.g. Égert et al. 2003):

$$\Delta p^{B\text{-}S} = (1-\alpha)\beta(\Delta prod^{T} - \Delta prod^{NT}) \quad (5)$$

Note that the hybrid approach collapses to the accounting framework if $\beta = 1$.

Finally, the third approach consists of estimating models for the inflation differential of the following form (see e.g. Wagner and Hlouskova (2004) for equation (6a) and Mihaljek and Klau (2004) for equation (6b)):[8]

$$\Delta p - \Delta p^{*} = \chi + \delta_1(\Delta p^{T} - \Delta p^{T*}) + \beta((\Delta prod^{T} - \Delta prod^{NT}) - (\Delta prod^{T*} - \Delta prod^{NT*})) \quad (6a)$$

$$\Delta p - \Delta p^{*} = \chi + \delta\Delta e + \beta((\Delta prod^{T} - \Delta prod^{NT}) - (\Delta prod^{T*} - \Delta prod^{NT*})) \quad (6b)$$

where e is the nominal exchange rate. In such a setup, the inflation differential (and not the domestic inflation rate) implied by productivity growth is obtained by applying β to annual growth rates of the productivity differential:

$$\Delta p - \Delta p^{*B-S} = \beta((\Delta prod^{T} - \Delta prod^{NT}) - (\Delta prod^{T*} - \Delta prod^{NT*})) \quad (7)$$

3.4.2. An Update

General Findings of the Literature

Numerous studies have estimated the size of the B-S effect both for transition countries and old EU member states. A first strand of argument, based on data for the 1990s, holds that the B-S effect had a sizeable impact on inflation rates in Central and Eastern Europe. More recent research emphasised, however, that the impact on the inflation rate is now considerably lower and lies between zero percent and two percent annually in those countries (for an overview on the implied inflation differential vis-à-vis the euro area, see e.g. Égert, Halpern and MacDonald, 2006). Generally, the results obtained on the basis of the simple accounting framework and the hybrid model on the one hand, and those derived using the first-differenced inflation differential models (equations (6a) and (6b)) yield fairly similar results if they are rendered comparable (results transformed into inflation rates or into inflation differentials). The reason for this is that both $1-\alpha$ or $(1-\alpha)\beta$ obtained in the simple accounting framework or in the hybrid model, and the β obtained in equations (6a) and (6b) are similar in magnitude, namely usually around or below 0.3.

The results for the old member states have two remarkable features (). First, the magnitude of the B-S effect is not very different from the size obtained for transition economies. Second, the cohesion countries, like Greece, Portugal and Spain do not exhibit substantially larger B-S effects than the core of the euro area.

This literature has the caveat that the results mostly refer to the 1980s and early 1990s for the old EU member states, and cover the period up to 2001 or 2002 for the transition economies. For this reason,

[8] Wagner and Hlouskova (2004) argue that it is necessary to estimate these models in first differences because of the lack of cointegrating relationships for the level variables.

updating the results for both groups of countries would appear a worthwhile exercise. We do this, relying on the simple accounting framework.

The Estimated Size of the Balassa-Samuelson Effect

The first stage of our approach is to calculate average yearly growth rates of labour productivity for the tradable and non-tradable goods sectors using annual data from 1995 to 2005.[9] We face two problems at this stage, namely price regulatedness and tradability. Indeed, sectors in which prices are not governed by market forces should be omitted, because prices would not react to productivity changes in the way they would in a sector driven by market forces. Furthermore, even measuring productivity is a huge problem in the public sector. In public administration, value added is captured by the wage mass. As a result, any increase or decrease in wages is automatically reflected in productivity gains or losses all things being equal.

It has been shown in the literature that these problems matter for the size of the productivity differential. Regarding tradability, we use manufacturing as the open sector.[10] Sectors with price regulatedness such as agriculture, energy and water supply and public administrations are excluded from our analysis. Consequently, our definition of the sheltered sector comprises construction and market services.

Before calculating the imputed B-S effect in accordance with equation (4), we need to quantify the share of market services in the HICP. Generally speaking, services account for around 40 percent of the HICP in the old member states, and range from 20 percent to 30 percent in the transition economies in 2006 (Table 2).

Let us now turn to the magnitude of the B-S effect reported in Table 2. As a matter of fact, our results broadly confirm the two major results of the literature. First, the cohesion countries do not exhibit higher B-S effects than the rest of the old EU countries. Indeed, our results indicate that Greece, Portugal and Spain have a B-S effect of as little as 0.5 percent per year, while other counties exhibit rates close to 1.5 percent.

Second, the B-S effect is fairly comparable across old and new EU member states. For instance, Austria, Finland and Sweden exhibit more similar inflation rates to those implied by the B-S effect than the transition economies.

Third, productivity growth has accelerated recently in the transition economies and so has the implied B-S effect. Earlier results showed that Hungary and Poland were the two countries having B-S rates above 1.5 percent a year. According to the updates, the three Baltic countries, the Czech Republic, Slovakia and Slovenia have now joined the privileged club, with yearly inflation rates due to the B-S effect doubling in those countries compared to earlier results. However, a note of caution should be sounded regarding the Czech Republic, Slovakia and Slovenia because of the large error margin coming from imprecise statistics. It is also worth noting that our updates provide a fair approximation for the results obtained using equations (6a) and (6b) for the reasons explained earlier.

The Balassa-Samuelson Effect: Upper-Bound Estimates

While these results are consistent with equations (5) and (7) for the reasons explained earlier, these results can be viewed as upper bound estimates. First of all, the share of market services as of 2006 is used for these calculations, and these shares were lower in the past.[11] Second, the simple accounting framework posits a proportional relationship between dual productivity and the relative price of

[9] The selection of this period is motivated by the fact that one has to be cautious in using productivity data from the early 1990s for transition economies, because of the turbulence of the early years of economic transformation. Therefore, 1995 seems a reasonable year to start with. We use the same period for the old EU member states for the sake of comparison.

[10] We also look at industry as a whole. However, energy production and water supply may not be fully tradable. Therefore, we decided to report only results based on the manufacturing sector. It is interesting to note that productivity growth is usually stronger in manufacturing than in industry as a whole in most of the transition economies, while in some old EU member countries productivity gains are higher in the energy and water supply sector than in manufacturing.

[11] The share of services in national inflation rates is higher for transition economies than their share in the HICP. Hence, earlier studies using weights from national CPI could show somewhat higher rates. However, given that the purpose of the HICP is to provide comparable inflation rates across Europe (mainly via adjusting the weights in the national CPI but not touching the actual price data), we should clearly use HICP data.

market non-tradables. In reality, the impact of dual productivity need not be reflected in a one-to-one change in the relative price of market non-tradables given that real wages in the open sector may grow faster or lower than productivity, and given that the wage equalisation process across sectors may be incomplete or over-proportionate. An amplification effect due to excessive real wage growth in tradables is certainly not sustainable in the long-run as it puts external competitiveness at risk and thus is not consistent with the Balassa-Samuelson effect. An attenuation effect due to lower wage growth compared to productivity gains is, by contrast, absolutely possible even over longer periods of time. Hence, a long-term coefficient that connects dual productivity to the relative price of market non-tradables could certainly be imagined to be lower (but not higher) than unity.

Table 2. The Balassa-Samuelson Effect in Europe, 1995-2005

	PRODUCTIVITY				BALASSA-SAMUELSON EFFECT				
%	**OPEN (1)**	**CLOSED (2)**	**DIFF (1)/(2)**	**DIFF2**	**wide**	**narrow**	**wide 2**	**narrow 2**	**Literature**
Euro area	3.1	0.5	2.5		1.0	0.7			
Austria	5.1	0.4	4.6	4.1- 4.6	1.8	1.6	1.6	1.4	1.4
Belgium	3.3	1.0	2.3		0.7	0.6			1.7
France	3.2	0.8	2.4		0.9	0.6			1.1
Germany	4.3	0.9	3.3	2.9-3.6	1.4	0.8			0.6
Netherlands	2.6	2.3	0.3	1.5-1.7	0.1	0.1	0.7	0.4	1.2
Finland	7.7	1.1	6.4	3.6	2.6	1.5	1.5	0.8	1.6
Italy	0.0	-0.4	0.3	-0.2-0.2	0.1	0.1			1.7
Ireland	14.4	NA	NA		NA	NA			2.6
Greece	3.8	2.0	1.8		0.7	0.5			1.7
Portugal	2.1	0.6	1.6		0.6	0.5			0.8
Spain	0.6	-0.9	1.6		0.6	0.5			1.9
Denmark	0.6	1.5	-0.9	-1.6 (1), 0.6 (2)	-0.3	-0.2			
Sweden	8.6	1.6	6.9		2.7	1.6			
UK	3.6	1.9	1.7		0.7	0.5			
Cyprus	2.3	1.3	1.0	2.2	0.4	0.3	0.8	0.6	
Czech Rep.	8.1	5.0	2.9	5.2 (1), 5.7 (2)	1.0	0.7	1.9	1.3	0.4
Hungary	8.9	1.7	7.1		2.1	1.6	1.5	1.2	1.7
Poland	14.3	4.6	9.2		2.4	1.7			1.4
Slovakia	7.3	0.9	6.3	1.5-2.0	2.1	1.5	0.5	0.4	0.4
Slovenia	9.2	2.3	6.7	1.1 (3)	2.2	1.6	0.4	0.3	0.8
Estonia	17.0	8.6	7.8		2.3	1.3			0.5
Latvia	13.6	7.5	5.7	4.9	1.6	1.1	1.4	0.9	0.5
Lithuania	15.7	5.7	9.4		2.4	1.7			0.9
Croatia	5.6	5.0	0.6		0.2	0.1	1.4	0.9	1.2
Romania	7.4	2.7	4.6		0.8	0.4			0.9

Notes: Austria, Greece, UK: 1995-2004; Portugal: 1995-2003; Romania: 1995-2002. The columns 'open' and 'closed' contain average labour productivity yearly growth rates for the manufacturing and the market services sectors. For Austria, Greece, Portugal, the UK and Romania, the sheltered sector also includes public services, while data is available only for the industry as a whole but not for manufacturing in Croatia. 'DIFF' is dual productivity growth. 'DIFFf2' contains figures considerably larger or higher than the ones shown under 'diff'. 1) and 2) indicate that the alternative measure is obtained using data from the 17-sectoral decomposition of Eurostat (NACE17, NewCronos), AMECO and the annual database of the WIIW, respectively. WIDE and NARROW indicate that total services and market-based services are used as a share of nontradables. DIFF is employed for WIDE2 and NARROW2. If not indicated, the alternative measures are obtained from AMECO data. Under 'literature' are shown summary data reported in Égert, Halpern and MacDonald (2006, p. 293) for transition economies: the inflation differentials due to the B-S effect are corrected by 0.35 percent to obtain inflation rates. 0.35 percent is used in Égert, Halpern and MacDonald (2006) to transform inflation rates into inflation differentials). Figures for the old EU-15 are summary results taken from Égert, Ritzberger-Gruenwald and Silgoner (2005) and corrected for inflation differentials if necessary.

Why is the Estimated Size of the Balassa-Samuelson Effect so Low in Emerging Europe?

The small size of the B-S effect is a little surprising considering the massive productivity gains in manufacturing that come close to or even exceed a yearly average of 10 percent in all the new member states of Central and Eastern Europe from 1995 to 2005. However, a number of factors stop these

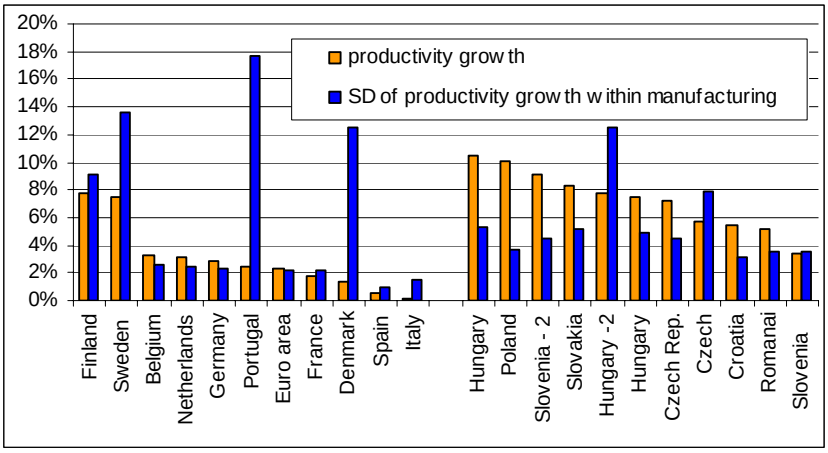
large productivity gains from feeding into overall inflation. Productivity growth may not lead to correspondingly high wage growth in tradables, wages may fail to equalise across sectors, productivity gains in non-tradables may offset a price increasing effect of wage spill-over, and finally, productivity-fuelled non-tradable price increases are dampened in overall inflation because of the low share of non-tradables in the inflation basket.

Large Dispersion of Productivity Growth in Tradables

Importantly, attenuation effects could happen if productivity growth in the open sector, in our case in the manufacturing sector, is very concentrated on a few sectors. In such a case, the manufacturing sector may not have the nominal wage-setting role needed for the cross-sectoral wage spill-over effect to happen, simply because wages increase only for a small proportion of workers (that limits wage equalisation) and because productivity growth in the leading sectors may be in excess of 10% or 20%, and, consequently, real wage growth will go less sharply than productivity growth.

We calculated the standard productivity growth deviation in 15 manufacturing sectors.[12] A higher dispersion indicates more unevenly distributed productivity growth rates across sectors, and this could jeopardise the overall wage-setting role of the open sector. Figure 2a below indicates that the dispersion tends to be higher in countries with overall higher productivity growth in the manufacturing sector as a whole. This holds true both for the transition economies and for Finland and Sweden. Even though a note of caution is once again necessary because the data drawn from different sources (NewCronos versus WIIW) for three countries (Czech Republic, Hungary and Slovenia) show substantial differences, these statistical anomalies do not alter the main conclusions.

Figure 2a. Dispersion of Productivity Growth in Manufacturing



Source: Author's calculations based on data obtained from NewCronos/Eurostat (old EU-15 & Czech Republic, Hungary and Slovenia) and the WIIW annual database (Central and Eastern Europe).
Note: Data from both sources is available and shown for the Czech Republic, Hungary and Slovenia. CZ, HU and SI refer to the data drawn from the WIIW database, and CZ -2, HU -2 and SI -2 refer to data obtained from NewCronos/Eurostat.

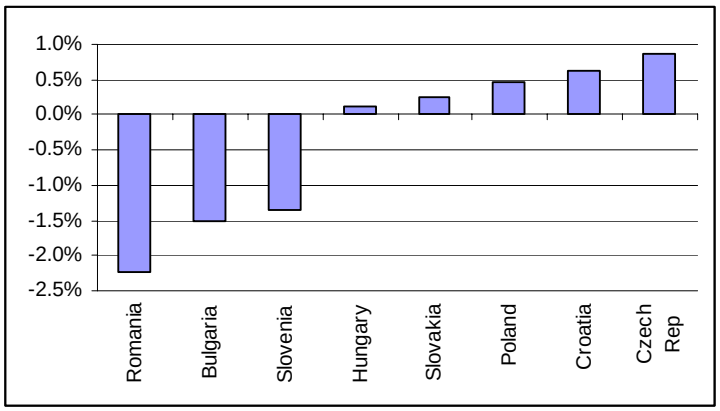
Incomplete Wage Equalisation and Substantial Productivity Gains in Market Non-Tradables

In addition to a possibly imperfect pass-through from productivity to wages in tradables, productivity-driven wage rises in the open sector may cause a less than proportionate increase in the relative price of non-tradables relative to that of tradables if wage equalisation between tradables and non-tradables is less than proportionate and if productivity increases also in the non-tradable sector. As shown in Figure 2b, wage equalisation is less than perfect in Bulgaria, Romania and Slovenia, i.e. wages grow in tradables compared to market non-tradables. Furthermore, productivity gains are substantial

[12] The industries are: food, textile, leather, wood, paper, refinery, chemistry, plastic, other non-metals, metallurgy, machinery, electronic equipment, transportation equipment, other manufactured goods. See the Appendix for the sector-specific productivity growth rates. Data for the euro area, the Czech Republic, Hungary and Poland are obtained from NewCronos/Eurostat. For Bulgaria, Croatia, Poland, Romania and Slovakia, as well as for the Czech Republic, Hungary and Slovenia, the data are drawn from the WIIW's annual database. We could not collect data for the three Baltic countries.

especially in the Baltic countries, offsetting the effects of large productivity gains in the tradable sector (see Table 2).

Figure 2b. Difference between average annual gross nominal wage growth in market services and manufacturing (1995-2005)



Source: Author's calculations based on data drawn from the annual database of WIIW.
Note: The period runs from 1996 to 2005 for Bulgaria and Croatia. The figures are obtained as follows: Average annual growth rates for market services are computed using data for (a.) wholesale, retail trade, repair motor veh. b.) hotels and restaurants, c.) transport, storage and communications, d.) financial intermediation and e.) Real estate, renting & business activities) and constructing an average with weights based on the respective size of the sectors in terms of employment. The average wage growth rate is divided by wage growth in manufacturing. Averaged over the period from 1995 to 2005

The Low Share of Market Non-Tradables in the HICP

Finally, the share of market non-tradable in the HICP is low in the transition economies. As Table 3 below evidences, it ranged, in 2006, from 9.6 percent in Romania and 24.2 percent in Slovenia. By comparison, it varies between 22.8 percent (Luxemburg) and 35.3 percent (Austria) in the euro area. Consequently, the low share of market non-tradables in the HICP mechanically dampens the impact of any productivity growth on overall inflation, even if productivity gains are fully transmitted onto the relative price of services.

Table 3. Weights of Services in the HICP

	Services				Services		
	All		Market		All		Market
%	*1996*	*2006*	*2006*	*%*	*1996*	*2006*	*2006*
Euro area	33.9	40.8	26.8	Cyprus	23.0	38.0	27.7
Austria	38.7	47.3	35.3	Malta	38.1	39.9	31.3
Belgium	31.2	37.8	26.1	Czech Rep.	27.2	33.0	23.5
Germany	35.8	43.6	23.7	Hungary	29.8	29.5	23.1
France	34.1	39.3	25.0	Poland	19.4	26.5	18.2
Netherlands	34.4	41.6	23.5	Slovakia	20.9	33.9	23.6
Luxembourg	31.3	31.6	22.8	Slovenia	26.8	33.2	24.2
Finland	31.9	40.7	23.2	Estonia	12.7	29.2	16.7
Italy	33.5	40.3	31.5	Latvia	15.9	27.6	19.3
Ireland	35.4	46.8	32.6	Lithuania	10.5	25.2	18.0
Spain	29.1	36.5	29.3	Bulgaria	9.4	21.2	15.5
Portugal	28.1	38.2	30.0	Romania	13.7	16.4	9.6
Greece	29.5	39.0	24.9	Turkey	20.3	27.8	14.7
Sweden	33.6	39.5	23.4				
UK	35.9	44.6	31.4				
Denmakr	36.4	38.9	21.6				

Source: The share of total services is the figure provided in NewCronos/Eurostat. The share of market services is the author's calculations based on data for a three-digit COICOP (classification of individual consumption by purpose) disaggregation level obtained from NewCronos/Eurostat. For the distinction between market-based and regulated services see the section on regulated prices.

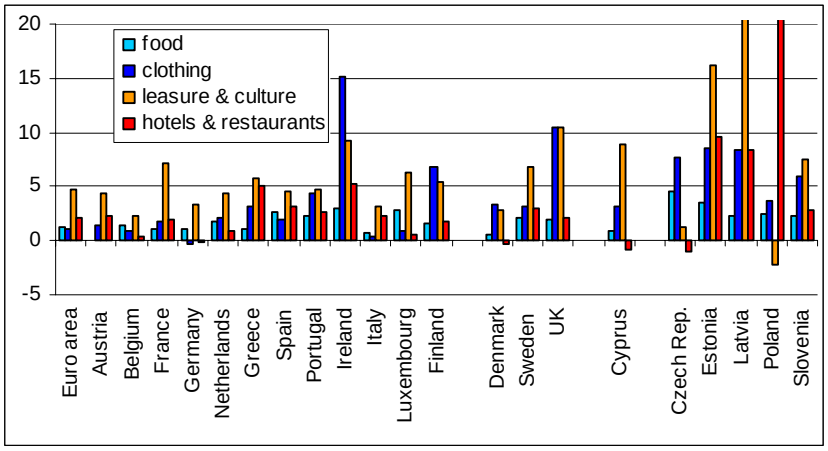
Going beyond that issue, it is also very interesting to study the share of services in the HICP, given that the respective shares in the HICP are derived on the basis of statistical surveys of final household expenditures, a rise in the share of services implies a higher share of services in total nominal household expenditure. Such an increase could therefore be the outcome of a pure **price effect**, as households spend more on services because they are more expensive. However, and more interestingly from a demand-side viewpoint, an increase could also signal that households consume greater quantities of services. This is an obvious possibility considering the advances in per capita disposable income in all the countries under consideration. Figure 1 sheds some light on this issue by presenting average growth rates of final household consumption at constant prices for selected categories which can be identified as goods (foodstuffs; clothing) and services (leisure & culture; hotels & restaurants) using a 12-sectoral COICOP [13]decomposition. Generally, consumption of services grew faster in real terms than that of goods in the old EU countries, with the notable exceptions of Finland, Italy and the UK, where consumption of clothing was at least as strong as for services. The picture is more mixed for the new member states. Among the countries for which data is available, the consumption of services systematically exceeded the consumption of goods in Estonia and Latvia but not in Cyprus, the Czech Republic, Poland or Slovenia.

