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Real Convergence and Inflation: Long-Term Tendency vs. Short-Term Performance



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Leon Podkaminer is Senior Economist at the Vienna Institute for International Economic Studies (wiiw).

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Leon Podkaminer

Real Convergence and Inflation: Long-Term Tendency vs. Short-Term Performance

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Abstract

The cross-country relationship between the relative price level and the relative GDP level is found to be significant and stable for EU member states over the period 1997-2006. The joint dynamics of price and GDP levels tend to gravitate towards the regression line but there is no shorter-term trade-off between fast real convergence and low inflation. Contrary to popular perception high inflation is not necessary for fast convergence. Moreover the trajectories of certain euro area states indicate that giving up one's national currency is risky: it may stop convergence or even precipitate divergence. Problems may also emerge when the initial parity is weak. In addition, the inability to nominally devalue may prove very costly. However retaining one's national currency is not risk-free, even if domestic inflation is low, and even though subsequent corrective devaluations remain possible. While participation in the euro area has proved troublesome for some countries, it is in the interest of all member states to deepen wage and fiscal policy integration in order to help overcome the stagnation experienced in those euro area states that suffer from strongly overvalued price levels.

Keywords: *real convergence, relative price level, inflation, euro, EU*

JEL classification: *E31, F15, F43, O47*

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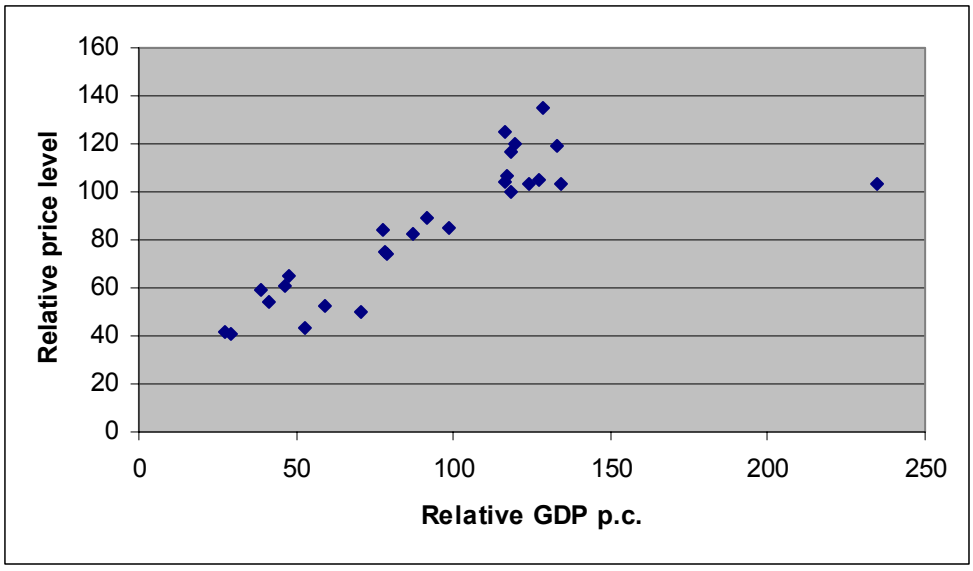
Real convergence and inflation: long-term tendency vs. short-term performance

1 Introduction

A country's price level, defined as the ratio of its purchasing power parity and the exchange rate, seems to roughly correspond to that country's per capita income level (at the purchasing power parity). This correspondence is illustrated by the scatter diagram (Figure 1) for the 27 (present) member states of the European Union in 2001.

Figure 1

Relative per capita GDP and relative price levels in Europe, EU-27 = 100, 2001



Source: Eurostat, November 2007.

The tendency of the relative price level to rise with the relative income level seems to be quite universal. It has long since been noted in many cross-country studies on relative income and price levels. Of course, there are some exceptions to that tendency. Very small countries sometimes fail to conform to the correspondence in question. This, for example, is the case with Luxembourg (the 'outlier' in Figure 1) whose very high income level happens to be combined with a moderate price level. This apparent anomaly can be explained by the country's small size and location (between neighbours characterised by much lower income and correspondingly low price levels). Prices of goods and services (including rents) prevailing in Luxembourg cannot diverge significantly from those prevailing in towns or shopping centres located a few miles away – just across the (nearby) borders. An opposite anomaly (a high price level at a relatively low income level) is often

observed in small countries highly dependent on income from foreign tourism (e.g. in Cyprus).

The tendency for the price levels to be higher in the higher-income countries can be traced back to a specific structural tendency whereby the more affluent countries are characterised by higher relative prices of services and – at the same time – by relatively greater volumes of services consumed. Customarily, this fact is interpreted as a manifestation of the so-called Balassa-Samuelson Effect (BSE). BSE alleges that services are increasingly more costly to produce than tradable goods (or that labour productivity tends to rise faster in production of goods than in services sectors).[1] Connecting that structural fact to BSE is conceptually unsatisfactory – at least to the present author (Podkaminer, 2003). Of course this is not the place to discuss this connection. The focus now is on a 'macro' correspondence as shown in Figure 1, not on the structural reasons for its factuality. It may be only worth adding that an explanation stressing the role of the demand-side factors seems conceptually more relevant (Podkaminer, 1998, 2005).[2]

