

“Real Exchange Rate Movements and Endogenous OCA Analysis: Lessons from the Euro Area for Asia”

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Preliminary Partial Draft Comments Appreciated

I. Introduction and Overview

Several economists have argued that the endogenous responses generated by the creation of a common currency are sufficiently strong that countries considering monetary union need not worry ex ante about how well or poorly they meet the major criteria delineated in the theory of optimal currency areas (OCA). One implication of this view is that trade integration is enhanced by monetary integration. Therefore, the traditional view of sequencing practiced by Europe – that trade integration should precede monetary integration – should be reversed and Asia should go immediately to the creation of a common currency. This, however, could be a very high risk strategy if one is not confident about the strength of the endogeneities.

While it is too soon to draw definitive conclusions, the experience with the Euro to date gives our best “natural” experiment to test the strength of major endogeneities. While international monetary economists seldom reach complete agreement about the application of OCA criteria to particular countries, it is rather widely agreed among them that many euro entrants did not meet the major OCA criteria. The requirements of the

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Maastricht criteria for entry and the willingness to accept associated adjustment costs seem to have been sufficient to eliminate huge initial disequilibria among the euro countries at the time of entry. Few believed that the internal adjustment mechanisms were sufficiently flexible within the euro area to allow payments disequilibria among members to be adjusted at low cost. The hope of many was that the adoption of the common currency would stimulate the adoption of domestic structural reforms that would reduce adjustment costs over time. The record for the adoption of such reforms is mixed and informed observers have drawn different initial conclusions based on different views about how best to judge progress. Huge adjustment costs have so far been avoided, but many economists have expressed concerns that mounting disparities in national wage and price movements are foreshadowing a day of reckoning.¹

There has been the admittedly heroic assumption that the euro area was launched from an initial state of equilibrium. In this paper we propose to analyze intra euro movements in real exchange rates, adjusting exchange rate changes for changes in wages, prices, productivity, and growth, with the objective of evaluating disequilibria within the euro zone and the extent to which domestic adjustment mechanisms have operated. We sidestep analyses of particular reforms since the theoretical bases for evaluating them are controversial and ambiguous. By focusing on different concepts of real exchange rates and their relative adjustment we obtain indirect evidence of disequilibria relative to the conditions that would hold if endogenous adjustment had occurred. These conditions depend on relative productivity developments and growth rates that affect relative unit labor costs, producer and consumer prices differently.

¹ On these issues see the analysis and references in Willett, Permpoon, and Wihlborg (2008).

Many economic factors involve with the movements of exchange rate. Some literature suggests that some factors are temporary, such as some economic shocks caused by natural disasters. They will change the price of the relative prices thus the exchange rate in a short run. Some factors are more fundamental which influence the long-run price and then the exchange rate. The most direct fundamental factors include input costs, productivity levels, tastes and so on (Pigott, 1981).

The Balassa-Samuelson theory provides a common framework in explaining the relationship between real exchange rate and some of its economic factors. The Balassa-Samuelson effect implies that the price level of the country with higher productivity tends to be higher, and its real exchange rate goes in the same direction, that is, the country with rapidly expanding economies and growth rate will have more rapidly appreciating exchange rates. We believe that the appreciation of real exchange rate movement based on rapid productivity growth would tend to be equilibrating rather than disequilibrating, but if it is only pushed by input cost such as labor cost without the relative productivity growth, then it should be of concern – the appreciation country might loss competitiveness in the international market eventually if the effect of some other adjusting factors such as the capital flows are not big enough. Next, we investigate the movement of real exchange rate, price, productivity and other factors to see if there is evidence of deviations from equilibrium.

The rest of this paper is organized as the following. First, we introduce the selected data for the analysis. Second, we discuss the evidence with respect to disequilibria in the data on real exchange rates, price indices, unit labor costs and productivity. The objective is to gain insight with respect to the strength of endogeneities

after the euro adoption. Finally, based on the experience in the Euro zone, we conclude and give some thoughts for the Asian currency integration.