The price effect and the quantity effect related to the consumption of services reveal two surprising features of the B-S effect. First, the price effect is indeed a self-reinforcing mechanism of the B-S effect. Higher productivity causes the relative price of non-tradables to increase, resulting in an increase in the share of non-tradables in the HICP. This, ultimately, strengthens the effect of productivity-fuelled service price inflation in the HICP.

Second, the quantity effect provides a bridge between the supply-side B-S effect and the demand-side effect suggested by Bergstrand (1991). Higher demand for services raises the share of services in the HICP, and this increases the impact on overall inflation of the very same amount of productivity gains.

Given that prices insulated from the effects of productivity gains via price regulation are parts of services, it is essential to filter them out when studying the size of the B-S effect. The share of market services, excluding rents, is substantially lower than the share of total services, thus indicating the importance of regulated services. Nevertheless, we can still observe that the share of the HICP taken by market services is around 10 percentage points more in the old EU countries than in transition economies (see Table 3).

Figure 1. Annual Growth Rate of Real Final Household Consumption (1995 constant prices) 1995-2004



Source: Author's calculations based on data obtained from NewCronos/Eurostat
Note: The period runs from 1995 to 2003 for Greece, Latvia, Portugal and Spain.

[13] Classification of Individual Consumption by Purpose

4. The Prices of Regulated Services and Goods

Relative price levels and inflation rates are strongly influenced by government interference in all European countries. This observation is particularly relevant for transition economies, but also holds true for the old EU member states. However, it is less of a surprise in the light of the results of a survey conducted by Dexter, Levi and Nault (2002), according to which roughly one third of the prices in the CPI basket of the USA are affected by price regulation.

We have already seen that the relative price level of non-market services seems to be systematically lower than those for market services (consumer services) in both transition economies and in a number of Western European countries.

Differences in wage levels between the market and non-market service sectors could be at the root of differences in price levels: wages tend to be lower in the public sector than in the private sector because of more job security and lower work load (thus lower productivity) - and this despite a generally more high-skilled labour force. But an even more important factor could be the disconnection between wages and prices in the public sector since price levels might be kept at an artificially low level because of political considerations, or because political decision-making cannot or does not want to keep track of the rising price level of market services during episodes of strong economic growth (like in Ireland or Finland).

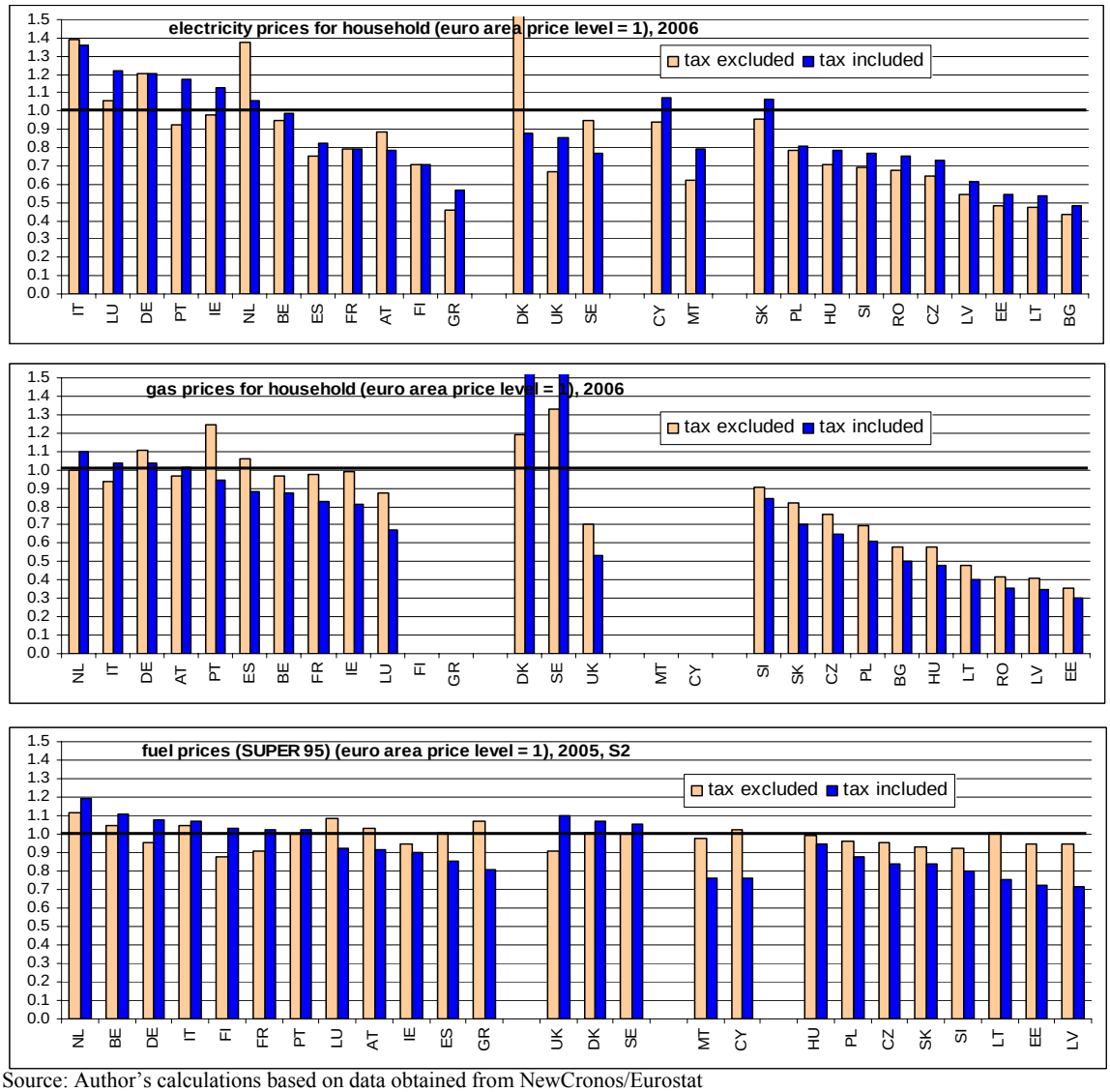
Figure 3 plots the relative price levels of household energy, such as electricity, gas and fuel. Three striking features emerge from this. First, household electricity is much cheaper in transition economies than in Western Europe, except for Slovakia. Households pay half the price of the euro area average in the three Baltic States and Bulgaria, and they are charged less in the Czech Republic, Hungary, Poland, Romania and Slovenia than their average euro area counterparts. Differences are even more marked for gas prices. This is because the transition economies obtain gas from Russia well below market prices.

Second, even euro area countries such as Spain, France, Austria, Finland and Greece, as well as the UK, have significantly lower electricity prices compared to the euro area average, both for pre- and after tax prices. However, differences in gas prices are visibly attributable to differing taxes, given the small dispersion of prices excluding taxes.

Third, the price level of fuel is very similar across countries, when taxes are not considered.[14] However, the differences more than double after all taxes are considered. This is not surprising in the light of the considerable lower excise taxes[15] applied to household energy, gas and fuel prices in the transition economies. Price level convergence will, however, occur in the near future due to European integration. All countries that joined the EU in 2004 and 2007 will have to comply with the minimum rates given by EU legislation after some years of transition ending between 2007 and 2014.

[14] The reason why net fuel prices net of taxes are more comparable across countries than gas and electricity prices is that there is a world market for oil but not for gas and electricity.
[15] Excise taxes not only concern energy products but also apply to alcoholic beverages and manufactured tobacco goods.

Figure 3. Relative Price Level of Energy (euro area=1)



Source: Author's calculations based on data obtained from NewCronos/Eurostat

Regulated prices[16] matter not only for the price level but also for inflation developments. The first reason for this is that they generally account for a large part of the consumer price index. As Table 4 demonstrates, regulated prices represent between 10 percent and 30 percent of overall HICP according to the definition of regulated prices.

The question of which items in the consumer price basket should be viewed as regulated is, as a matter of fact, not uncontroversial. A *narrow definition* proposed in ECB (2003a) considers the following subcategories as regulated: 1.) refuse collection, 2.) sewerage collection, 3.) medical and paramedical services, 4.) dental services, 5.) hospital services, 6.) passenger transport by railway, 7.) postal services, 8.) education and 9.) social protection. Lünneman and Mathä (2005) complete this list with 1.) cultural services and 2.) passenger transport by road.

An intermediate definition would also include rents given that in a score of countries, both in Central and Eastern Europe and in Western Europe, they are heavily influenced by the large number of social housing owned by central and local governments. Finally, *the widest definition* would also include energy prices related to housing, notably 1.) electricity, 2.) gas, 3.) liquid and solid fuels and 4.) heat energy.

[16] The terms administered, administrative and regulated prices are used interchangeably in the rest of the paper.

One problem with this classification is that the degree of regulation might change over time. In particular, the degree of regulation might decrease if there is a change in ownership structure, such as a move from public to private ownership, or if there is market liberalisation. This line of reasoning is reflected in the figures regarding the share of regulated prices in overall CPI published regularly in the EBRD's Transition Reports, where the share of regulated prices drops to zero in some countries with advances in market reforms (see Table 4). However, the privatisation of sectors like water, sewage, electricity or rail transport cannot establish true market competition, which necessitates some sort of price regulatory schemes. Hence, privatisation does not automatically remove but possibly only alleviate price regulation.

Whereas price regulation mostly concerns services, the prices of some goods can also be affected directly or indirectly by public administration decisions. The prices of pharmaceutical products, such as medicines, which are fully or partly reimbursed by the healthcare system, are directly influenced by the subsidy levels. The second group of goods includes alcoholic beverages, tobacco and fuel for personal transportation: their prices are influenced by occasional changes in a range of taxes other than VAT[17].

The share of narrowly defined regulated service prices (excluding both rents and household energy) in the HICP ranges from around 6 percent to roughly 10 percent, both in the new member states and in euro area countries, as shown in Table 4. On the basis of the intermediate definition comprising rents but excluding household energy, the share of regulated services increases considerably up to 21 percent in the euro area, but remains below 11 percent in transition economies. This is because owner occupancy ratios are lower in Western Europe than in Central and Eastern Europe, and this is reflected in higher household expenditure on rents in the former group of countries. However, regulated services become more aligned when looking at the broadest definition, mainly due to the higher share of household energy in total household consumption in the new member states.

When it comes to looking at *regulated goods* (as opposed to regulated services), the shares are clearly higher in transition economies both for goods concerned directly and indirectly by price regulation. This is chiefly attributable to higher consumption of pharmaceutical products and fuel in total household consumption.

[17] At the extreme, all products could be considered as regulated because changes in the VAT or whether they are reclassified from reduced to standard VAT rate (or vice versa) influences the final consumer price. However, the number of different taxes that apply to the aforementioned three items makes them more prone to public interference via taxes than the rest of the consumer basket.

Table 4. The share of regulated prices in the HICP (Eurostat, 2006) and in the CPI (EBRD, 2005)

%	no rent	with rent	with rent & hh energy	goods direct	goods indirect	Total Narrow	Total Broad	EBRD
	(1)	(2)	(3)	(4)	(5)	(1)+(4)	(3)+(4)+(5)	
Euro area	8.4	14.7	19.7	1.3	6.5	9.6	27.5	
Austria	9.1	12.7	16.9	1.0	5.9	10.0	23.8	
Belgium	6.6	13.0	19.0	1.7	7.4	8.4	28.1	
Germany	10.6	21.4	28.1	1.3	7.1	11.8	36.5	
France	8.5	15.1	19.7	1.3	7.1	9.8	28.2	
Netherlands	8.3	15.9	21.4	0.5	6.7	8.8	28.7	
Luxemb.	5.5	9.0	12.1	0.7	12.9	6.2	25.7	
Ireland	10.0	12.6	17.2	0.6	8.4	10.6	26.2	
Italy	6.2	9.0	13.0	1.5	4.2	7.7	18.8	
Finland	9.3	17.8	20.4	2.0	9.8	11.3	32.1	
Greece	11.3	14.6	18.6	0.4	5.3	11.7	24.3	
Portugal	7.3	9.3	13.3	1.8	6.8	9.1	21.8	
Spain	5.9	8.2	12.3	1.0	7.0	6.9	20.3	
Denmark	10.8	18.6	26.1	1.0	7.2	11.8	34.2	
Sweden	7.0	16.9	24.3	0.9	8.7	7.9	33.9	
UK	9.6	14.3	17.5	0.5	6.2	10.1	24.2	
Cyprus	9.3	10.7	15.2	1.2	9.4	10.5	25.8	
Malta	6.3	6.8	8.8	1.2	7.3	7.4	17.3	
Czech Rep.	7.4	11.1	21.0	1.0	10.2	8.5	32.2	10.9
Hungary	7.8	7.9	15.9	2.8	11.2	10.6	29.9	17.0
Poland	7.5	9.9	19.8	4.4	11.6	11.9	35.8	1.2
Slovakia	9.4	11.2	26.8	1.4	7.5	10.8	35.8	19.9
Slovenia	8.1	10.1	16.7	1.3	9.2	9.4	27.2	16.7
Estonia	7.4	8.9	15.6	1.7	12.5	9.1	29.8	26.7
Latvia	8.3	9.3	17.2	2.6	8.5	10.9	28.2	14.3
Lithuania	6.9	7.5	15.5	2.8	11.6	9.8	29.9	na
Bulgaria	6.9	7.3	20.0	4.8	5.5	11.6	30.2	21.3
Romania	8.0	8.4	22.8	2.1	6.4	10.2	31.4	21.9
Turkey	10.1	14.7	23.0	0.8	5.1	10.9	28.9	

Source: EBRD Transition Report 2005 and author's calculations based on data obtained from NewCronos/Eurostat using a three-digit COICOP disaggregation level of the HICP and the three definitions spelled out earlier. The figure obtained for Slovakia from the EBRD refers to 2004.

Regulated prices matter for overall inflation developments not only because of their high share in the HICP but also because they usually exhibit a peculiar evolution over time. First, changes are infrequent. They may take place at the beginning of the year. Also, they may be related to the timing of general elections with politicians being more willing to increase regulated prices after rather than before elections. Second, if regulated prices are changed, the price modification might be very large. This is especially well illustrated in Figures 4a to 4d both for transition economies (Estonia, Lithuania and Slovakia) and for the euro area (Austria, Germany and the Netherlands).

Figures 4a and 4b also witness the very heterogeneous development of regulated services with regard to the timing and the magnitude of changes in the euro area and in Denmark, the UK and Sweden. It is also apparent that while regulated service prices exceeded average inflation in Ireland, the UK and perhaps also in Austria, Portugal and Denmark, year-on-year regulated price inflation was partly below and partly above the overall inflation rate in the rest of the EU-15.

When looking at developments in Central and Eastern Europe, the striking difference is that regulated service price inflation, irrespective of the definition (narrow or broad), is persistently above average inflation.

The reason for these above-average changes is partly rooted in the early days of the transition process when the prices of regulated services were kept unchanged, while the prices of most of the goods and market services were set free. Price liberalisation led to very high inflation rates, which resulted in a

widening gap between regulated and market service prices.[18] Keeping regulated prices unchanged during the early 1990s, which helped stem hyperinflation, was made possible by the fact that only operational costs had to be taken into account by the price setting procedure given that, as Zavoico (1995) puts it, the capital stock of the sectors falling under price regulation were inherited for free from the socialist regime. However, by the time the main storm of price liberalisation was over, two factors surfaced and had to be considered in setting the price of regulated items: a.) capital maintenance costs and b.) the replacement of the capital stock at market prices. This came at the cost of large price increases given that most of the sectors concerned are very capital intensive.

There are three main reasons why regulated prices kept and will keep on rising faster than most of the components of the CPI in transition economies. Firstly, prices were below cost recovery in most transition economies. While the gap between end-user prices and cost recovery prices has been considerably reduced, electricity, gas and water prices were still below cost recovery in a number of cases in 2003 as shown in Table 5.

Table 5. Cost recovery levels in the energy and water sectors

	Electricity		**Gas**		**Water supply**	
	2000	2003	2000	2003	2000	2003
Bulgaria	0.43 (0.40)	0.67 (0.71)	0.55	0.67	0.48	0.77
Croatia	0.62 (0.90)	0.79 (0.99)	0.89[a]	1.02[b]	0.50	--
Czech Rep.	(0.60)	(1.00)	--	--	1.00	--
Estonia	(0.80)	(0.87)	--	--	--	0.81 [b]
Hungary	(0.70)	(1.01)	--	--	--	
Latvia	(0.80)	(0.88)	--	--	--	0.77 [b]
Lithuania	(0.80)	(0.97)	--	--	--	--
Poland	0.95 (1.10)	0.82 (0.82)	0.68	0.89[b]	0.86	0.84
Romania	0.48 (0.60)	0.80 (0.81)	0.60	0.92	--	0.40
Slovakia	(0.70)	(1.00)	--	--	--	--
Turkey	0.73 (1.03)	1.03 (1.09)	1.54	1.82 [b]	--	--

Sources: ECA INFRASTRUCTURE INDICATORS DATABASE (World Bank), EBRD (2001), p 95 for figures in parentheses for electricity for 2000; World Bank (2006a), p. 35 for figures in parentheses for electricity for 2003; World Bank (2003), p. 45 for Croatia for water supply.

Note: The cost recovery ratio is obtained as the weighted average of (residential and non-residential) end user tariff over the cost recovery tariff. The EBRD figures refer to residential end user tariffs.

[a]2001

[b]2002

The gap between end-user prices and cost recovery prices is sustained by direct (concerning the prices) and indirect (concerning firms' balance sheets) public subsidies, which are, however, disappearing because of efforts to sort out public finance and because of EU competition rules. This has led to substantial price increases. It is worthwhile mentioning that raising prices to cost recovery price levels does not suffice to eliminate the need for public subsidies. As a recent report by the World Bank (2006b) shows, the need for public subsidies arises from problems related to fee collection and because of unaccounted losses, mainly due to leaking and inefficient transport pipelines and theft.