It is plain arithmetic that a rise in an EU member state's relative price level results from a combination of two processes: (1) nominal appreciation of its exchange rate (vs. the euro); (2) its inflation being higher than the average in the EU. Thus, under the fixed exchange rate regime the 'burden' of changes in the relative price level falls on domestic inflation. Essentially, this is also the case once a country enters the European Exchange Rate Mechanism II and thereby pledges to maintain a stable exchange rate for an extended (at least two-year) period of time. Participation in ERM II, which is an antechamber to full membership in the euro area, is often seen as fraught with serious dangers.[3] Among others there is – according to many authors – a potentiality of a conflict between real growth being faster than in the 'old' EU (i.e. *real convergence*) and inflation being much higher than in the 'old' EU (which is generally believed to be associated with real convergence). But inflation higher than the EU average may fail to satisfy a restrictive Maastricht inflation criterion, hence prolonging an applicant country's uncomfortable stay in ERM II. This seems to be the current situation of the Baltic countries which, having experienced very fast real growth combined with 'excess inflation', have recently failed to be admitted into the euro club. The same fate may be awaiting other new member states (except Slovenia which managed to get through at the beginning of 2007) – in the first place Bulgaria (which has been on a currency board regime for over ten years now). To

1 The original (and fairly informal) statement of BSE is in Balassa (1964) and Samuelson (1964). Modern, apparently rigorous, formulation of BSE is due to De Gregorio, Giovannini and Wolf (1994).

2 It is worth noticing that extensive econometric studies are not quite supportive of the hypothesis on the empirical adequacy of BSE. Summarizing many years of econometric research (also one's own) on BSE, Égert (2007, p. 1) finds it proper to use the following words: '... *our estimation results provide the obituary notice for the Balassa-Samuelson effect*'.

3 Buiter and Grafe (2002) called the ERM II a 'purgatory' for the new member states wishing to adopt the euro. Is not clear though for what specific sins these countries are to suffer.

many authors the conflict between fast growth and low inflation needs to be defused - primarily by a suitable relaxation of the Maastricht inflation criterion (see for example Buiter and Grafe, 2002; Buiter, 2005; Podkaminer, 2006).[4]

But what is the *actual* justification of the opinion on the inevitability (or at least high likelihood) of the conflict between fast growth and low inflation? Generally, that conflict seems to be taken for granted, or simply *assumed*, in the literature. Many publications even signal that conflict in their titles (e.g. De Grauwe and Schnabl, 2005; Dobrinsky, 2006; Lein-Rupprecht, Leon-Ledesma and Nerlich, 2007). Essentially these authors are only concerned with drawing apparently necessary conclusions from the existence of that conflict. The assumption in question seems to be an obvious, unquestionable – and thus requiring no further proof – consequence of the regularity exemplified in Figure 1. At best it is motivated by a reference to BSE (the latter's conceptual and empirical inadequacy notwithstanding). This attitude is well exemplified by the following concluding remark in De Grauwe and Schnabl (2005, p. 555): '*This paper explores the conflict of real and monetary convergence during the EMU run-up of the Central and Eastern European member states. Using a Balassa-Samuelson model of productivity-driven inflation, we find a high probability of higher inflation in the new member states.'*

This paper addresses several concrete issues and intends to achieve several specific goals. In Section 2 it is argued that the empirical data for Europe, characterizing a longer span of time, do indeed suggest the existence of a fairly *stable* and tight relationship between the relative price level and the relative per capita GDP level, of the type shown in Figure 1. That relationship, interpreted as a longer-term standard, is then used in Section 3 for a quantification of the relationship between the longer-term growth and inflation rates (under fixed exchange rates). This quantification, which does not need to invoke BSE or any other abstract model, may seem to be supporting the thesis on the complementarity of fast convergence and high inflation (under fixed exchange rates). Section 4 puts the findings of Section 3 into perspective. It is argued that a fast rise in the price level is in fact not a *necessary* condition for fast convergence. This conclusion follows from the inspection of the trajectories of jointly changing relative GDP and price levels over the years 1997-2006 for selected EU countries. Although most of these trajectories seem to be gravitating – in the longer run – to the relationship elicited in Section 2, in shorter periods (but possibly extending over many years) a fast rise in the price level does not seem to be necessarily linked to fast convergence. Often such a rise precipitates stagnation or even real divergence. In a number of cases fast convergence seems quite possible without any pronounced rise in the relative price level. Section 4 attempts to substantiate the findings of Section 3 with the data for all countries. Finally, Section 6 summarises and draws some

[4] There are literally hundreds of journal articles and other publications (working papers, occasional pamphlets, etc. lavishly produced at international organizations and national central banks) discussing essentially the same point.

conclusions, especially regarding some potential disadvantages likely to emerge *after* adoption of the euro.

2 Stability of the relationship between the relative GDP and price levels

Data for the years 1995-2006, comparable to those for 2001 (Figure 1), are currently available from Eurostat. Of course it must be remembered that the data for 2006 are still more provisional than for less recent years (and the data for the very early years are not quite complete and generally less reliable than for more recent ones).

On the whole, the scatterplots for individual years are hardly distinguishable visually. The similarity of the scatterplots can be substantiated statistically. The following non-linear regression appears to provide the best 'fit' for each year:

$$Log(P) = b+cY$$

where Log(P) stands for the natural logarithm of the relative price level (P), Y is relative GDP per capita and b, c are parameters. Statistical quality of the OLS estimates (Table 1) is very high.[5]

Table 1

Regression parameter estimates for Log(P) = b+cY, years 1997-2006

	'b'	t-stat	'c'	t-stat	R-sq. adj.
1997	3.3547	41.08	0.011209	13.06	0.8760
1998	3.4088	44.75	0.010674	13.34	0.8806
1999	3.4183	47.76	0.010555	13.89	0.8847
2000	3.5204	50.39	0.009543	12.96	0.8698
2001	3.5321	49.32	0.009618	12.67	0.8645
2002	3.5211	54.82	0.009731	14.39	0.8918
2003	3.4606	54.82	0.010425	15.72	0.9077
2004	3.4828	54.60	0.010219	15.27	0.9027
2005	3.5543	54.04	0.009471	13.87	0.8844
2006	3.5640	52.29	0.009419	13.33	0.8761