Secondly, the capital stock of some of the sectors (e.g. railways and public transportation) is very obsolete and needs to be renewed to improve the quality of the services and to catch-up with EU standards. This implies massive investments and price increases in the absence of public subsidies, both of which may, however, be mitigated by transfers from EU Structural and Cohesion Funds. Finally, the road towards the consolidation of the sectors providing regulated services is very bumpy and is characterised by numerous setbacks due to changes in political agendas as a result of elections.[19] Hence, longer delays on the road may be followed by more pronounced upward price

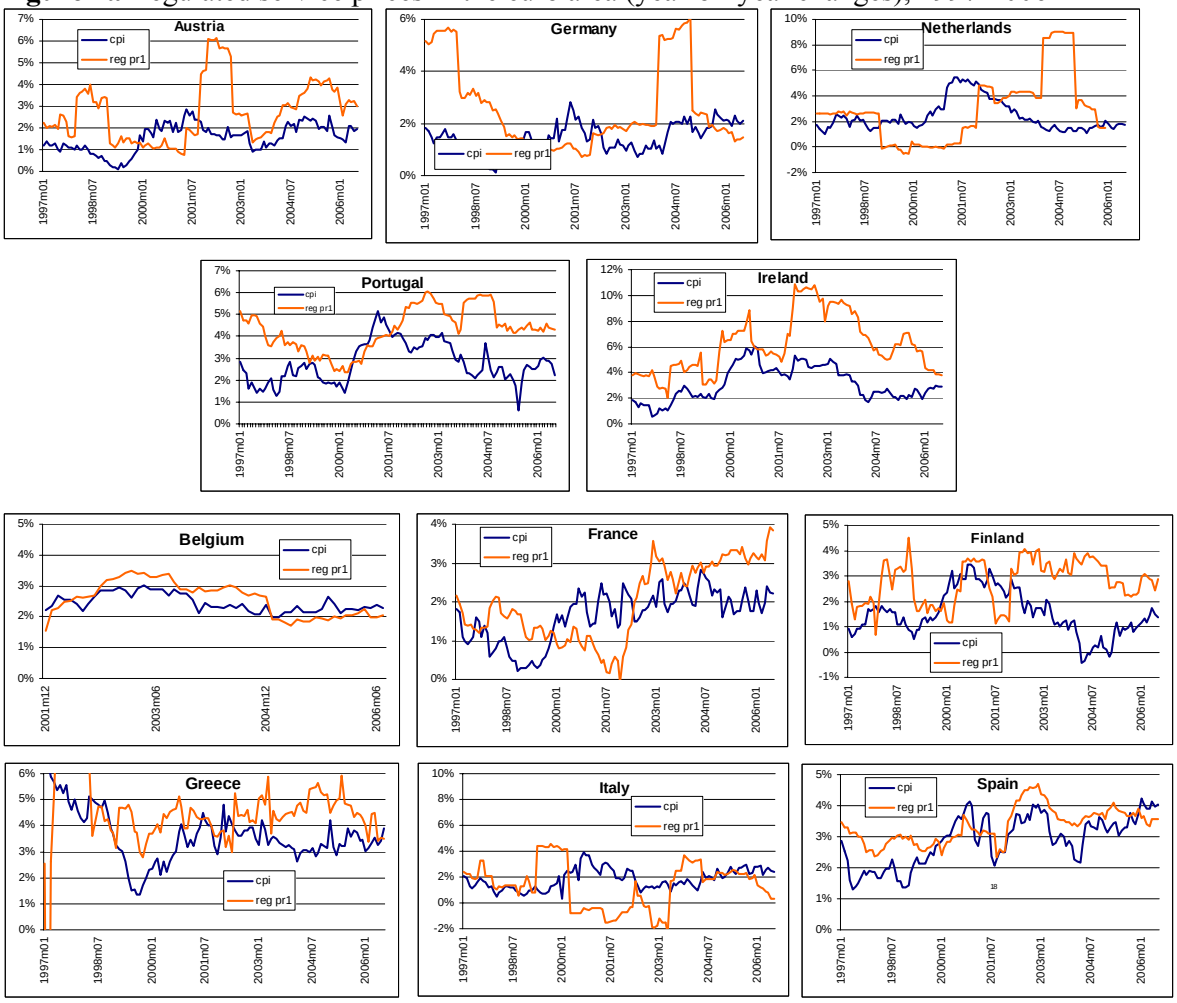
[18] During the more recent episode of hyperinflation of 1997 in Bulgaria, the growth rate of regulated prices remained also well below the overall inflation rate.

[19] Price increases could be limited by enhancing efficiency through privatisation and market liberalisation. However, as already noted, true market competition is not always possible, and an appropriate price regulatory framework needs to be established in such cases.

corrections later on. It is worthwhile mentioning that these problems may also hold true in parts of the euro area and in particular in poorer member states such as Greece and Portugal.

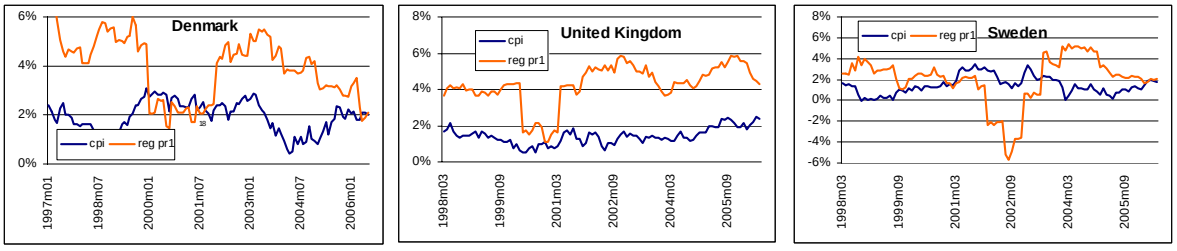
It is important to emphasise that changes in regulated services have no direct link to the B-S effect in the medium to long run because public interference in price–setting, and the impact of the upgrading of the capital stock on prices, outweigh the effects of wage pressures coming from the tradable sector due to productivity gains in that sector. Nevertheless, price developments of regulated services cannot probably fully escape in the very long run from the wage pressures of the tradable sector attributable to the B-S effect.

Figure 4a Regulated service prices in the euro area (year-on-year changes), 1997-2006



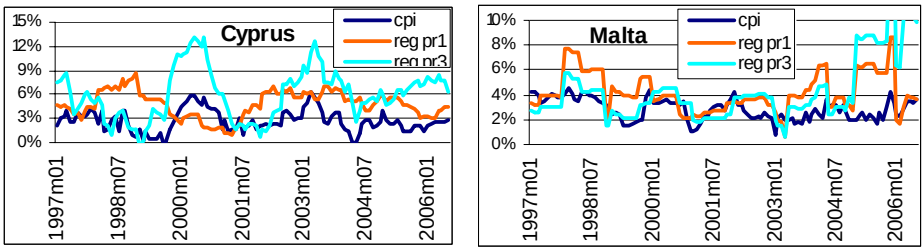
Source: Author's calculations based on data obtained from NewCronos/Eurostat.
Note: reg pr1 refers to the narrow definition of regulated services.

Figure 4b Regulated service prices in Denmark, UK and Sweden (year-on-year changes) 1997-2006



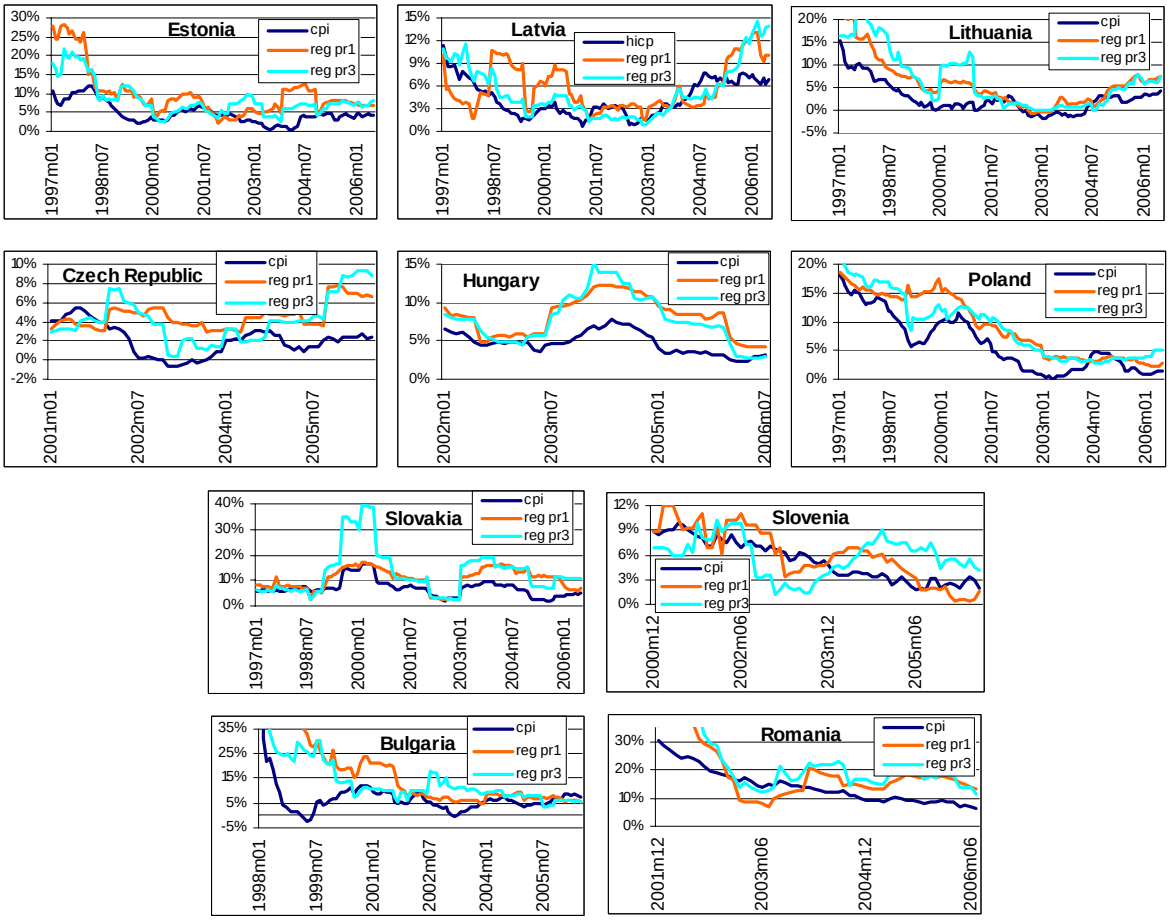
Source: Author's calculations based on data obtained from NewCronos/Eurostat.
Note: reg pr1 refers to the narrow definition of regulated services.

Figure 4c Regulated service prices in Cyprus and Malta (year-on-year changes), 1997-2006



Source: Author's calculations based on data obtained from NewCronos/Eurostat.
Note: reg pr1 and reg pr3 refer to the narrow and the broad definitions of regulated services.

Figure 4d Regulated service prices in Central and Eastern Europe (year-on-year changes), 1997-2006



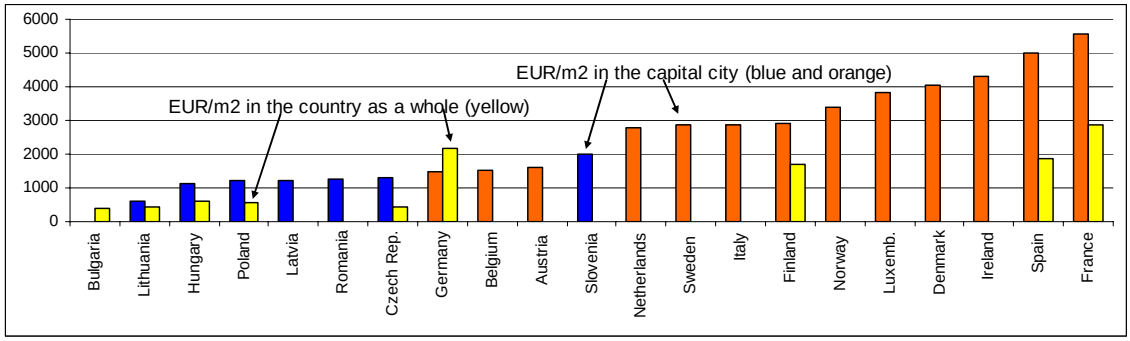
Source: Author's calculations based on data obtained from NewCronos/Eurostat.
Note: reg pr1 and reg pr3 refer to the narrow and the broad definitions of regulated services.

5. Residential House Prices

House prices, measured as the euro price of a square metre, are substantially lower in transition economies than the euro area. However, there are huge regional divides, in particular between capital cities (and urban areas) and other regions. In Budapest and Warsaw, house prices are twice as high as in the countryside, and there is a more than threefold difference between Prague and the Czech countryside. As a result of substantially higher house prices in the capital cities, the east-west differences become smaller. For instance, the price of a square meter is between 1100 and 1300 euros in Budapest, Warsaw, Riga, Bucharest and Prague, and this level is only slightly below the 1500 to 1600 euros we can observe in Brussels, Berlin and Vienna. At the same time, house prices are the most heterogeneous segment of the price level in euro area as house prices in Madrid and Paris are nearly four times higher than in Brussels, Berlin and Vienna (Figure 5a).

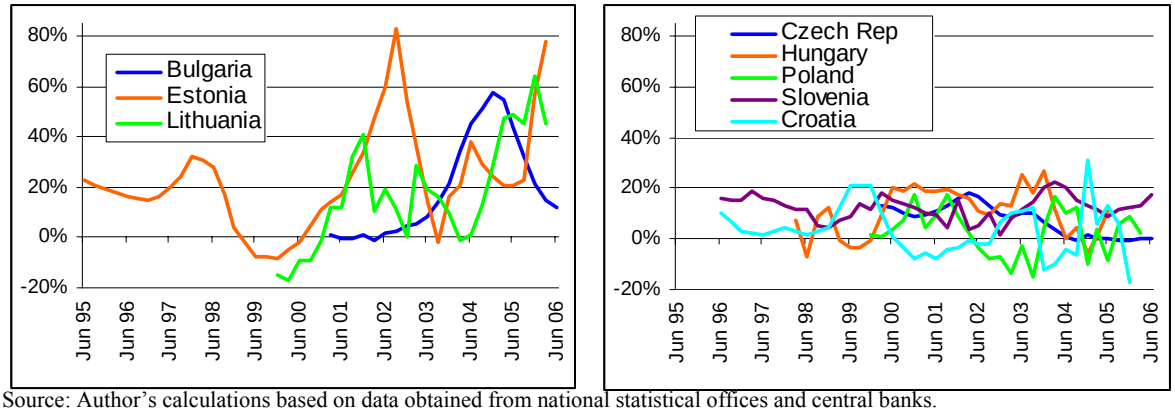
Over the last ten years or so, house prices grew at a rapid pace in Central and Eastern Europe, and house price developments are in sharp contrast with the evolution of the overall inflation index in a number of transition economies. While the CPI moved to one-digit territory in most of the countries over the last couple of years, house prices started to rise at two-digit pace, in particular in Bulgaria, Estonia and Lithuania where year-on-year house price inflation reached or even exceeded 60 percent at some point during the last five years or so. While house prices grew at a lower pace in Slovenia, they were above inflation. In Croatia, the Czech Republic, Hungary and Poland, house price inflation exhibited high growth rates only periodically and decelerated to or even below headline inflation (Figure 5b).

Figure 5a. Selected House Prices in Central and Eastern Europe (euro/m2), 2005



Source: House prices for the capital cities: European Council of Real Estate Professions

Figure 5b. House Prices in Central and Eastern Europe (year-on-year changes)



Source: Author's calculations based on data obtained from national statistical offices and central banks.

High house price inflation raises the question of what the driving forces underlying these increases are. Increased house prices can be indeed be separated into the following two components: 1.) general and transition-specific fundamentals and 2.) house price increases reflecting and/or leading to house price misalignments.

Price increases due to changes in the fundamentals: The determinants of house prices (P^H) can be obtained from the demand for housing (D^H) (equation (1)) and from the supply of housing (S^H) if demand equals supply (see e.g. UK HM Treasury, 2003; Gallin, 2003).

$$D^H = f(\overset{-}{P^H}, \overset{+}{Y}, \overset{-}{r}, \overset{+}{WE}, \overset{+/-}{D}, \overset{+}{e}, \overline{X}, \overset{+}{N^H}) \quad (1)$$

$$S^H = f(\overset{+}{P^H}, C(\overset{+}{P^L}, \overset{+}{W}, M)) \quad (2)$$

$$P^H = f(\overset{+}{Y}, \overset{-}{r}, \overset{+}{WE}, \overset{+/-}{D}, \overset{+}{e}, \overline{X}, \overset{+}{N^H}, C(\overset{+}{P^L}, \overset{+}{W}, M)) \quad (3)$$

Demand for housing can be written as a function of house prices (P^H), income (Y), the real interest rate on housing loans (r), financial wealth (WE), demographic and labour market factors such as the share of the labour force in total population or the unemployment rate (D), the expected rate of return on housing (e), the need for housing (N^H) and other demand shifters (X).

The need for housing can be further separated into 1.) new housing due to the need for better quality housing and due to geographical reallocation of populations, 2,) the difference between the existing housing stock and the desired housing stock, and 3.) the expected change in the number of households (Dhonte, Bhattacharya and Yousef, 2000). This latter factor indeed overlaps to some extent with the other demographic variables.

The supply of housing can be thought of as depending on house prices and on the real costs of construction (C) including the price of land (P^L), wages (W) and material costs (M).

The evolution of the price of land is closely related to economic geography arguments. The progress in urbanisation and the increase in concentration of economic activity at given locations leads to the scarcity of land in urban areas, thus increasing land prices (Glaeser, 1998; Quigley, 1998). Hence, house prices will rise faster than construction prices including wages and materials, merely because of the rise in the price of land. The scarcity of land in urban areas may be further exacerbated by institutional factors such as zoning and restrictive building regulations (Case and Meyer, 1995; Glaeser and Gyourko, 2002; and Glaeser, Gyourko and Saks, 2003).

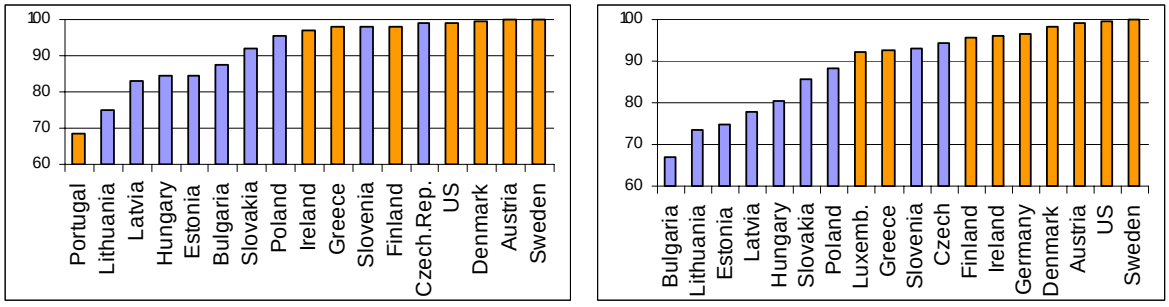
Transition/catching-up specific fundamentals:

House prices in transition economies are bound to increase due to increases in construction costs for the following reasons:

1.) Quality changes: A huge quality increase in the supply of new residential and commercial properties can be observed in transition economies. This quality increase shows up in construction costs if quality changes are not adjusted for. To illustrate this point, it suffices to say that the housing stock during the early 1990s consisted mostly of apartment blocks made of concrete in urban areas, and of cubiform village houses in rural areas. New residential property (flats, terraced and family houses) is of much better quality.

The overall quality of the housing stock in Central and Eastern Europe, except for the Czech Republic and Slovenia, lags far behind Western European standards, as shown, for example, by the share of dwellings with piped water and flush toilets as a share in the total dwelling stock (see Figure 6). An increase in quality would be necessarily reflected in higher prices.

Figure 6. Dwellings with piped water (left-hand side) and with flush toilet (right-hand side) as % of the total dwelling stock, around 2001



Source: OECD

2.) Wages: Another cost-push factor is the continuous increase in wages as a result of advances in real convergence. This could cause a rise in construction costs, unless counterbalanced by productivity gains in the construction sector.

Regarding the price of land, changes can occur with more economic concentration. This is probably one main reason for capital/countryside divides, given that economic activity in capital cities is more buoyant than in the countryside. Cities attract more economic activity and create economies of scales, and this leads to further concentration. This in turns increases the scarcity of land and pushes prices up.

Overall demand is typically strengthened in transition economies via two channels. The first is the rapid development of the credit and mortgage markets. Not only is it easier to get credit for the purchase of a house, but also loan to value ratios and average maturities have been extended, and new financial innovations appeared on the market, such as accordion loans.[20] Looser financial constraints naturally increase demand. The second channel is related to capital account liberalisation and the appearance of foreign investors on the market. The fact that demand is not limited to the population of the country but extends to the whole EU or even the developed world, increases potential demand. A rise in demand due to these two factors could well be viewed as sustainable from a longer run perspective. Nevertheless, both factors can trigger a house-price frenzy.[21]

Notwithstanding the similarity of some of new and old EU member states in terms of significant house price increases, the impact of these increases on the inflation rates is possibly very different. This is because the share of rents in the HICP is considerably lower in the new member states than in the old ones due to significantly higher ownership occupancy ratios in the former and the ensuing lower share of rents in household expenditures.[22]

[20] An accordion loan usually means that the monthly instalment are fixed throughout the lifetime of the loan. However, changes in the interest rate (and in the exchange rate for FX denominated loans), are absorbed by the adjustment of the maturity of the loan.

[21] See e.g. Égert and Mihaljek (2007) for an empirical analysis regarding these factors in Central and Eastern Europe.

[22] *Price increases reflecting house price misalignment:* In common with other segments of the economy, a peculiarity of house prices is the strong distortion of their relative price to goods prices as an inheritance from central planning. Indeed, in most of the transition economies, the price of a square metre of housing surface was probably lower than what would have been predicted by the underlying fundamentals. As a result, part of the increase might be due to an adjustment from low initial levels to that implied by economic fundamentals (*adjustment from initial undershooting*). House price increases may also reflect price developments, which are not related to changes in the domestic fundamental variables or to the adjustment process from initial undershooting. Such a growth can be labelled as excessive and is expected to be corrected at some point in time (*excessive growth in house prices*).

Table 6. The share of rents in the HICP (Eurostat, 2002-2005) and ownership occupancy ratios (2001)

%	% rents in HICP	Ownership Occupancy ratio		% rents in HICP	Ownership Occupancy ratio
Euro area	6.4		Cyprus	1.0	n.a.
Austria	3.7	56.8	Malta	0.5	n.a.
Belgium	6.4	66.4			
Germany	11.1	42.2	Czech R.	4.5	71.5
France	6.4	56.0	Hungary	0.1	89.6
Netherlands	7.9	50.4	Poland	3.8	n.a.
Luxemb.	3.7	66.6	Slovakia	1.5	49.2
Finland	7.7	n.a.	Slovenia	2.3	90.0
Italy	2.8	67.4	Estonia	1.7	85.2
Ireland	2.7	80.0	Latvia	1.0	74.8
Spain	2.2	n.a.	Lithuania	0.3	91.1
Portugal	1.9	75.4	Bulgaria	0.4	92.2
Greece	3.2	n.a.	Romania	0.3	n.a.
Sweden	9.9	39.9	Turkey	5.0	n.a.
UK	4.9	71.3			
Denmark	7.8	53.1			

Source: rents: NewCronos/EurostatEBRD, ownership occupancy ratio: Czech Statistical Office.

6. Market-Based Goods Prices

We have shown that even goods prices in Central and Eastern Europe are lower than in Western Europe. One could think of a number of reasons why the price level of goods differs across countries at different stages of economic development: differences in the quality of goods, pricing-to-market practices and the importance of local factors such as local tastes, the distribution sector and national tax systems.

6.1. The Quality of Goods

Prices may differ because the quality of the goods consumed in the different countries also differs.[23] In particular, households in poorer countries tend to buy poorer quality goods simply because they are cheaper. By contrast, households of wealthier nations pay more attention to the quality of the goods they purchase and are prepared to pay a correspondingly higher price.

This could be formulated as an extension of Engel's Law according to which richer households spend less of their budget on food than poorer households: Not only there is a shift away from food in private household spending as households grow richer but households also upgrade the quality of the goods (including foodstuff) included in their consumption basket.[24] In other words, wealthier consumers are more quality sensitive, while poorer households are more sensitive to prices.[25]

The quality argument is closely related to the so-called brand effect. Given that brands usually stand for higher quality, and are associated with higher prices, richer consumers tend to buy more branded and thus more expensive goods than poorer ones.

[23] Note that the quality argument could also apply for service prices.

[24] A rise in quality also implies an increase in the variety of goods as the less well-off part of the population continues to consume goods of lower quality.

[25] There is ample anecdotal evidence of this. It suffices to walk into a supermarket in Austria, and one would find only first class fruits and vegetables, while it would be an easy task for a visitor to a supermarket on the Hungarian or Czech side of the border to detect numerous fruits and vegetables classified as second class. Importantly, most of those fruits and vegetables are not home grown but are coming from all over Europe and the world. Also, while large department stores offering cheap and thus low-quality Chinese textile products are mushrooming nowadays in Central and Eastern Europe, they are almost unknown in most of Western Europe. However, speak to a vendor in such a store, and you will soon learn that it is not possible to sell the very cheapest and very-low quality T-shirts and shoes anymore, probably because households can afford to spend more on clothing ten years ago.

A shift towards higher goods prices can occur through a simple shift towards better quality goods. However, a special case of this shift may occur in fast catching-up transition economies, where this shift towards more quality goods on the consumer side is matched with a shift towards more quality goods on the producer side. A characteristic of the transition and real convergence process is the build-up of production capacities to produce goods of better quality, chiefly thanks to FDI inflows to the manufacturing sector. The initially low-quality home products will enhance their reputations, and new local brands will emerge or the low-quality home brands will be replaced by high-quality international brands. Also, product names, which recall the socialist era, are used now to launch new product lines of higher quality (and to ride on the wave of retro fashion wave). As a result, as argued in higher prices can be set for the goods of improved quality and the shift towards better quality in household consumption will be achieved improved goods and produced in the home country rather than via imported goods.[26]

6.2. Pricing-to-Market Practices

It is not surprising that the prices of goods are different across countries if the composition of the goods in the compared baskets is not the same. It is therefore advisable to look at the price level of homogenous goods to see whether price level differences are due to the composition effect. The car price data published every year by the European Commission makes such a comparison possible, given that the prices obtained from the official price lists of the major car manufacturers refer to the very same model with the same equipment and parameters.

Figure 8 hereafter summarises the relative price levels[27] of different segments of the markets. The most striking observation is that car prices in the CEECs but also in Cyprus, Malta and Greece are generally lower than the euro area average. In particular, price differences are the most pronounced (around 10 percent) for smaller cars (segments B, C and D)[28]. This might indicate that car manufacturers are setting prices deliberately lower for smaller cars in the new member states because of the lower disposable income of households in those countries.[29]

At the same time, price differences vanish as we move towards the higher end of the spectrum, i.e. for luxury cars (segments E and F), implying the absence of pricing-to-market for this segment of the market, probably because the price elasticity of demand is much lower for luxury cars than for smaller cars.

However, there seem to be some outliers. On the one hand, the prices of small cars are very close to the euro area average in the Czech Republic, Poland and Slovakia, and the prices of the more expensive cars are even above euro area average. On the other hand, cars in the small car segments are cheapest in Hungary (around 15 percent cheaper). This divergence can be clearly explained by recent developments of the nominal exchange rates against the euro. Given that the price data provided by the European Commission is collected during the first quarter of 2006, and given that the Czech and Polish currencies appreciated by around 6 percent vis-à-vis the euro, the Slovak koruna also strengthened somewhat while the Hungarian forint depreciated by 5 percent between early 2005 and early 2006 as shown on Figure 9, higher prices in the Czech Republic, Poland and Slovakia and lower prices in Hungary simply reflect the evolution of exchange rates.[30] If we correct for these changes, the price level of small cars would stand at around 90 percent of the euro area average in all four countries and the price of luxury cars would be in parity with euro area prices. This observation indeed sheds light on the fact that car manufacturers are resorting to local currency pricing (LCP), i.e. they

[26] See e.g. Égert, Lommatzsch and Lahrèche-Révil (2006) for empirical evidence for this happening on the basis of the real exchange rate and Brůha and Podpiera (2007) for a theoretical modelling of the real exchange rate by introducing investment into quality in a New Open Economy Macroeconomics model.

[27] The data shown include VAT. However, the picture remains very similar for pre-tax prices.

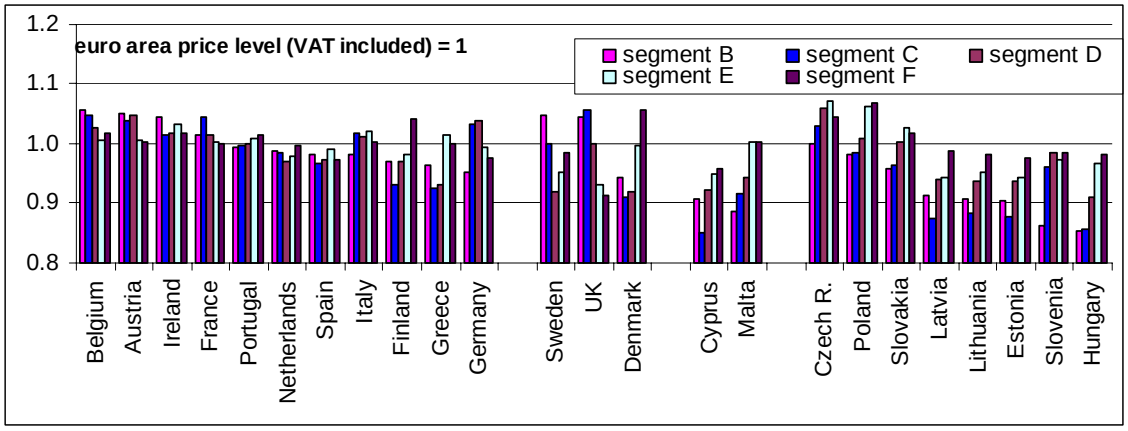
[28] For some reason, smaller cars are below euro area average also in Finland and Denmark

[29] When looking at individual car manufacturer, a few of them do not discriminate between markets even for the small car segment.

[30] If the price is fixed in the domestic currency and if the exchange rate appreciates (depreciates), the price in euro will rise (fall).

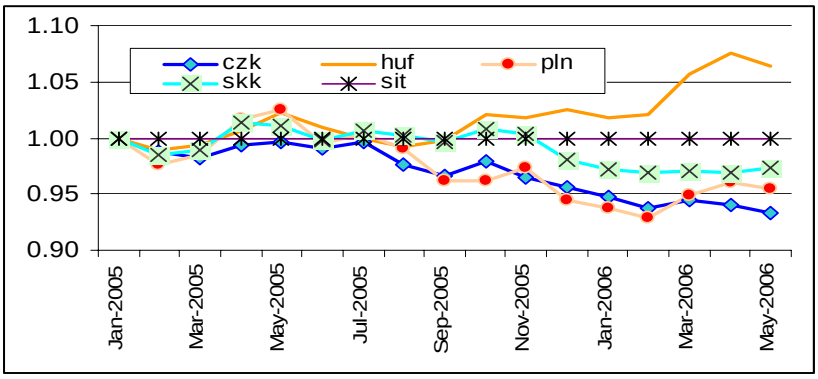
determine car prices in the domestic currency, correcting prices only with substantial delays.[31] Therefore, nominal exchange rate appreciation or depreciation is automatically mirrored in a rise or fall in the euro price.

Figure 8. The Relative Price Level of Cars (euro area=1, 2006)



Source: Author's calculations based on data obtained from the European Commission (DG Competition).
Note: Euro area average is computed as the unweighted arithmetic average of the euro area excluding Luxembourg. Segment B includes small cars like Ford Fiesta or Opel Corsa, while segment F comprises luxury cars such as Audi A8, Mercedes S350 or BMW 740i. The average price level of each segment (B, C, D, E, F) is calculated as the simple average of the price of 12, 13, 15, 6 and 3 models, respectively.

Figure 9. Nominal Exchange Rate against the Euro (2005 January=1)



Source: National central banks via the WIIW Monthly Database.
Note: An increase (decrease) indicates an appreciaton (depreciation).

6.3. The Importance of Local Factors

6.3.1. Limited Tradability and Local Tastes

Most obvious is the difference in the relative price of goods for non-durable goods. Non-durable goods very often include goods that are produced and consumed in the home country and which are not subject to international competition. For instance, trade in fresh bakery and dairy products is seriously limited due to short conservation periods, and also because of very country-specific products across countries. There are indeed a number of goods that are consumed only in one country but not in the others, eliminating the possibility of cross-border trade. The upshot is that the price of these goods is determined in the domestic market. This is precisely here that the B-S effect kicks in given that these goods are labour-intensive, and, as a result, the general wage level is a major determinant of their price

[31] Note, however, the LCP is not necessary for pricing-to-market, because differentiating in prices across markets could be also achieved using Producer Currency Pricing (PCP), i.e. when the price of goods is fixed in the currency of the producer. In such a case, changes in the exchange rate could amplify or diminish price differences across markets.

level. Hence, the price level of these goods will be lower in poorer countries because of the lower overall wage level attributable to lower productivity levels in the tradable sector. Nevertheless, the prices of these goods will increase in line with the rise of the overall wage level due to productivity gains in the open sector, which is mostly not compensated for by productivity gains in the sectors concerned.

Analogously, let us consider a good, which incorporates both inputs traded internationally and local non-tradable inputs (see Engel, 1999). Consequently, the price of the good (P^G) is a weighted average of the price of the tradable and non-tradable components as shown in equation (8):

$$P^G = \alpha \cdot P^T + (1-\alpha) \cdot P^{NT} \qquad (8)$$

Hence, in the case of low-wage countries, the higher the share of non-tradables, the lower the price of the good considered.

6.3.2. Distribution Sector

Goods may contain local non-tradable inputs not only at the production level. Another layer of local costs due to wholesale and retail distribution are in fact part of the final consumer price as shown below:

$$P^G = \alpha \cdot P^T + (1-\alpha) \cdot P^{NT} + C^D(W, R, U, M, T) \qquad (9)$$

where C^D is the cost of distribution, which can be further decomposed into a.) wage costs (W), b.) rents (R), c.) utilities such as water and electricity (U), d.) marketing costs (M) and e.) transportation related to the moving of goods to the outlets (T).

Evidently, the price of the very same good will be lower in the poorer country than the richer country simply because of cheaper distribution due to lower overall wage level and the resulting lower non-tradable price level in the poorer country.

However, this is true only if the level of labour productivity in the distribution sector is the same across the two countries, because what really matters is the level of productivity in the distribution sector. Higher productivity implies lower unit labour costs (wage over productivity) and thus lower consumer prices. As a consequence, high-wage countries need not have higher distribution costs if their distribution sectors are highly efficient.

As far as inflation developments are concerned, a catching-up in productivity in the open sector should lead to a rise in distribution costs, implying a rise in the consumer price of goods. Again, however, this holds true only if productivity does not change in the distribution sector since productivity gains could counterbalance the wage pressure coming from the open sector.

With this in mind, we set out to analyse the distribution sector in Europe. As Figure 10 indicates, there were remarkable productivity gains in the distribution sector in most of Central and Eastern Europe, in particular in the three Baltic countries, the Czech Republic and Poland. This suggests that real convergence does not exert an upward push on goods prices through the distribution sector, or even goods prices could decrease thanks to a much more efficient distribution sector.

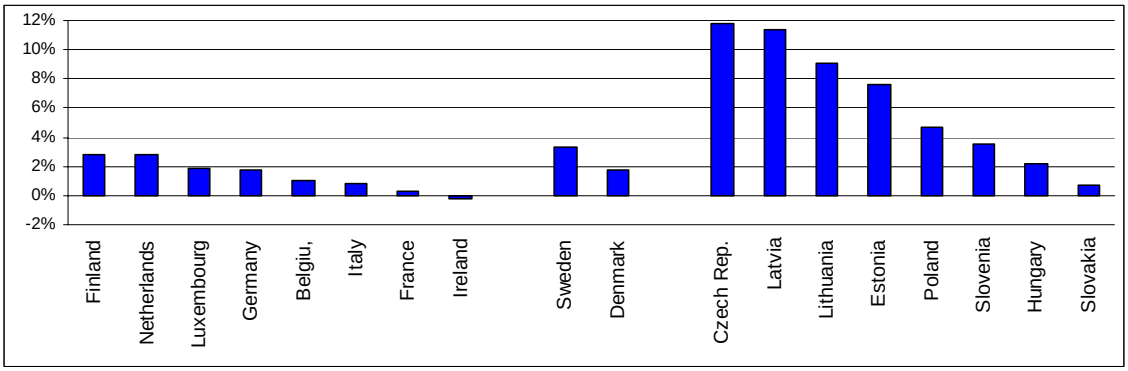
Table 7. Regulation of the Distribution Sector, 2003

Specific regulation of large outlet		Protection of existing firms		Regulation of shop opening hours	
Czech republic (1998)	0.0	Czech republic	0.0	Czech republic	0.0
Netherlands	0.0	Hungary	0.0	Hungary	0.0
Portugal	0.0	Ireland	0.0	Ireland	0.0
Sweden	0.0	Portugal	0.0	Slovak Republic	0.0
United Kingdom	0.0	Slovak Republic	0.0	Sweden	0.0
Hungary	1.0	United Kingdom	0.0	Greece	3.5
Turkey	1.8	Austria	3.0	Italy	3.5
Ireland	2.0	Finland	3.0	Turkey	3.5
Slovak Republic	2.5	Germany	3.0	Poland	4.0
Finland	3.0	Italy	3.0	Portugal	4.0
Italy	3.0	Netherlands	3.0	Austria	5.5
Poland	3.0	Poland	3.0	Denmark	5.5
Spain	3.0	Spain	3.0	Finland	5.5
Denmark	4.0	Sweden	3.0	Germany	5.5
Austria	5.0	Turkey	3.0	Spain	5.5

Belgium	5.0	Belgium	6.0	Belgium	6.0
Germany	5.0	Denmark	6.0	France	6.0
France	6.0	France	6.0	Netherlands	6.0
Greece	6.0	Greece	6.0	United Kingdom	6.0

Source: OECD Regulatory Indicators

Figure 10. Productivity Growth in the Distribution Sector, Annual Averages, 1995-2004

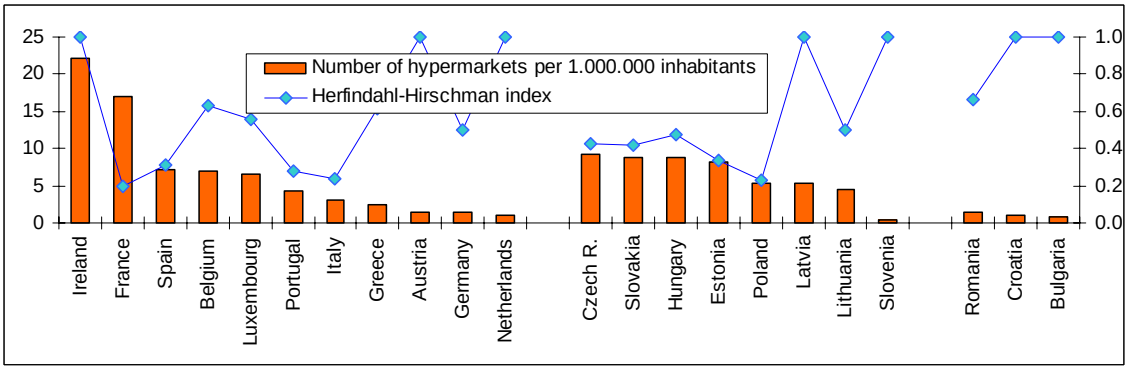


Source: Author's calculations using NewCronos/Eurostat data.
Note: 1995-2003 for Sweden and Lithuania

As a matter of fact, retail distribution was profoundly transformed in Central and Eastern Europe over the last 10 years or so as large hypermarket chains from the old EU-15 countries appeared in the region in the second half of the 1990s and the discounters moved to the region during the last five years, putting an end to the supremacy of the small corner shops and medium-size supermarket chains, and spurring considerable advances in the sector's efficiency.[32] It is worth mentioning that most of the large hypermarket and discounter chains are now present in Central Europe. By contrast, the Western European retail markets appear to be more fragmented as the French retailers concentrate on the Latin countries, the British ones on the UK and Ireland, whereas Germany and Austria is dominated by smaller discounter chains. As can be seen from Figure 11, the Baltic countries, the Czech Republic, Estonia, Hungary and Slovakia make up, after Ireland and France, one of the regions in Europe most densely covered by hypermarket stores, measured in terms of the number of hypermarkets per million inhabitants. Latvia, Lithuania and Poland match with the European average.

Two interesting observations deserve some attention. First, while Central Europe is the battlefield of all large European hypermarket and discounter retail chains, the Baltic countries form a distinct geographical market dominated by Scandinavian retailers and home-grown champions. Second, the large retailers are strikingly absent in Slovenia and in Bulgaria, Croatia and Romania.

Figure 11. Productivity Growth in the Distribution Sector, Annual Average 1995-2005.



Source: Author's calculations using NewCronos/Eurostat data and data collected from the internet (see Appendix).

[32] They are not only much more efficient in terms of turnover and profit per workers and per surface, but they are also less subject to changes in the property market because these chains usually own the ground and the building of their stores as opposed to small shops, where the owners mostly rent the shop.

6.3.3. National Tax Systems

Another widely recognised factor, which prohibits the equalisation of goods prices across countries, is the existence of national tax systems including most importantly value-added tax and other kinds of indirect taxes. Even if local factors were similar in the countries, a difference in the VAT rate (τ) would bring about persistent differences in the price level of consumer goods:

$$P^G = (\alpha \cdot P^T + (1-\alpha) \cdot P^{NT} + C^D(W, R, U, M, T)) \cdot (1+\tau) \qquad (10)$$

A first glance at Figure 12 would not lead us to conclude that differences in standard rates would explain much of the differences in overall price levels observed in particular between new and old EU member states.[33] The surprisingly similar standard VAT rates could be even viewed as a success story of tax harmonisation, in part spurred by the EU standards in this area. Nevertheless, a number of countries also have reduced and super reduced rates besides the standard VAT rate. Some countries even apply zero rates or so-called parking rates to a limited set of goods and services. Although this makes the task of assessing which part of the price level differences are due to different VAT rates a little more complicated, it would probably not alter the first conclusion that different VAT rates are overall not the major factor behind different price levels.[34]

Nonetheless, VAT changes are bound to generate sudden moves in a country's inflation rate, at least in the short run. In the period after 1996, a number of increases in the VAT rates took place in Europe. Some old member states did some upward adjustment to the standard rate by 1 or 2 percentage points. Exceptions are France, where the standard rate was cut from 20.6 percent to 19.6 percent in April 2000 and Germany, where an increase of the standard rate by 3 percentage points took effect in January 2007. By contrast, changes in the VAT rate were larger in the new member states and went into both directions. The Czech Republic and the Baltic states reduced VAT rates, while Cyprus and Slovenia increased them. Hungary implemented yoyo like changes by increasing the rates in 2004, and decreasing them in early 2006, while again implementing a rise later in the same year.