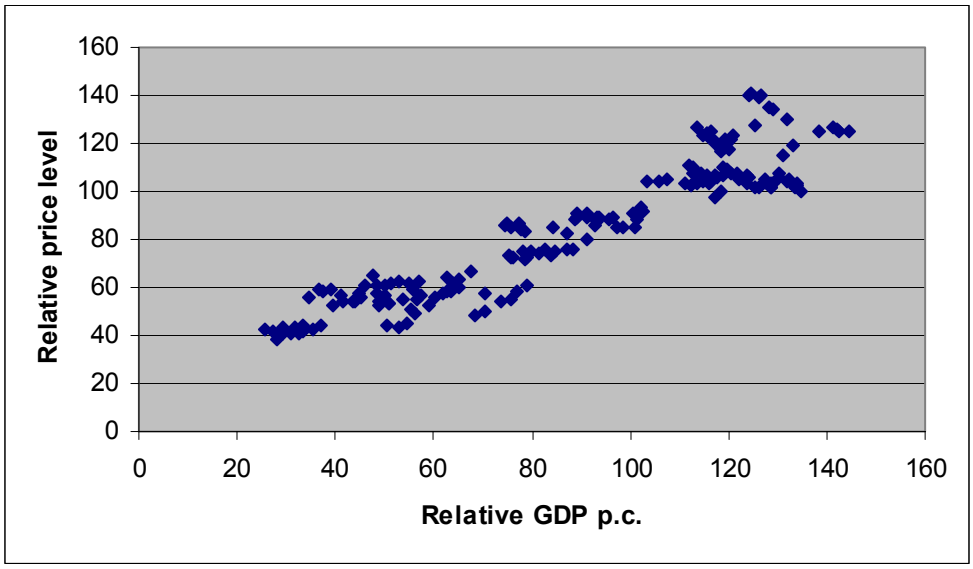
Not only the same functional form guarantees the best fit to the data for different years. Also the parameter estimates turn out to be of quite similar magnitudes. Formally, the Wald test does not reject, at very high significance levels, the hypotheses on the joint equality of the two parameters for any pair of years (since 2000). This justifies averaging the

[5] Observations for Luxembourg were disregarded. Heteroskedasticity-consistent test statistics (White) are (almost) equally impressive.

parameters from Table 1.[6] Alternatively, one can pool the data for individual years and estimate the same equation with a much more numerous sample. The Ordinary Least Squares estimates for the pooled data (182 observations, excluding Luxembourg) for the years 2000-2006 are in Table 2 (and the corresponding scatterplot is in Figure 2). As can be seen the parameter estimates from Table 2 do not differ from the respective estimates for individual years (Table 1) perceptibly.

Figure 2

Relative GDP and price levels, EU-25 = 100, 2000-2006



Source: Eurostat, Nov. 2007

Table 2

Regression parameter estimates for Log(P) = b+cY, pooled data for 2000-2006

'b'	t-stat	'c'	t-stat	R.sq. adj.
3.518451	142.87	0.009784	37.88	0.8879

The stability of the parameter estimates (Table 1) suggests that the 'averaged' regression:

$$\text{Log}(P) = 3.518451+0.009784Y \qquad (1)$$

could be interpreted as a standard of a sort. It is likely to provide as good a fit also for the samples of observations for the forthcoming years as it is for the seven years past.

6 The average of the constants ("b") from Table 1 is 3.5193 (with the standard error of 0.047) and the average of the regression coefficients from Table 1 is 0.00977 (with the standard error of 0.00039).

3 Quantifying the relationship between inflation and the real growth rates

With (1) being attributed the role of a longer-term standard, one is tempted to make use of it for the quantification of the relationship between the rates of inflation and growth.[7] But first one has to make some seemingly innocuous assumptions. Assume a country with a per capita GDP equal to Y° in a given year and with a relative price level equal to P°, satisfying (1). Further, assume the country's currency is firmly fixed to the euro (or *is* the euro). In consequence the changes in the country's price level can occur only through its inflation rate. Assume the average EU inflation rate is set to be, say, 3.5 per cent and the average EU per capita GDP growth rate is 2.5 per cent. Assuming those averages are virtually unaffected by what is happening in our country, one can determine the level of domestic GDP growth (denoted as 'g') consistent with, let us say, 3 per cent domestic inflation. Specifically, the country's relative price level in the next year, which is approximately[8] P°(1.03/1.025) by assumption, should be equal to

$$3.518451+0.009784Y°(100+g)/102.5$$

where Y°(100+g)/102.5 represents (again approximately) the relative level of the country's per capita GDP.

The 'g' solving the equation

$$\text{Log}(P°(1.03/1.025))=3.518451+0.009784Y°(100+g)/102.5 \qquad (2)$$

determines the domestic per capita GDP growth rate such that the next year the country considered is again positioned precisely on the line given by (1). It may be observed, that that 'g' depends not only on the growth and inflation rates assumed for the entire EU, and on the domestic inflation rate – but also on the country's initial relative GDP level Y°. The dependence of 'g' on domestic inflation rate and the initial GDP level illustrated by the contents of Table 3.

According to Table 3, a domestic inflation rate of 3 per cent is consistent with a domestic GDP growth rate ranging between 4.2 and 4.4 per cent – assuming for the EU that GDP grows at 3.5 per cent and that its inflation is 2.5 per cent. A 4.4 per cent GDP growth is consistent in a relatively less affluent country (with the relative GDP level equal 60 per cent) while in a more affluent country (relative GDP level equal 72.5 per cent) such a GDP growth rate would equal 4.2 per cent. Under a 4.5 per cent domestic inflation the

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7 This temptation proved irresistible to the present author (Podkaminer, 2006.)