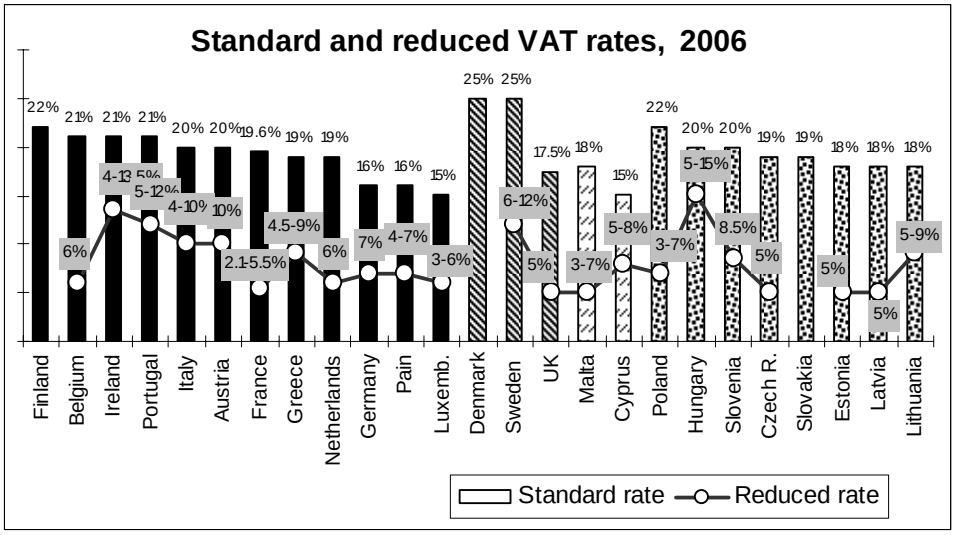
Popular wisdom holds that while tax increases are almost fully transmitted onto consumer prices, tax reductions only partially feed into consumer prices. It is therefore interesting to study the extent to which changes in VAT rates influence inflation rates in the EU after 1996. Tables 8a and 8b summarise VAT rate hikes or cuts after 1996 and their impact on the HICP one month and two months after the change took place. Notwithstanding the caveats of such an exercise[35], changes in the VAT rate turn out to have an effect on the inflation rate. The second and somewhat more puzzling result is that variations in VAT rates bring about less than proportionate changes in the inflation rates, irrespective of the direction of the change in the VAT rate.

[33] In the old EU-15 countries, standard VAT rates were increased progressively from around 10% in the 1970s to the neighbourhood of 20% nowadays, increasing inevitably the overall price level. However, new member states started economic transition in the early 1990s with already high standard VAT rates. Cyprus is an exception as it increased the rate from 5% in 1992 to 15% in 2003.

[34] Different tax rates can also bring about differences in service prices.

[35] There are two drawbacks. First, it is difficult to assess the overall effect of VAT rate changes in the presence of reduced and super reduced rate because of the lack of information to what proportion of the items in the HICP they are applied. Changes in the VAT rates could be also accompanied by a regrouping of items in standard, reduced and super-reduced rates. Second, looking at changes disregarding the development of the economic fundamentals can provide us only with an approximate measure.

Figure 12. Reduced and Standard VAT Rates in Europe, 2006.



Source: European Commission (DG Taxation and Customs Union)

Table 8a. The Unconditional Effect of Changes in VAT Rates on the HICP, 1996-2006.

Country	Date	Old and new VAT rates	Impact on prices	M-o-M change in the HICP			Direction of change	Size of change
				1M before the change in the VAT rate	1M after	2M after		
Belgium	01/01/2000	RR: 1/6/12 -> 6	???	0.5%	-0.3%	0.8%		
France	01/04/2000	SR: 20.6 ->19.6	-0.8%	0.3%	0.0%	0.1%	YES	LESS
Germany	01/04/1998	SR: 15 ->16	0.9%	-0.1%	0.2%	0.3%	YES	LESS
Greece	01/04/2005	RR: 4/4.5 -> 8/9	0.5%	0.2%	0.4%	0.3%	YES	LESS
		SR:18 ->19	0.8%					
Finland	01/01/1998	RR: 6/12/17 -> 8/17	Increase?	0.1%	0.3%	-0.2%	YES	???
Ireland	01/01/2001	RR: 4.2 -> 4.3	0.1%	-0.3%	-0.1%	0.4%	NO	LESS
		SR: 21 -> 20	-0.8%					
Ireland	01/03/2002	SR: 20 -> 21	0.8%	0.1%	0.6%	0.5%	YES	LESS
Italy	01/10/1997	SR: 19 ->20	0.8%	0.2%	0.3%	0.2%	YES	LESS
Netherlands	01/01/2001	SR: 17.5 -> 19	1.3%	0.2%	1.0%	0.5%	YES	OK
Portugal	05/06/2002	SR: 17 -> 19	1.7%	0.4%	0.3%	0.4%	NO	
Portugal	01/07/2005	SR: 19 -> 21	1.7%	0.0%	0.6%	0.4%	YES	LESS
UK	01/09/1997	RR: 8 -> 5	-2.8%	0.3%	0.0%	0.2%	YES	

Source: Author's calculations

Notes: RR and SR refer to the reduced and the standard VAT rate, respectively. The column "impact on prices" gives the change on prices implied automatically by changes in the VAT rates. The column "direction of change" indicates whether the observed unconditional change after the change in the VAT rate is in line with the change in the VAT rate. The column "size of chang" shows whether the size of the observed unconditional change after the change in the VAT rate is roughly in line with the size of the change in the VAT rate. ***Belgium:*** the reduced rates of 1 percent, 6 percent and 12 percent were replace by a single rate of 6 percent. Hence, it is difficult to assess the overall impact (increase or decrease) without having detailed information on the distribution of items across the three rates. ***Ireland:*** Reduced rates were changed on six other occasions in Ireland. These event are not reported first because changes were very small, ranging between 0.1 and 0.5 percentage points and second because no tangible effect of these changes can be observed in the data.

Table 8b. The Unconditional Effect of Changes in VAT Rates on the HICP, 1996-2006.

Country	Date	Old and new VAT rates	Impact on prices	M-o-M change in the HICP			Direction of change	Size of change
				1M before the change in the VAT rate	1M after	2M after		
Czech Rep.	29/04/2004	SR: 22 -> 19	-2.5%	0.1%	0.5%	0.0%	NO	
Estonia	01/01/2000	RR: intr 5	-11%	1.0%	0.0%	-0.1%	YES	
Hungary	01/01/2004	RR: 0/12 -> 5/15	Increase	0.4%	1.5%	0.7%	YES	
Hungary	01/01/2006	SR: 25 ->20	-4.0%	0.2%	-0.8%	0.0%	YES	LESS
Latvia	01/01/2003	RR: intr 9	-7.6%	0.4%	0.2%	0.3%	YES	
Latvia	01/05/2004	RR. 9 -> 5	-3.7%	0.5%	0.9%	0.7%	YES	
Lithuania	01/05/2000	RR: intr 5	-11%	0.1%	-0.3%	0.4%	YES	
Lithuania	01/01/2001	RR. 5 -> 5/9	3.8%	0.2%	-0.3%	0.2%	NO	
Slovenia	01/01/2002	RR: 8 -> 8.5	0.5%	0.2%	1.4%	0.6%	YES	MORE
		SR: 19 -> 20	0.8%					
Slovakia	01/07/1999	RR: 6->10	3.8%	0.9%	5.9%	0.7%	YES	MORE
Slovakia	01/01/2003	RR: 10 -> 14	???	0.7%	3.3%	0.2%		
		SR: 23 -> 20						
Slovakia	01/01/2004	One rate: 19	increase?	0.6%	2.3%	0.3%	YES	
Cyprus	01/07/2000	RR: intr 5	-2.8%	-0.4%	0.7%	0.0%		
		SR: 8 -> 10	1.9%					
Cyprus	01/07/2002	SR: 10 -> 13	2.7%	0.7%	0.6%	0.7%	NO	
Cyprus	01/01/2003	SR: 13 -> 15	1.8%	0.7%	1.0%	0.7%	YES	LESS
Cyprus	01/01/2006	RR: 5 -> 5/8	2.9%	0.0%	0.0%	0.3%	NO	
Malta	01/01/2004	15 ->18	2.6%	0.5%	0.3%	0.0%	NO	

Source: Author's calculations
Notes: See Table 8a.

7. External Factors and Economic Structures

7.1 Oil Prices

We have seen that differences in the price of fuel are mainly a result of different tax rates and thus price level convergence is purely a question of tax harmonisation. Nevertheless, changes in oil prices may influence countries very differently on two grounds. The first reason can be found in differences in the position in the business cycle. Oil price increases are more easily and quickly passed through to consumer prices during periods of strong economic conditions than during times of slow growth. Consequently, a given rise in the price of oil will affect inflation rates differently, if business cycles are not synchronised across countries.

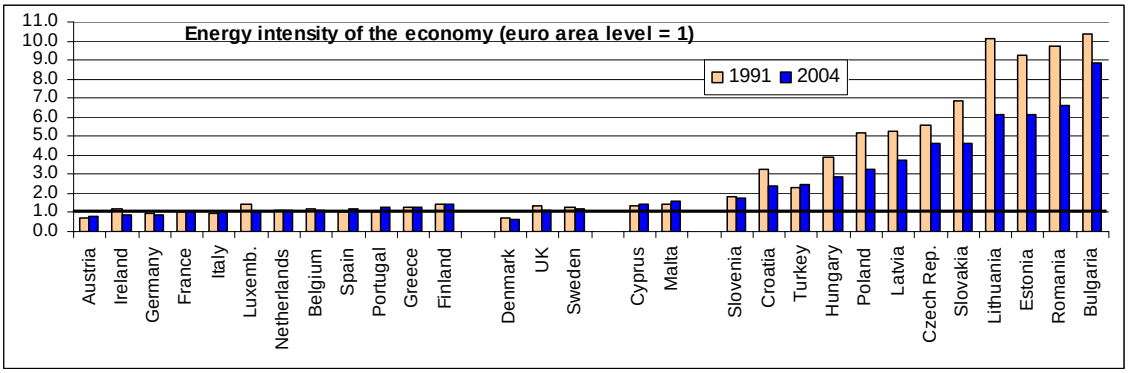
The second reason is more structural. Despite profound economic restructuring and modernisation, the economies of the former Eastern bloc remain very oil intensive. The most oil intensive economies, like Bulgaria, Estonia, Lithuania and Romania need six to nine times more oil to produce the same amount of GDP than Western European countries, although these figures almost halved from 1991 to 2004. And even the most oil efficient transition economies such as Slovenia and Croatia consume at least twice the amount of oil per unit of GDP than their Western counterparts. In addition, the transition economies (except for the Czech Republic, Poland and Slovenia) import considerably more oil per unit of GDP than the euro area average, as evidenced by Figure 13b. Nevertheless, this picture needs to be viewed with some caution given that these calculations are based on GDP figures converted at current market exchange rates to the euro. The use of PPP exchange rates would result higher GDP figures, which in turn would reduce the oil intensity of the countries under study.

The implications are twofold. First, a rise in the price of oil has a larger impact on production costs. Consequently, producer prices are bound to increase faster than in the euro area, which may fuel domestic inflation for domestically produced and consumed goods and it also causes losses in competitiveness and a deterioration of the trade balance. A correction of the trade balance could then lead to a nominal depreciation, which, in a second round, will lead to higher imported and thus overall inflation. There is also a direct feedback to the consumer price index, which is determined by the share of fuel products in the HICP, and from a broader perspective, the share of energy products (including heating oil and gas, the price of which are related to oil price movements) in the HICP. While fuel accounts for a similar proportion of the HICP in the transition economies and in the euro area (with the

exception of Estonia and Slovenia), energy items represent a 40 percent to 100 percent larger chunk of the HICP in the transition economies when compared to the euro area average (see Figure 17c). Clearly, transition economies would react with higher inflation rates to hikes in energy prices.

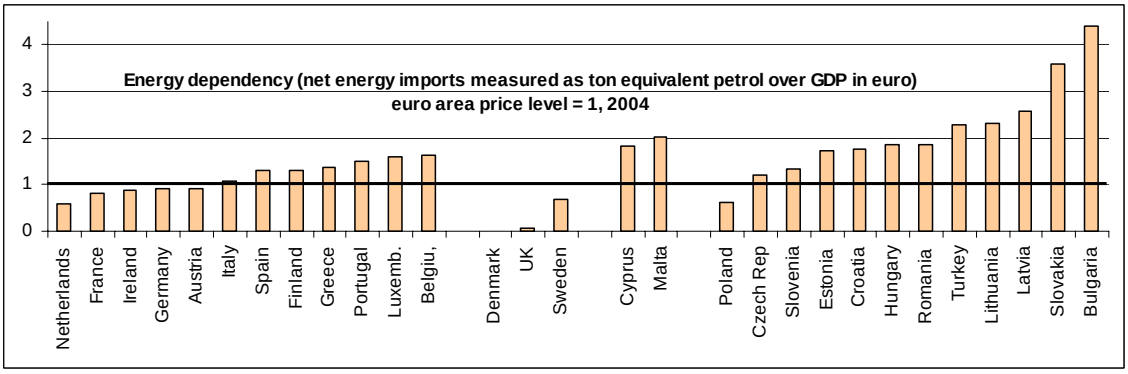
However, real catching-up also bears further economic restructuring and a convergence of economic structures, which would entail a further fall in oil intensity and in the share of energy in the HICP and in more synchronisation of the reactions to changes in oil prices.

Figure 13a. Oil intensity of the economies, 1991 and 2004 (current prices)



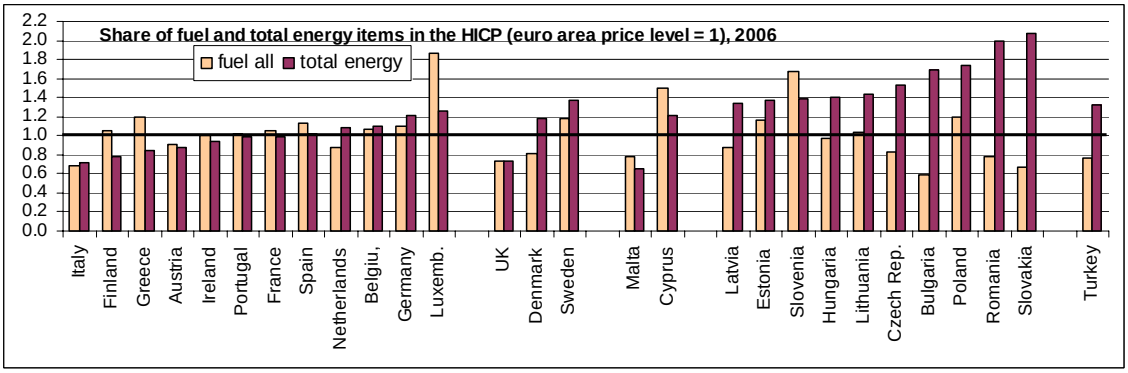
Source: Author's calculations using NewCronos/Eurostat data.

Figure 13b. Energy dependency, 2004



Source: Author's calculations using NewCronos/Eurostat data.

Figure 13c. Share of fuel and total energy in the HICP, 2006



Source: Author's calculations using NewCronos/Eurostat data (3-digit COICOP disaggregation of the HICP).

7.2 The Exchange Rate

7.2.1 The Exchange Rate Pass-Through

The exchange rate pass-through is one of the channels through which exchange rate changes could generate asymmetric responses in inflation rates. The first obvious asymmetry exists between euro area countries and the transition economies because exchange rate pass-through matters much less for the euro area than for the transition economies. What really matters for euro area countries is the euro/dollar exchange rate and their extra euro area openness whilst exchange rate pass-through is potentially important for the entire foreign trade of the transition economies (except for those with currency board arrangement vis-à-vis the euro, like Bulgaria, Estonia and Lithuania).

A second asymmetry pointed out for instance by Lane and Honohen (2004) regards the euro area itself given differences in the degree of extra euro area openness across member states.

Finally, differences in inflation rates brought about by exchange rate developments could be potentially larger across transition economies than within the euro area for a number of reasons. On one hand, changes in the exchange rate faced by individual economies are simply different due to different exchange rate arrangements (peg, managed or free floating) and due to diverging developments of the economic factors affecting the exchange rate, which may or may not reflect differences in the business cycle position. On the other hand, even though the exchange rate, whether the rate against the euro or the effective exchange rate, moved the same amount in all transition economies, the outcome on prices would be different because the size of the exchange rate pass-through differs across countries.

Let us now turn to the factors determining the size of the exchange rate pass-through and summarise the estimation results available for transition economies. There is indeed a substantial amount of research dealing with the question of how the exchange rate influences domestic prices. The starting point is how firms set the prices of imported goods. If the prices of imported goods are set in the local currency (local or consumer currency prices, LCP), the exchange rate will have zero impact on prices (zero pass-through). By contrast, if the price of an imported good is set in the exporting country's currency (producer currency pricing - PCP), any change in the exchange rate will be immediately reflected in the price of the given good (complete pass-through).

The exchange rate pass-through could cause consumer prices to change via imported goods in the consumer basket and also through imported intermediate goods affecting, firstly, producer prices and then consumer prices. Even though the pass-through is complete for imported goods, there are good reasons to think that the pass-through would be lower for producer prices and even lower for consumer prices. First, final consumer prices include the costs of wholesaling and retailing (including transportation, marketing and advertisement and, importantly, wage costs), which are less sensitive to exchange rate movements and thus create a buffer between prices and the exchange rate. Second, final products may be a combination of imported and domestic goods. While PCP may apply to the imported intermediate good, the pass-through will be lower than unity because of the domestic goods component.

There are two widely accepted observations regarding the pass-through. The exchange rate pass-through is generally found to be higher in developing and emerging market economies than in more established market economies. At the same time, the exchange rate pass-through was declining in most of the countries over time. A first strand of the literature stresses the importance of the macroeconomic factors, in particular inflation rates (Taylor, 2000). The higher inflation is, the higher the exchange rate pass-through is thought to be because in a high inflationary environment, prices are adjusted more frequently. This implies that exchange rate changes can be incorporate into prices more quickly. Hence, higher pass-through in developing countries can be explained by chronically higher inflation rates. At the same time, the magnitude of the pass-through has declined over time because of decreasing inflation rates both in developing and developed countries.

Another body of the literature argues that what is crucial for the size of the pass-through is the composition of imports (Campa and Goldberg, 2002). This literature points out that the pass-through is higher for homogenous goods, while it is lower for differentiated goods, where there is more scope for

pricing-to-market practices. As a result, poorer countries that import more homogenous goods face higher pass-through than richer countries where the share of manufactured goods in total imports is higher. In addition to that, a shift in the composition of imports towards more differentiated goods occurs with economic development. Hence, catching-up countries may see an increase in the exchange rate pass-through.

Nevertheless, Frankel, Parsley and Wei (2005) cast some doubt on the role this so-called composition effect plays in the size of the pass-through as they find that the pass-through for very homogenous goods such as Marlboro cigarettes, Coca-cola, Cognac, Gilbey's gin, Time magazine, Kodak colour film, Cointreau liqueur and Martini&Rossi Vermouth is much lower at the docks in the US than much of the rest of the World.

Expectations are another important factor determining the importance of the pass-through. Generally, the pass-through is higher if changes in the exchange rate are perceived as permanent rather than temporary. However, and more importantly, exchange rates are or were frequently used in transition economies to provide a nominal anchor for inflationary expectations. If the exchange rate is a credible anchor for instance in a crawling peg or band type of arrangement, then changes in the exchange rate will be quickly incorporated into expectations and, consequently, into (both tradable and non-tradable) prices. By contrast, the exchange rate should not be strongly associated with the exchange rate in an inflation targeting framework, where expectations are anchored down by credibly communicated inflation target. In such a framework, the pass-through is low because of the disconnect between non-tradable prices and the exchange rate.

Both inflation rates and the composition effect seem to go in the direction of a reduced exchange rate pass-through in most transition economies (Table 9). From the viewpoint of the macroeconomic environment, inflation rates decreased substantially between 1997 and 2005, with very large drops in Bulgaria, Hungary, Poland and Romania. The composition effect, measured as the share of manufactured goods and machinery and transport equipment in total imports in 2005, also suggest low pass-through given a very large share of differentiated goods in most countries. In addition, this share rose substantially in all countries but Slovenia.

At the same time, the long-run exchange rate pass-through coefficients allow us to see the effect of different monetary policy and exchange rate regimes on the pass-through. The pass-through is the lowest in the Czech Republic where direct inflation targeting and float exchange rates have a long track record. It tends to be higher in Hungary, Romania and Slovenia, where the exchange rate has been an intermediary target of the monetary policy.

Table 9. Long-Run Exchange Rate Pass-Through in Transition Economies

	CPI	ΔCPI	COMPOSITION EFFECT		EXCHANGE RATE PASS-THROUGH		
	%	%	LEVEL	CHANGE	To IMPORT	To PPI	To CPI
Czech Rep	1.6	-6.4	73.8	+20.1	0.65	0.41	0.23
Hungary	3.5	-15.0	77.3	+19.4	0.87	0.57	0.30
Poland	2.1	-12.8	67.7	+12.4	0.84	0.60	0.31
Slovakia	2.8	-3.2	69.1	+30.9	1.01	0.73	0.35
Slovenia	2.	-5.9	67.5	+5.5	0.40	0.78	0.53
Estonia	4.2	-5.1			0.83	0.47	0.35
Latvia	7.0	-1.1			0.45	0.66	0.39
Lithuania	2.7	-7.6			0.32	0.55	0.32
Bulgaria	5.0	-13.8	60.2	+20.3	--	0.94	0.68
Croatia	3.3	-2.4	66.5	+22.2	--	0.17	0.22
Romania (EFF/EUR)	9.1	-146.9	68.6	+24.0	--	0.48	0.21
Romania (USD)					--	0.53	0.42

Source: Exchange rate pass-through estimates come from Coricelli, Égert and MacDonald (2006).
Notes: The CPI figures refer to 2005, and ΔCPI is the difference between average annual inflation in 2005 and in 1997. For Bulgaria and Croatia, the difference is calculated for 2005 and 1998. The level of the composition effect is given as the share of manufactured goods and machinery and transport equipment in total imports in 2005. The change indicates the change from the early 1990s to 2005. Figures for the long-run exchange rate pass-through are averages obtained on the basis of available long-run pass-through estimates from the literature. The averages are based on non-negative pass-through estimates. Negative pass-through estimates were set to zero.

7.2.2 Trend Nominal Appreciation – Equivalence or Fallacy?

As we have seen, the influence of the exchange rate on domestic inflation is slowing down in the transition economies. Hence, a given change in the exchange rate is not reflected in a correspondingly high change in the inflation rate. In contrast to this stands the role of the exchange rate on price levels since for instance an appreciation of the exchange rate will increase the price level of the transition economies expressed in euros. This increase will be immediate and full in the very short-run. In the longer term, the impact depends inversely on the strength of the exchange rate pass-through. A lower pass-through will imply that a nominal appreciation or depreciation would cause a more important increase or decrease in the price level expressed in euros.

It is worthwhile pausing in this context on the equivalence advocated by numerous economists between price level convergence caused by higher productivity-driven inflation rates (Balassa-Samuelson) and price level convergence due to the appreciation of the nominal exchange rate. In the standard Balassa-Samuelson framework, PPP holds for tradables, so the change in the price level comes as an increase in non-tradable prices due to productivity gains in the tradable sector. In the case of nominal appreciation, a rise in the price level comes once again from the rise in the price level of non-tradables due to the nominal appreciation, while the prices of tradables remain constant in the foreign currency given that PPP holds.

Nevertheless, if we consider this equivalence more in depth, it quickly turns into a fallacy. Because of the incomplete pass-through to tradable goods, PPP fails to hold for tradable goods and the failure of PPP implies that the real exchange rate of the open sector appreciates. This has two implications. First, an appreciation, which is needed to produce the size of a price level convergence, which equals the one due to the Balassa-Samuelson effect (non-tradable prices) leads to a more pronounced increase in the price level, because the price level of the tradable goods also rises. Second, it worsens competitiveness as the real exchange rate of the tradable goods appreciates. This stands in contrast to the B-S effect, which is competitiveness neutral and where price level convergence comes only through non-tradables.

The equivalence might be extended to the whole price level because we have seen that tradable goods are also a source of price level convergence. This means that real convergence may also entail an increase in the price level of tradable goods, thanks to a shift to better quality goods and perhaps also to pricing-to-market practices. Now, the question is whether these price increases are fully equivalent to a nominal appreciation. The answer is clearly no for two reasons. From a consumer viewpoint, a nominal appreciation raises the price level of both poor and better quality goods, while this is not the case if price level convergence comes via a mismeasurement of a shift towards high price goods. From the perspective of exporting firms, nominal appreciation worsens the competitiveness of the very same good, while competitiveness is not affected if prices increase because of better quality.

Nevertheless, nominal appreciation could be sustained for some time. In particular, high mark-up sectors could react by squeezing profits. In addition, firms which have large foreign currency denominated liabilities could compensate by narrowing margins via the decrease in their debt's value in domestic currency terms (balance sheet effect).

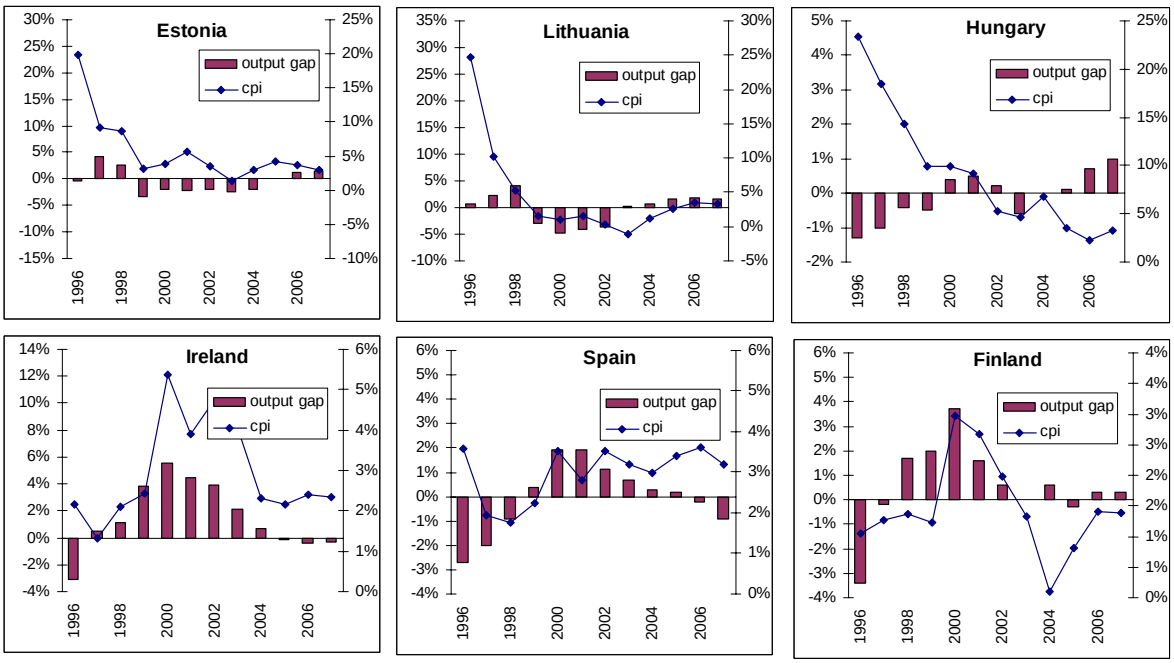
Yet, price level convergence coming exclusively from a nominal trend appreciation could mean a bumpy road. First, low mark-up sectors will loose out very quickly. Second, even for high mark-up sectors, mark-ups will be squeezed to zero and/or prices on the exports markets will increase leading to losses in market shares at some point. This hollows out the export sector, which is the main engine of real convergence in transition economies. Also, domestic input prices, like rents, market and non-market services and, importantly, wages would increase in foreign currency terms. Even though this could be compensated by a drop in the price of imported inputs, such increases could prompt the reallocation of economic activity to cheaper locations.

7.3 Business Cycle Synchronisation

The output gap is usually viewed as an important determinant of inflation rates (see e.g. Lane and Honohen, 2004; Angeloni and Ehrmann, 2004 and Hofmann and Rembsperger, 2005, for euro area countries and Rogers, 2001, 2002, more generally). However, the link between output gaps and

inflation rates is not that obvious as shown in Figure 14 below because some items such as regulated prices and the prices of those goods that are strongly influenced by external factors may be not connected to domestic output gaps. Indeed, the European Commission (2006) shows that headline inflation is less correlated with the output gap than a number of hand-picked goods and services. This phenomenon is also demonstrated by Chmielewski and Kot (2006) for the case of Poland.

Figure 14. Output gaps and inflation rates (HICP) in selected countries



Source: AMECO Database.
Note: The output gap is calculated as the gap between actual and trend gross domestic product at 2000 market prices.

If we assume that output gaps and inflation rates are related,, inflation rates may differ across countries thanks to differences in output gaps, i.e. the position in the business cycles. The literature on optimal currency areas deals extensively with the question of how business cycles can become more synchronised if the exchange rate is fixed. Factor mobility, labour market flexibility, trade openness and similar economic structures figure on the wish-list.

A relatively recent argument, which elaborates more on similar economic structures, says that intra-industry trade is a key determinant of business cycle harmonisation (Frankel and Rose, 1998). The higher the share of openness and the more important the share of intra-industry trade in total trade flows, the stronger the synchronisation of business cycles because a slowdown or acceleration in a given sector will equally affect both countries. Also, Frankel and Rose (1998) argue that intraindustry trade would secure endogenously business cycle synchronisation. Business cycles may be less correlated today, but if the share of intraindustry trade in total trade is high enough, business cycles will become synchronised in the future.

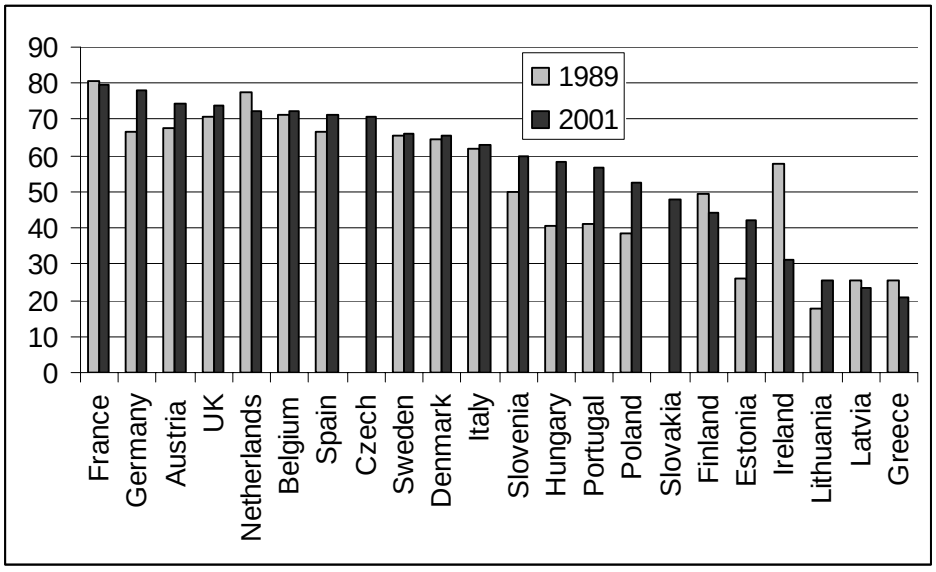
Finally, fiscal policy has recently been found to have a strong impact on business cycle fluctuation. Darvas, Rose and Szapáry (2005) demonstrate for the case of 21 OECD countries that higher fiscal convergence in terms of the government's budget position tends to be linked to higher business cycle synchronisation.

A large number of studies sought to determine the degree of business cycle synchronisation within the euro area on the one hand, and between the euro area and the transition economies on the other. Regarding business cycle synchronisation between transition economies and the euro area, the empirical results indicate a substantial amount of heterogeneity across countries. For instance, Darvas and Szapáry (2005) find that Hungary, Poland and Slovenia are the countries with the highest degree of synchronisation concerning GDP, industry and exports, while the Baltic countries, the Czech

Republic and Slovakia exhibit less co-movement with the euro area business cycle. This result is confirmed in a meta-analysis by Fidrmuc and Korhonen (2006), which actually summarises the results of 35 papers. The result is not very surprising in the light of the evolution of intraindustry trade as a share of total trade. As shown in Figure 15, intraindustry trade in total trade rose sharply from 1989 to 2001 in the Central and Eastern European countries. Hungary, Poland and Slovenia are the ones with the highest shares.

However, some qualifications are of order. First, the share of intraindustry trade in total trade is still lower in these three countries than in core euro area countries. As a result, Eickmeier and Breitung (2006) find that transition economies are less correlated with the euro area than core euro area countries among them. Second, despite very high intraindustry trade, the Czech Republic is only weakly correlated with euro area business cycle, most probably because the 1997 currency crisis and the following economic recession dominates the short sample. Nevertheless, the endogeneity argument would lead to more synchronisation in the future. Third, the case for the Baltic countries is less sure because of the low share intraindustry trade in total trade.

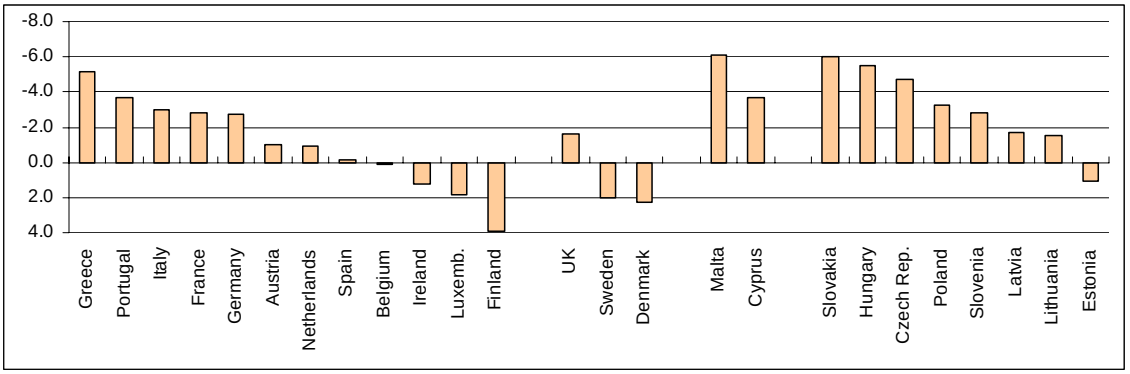
Figure 15. Intra-industry Trade with the EU-15 in 1989 and 2001



Source: Djablik and Fidrmuc (2004)

If we take seriously the argument about fiscal position and business cycle synchronisation, we would think, based on Figure 16 below, that fiscal policy would matter a lot in this respect both within the euro area and also between the euro area and the transition economies. Less correlation between core euro area countries and economies on the periphery could be a result of high public deficits in Greece and Portugal and large surpluses in Finland and Ireland. Transition countries that have higher intraindustry trade with the euro area tend to record higher public deficits than the Baltic states. These differences could compensate if not offset completely each other's impact on business cycle correlation.

Figure 16. Consolidated balance of the general government (% of GDP), 2000 to 2005



Source: NewCronos/Eurostat. General government's net lending (+) net borrowing (-) under the Excessive Deficit Procedure.

8. The Mismatch between Price Level Convergence and Inflation Differentials

Thus far, we have attempted to illustrate, where appropriate, how structural and cyclical factors may impact differently on price level convergence and on inflation differentials, i.e. why inflation differentials are not necessary a synonym for price level convergence and vice versa. In this section, these differences are put forth more explicitly and summarised in Figure 17. Let us start with the long-term factor. First, the influence of the long-term nominal exchange rate trends hinges on the strength of the exchange rate pass-through. If the exchange rate pass-through is complete, exchange rate changes will fully show-up in inflation rates, but will have no consequence on relative price levels. In contrast, if the pass-through is weak, exchange rate changes will have little influence on the inflation rate but will move up or down the relative price level.

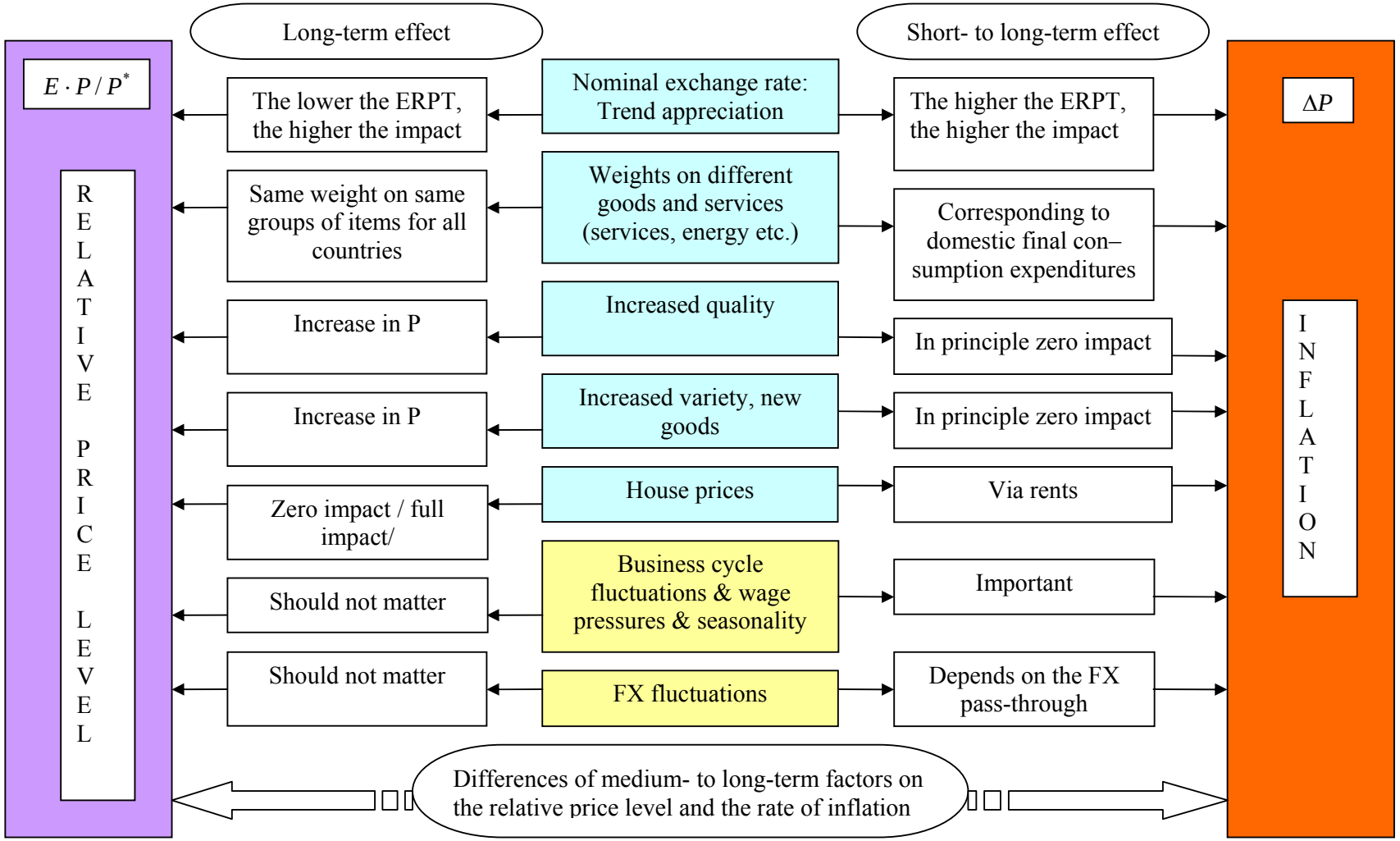
Second, the weights attributed to different items are comparable in price level comparison while they depend on final household expenditure for the inflation rate. As a result, major difference in consumption patterns will be reflected in different weights. The upshot of this is that price level convergence can happen with less than corresponding inflation rates and that higher inflation rates do not necessarily cause a corresponding convergence in price levels. For the first, let us consider the share of market prices. As their share in the consumer basket is lower in the transition economies than in euro area countries, a Balassa-Samuelson type of increase would lead to lower inflation rates in transition economies, but it will cause a levelling of price levels. Energy prices, which are more important in the transition economies' HICP than in the euro area countries' HICP, stand in contrast to this. Hence, increases in energy prices will lead to higher inflation but to less price level convergence in transition economies.

Third, changes in quality and the introduction of new goods should not matter for inflation rates given that they are assumed to be corrected for these two factors (even though this is not exactly the case in practice). By contrast, the collection of data on price levels, carried out at low frequencies (typically every 3 years) does not ensure the comparability of the data over time. As a result, the effect of new higher-price goods or of better quality goods will not be filtered out from the data and will result in higher price levels.

Finally, house prices feed into inflation rates only indirectly via rents. Here again, the overall impact crucially depends on the share of rents in the HICP, which can vary substantially across countries. By contrast, house prices show up both directly (via house prices) and indirectly (via rents) in the price level data that one can observe in practice. Nevertheless, these pieces of information seem to be lacking from official statistics such as those provided by Eurostat and national statistical offices, which do not encompass house prices and rents.

Coming now to the short-term factors such as business cycle fluctuations, seasonality or exchange rate fluctuations, it is clear that these factors are important for inflation developments but less so for price level convergence.