8 This abstracts from changes in *structures* of prices (and quantities) in the country under consideration (and in its EU partners). Such changes are allowed for in the calculation of the proper purchasing power parities (and hence the proper relative price levels) and the proper per capita GDP levels (at these parities). Of course the formulae allowing for the changes in the structures of prices and quantities are too complicated to be of use in the present context.

'permissible' GDP growth rate would be 6.9 per cent in a less affluent country (relative GDP level equal 60 per cent) and 6.3 per cent in a more affluent (relative GDP level equal 72.5 per cent) one. Conversely, a higher GDP growth rate requires a higher inflation rate – at any initial level of the relative GDP.

Table 3

GDP growth rates (%), depending on the initial relative GDP level and the domestic inflation rate (%)

(assuming 3.5% average EU GDP growth rate and 2.5% average EU inflation rate)

	Inflation (%)	**2.0**	**2.5**	**3.0**	**3.5**	**4.0**	**4.5**
Y°	Price level (P°)						
60.0	60.7	2.6	3.5	4.4	5.2	6.1	6.9
62.5	62.2	2.7	3.5	4.3	5.1	6.0	6.8
65.0	63.7	2.7	3.5	4.3	5.1	5.9	6.6
67.5	65.3	2.7	3.5	4.3	5.0	5.8	6.5
70.0	66.9	2.8	3.5	4.2	5.0	5.7	6.4
72.5	68.6	2.8	3.5	4.2	4.9	5.6	6.3

The contents of Table 3, illustrating the trade-off between fast growth (real convergence) and low inflation, seem to support the desirability of some relaxation of the Maastricht inflation criterion for the countries aspiring to the euro. Somewhat ironically, Table 3 also seems to support the view that higher inflation is consistent with faster growth irrespective of the country's relative GDP level, i.e. also for the richer euro club member states.

It is however important to remember that the trade-off illustrated in Table 3 is derived under the assumption that the country is located – both initially and in the subsequent year – on the line given by (1). A misalignment between the inflation and GDP growth rates would result in the country's straying off the line given by (1), even if initially located on that line. It ought to be understood that the situations when a country glides on the line given by (1), without ever leaving it, must be fairly rare in real life. Thus, Table 3 does not actually say anything on the *likely* paths of inflation and GDP – let alone on the *desirable* paths of both items.

To reach some conclusions on the likely – and possibly desirable – joint dynamics of the relative price and GDP levels one may need to confront the data on actual performance for a greater number of cases.

4 The joint dynamics of GDP and price levels for selected countries

Although line (1) is a good approximation of the relationship between relative GDP and price levels for the *whole* sample of EU member states, it is not yet clear whether this line

stands in some relation to the paths taken, over time, by individual countries. If those paths systematically diverged from the line (1) – e.g. being located more or less parallel above and below it – the line itself would be a (possibly interesting) statistical artefact of no specific significance. However, as Figures 3 and 4 suggest, the paths seem to gravitate, or be attracted, to that line, at least for the selected countries.

The 'attraction' is most evident for the new EU member states (Figure 3), of which Poland's experience is a good example. Poland's trajectory was running along the reference line (1) in 1997-1999. Moreover, its relative price levels were close to (and slightly lower than) the 'theoretical' ones.[9] In 2000-2002 Poland was hit by a 'shock': the relative price level shot up suddenly (primarily due to a strong nominal appreciation of the domestic currency). The overvaluation shock coincided with stagnation. Poland's GDP growth was slower than the EU's, resulting in real *divergence* (i.e. a decline of the relative GDP level). The years 2003-2004 brought the country closer to the reference line – primarily through a nominal devaluation. This happens to be associated with acceleration of growth (positive real convergence). A return to overvaluation in 2005 (again primarily due to a strong nominal appreciation) goes together with a growth slowdown. The relative price level stabilization in 2006 is again associated with faster growth.

The description of the trajectory for Poland suggests that a sudden and strong rise in the relative price level coincides with the slowdown of real convergence (or sometimes even real divergence). This statement seems to apply also to the Hungarian and Czech cases. The strong rise in the Czech relative price level over 1997-2002 was combined with strong real divergence. One may observe that in more recent years the Czech Republic has been fast converging in real terms, with only a moderate rise in the relative price level.

Slovenia's experience is different: the country has not experienced any sudden shocks to its price level. This is the result of the exchange rate policy which has kept the level of real exchange rate constant. The policy stipulated constant, administratively enacted (under a sliding peg exchange rate regime regime) nominal devaluation matching domestic inflation. Under fairly unchanged relative price levels, Slovenia gradually reduced the level of overvaluation – the distance to line (1) – only to finish (by 2006) with an undervalued price level.[10] This transition has been associated with a steady rise in the relative GDP level – i.e. an uninterrupted real convergence so far.

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[9] Henceforth, the relative price level higher than 'theoretical' – i.e. given by (1) – will be referred to as '*overvaluation*'. Conversely, a relative price level located below (1) will be referred to as '*undervaluation*'.

[10] According to preliminary data for 2007, the levels of undervaluation for Slovenia are being strongly reduced – the Slovenian trajectory moves up, towards the line (1) again. This is the outcome of adoption of the euro – i.e. the inability to devalue the nominal exchange rate of the national currency vs. the currencies of Slovenia's major trading partners.

Figure 3

Trajectories of relative GDP and price levels for Poland, Hungary, the Czech Republic and Slovenia.