Figure 17. Differences and Similarities of Factors Affecting Price Level Convergence and Inflation



9. Decomposing Inflation Developments

9.1. Evidence from an Accounting Framework

In this section, we first analyse the prices of the most important categories of the HICP, namely energy, food, services including regulated services and rents, relative to the price of (non-energy) goods (including durable, semi-durable and non-durable goods). We then study the contribution of the main categories to the overall inflation rate. For this purpose, we use a simple accounting framework, where the average annual contributions are calculated as the average annual growth rate of a given category multiplied by its share in the HICP and compared to overall inflation.

Regarding relative price developments, some general observations can be drawn from Table 10 presenting averages for 1996 to 2005 and 2001 to 2006[36]. First, the relative price of energy increased faster in transition economies than in the euro area, notwithstanding large dispersion within the euro area (1 percent in Italy and close to 6 percent in the Netherlands). Second, while the relative price of services also tends to rise faster in transition economies (with the exception of Latvia, Poland and Romania) than in the euro area (except for Ireland), regulated services and rents, which are parts of overall services, grew at even higher rates in most of the transition economies (except in Slovenia) but remained more in line with overall service prices in the euro area (except for Ireland). Finally, relative price adjustments for foodstuff are comparable or even lower in transition economies than in euro area countries.

Notwithstanding these observations, service price inflation contributes only to 20 percent to 40 percent of the HICP in transition economies, while the range goes from 30 percent to 70 percent in euro area countries. An exception is the Czech Republic with services contributing to nearly 70 percent of the HICP. In addition to this, regulated services account for around 1/3 to 1/2 of service price inflation in Central and Eastern Europe, and to a much lesser extent in the euro area except for Finland, Germany and Ireland. By contrast, rents barely have any effect on the inflation rate in the transition economies, whereas they represent up to 15 percent of the HICP in the euro area.

In contrast to services, price increases in energy and foodstuffs clearly make up a larger chunk of the HICP in Central and Eastern Europe than in the euro area, with the contributions ranging from 20 percent to 50 percent against 10 percent to 30 percent for energy and from 20 percent to 50 percent against 20 percent to 30 percent for foodstuffs.

Finally, the importance of goods inflation for overall inflation appears comparable, even though cross-country heterogeneity within the country groups is again fairly high.

[36] For some countries, only data for the subperiod are available. For Estonia and Hungary, disaggregated data for the main components of the HICP are available on from 2002 to 2005.

Table 10. Accounting Framework: inflation in Europe

			Relative prices to that of industrial goods						Respective contribution to the inflation rate (in %)					
		Inflation (HICP)	energy	food	services			goods	energy	food	services		
					all	reg serv.	rents				all	reg serv.	rents
euro area	1996-2005	1.9	3.0	1.3	1.5	0.9	1.1	14	17	23	46	7	7
	2001-2005	2.2	2.9	1.9	1.7	2.1	1.0	12	15	25	48	11	5
Austria	1996-2005	1.5	2.9	1.5	2.1	3.0	2.8	4	16	18	63	14	9
	2001-2005	1.9	2.7	1.8	2.2	3.3	2.8	6	12	19	62	15	6
Belgium	1996-2005	1.8	3.1	1.2	1.3	0.2	1.1	14	23	24	40	3	6
	2001-2005	2.0	2.4	1.4	1.1	-0.4	1.0	17	18	25	40	2	7
Germany	1996-2005	1.3	4.5	1.3	1.3	2.7	1.1	4	34	19	45	19	10
	2001-2005	1.6	4.7	2.1	1.5	2.6	0.9	3	29	23	46	18	8
Luxembourg	1996-2005	2.4	3.8	2.3	1.6	1.7	1.6	15	20	32	34	5	5
	2001-2005	2.8	3.1	3.1	1.8	1.9	1.2	14	17	39	33	5	3
Netherlands	1996-2005	2.5	5.6	1.1	2.1	3.0	2.1	12	24	16	48	15	12
	2001-2005	2.8	5.8	1.3	2.8	3.6	1.9	10	21	14	54	17	8
Ireland	1996-2005	3.2	5.0	3.4	4.8	7.1	5.0	-1	14	28	60	18	4
	2001-2005	3.4	5.0	2.8	5.2	7.5	3.6	1	12	21	69	20	3
Finland	1996-2005	1.5	3.0	0.7	2.1	3.0	2.5	6	19	15	60	18	12
	2001-2005	1.4	2.5	0.5	2.0	3.0	2.5	7	15	13	68	23	15
Italy	1996-2005	2.3	1.2	0.4	1.1	1.1	1.6	26	9	19	46	7	4
	2001-2005	2.4	1.0	1.3	1.2	1.2	0.8	24	7	24	46	7	3
Greece	1996-2005	3.6	0.8	1.2	2.0	2.1	2.4	23	7	27	45	11	5
	2001-2005	3.5	1.9	1.4	1.5	2.0	2.2	22	8	26	44	14	4
Portugal	1996-2005	2.8	2.4	0.8	2.5	3.2	1.1	18	12	21	49	11	2
	2001-2005	3.2	3.4	0.6	2.4	3.3	0.8	18	14	17	50	12	2
Spain	1996-2005	2.8	1.7	1.5	2.1	2.1	2.8	18	10	29	45	7	3
	2001-2005	3.2	1.4	2.6	2.3	2.3	2.6	15	8	33	44	7	3
France	1996-2005	1.6	2.5	2.2	1.6	1.8	1.7	6	15	34	45	10	8
	2001-2005	2.0	2.2	2.5	2.0	1.9	2.0	8	11	31	50	11	8
Denmark	1996-2005	1.9	3.8	0.9	2.6	2.6	2.2	6	23	14	56	13	11
	2001-2005	1.9	2.3	0.4	2.5	3.5	2.0	10	17	11	61	21	11
Sweden	1996-2005	1.5	4.7	1.7	2.5	2.2	2.2	-7	35	20	53	8	14
	2001-2005	1.7	5.8	1.4	2.6	2.3	2.6	-3	37	14	53	8	14
UK	1996-2005	1.4	5.7	3.9	5.9	5.3	5.0	-48	17	22	109	19	10
	2001-2005	1.5	5.7	4.1	6.2	7.1	5.0	-51	13	19	119	32	9
Cyprus	1996-2005	2.7	8.4	4.8	3.3	5.1	3.3	-3	24	41	36	12	1
	2002-2005	2.7	12.5	6.6	4.5	7.2	4.9	-18	33	44	40	18	1
Malta	1996-2005	2.8	5.4	2.3	3.3	3.8	0.6	9	11	25	56	9	0
	2001-2005	2.4	5.1	2.3	3.0	3.9	0.7	7	11	26	57	10	0
Czech Rep.	2001-2005	2.0	5.5	2.4	5.4	6.1	5.0	-14	29	19	67	16	8
Estonia	2002-2005	3.0	7.2	1.8	3.4	5.7	2.9	5	35	25	37	15	2
Hungary	2002-2005	5.1	4.2	2.1	4.6	6.1	5.7	14	18	26	42	12	0
Latvia	1996-2005	4.2	2.3	-0.1	2.0	2.1	7.2	20	19	32	31	12	5
	2001-2005	4.1	2.8	2.4	0.8	2.5	2.2	17	17	45	22	11	1
Lithuania	1996-2005	2.6	7.3	0.2	4.7	5.4	11.9	7	45	15	39	15	2
	2001-2005	0.9	3.9	2.6	3.6	4.5	4.8	-35	37	50	49	21	1
Poland	1996-2005	6.4	3.6	-0.4	2.8	3.9	7.7	23	21	27	31	10	7
	2001-2005	2.7	3.6	0.4	1.6	3.4	3.8	17	30	25	31	15	8
Slovakia	2001-2005	5.9	9.3	2.0	7.2	10.0	15.2	8	31	18	44	14	4
Slovenia	2001-2005	5.6	4.7	1.8	4.0	2.9	5.2	17	18	22	42	9	3
Bulgaria	1996-2005	7.3	7.5	-0.9	10.2	14.8	21.8	16	27	28	34	17	1
	2001-2005	5.3	4.5	-0.1	2.1	4.2	1.5	17	26	35	23	12	0
Romania	2002-2005	14.7	10.3	0.7	2.5	8.5	3.8	17	30	40	14	12	0
Turkey	1996-2005	47.7	4.6	1.5	6.1	6.5	8.6	28	12	33	27	11	6
	2001-2005	29.5	7.1	1.6	2.0	2.8	1.4	27	15	32	26	11	5

Source: Author's calculations.
Note: Relative prices to those of industrial goods are obtained as average annual inflation rate of a given subcategory over the average annual inflation rate of industrial goods. The respective contribution to the inflation rate is computed as the average annual inflation rate of a subcategory multiplied by its share in the CPI divided by the average annual inflation rate.

9.2. Econometric Evidence

9.2.1 Data Description and Preliminary Data Analysis

We now proceed to test econometrically the relative importance of the factors analysed thus far and regress yearly domestic inflation rates (HICP) on a set of yearly structural, cyclical and external factors for three groups of countries, namely 1.) the euro area excluding Luxembourg, 2.) transition economies (CEE-10) including the CEE-5, the three Baltic countries, Bulgaria and Romania and 3.) the euro area and the CEE-10. The tests are carried out for the period from 1996 to 2005. The choice of the period is given by the availability of the HICP data. We also investigate the period after the launch of the euro, i.e. from 1999 to 2005.

We use six blocks of variables in an attempt to cover comprehensively the determinants of inflation rates. The first block focuses on cyclical factors. Two output gap measures [37] - both obtained from the European Commission -, the rate of growth of unit labour costs and the consolidated balance of the general government as a share of GDP are used to capture the influence of cyclical factors on the inflation rate.

The second and third blocks focus on structural factors. In the second block, the Balassa-Samuelson effect is analysed in two different ways. First, the narrow and the wide estimates of the Balassa-Samuelson effect from column 6 and 7 of Table 3 are used along the lines of Hofmann and Remsperger (2005). In addition to this, time series of the productivity differential between the open sector and the market service sector, as computed for Table 3, are also employed.

The third block of variables deals with other structural factors related to changes in final household consumption due to economic catching-up. It is difficult to find good and precise measures of the other sources of structural inflation linked to goods prices. Nevertheless, the use of initial price levels could provide us with useful – and indirect - insights. Hence, the relative price level of 1997 is used to see the extent to which initially different price levels could generate diverging inflation rates. We use a number of variables that may reflect changes in the structure of final household consumption. First, the growth rate of GDP per capita might be able to capture the shift in private consumption to better quality goods and to more services as disposable income increases. Second, the share of food items in the HICP basket should be negatively related to a shift towards better quality goods and to more services. Third, changes in the share of recreation in the HICP including both goods and services are to reflect a similar shift. Finally, the growth rate of final household consumption at constant prices might be used as a proxy for demand-side pressures, both for goods and services.

The fourth block of variables looks at the extent to which regulated prices impact on the inflation rate. We use three variables capturing the effect of regulated prices on overall inflation: inflation rates that are constructed in accordance with the narrow, intermediate and broad definitions of regulated prices.

The fifth model concerns external factors, namely changes in the price of crude oil and external openness to exchange rate fluctuations. The second variable is obtained as import openness (import of goods relative to GDP) multiplied by the nominal effective exchange rate[38]. For euro area countries and countries with a currency board linked to the euro (Bulgaria, Estonia and Lithuania), non-euro area openness (proxied by extra EU-15 imports) is used, while total import of goods is retained for the remaining transition economies.

The final set of variables covers monetary aggregates, annual changes in M2 and M3 (depending on data availability), yearly growth rates in residential house prices and two dummy variables that are constructed to measure the effect of increases and decreases in VAT. The variables take the value of 1, if there was an increase or decrease in VAT in a given year.[39]

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[37] The first measure is the gap between actual and trend gross domestic product at 2000 market prices (output gap). The second measure is the gap between actual and potential gross domestic product at 2000 market prices (output gap2).

[38] An increase (decrease) in the nominal effective exchange rate indicates an appreciation (depreciation).

[39] The source of the output gap, unit labour cost, GDP per capita, final household consumption, openness and the nominal effective exchange rate variables are drawn from the AMECO database of the European Commission. Data for the productivity differential are constructed as explained earlier in the text. The regulated price series, the share of food and recreation activities are constructed using data obtained from Eurostat's NewCronos database. Monetary aggregates come

Finally, in accordance with the general finding of a high inflation persistence in the euro area (see e.g. Angeloni and Ehrmann, 2004 and Angeloni, Aucremanne and Ciccarelli, 2006), we also include the HICP lagged with one year.

9.2.2 Estimation Results

All the data are of annual frequency and are calculated as average yearly growth rates. It is nevertheless necessary to check whether or not the data series are stationary. For this purpose, we use the Levin, Lin and Chu (2002) panel unit root test. Although this test does not allow for country-specific unit roots, it seems to fit our dataset best given the limited time series dimension of our data (10 observations at best), which would made the use of heterogeneous panel unit root tests difficult. The results, not reported here, indicate that the null of a unit root can be rejected for all series. The results for first- and second-differenced data confirm this finding.

We follow a general-to-specific model selection strategy to identify blocks of statistically significant variables. We first include all variables described above and eliminate the insignificant ones. At the end of this procedure, we are left with a parsimonious specification containing only the variables which turn out to be statistically significant. The estimations are carried out using Generalised Methods of Moment (GMM) because the potential correlation between the lagged dependent variable (the inflation rate) with the error terms leads to a bias in the OLS estimator. Lagged values of the explanatory variables are used as instruments. Nevertheless, we still use pooled OLS estimators because the initial price level and the narrow and wide Balassa-Samuelson measures are indeed country constants.

As noted earlier, two alternative measures for the output gap are employed. Because our dataset on house prices does not cover our whole country sample, the inclusion or not of house prices slightly changes the country coverage. For this reason, we analyse starting specifications including and excluding house prices. Furthermore, the Balassa-Samuelson constants (narrow and wide) and the productivity differentials are included always separately and never together in the starting specifications. Finally, the series concerning regulated prices usually start around 1998 which leads us to include those series only for the second subperiod.

The estimates, reported in Tables 11 to 14 hereafter, reveal a number of interesting features of the determinants of inflation rates in Europe.

For the euro area, the two most robust variables are inflation persistence measured by means of the lagged inflation rate and cyclical fluctuations captures by the two measures of output gap and unit labour cost developments (see Table 11). A second set of fairly robust variables includes oil prices and regulated prices. Oil prices, while highly significant, are quantitatively negligible as 1% change in oil prices leads to a 0.008% increase in the HICP. By contrast, somewhat surprising is the finding that regulated prices are not only highly significant but also numerically important with the coefficients located around 0.2, when they are included in the equations from 1999 to 2005.

The other variables are found to be less stable and depend to a great extent on the measure of output gap, the time period and the estimation method used. For instance, government deficits turn out to be significant with the expected negative sign (an increase in the deficit is related to higher inflation rates) only when OLS is used but not for GMM. The same holds true for house prices. In addition, the effect of the exchange rate through import openness is not very robust. This stands indeed in contrast with the finding of Honohan and Lane (2004), who find the exchange rate variable to be very important after the introduction of the euro. Our results may indicate the sensitivity of the estimates to the extension of the period used by a couple of years.

On the other hand, none of the structural factors enter the equations. Both the alternative measures of the B-S effect and the battery of proxies aimed at capturing shifts in final household consumption are not significant.

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from the BIS macroeconomic database for the euro area and from national statistics via the WIIW's monthly database for CEE economies. House prices are obtained from national data sources for selected transition countries (Bulgaria, Czech Republic, Estonia, Hungary, Lithuania, Poland and Slovenia) and from the Macroeconomic Database of the BIS for the old EU-15 countries (data are not available for Italy). The price of oil is obtained from Datastream (Brent Crude - Physical Del.,fob U$/BBL, Datastream code: OILBRNP).

For the CEE-10, the results are somewhat different. For this group of countries, the three most robust variables are the exchange rate, regulated prices and monetary aggregates. It is not very surprising that the exchange rate is important given that this variable is understood in policy circles to have the greatest impact on inflation rates in transition economies. Nevertheless, we find that the size of the exchange rate pass-through declined on average from around 50% to close to 10%. Regulated prices are found to have a comparable impact on inflation than in the euro area. By contrast, the fact that monetary aggregates are important in transition economies is truly amazing in light of the conventional wisdom that money demand functions tend to be unstable during the process of economic transition. There is indeed an abundant literature on the instability of money demand functions during the early years of transition. Nonetheless, money demand was found to be stable in Hungary and Poland by Buch (2001) and in a panel of six transition economies by Chowdhury and Fidrmuc (2004). Our results also suggest that money demand is probably stable for the average of our ten transition economies.

While not unimportant, inflation persistence and the business cycle captured by output gap and unit labour cost developments are less robust determinants of inflation rate in transition economies than in the euro area. In common with the euro area, regulated prices are a robust determinant of the HICP. Furthermore, structural factors do not play a role even in transition economies. This is striking given the widespread belief that higher inflation rates in transition economies are mainly due to structural factors related to the catching-up process.

The panel comprising both euro area and transition economies (EU-11 and CEE-10) might offer interesting insight because of the larger cross sectional variation of the variables than in the two narrower country subsamples. The scenery that opens up before our eyes is very colourful, in particular when we look at the period running from 1999 to 2005. The lagged inflation rate, alternative output gap measures and regulated prices are all very significant and have large coefficients ranging from 0.2 to 0.3. If included in the equation, (increases in) house prices turn out to raise inflation rates, even though the overall impact is limited (0.02). Oil price and the exchange rate also matter, although they are less robust to different model specifications.

The major difference to the narrower subsamples is that we are able to establish statistically significant relationships between inflation rate and structural factors. This is probably bad news for the proponents of the Balassa-Samuelson effect as the coefficients on both the narrow and the wider definitions are always negative: higher implied Balassa-Samuelson effects generate lower inflation rates. It should be mentioned that the productivity differential variable once again remains silent and never enters any of the specifications. This is a clear sign that the Balassa-Samuelson does not matter or is at least dominated by other factors.

On the front of the structural factors capturing shifts in final household consumption,, the news are more encouraging if not bright. The price level variable is found to be negatively correlated to the inflation rates: lower initial price levels can thus be related to higher inflation rates. All the same, growth rates in the GDP per capita variable have a positive influence on the HICP, and a higher share of foodstuff in the HICP has a negative link to the inflation rate. This latter finding indicates that a decrease in the share of food that is presumed to go in tandem with a move towards higher quality goods and more services results in higher inflation rates. Nevertheless, we were not able to establish expected positive relationship between the share of recreation activities in the HICP and real final household consumption on the one hand, and the inflation on the other.[40]

[40] Furthermore, final household consumption is found to enter the specifications with a systematically negative sign. Since we do not have any sensible explanation for this observation, we excluded this variable from the estimations.

Table 11a. Euro Area (excluding Luxembourg) Dependent variable: annual change in the HICP: $P_t = f(\overline{X})$

	1996-2005				1999-2005								
	Regulated prices excluded				Regulated prices included								
	House prices included				House prices included						No house prices		
	GMM	GMM	OLS	OLS	GMM	GMM	GMM	OLS	OLS	OLS	OLS	OLS	OLS
CONSTANT			0.441***	0.363***				0.921***	0.781***	2.516***	0.732***	2.684***	0.898****
INFLATION (-1)	0.301**	0.622***	0.622***	0.713***	0.272***	0.308***	0.194*	0.502***	0.522***	0.428***	0.414****	0.342****	0.381****
CYCLICAL FACTORS													
OUTPUT GAP1	0.197***		0.245***		0.357***			0.308***	0.306***	0.274***	0.334****	0.278***	0.327***
OUTPUT GAP2		0.262***		0.215***		0.253***							
ULC							0.152*						
GOV. SURPLUS/DEFICIT			-0.063***	-0.043***									
BALASSA-SAMUELSON EFFECT													
B-S WIDE (CONST.)			-0.057**	-0.054*				-0.207***			-0.384***		
B-S NARROW (CONST.)									-0.178***				-0.337***
PRODUCTIVITY DIFFERENTIAL.												-1.928***	
REGULATED PRICES													
REG1					0.168*	0.139*	0.151**						
REG2													
REG3											0.215***	0.150***	0.203***
OTHER STRUCTURAL FACTORS													
SHARE OF RECREATION IN THE HICP													
SHARE OF FOOD IN THE HICP													
REAL FINAL HOUSHOLD CONSO													
PRICE LEVEL 97 (CONST.)										-1.689**			
GDP PER CAPITA													
EXTERNAL FACTORS													
OIL PRICE		0.005***											
OIL PRICE (-1)	0.012***		0.008***	0.008***	0.007***	0.009***	0.011***	0.008***	0.008***	0.008***			
NEER				-0.058**			-0.052**						
NEER (-1)													
OTHER FACTORS													
MONETARY AGGREGATES													
HOUSE PRICES			0.024***	0.017**				0.022***	0.024***	0.019***			
VAT INCREASES													
VAT DECREASES													
R2-adj	0.489	0.508	0.758	0.756	0.545	0..492	0.120	0.697	0.686	0.703	0.708	0.710	0.734
Jarque-Bera normality test (p-value)	0.192	0.000	0.026	0.014	0.167	0.009	0.880	0.717	0.551	0.084	0.019	0.000	0.057
No. of OBS	88	98	99	99	72	72	83	70	70	70	74	74	74
No. of COUNTRIES	11	10	10	10	11	11	11	10	10	10	11	11	11

Notes: PriceLevel97 is the relative price level in 1997. *, ** and *** indicate statistical significance at the 10, 5 and 1 percent level, respectively. "House prices included" and "No house prices included" indicate whether or not house prices were included in the starting specification. REG1, REG2 and REG3 refer respectively to the narrow, intermediate and wide definitions of regulated prices

Table 12. Central and Easter Europe (CEE-10)Dependent variable: annual change in the HICP: $P_t = f(\overline{X})$

	1996-2005			1999-2005	
	Regulated prices excluded House prices included			Regulated prices included House prices included	
	GMM	GMM	GMM	GMM	GMM
CONSTANT					
INFLATION (-1)	0.137***	0.089***	-0.240***	0.084	0.157***
CYCLICAL FACTORS					
OUTPUT GAP1 (-1)	0.356***				
OUTPUT GAP2 (-1)		0.560***			
ULC			0.776***	0.194****	
GOV. SURPLUS/DEFICIT	-1.119***				
BALASSA-SAMUELSON EFFECT					
B-S WIDE (CONST.)					
B-S NARROW (CONST.)					
PRODUCTIVITY DIFF.					
REGULATED PRICES					
REG1				0.134**	
REG2					
REG3					0.212**
OTHER STRUCTURAL FACTORS					
SHARE OF RECREATION IN THE HICP					
SHARE OF FOOD IN THE HICP					
REAL FINAL HOUSHOLD CONSO					
PRICE LEVEL 97 (CONST.)					
GDP PER CAPITA					
EXTERNAL FACTORS					
OIL PRICE					
NEER	**-0.611****	-0.706***	-0.471***		
NEER (-1)				-0.111***	-0.129***
OTHER FACTORS					
MONETARY AGGREGATES	0.919***	1.078***	0.543***	0.147***	0.191***
HOUSE PRICES					
VAT INCREASES					
VAT DECREASES					
R2-adj	0.699	0.689	0.873	0.394	0.454
Jarque-Bera normality test (p-value)	0.000	0.079	0.001	0.403	0.000
No. of OBS	64	68	68	49	49
No. of COUNTRIES	10	10	10	10	10

Notes: See Table 11.

Table 13ac. Euro Area (excluding Luxembourg) + CEE-10 Dependent variable: annual change in the HICP: $P_t = f(\overline{X})$

	1996-2005							
	Regulated prices excluded							
	House prices included						House prices excluded	
	GMM	OLS	GMM	GMM	OLS	GMM	GMM	GMM
CONSTANT		1.512***			1.520***			
INFLATION (-1)	0.346***	0.555***	0.420***	0.425***	0.498***	0.143***	0.077***	-0.029
CYCLICAL FACTORS								
OUTPUT GAP1	0.301***	0.136***				0.493***		
OUTPUT GAP2			**0.237*****				0.189***	
ULC				0.059***	0.087**			0.511***
ULC (-1)				0.059***	0.087**			-0.024***
GOV. SURPLUS/DEFICIT							-0.347***	
BALASSA-SAMUELSON EFFECT								
B-S WIDE (CONST.)								
B-S NARROW (CONST.)								
PRODUCTIVITY DIFF.								
REGULATED PRICES								
REG1								
REG2								
REG3								
OTHER STRUCTURAL FACTORS								
SHARE OF RECREATION IN THE HICP								
SHARE OF FOOD IN THE HICP								
REAL FINAL HOUSHOLD CONSO								
PRICE LEVEL 97 (CONST.)		-0.795**			-0.768*			
GDP PER CAPITA								
EXTERNAL FACTORS								
OIL PRICE (-1)	0.010***	0.011***	0.008***	0.010***		0.012**	0.018***	0.003***
NEER				-0.071***	-0.077***	-0.0598***	-0.0633***	
NEER (-1)	**-0.073***	-0.113***	-0.142***	-0.128***	-0.111***	-0.226***	-0.177***	
OTHER FACTORS								
MONETARY AGGREGATES							0.922***	
HOUSE PRICES	0.026***	0.021***	0.016***	0.033***	0.019**			
VAT INCREASES								
VAT DECREASES								
R2-adj	0.424	0.796	0.501	0.391	0.814	0.594	0.587	0.521
Jarque-Bera normality test (p-value)	0.000	0.000	0.000	0.000	0.022	0.000	0.000	0.001
No. of OBS	150	150	150	119	150	152	152	151
No. of COUNTRIES	17	17	17	17	17	21	21	21

Notes: See Table 11.

Table 13b. Euro Area (excluding Luxembourg) + CEE-10 Dependent variable: annual change in the HICP: $P_t = f(\overline{X})$

	1999-2005												
	Regulated prices excluded												
	House prices included							House prices excluded					
	GMM	GMM	GMM	OLS	OLS	OLS	OLS	GMM	GMM	GMM	GMM	OLS	OLS
CONSTANT				0.781***	0.817***	0.843***	0.796***					2.134***	1.896***
INFLATION (-1)	0.200***	0.276***	0.255***	0.301***	0.302***	0.319***	0.320***	0.306***	0.307***	0.228***	0.198***	0.242***	0.244***
CYCLICAL FACTORS													
OUTPUT GAP1	0.394****			0.195***	0.176***			0.321***	0.271***			0.182**	
OUTPUT GAP2		0.367***	0.296***			0.180***	0.201***			0.322***	0.284***		0.164***
ULC													
GOV. SURPLUS/DEFICIT								-0.106***	-0.064***				
BALASSA-SAMUELSON EFFECT													
B-S WIDE (CONST.)					-0.257**	-0.283***							
B-S NARROW (CONST.)				-0.328**			-0.351***						
PRODUCTIVITY DIFF.													
REGULATED PRICES													
REG1	0.351***	0.397***		0.268***	0.266**	0.273***	0.276***	0.223***	0.269***	0.182***	0.187***	0.221***	0.229***
REG2													
REG3			0.310***										
OTHER STRUCTURAL FACTORS													
SHARE OF RECREATION IN THE HICP													
SHARE OF FOOD IN THE HICP	-0.016*		-0.034**										
REAL FINAL HOUSHOLD CONSO													
PRICE LEVEL 97 (CONST.)												-1.199**	-0.922*
GDP PER CAPITA								0.042***		0.021***			
EXTERNAL FACTORS													
OIL PRICE (-1)		0.009***		0.009***	0.009***				0.006***	0.008***	0.006***	0.009**	0.009**
NEER											-0.129**		-0.206**
NEER (-1)				-0.113***	-0.116***				-0.153***			-0.205***	
OTHER FACTORS													
MONETARY AGGREGATES													
HOUSE PRICES	0.007***	0.007***	0.022**	0.017**	0.018**	0.014**	0.013**						
VAT INCREASES													
VAT DECREASES													
R2-adj	0.271	0.380	0.091	0.778	0.778	0.775	0.774	0.411	0.545	0.201	0.268	0.765	0.641
Jarque-Bera normality test (p-value)	0.014	0.116	0.000	0.747	0.717	0.787	0.854	0.000	0.000	0.000	0.000	0.000	0.038
No. of OBS	91	93	91	107	107	107	107	119	119	123	123	134	134
No. of COUNTRIES	17	17	17	17	17	17	17	21	21	21	21	21	21

Notes: See Table 11.

10. Concluding Remarks

In this study, we sought to provide an overview of the factors, which may play a role in the determination of the price level and which may drive the inflation rate. We demonstrated that the price level of transition economies and less developed old EU countries is lower than in core euro area countries. This observation is attributable to the lower price level of virtually all goods and services. Regarding possible structural factors driving price levels and inflation developments, we found that the Balassa-Samuelson effect had a limited role to play in the transition economies despite large productivity gains in the tradable sector because of the incomplete pass-through form productivity to inflation rates due to a.) large productivity gains in some countries' nontradable sector, b.) the low share of (market) services in the inflation basket and c.) an unequal distribution of productivity gains in the tradable sector ensuing a disconnect between productivity gains and wages, unequal wage equalisation across sectors. At the same time, price level convergence could occur thanks to changes in tradable and non-market non-tradable goods prices. Most importantly, advances in real convergence could lead to a shift in consumption patterns of households. Richer households tend to consume higher quality goods (quality effect), less energy and foodstuff and more services (composition and demand-side effect). In addition, higher wages could (but need not) increase the price of domestically produced and consumed goods and the prices of all goods and services via more expensive wholesaling and retailing. Yet, wage increases were often largely offset by substantial productivity gains in the distribution sector of the transition economies.

We pointed out that differences in economic structures could imply different inflation rates. And economic structures of transition economies may still be different to that of euro area countries in spite of the profound economic structure of the last 15 years or so. First of all, transition economies are more sensitive to oil price developments because they have more oil intensive production and they rely more on external oil resources than euro area countries. Second, business cycle synchronisation is helpful to diminish inflation differentials across countries. This could be ensured by trade linkages in general and via intraindustry trade in particular. While the share of intraindustry trade is fairly high in some transition economies, this is not the case for others.

We argued that price level convergence should not necessary show up in inflation rates and that higher inflation rates do not automatically imply price level convergence. For instance, a lower exchange rate pass-through yields stronger price level adjustments but lower inflation rates. Also, different weights in the HICP due to differences in economic development could imply differing inflation rates but universal effects on the price level. Furthermore, changes in quality increases the price level but those changes should be eliminated from inflation rates. Finally, house price developments directly affect the actual price level and have no effect on the price level measured statistically, whereas their impact on the inflation is limited to rents.

Besides a detailed overview of the factors driving price level convergence and inflation rates and a descriptive illustration of the main arguments, the second objective of this paper was to provide some qualitative evidence regarding the relative importance of the different (structural, cyclical and external) sources of inflation rates. Our first observation is that some factors are just less important for transition economies than for old EU members. Based on a simple accounting framework, we showed for instance that notwithstanding larger adjustments in the relative price of services compared to that of goods, service price inflation accounted for only half as much of HICP inflation in transition economies than in euro area countries in the period 1996 to 2005. All the same, rents play a much bigger role in inflation developments in the euro area than in transition economies where their contribution to overall inflation is almost zero. Second, goods and regulated services turn out to be equally important in both country groups. Finally, the relative price of energy increased more in transition economies than in the euro area, and because of their higher weight in the inflation rate, they also contributed more to inflation developments in the first group of countries. Similarly, the importance of foodstuff is considerably larger in transition economies than in the euro area. Finally,

Some of these results are confirmed by our panel estimations. In particular, inflation rates do not appear to be influenced by the Balassa-Samuelson effect, irrespective of the alternative measures used, and little sign is found of inflation being driven by other structural factors in the euro area and in the transition economies. Nevertheless, once these two country groups are pooled together, initially

different price levels and progress in real convergence, captured by changes in the composition of the HICP and the growth rate of GDP per capita tend to lead to higher inflation rates. This indicates that although the Balassa-Samuelson effect has little importance in practice, other structural factors affecting both tradable and non-tradable goods are at work in low price level and high growth countries such as the transition economies. These factors relate to a.) the shift towards higher quality goods, b.) the composition effect, c.) the demand effect for non-tradables, d.) the nontradable component effect and e.) the role of the distribution sector. Unfortunately, our results do not permit a precise decomposition to pin down the relative importance of these factors.

Second, inflation persistence, cyclical effects and regulated prices are particularly important determinants of inflation rates both in the euro area and in transition economies.

Third, house prices and oil prices are found to exert a significant (but quantitatively small) positive influence on inflation rates in the euro area whereas they do not matter in transition economies. What really is important in transition economies is the exchange rate, although the relationship between exchange rate and inflation appears to have been weakened over time.

Finally, we find little evidence that public finances are of relevance for inflation developments or that VAT increases or decrease matter a lot in both country groups.

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APPENDIX 1. *Productivity Growth Rates: Methodological and Data Issues*

The Eurostat NewCronos database is the main source of the data to compute average productivity figures. NewCronos provides a 6-sectoral and a 17-sectoral decomposition of gross value added at constant prices, and employment data.[41] If needed, we complement this dataset with the European Commission's AMECO dataset and, with the annual database of the Vienna Institute for Comparative Economic Studies (WIIW) for the transition economies.

This enables us to compute productivity growth rates for the same sector using data drawn from different databases. The results are sometimes very astonishing or even disturbing. Surprisingly enough, the 6-sector and the 17-sector decomposition Eurostat data do not yield the same productivity growth rates for a number of cases, mainly because of differences in the employment data. For the Czech Republic, there is a fall of more than 30 percent in employment in 2005 as compared to 2004 for the financial services, real estate and renting sector when using the 6-sector decomposition but there is no such drop when the 17-sectoral decomposition is used. The consequence is that productivity growth is 5 percent per annum in the first case while it is only the half of that in the second case. The implications of these differences are very different figures for dual productivity growth (see Table 3). A less brutal but still significant difference can be observed for Denmark. The comparison of data computed on the basis of NewCronos and AMECO also yields differences for the productivity growth rate in the manufacturing sector. Finally, another staggering gap opens between Eurostat data and data provided by the WIIW. While yearly productivity growth is above 8 percent for Slovenia when using Eurostat data, it moderates to below 4 percent on the basis of the WIIW data.

The AMECO database provides us with four types of employment data: a.) the number of employed persons, b.) the number of full-time equivalent employed persons, c.) the number of employees, and d.) the number of full-time equivalent employees.[42] The use of different employment data matters in some cases. These figures are reported in Table 3 if the impact on dual productivity is larger than 0.5 percentage points.

A final note concerns a handful of countries, namely Austria, Greece, Portugal, the UK and Romania, for which either sectoral value added or employment data were not available from NewCronos. For these countries, productivity growth could be calculated using AMECO data only for total services, including public administration, and not for market-based services. This probably puts an upward bias on dual productivity given the very low growth rates in public services.

[41] The 17 sectors are: 1) agriculture, hunting and forestry, 2) fishing, 3) mining & quarrying, 4) manufacturing, 5) electricity, gas and water supply, 6) construction, 7.) wholesale and retail trade, repair of motor vehicles, motorcycles and personal and household goods, 8) hotels and restaurants, 9) transport storage and communication, 10) financial intermediation, 11) real estate, renting and business activities, 12) public administration and defence, compulsory social security, 13) education, 14) health and social work, 15) other community and social personal service activities, and 16) activities of households. The 6-sectoral decomposition has the following sectors: a.) agriculture (1+2), b.) industry (3+4+5), c.) construction (6), d.) services 1 (7+8+9), e) financial services (10+11), f.) public services (12+13+14+15+16). The employment data refer to 1000 of employed persons in the sector.

[42] Data on full time equivalent employment and employees is available for Austria, the Czech Republic, Germany, France, Hungary, the Netherlands and Spain. By contrast, only data on the number of employed persons but not on that of employees could be obtained for Cyprus.

Table A1. The Distribution of Hypermarkets and Discounters in Europe, 2006

	BE	DE	FR	NL	AT	GR	ES	PT	IE	IT	LU	FI	DK	SE	UK	SI	SK	PL	HU	EE	CZ	LV	LT	BG	HR	RO
Hypermarkets																										
TESCO									92						X		20	80	58		30					
METRO (Makro)	9	60	80	16	12	7	34	10		47			4		33		5	23	13		12			7	5	23
CORA	7		59								2								7							1
AUCHAN			116				46	17		43	1							19	10							
CARREFOUR	56		217			20	144	7		52								32								5
CARREFOUR (C&C)			106							16																
LECLERC			340				7	12		17						1		14								
GEANT			113															18								
EROSKI			3				79																			
WAL MART		51													X											
SAINSBURY'S															X											
AHOLD																	23	14			53					
SELVER																				4						
ETK																				3						
RIMI BALTIC																				4		12	7			
NORFA																							8			
Discounters																										
ALDI	X	X		X	370			X	X		X		X		X	40		X								
LIDL	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X				X	
Penny Market (REWE Group)		2400	X		244					339*							51	35	137		201			9		17
Zielpunkt					310																					
EDEKA		10834			823																					
VP MARKET																				26		100	49	10		8

Note: Data collected from publicly available sources, chiefly from the websites of the firms under consideration.

Table A2. Average Labour Productivity Growth, euro area, 1995-2004

	Euro a.	BE	DE	FR	NL	FI	IT	ES	PT	SE	DK
	1995-2004	1995-2004	1995-2003	1995-2004	1995-2004	1995-2004	1995-2004	1995-2003	1995-2002	1995-2003	1995-2004
Total	2.3	3.3	2.8	1.8	3.2	7.7	0.2	0.6	2.5	7.5	1.4
food	0.3	1.1	-1.0	-1.3	2.1	7.3	0.4	1.0	5.1	1.7	1.4
textile	0.7	6.6	3.8	4.0	7.3	1.3	0.2	1.6	1.0	2.9	4.5
leather	-1.2	3.1	2.2	0.3	6.4	2.7	-1.6	0.7	-2.2	4.8	-6.6
wood	2.7	6.6	3.1	7.0	1.9	5.2	2.9	0.7	3.6	7.5	1.2
paper	2.8	3.4	1.4	0.4	4.5	4.3	1.5	0.7	-2.1	4.0	0.8
rafinery	6.5	-2.6	-1.8	1.5	-0.9	25.8	-4.0	2.4	-57.5	6.0	-46.1
chemistry	4.6	2.9	4.9	1.0	6.2	3.0	0.3	0.2	4.3	9.9	3.1
plastic	1.8	4.7	1.9	3.1	1.8	0.8	0.0	1.7	3.2	3.0	-2.0
other nonmet	1.1	0.8	2.3	2.0	1.9	3.1	-0.4	1.5	1.3	1.5	1.9
metallurgy	1.4	2.8	2.4	1.7	1.9	2.2	0.1	-0.8	-3.5	0.9	0.7
machinery	1.2	4.5	0.6	4.3	2.1	2.5	-0.7	1.8	-4.6	2.1	-1.1
electronics	6.0	7.3	7.7	4.1	2.2	30.9	-0.8	0.2	16.4	56.0	6.2
transp eq	1.9	4.5	1.6	1.9	7.5	0.2	1.2	0.1	26.6	6.0	-1.6
other manuf	0.8	5.2	0.4	-0.9	1.0	2.3	0.7	-1.3	-3.7	3.9	1.9

Source: Author's calculations based on the NewCronos/Euostat.

Table A3. Average Labour Productivity Growth, CEECs, 1995-2004

	CZ	CZ -2	HU	HU -2	PL	SK	SI	SI -2	BG	HR	RO
	1996-2004	1995-2004	1996-2004	1995-2003	1996-2004	1996-2004	1996-2004	1995-2004	1998-2004	1998-2004	1996-2004
Total	7.2	5.7	10.5	7.7	10.0	8.3	3.4	9.2	7.5	5.5	5.2
food	3.6	2.1	2.9	-2.9	6.0	4.6	1.8	-0.5	4.8	3.7	7.9
textile	5.0	6.0	6.6	2.0	8.7	0.5	1.2	5.3	4.9	-0.1	4.7
leather	-4.0	2.9	0.9	-4.1	6.3	8.4	-4.6	4.2	5.1	2.5	1.3
wood	8.4	5.8	5.5	2.6	8.3	5.1	-1.8	5.3	13.1	3.1	5.2
paper	6.3	7.4	6.6	10.4	7.6	10.2	-0.7	7.0	2.3	9.6	0.7
rafinery	8.7	-10.5	8.0	-7.2	3.1	7.3	0.0	na	11.6	5.1	10.5
chemistry	6.9	1.7	4.7	-0.7	9.8	8.8	6.2	12.7	8.7	6.4	9.9
plastic	7.3	22.3	5.8	8.9	10.1	5.6	0.9	6.1	10.1	5.6	5.4
other nonmet	7.4	8.7	6.5	2.6	11.0	5.6	4.6	7.9	11.6	8.5	9.1
metallurgy	4.6	-0.5	7.2	3.3	9.5	3.4	2.2	8.7	18.7	6.7	7.2
machinery	10.4	5.7	8.3	16.4	12.8	11.7	2.2	15.2	13.7	10.7	7.8
electronics	18.3	15.8	23.1	44.5	13.9	10.1	7.9	13.5	15.0	0.7	7.9
transp eq	8.5	16.6	14.7	14.8	18.7	21.8	8.4	15.4	14.1	8.1	12.8
other manuf	8.2	0.3	6.2	0.3	9.1	15.1	3.4	7.1	17.2	7.4	11.8

Source: Author's calculations based on the WIIW annual database.

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