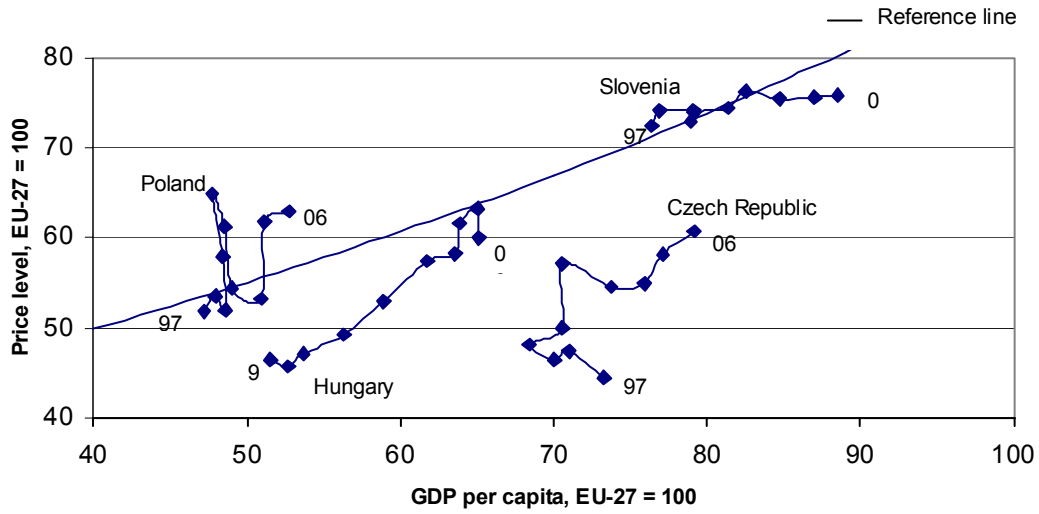
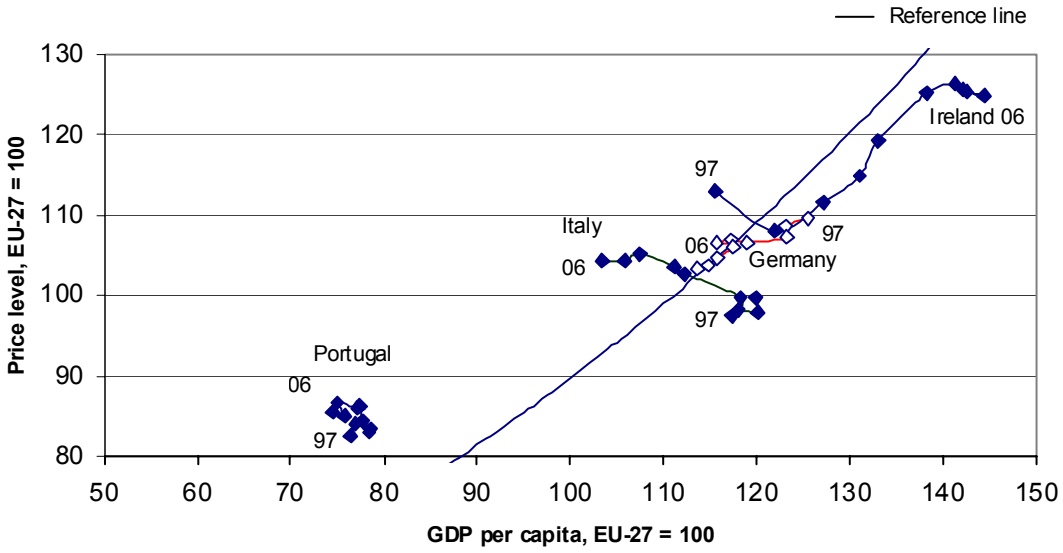


Figure 4

Trajectories of relative GDP and price levels for Portugal, Germany, Italy and Ireland.



As can be seen (Figure 4), the trajectories for Ireland and Germany also tend to 'stay in touch' with line (1). It is worth noting that the fast rise in Ireland's relative GDP level has continued under sustained undervaluation since 1998. However, undervaluation (or absence of overvaluation) is not quite a guarantee of fast growth. This is the lesson from the German performance. The German trajectory which has been located very close to

line (1) – often exactly on that line – appears to be moving backwards, slowly but quite consistently.

Of course, one may expect the average relative GDP level for the whole group of rich countries to be gradually falling back, at least in the longer run. Such a development would be an arithmetical consequence of the (anticipated and actually occurring) faster growth of the less affluent countries (i.e. the new member states of the EU). However the real divergence of Germany (and Italy) seen in Figure 4 is not an effect of the fast convergence of lower-income countries (whose weight is still too low to affect the EU-wide averages). Primarily, German and Italian real divergence represent their losing out to *other* rich countries (Ireland, the UK, the Scandinavian countries) which kept growing fast.

The regression of Germany's relative GDP level cannot be linked to overvaluation. Rather, it ought to be seen as the consequence of the overall deflationary economic policy conducted in that country since the mid-1990s. That policy focused on repression of wages, enhancing labour market flexibility, and on fiscal reforms combining generosity in taxation of profits/high incomes with austerity in social spending. All in all, the German economic policy is successful in e.g. reducing the share of wages in the GDP, depressing unit labour costs, and increasing external competitiveness. Those successes have come at a price: repression of domestic demand and stagnation of overall GDP growth.[11]

The trajectories for Italy and Portugal do not, on the whole, seem to be gravitating towards line (1). However their situation is quite specific – and relatively recent – but perhaps instructive as far as the new member states aspiring to adopt the euro are concerned. In both countries a mechanism now operates obstructing that gravitation. It may be observed that prior to 2000 both countries had continued their real convergence, however slowly. Thus they had been approaching line (1) at a roughly constant relative price level (which had been highly overvalued in Portugal and deeply undervalued in Italy). After 2000 the situation changed radically in Italy when the price level underwent a quantum leap. Within three years a deep undervaluation was replaced by a high overvaluation. The passage from under- to over-valuation can, only to some extent, be *directly* blamed on Italy's inflation having been higher than elsewhere in the EU. In addition, there has been a strong real divergence – Italy's relative GDP falling quite fast. This has additionally pushed the Italian trajectory further off the line (1). At the root of Italy's problem there may have been

[11] Over the years 1999-2005 the real effective exchange rate (deflated by unit labour costs) for Germany fell by over 10 per cent, cumulatively. At the same time the respective exchange rates *rose* 15 per cent (for Portugal) and about 10 per cent (for Italy and Spain). The price competitiveness of the German production improved by some 25 per cent vs. Portugal's and about 20 per cent vs. Italy's or Spain's. Unsurprisingly, the German *surplus* in trade with other members of the euro area doubled between 1999 and 2005, to close to 100 billion euro. But the German GDP rose during that period only 6.2 per cent – far less than the whole euro area's 11.6 per cent. The entire GDP growth in Germany was due to the rising trade surplus: the contribution of domestic demand to the GDP growth was *negative*. But in the entire euro area growth is practically driven by the domestic demand, with the negligible contribution of the trade balance (see also Bibow 2006, De Grauwe 2006, Flassbeck 2007).

the loss of price (or unit labour cost) competitiveness, primarily in favour of Germany, under the absence of an own currency. For many decades after WWII, Italy used to neutralise the effects of its prices (and unit labour costs) rising faster than elsewhere by periodically devaluating the lira vs. the German mark, bringing the relative price level to reasonable levels.[12] Such levels prevailed in Italy at the onset of the euro. However since 1999 this method could no longer be used – the euro is the common currency of both Italy and Germany.

Is Italy then condemned to a worsening overvaluation combined with real divergence? It is hard to think of any specific practical way of reducing the levels of overvaluation. Arithmetically, to achieve that goal one would need a combination of a very low (lower than elsewhere in the EU) domestic inflation (or low, or even negative, rates of growth of wages) and a real growth faster than elsewhere in the EU. But given the fact that inflation in the EU tends to be low (and especially that the unit labour costs in Germany tend to fall) a sufficiently low inflation in Italy or Portugal would perhaps have to be *negative*. A postulate to engineer a price and wage deflation as methods of restoring external competitiveness does not seem to be constructive though. The levels of unemployment, social misery – and the overall *absolute* GDP decline – that might be necessary to achieve 'success' that way would seem to be unacceptable. Of course, the ideal way to eliminate overvaluation would be through a spontaneous, fast GDP growth, following a path similar to that taken by Slovenia (Figure 3). The problem is that Slovenia's elimination of overvaluation was not quite spontaneous as it involved an active manipulation of the exchange rate. Besides, if a country could painlessly grow out of overvaluation by speeding up its real GDP growth, the overvaluation would cease to be an issue altogether. It would be sufficient to allow an arbitrarily high price (and wage) inflation, possibly reinforced by an arbitrarily strong nominal exchange rate – and then wait for a strong real GDP growth to automatically adjust the relative GDP level to the (arbitrarily high) price level. More seriously, replacing the national currency with the euro – though bringing many obvious advantages – is not all that riskless. A too strong initial conversion rate (at which the national currency is irrevocably swapped into euro) can freeze a country at a position of a high (and self-reinforcing) overvaluation, condemning a country to stagnation (or relative decline) – which seems to be the fate of Portugal. Moreover, even a deeply undervalued initial position does not eliminate the risk of ending, pretty fast, with the overvalued price level and real divergence setting in. This appears to be the Italian lesson.

[12] In Poland the overvaluation of the years 2000-3 was eliminated quite spontaneously, with nominal devaluation governed by the responses of the exchange markets. Of course, the reduction of absurdly high official interest rates played a role. Slovenia grew out of the overvaluation under active involvement of the authorities which kept devaluing the nominal exchange rates.

5 The speed of real convergence and the speed of change of the relative price levels for the full sample of countries

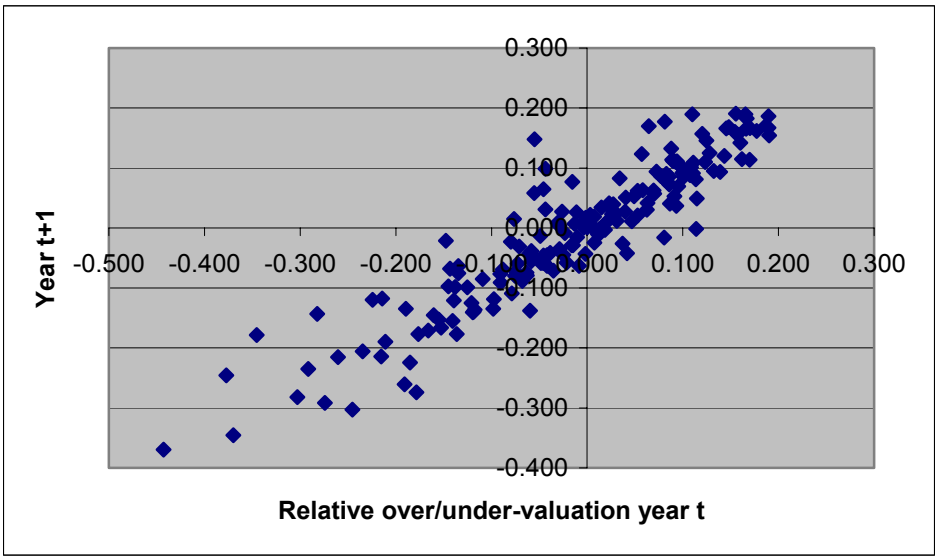
The reference to line (1) being an 'attractor' for individual country trajectories may need to be substantiated with the data for all countries (excepting Luxembourg). The statistical substantiation proposed below works with the relative residuals to regression (1) defined as follows:

$$R(t,j) = [P(t,j) - T(t,j)]/P(t,j) \qquad (2)$$

where P(t,j) is the observed relative price level (in year t, and country j), and T(t,j) is the respective theoretical value of that price level calculated according to equation (1). Evidently, R(t,j) is a measure of the distance from the trajectory (for the j-th country in the year t) to line (1). The negative Rs represent undervaluation, positive – overvaluation. If (1) were to act as an attractor, one would expect the series of residuals for individual countries to diminish with time. A simplified test of (1) being an attractor would be concerned only with the residuals for consecutive years. The scatterplot of these residuals for all countries and years (starting with 1999) is in Figure 5.

Figure 5

Relative residuals for consecutive years



The parameter γ of the regression R(t+1)= γ +βR(t) turns out to very small and statistically not different from zero. In contrast, the estimate for β (equal to about 0.86) is highly significant (t-statistics is over 33). Importantly, the hypothesis of β being equal to 1 is decisively rejected. The implication of this is that the relative residual for consecutive years tends to diminish. Thus the actual trajectories do indeed tend to gravitate to line (1).[13]

[13] Thus, an average half-life of R is about 4.6 years (4.6= ln(0.5)/ln(0.86).) In other words, on average R is halved every 4.6 years. It is also possible to regress the residuals for any year on the respective residuals dated more than one year

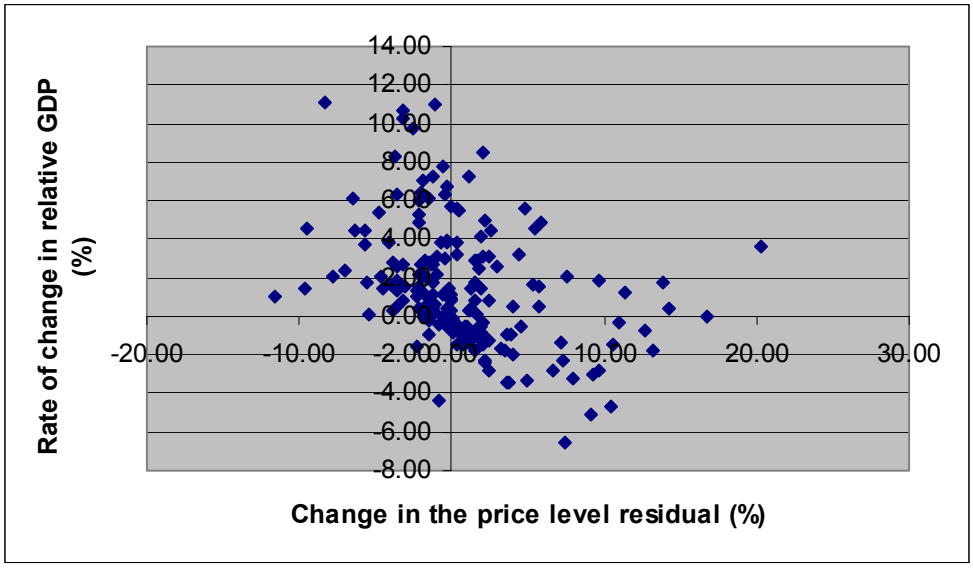
Attraction appears to be weaker (β is higher) under overvaluation in year t. In other terms, the speed of correction of overvaluation tends to be slower than that of undervaluation. This may reflect the experience of the fixed-exchange rate (and euro) countries trapped far above line (1).

However, Figure 5 does not suggest any specific direction of the gravitation. (As can be seen from Figures 3 and 4, the actual movements of individual trajectories can be decomposed into vertical and horizontal components – the former representing changes in the relative price levels, the latter in the relative GDP levels.)

In particular, it does not allow any specific conclusions as to the linkages between changes in the relative price levels and the speed of real convergence. Figure 6 may help identify such linkages as it plots the yearly rates of growth of the relative GDP levels vs. the yearly changes (plain differences) in the relative price levels for all EU countries starting with 1999/2000.

Figure 6

Growth rates of relative GDP levels vs. changes in relative residuals



As can be seen, positive changes in the relative residuals (which primarily reflect a movement towards overvaluation) tend to be associated with real divergence. Conversely, negative changes in the relative residuals (generally representing a movement towards undervaluation) tend to associated with real convergence. The correlation coefficient for the variables from Figure 6 is negative (and equal to -0.3722). Falling residuals are

earlier. It turns out that the regression coefficients for any such regression is less than one (with the constants very small and statistically insignificant). The β for the regression linking R(t+5) to R(t) is 0.5157, β for the regression linking r(t+4) to R(t) is 0.607.

accompanied by real convergence in 83 per cent of cases (and only in 17 per cent of cases with real divergence, though of moderate scale). Rising residuals are accompanied by real convergence in 45 per cent of cases – and in 55 per cent of cases by real divergence (on quite a high scale). It may be added that real divergence is even more likely when there is a rise in the relative residual from a position of overvaluation. (Overall a rise in the relative residual from a position of overvaluation occurs in 34 cases. 24 of them are associated with real divergence.) In contrast, a fall in the relative residual from a position of overvaluation (i.e. a change correcting the overvaluation), which occurs in 55 cases, is associated with real convergence in 45 cases.

All 182 observations for the years 2000/1999 to 2006/2005 can be classified according to three criteria: initial over/undervaluation; positive/negative change in relative residual; and real convergence/divergence (see Table 4).

Table 4

Number of cases classified according to various criteria14

	ΔR > 0	**ΔR>0**	**ΔR<0**	**ΔR<0**
	real convergence	real divergence	real convergence	real divergence
undervaluation	29	24	34	6
overvaluation	10	24	45	10

According to Table 4 there is also a tendency for the undervaluation to get corrected (ΔR > 0). This happens in 53 out of 93 cases. The frequency of a correction of an undervaluation (53/93 = 62 per cent) is larger than the frequency of correction of overvaluation (34/89 = 57 per cent). This may reflect the plight of many countries with fixed exchange rates (including the euro area members and the participants in the ERM II). Finally it may be observed that the frequency of real convergence with undervaluation (68 per cent) is higher than with overvaluation (62 per cent).

6. Summary and conclusions

- The relationship linking relative price and GDP levels, line (1), is statistically highly significant and stable. A higher relative GDP level tends to be associated with a higher price level.
- However, a conclusion that in any individual country one may expect a trade-off between low inflation and fast real convergence is not quite warranted. Such a trade-off

14 ΔR(t, j) is defined as R(t+1,j)-R(t,j), where R defined by (2).

can be expected in a country moving exactly along line (1). But there is no reason why the actual dynamics should be restricted to just such movements.

- Line (1) seems to be of some importance for real dynamics. Apparently, the actual trajectories tend to gravitate towards that line. But that gravitation is neither very fast, nor monotonic. In particular, real convergence can be sustained over longer periods of time also with inflation lower than the EU average. Inflation higher than the EU average does not necessarily accompany fast growth. Conversely, overvaluation does not seem to be conducive to fast convergence. It can be a source of stagnation, or even real divergence.
- Replacing national currency with the euro carries a risk to real convergence - not only when the initial conversion rate makes the initial price level too high (as in Portugal). Even if the initial price level is undervalued (as in Italy), the inability of the national currency to weaken (or be weakened through policy actions) may lead to a fast erosion of external competitiveness and produce a secular stagnation (or real divergence).
- Maintaining national currency is not riskless either, even with low domestic inflation. Fast and strong nominal appreciation of the exchange rate can push the domestic price level far above line (1), thereby precipitating stagnation or even recession (as in Poland in 1999-2002). However a more or less spontaneous correction – in the form of nominal devaluation – is not precluded. It goes without saying that a disciplined fiscal policy may help reduce the risk of undue overvaluation. But even the best fiscal policy alone could be powerless in overcoming the effects of excessively strong *foreign* competitive pressures. Attempts at a radical acceleration of 'structural reforms' (e.g. labour market deregulation, lower progressivity of taxes, lowering of non-wage costs and benefits etc.) need not help much. Worse still, such reforms may not only prove counterproductive domestically (as in Germany), but may also strengthen the classical 'beggar thy neighbour' attitudes and contribute to a general growth slowdown within the whole Union.
- Participation in the common currency area has proved troublesome – at least for some countries. This seems to indicate that the whole project may be suffering from some deficiencies – or is perhaps simply premature. However the failure of the whole project – e.g. re-introduction of national currencies in some euro area member(s) would probably have disastrous consequences for the *whole* EU. It is in the interest of all member countries – and especially of the new member states – to contribute constructively to a fast deepening of pan-European integration, also on fiscal and wage policy matters. Such an integration could help overcome stagnation in the euro area countries which have been condemned – not always due to their own faults – to strongly overvalued price levels. Of course, achieving deeper integration on fiscal and wage matters does not seem realistic without a much deeper political integration. Time will tell whether such an integration eventually happens.

References

Balassa, B. 1964. The Purchasing Power Doctrine: A Reappraisal, *Journal of Political Economy*, vol. 72, 584-89.

Bibow, J. 2006. 'Global Imbalances, Bretton Woods II, and Euroland's Role in All This', Levy Institute Working Paper, No. 486

Buiter, W., Grafe, C. 2002. Anchor, Float or Abandon Ship: Exchange Rate Regimes for Accession Countries, *Banca Nazionale del Lavoro Quarterly Review*, vol. 60, 111-142

Buiter, W. 2005. The purgatory and beyond: when and how should the accession countries from Central and Eastern Europe become full members in the EMU?, in Breuss., F., Hochreiter, E. (eds), *Challenges for Central Banks in an Enlarged EMU*, Vienna, Springer Verlag

De Grauwe, P., Schnabl, G. 2005. Nominal Versus Real Convergence – EMU Entry Scenarios for the New Member States, *Kyklos*, vol.58, 537-555

De Grauwe, P. 2006. 'On Monetary and Political Union', CESifo Forum, No.4

De Gregorio, J., A. Giovannini and H.C. Wolf, 1994. International Evidence on Tradables and Nontradables Inflation, *European Economic Review*, vol.38, 1225-44

Dobrinsky, R. 2006. Catch-up inflation and nominal convergence: The balancing act for new EU entrants, *Economic Systems*, vol. 30 , 424-442

Égert, B. 2007. 'Real Convergence, Price Level Convergence and Inflation Differentials in Europe', Austrian National Bank Working Paper No. 138

Flassbeck, H. 2007. Wage Divergences in Euroland: Explosive in the Making, in Bibow, J., Terzi, A., *Euroland and the World Economy: Global Player or Global Drag*, London, Palgrave Macmillan

Lein-Rupprecht, S.M., Leon-Ledesma, M.A., Nerlich, C. 2007. 'How is real convergence driving nominal convergence in the new EU Member States?', ECB Working Paper Series, No. 827

Podkaminer, L. 1998. Non-tradable goods and deviations between purchasing power parities and exchange rates: Evidence from the 1990 European Comparison Project, w H. Gabrisch. H., Pohl, R. (eds), *EU Enlargement and Its Macroeconomic Effects in Eastern Europe*, London, Macmillan

Podkaminer, L. 2003. Analytical notes on the Balassa-Samuelson Effect, *Banca Nazionale del Lavoro Quarterly Review*, vol.61, 207-223

Podkaminer, L. 2004. Why is food cheaper in rich (European) countries?, *Banca Nazionale del Lavoro Quarterly Review*, vol.62, 265-297

Podkaminer, L. 2006. 'Real convergence and inflation', The Vienna Institute for International Economic Studies", No. 5, May

Samuelson, P. 1964. Theoretical Notes on the Trade Problem, *Review of Economics and Statistics*, vol. 46, 145-54

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