II. Data Selection

For the purpose of our analysis, we select annual data on real exchange rates, consumer and producer price, unit labor cost, comparative prices, productivity, and current account of the euro countries from ECB and OECD. For the convenience of comparison, we focus on 12 euro countries which adopted the euro in the early years (1999 to 2001) and exclude the recent new member states. The 12 euro countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain. Our data range from 1999 to 2007 or 2008 based on their availability. The following gives some details.

For the real exchange rate, we use a Real Effective Exchange Rate Index (REER) for each of the 12 euro-countries. The base year is year of 1999 and the data range from 1999 to 2007. There are several REERs developed by ECB. They are weighted averages of real bilateral euro exchange rates against the currencies of the euro-countries main trading partners. We use the REER 12 for each country based on the trade weights within the 12 euro-country group. Thus , REER12 reflects movements of competitiveness within the Euro zone.

Two kinds of REER12s are available. They are the CPI based and ULC based (REER12-CPI and REER12-ULC). REERs don't have separated data for Belgium and Luxembourg but have a combined data for the Belgo-Luxembourg economic union.

We also collected several sets of prices and cost index from 1999 to 2008. They include consumer price index (CPI - no food and energy and CPI –all items), producer price index (PPI-manufacturing and PPI-total economy), and unit labor costs (ULC-manufacturing, and ULC-total economy). Each of them exhibits different patterns of movements. Also, we have the comparative price level (the ratio between relative purchasing power parity and market exchange rates for each country and measures of consumption by private households), labor productivity index (GDP per hour worked), and current account as percentage of GDP from 1999 to 2007. All these index take year 2000 as the base year and have separate data for Belgium and Luxembourg.

III. A Look at the Evidence

Chart 1 provides a clear illustration of why there might be concerns that the internal adjustment mechanisms within the euro area are not operating powerfully. Under the assumption that the euro area was launched from an initial state of equilibrium (we have research in progress that loosens this assumption by looking at trends prior to 1999) we see only quite limited evidence of CPI inflation levels reverting toward the group average. Among the relatively low average inflation countries of Belgium, Finland and Germany the first two show some movement recently to increase their CPI inflation rates. High average CPI-inflation countries are Ireland, Greece, Spain and Portugal.

Chart 2 tells a largely similar story. It is based on calculations of CPI based real exchange rates within the euro area. Ireland, Spain, Greece and Portugal have appreciated in real terms relative to an average of their internal trading partners.

Chart 3 shows that there has been considerable price convergence among the full 27 current EU members as measured by the coefficient of variation of the comparative price levels. However, comparing this convergence trend among the 27 with the lack of convergence among the first 12 EMU-members it is evident that the convergence among the 27 comes primarily from the developments in the non-euro countries. There is little movement toward decreased dispersion within the euro zone in this indicator.

A further issue is that continuously diverging CPI price levels can be consistent with equilibrium if they are being driven by differentials in productivity growth as is emphasized in the Balassa-Samuelson analysis. According to this analysis we expect countries with relatively high productivity growth to have relatively high CPI inflation and higher CPI inflation than PPI-inflation.

Under a regime of fixed exchange rates and high levels of competition among exporters, the export prices will be largely exogenously determined from the standpoint of each country. If there is considerable labor mobility, then skill adjusted wage rates should also tend to equality. If productivity growth occurs primarily in the traded goods industries, then prices will tend to rise in the non-traded goods sector by the differential in the rates of productivity growth. Thus we get the counter-intuitive sounding conclusion that higher productivity growth will lead to higher inflation in a CPI index including non-traded goods, just the opposite from what we would expect from the quantity theory. The answer to this seeming paradox is that in the quantity theory analysis the money supply is taken to be exogenous while in the Balassa-Samuelson fixed rate case it is endogenous. Faster productivity growth leads to a balance of payments surplus that leads to monetary expansion at a faster rate than for the group as a whole.

A recent paper by Andres and Oxelheim (2006) find that producer prices in the euro zone behave quite differently from consumer prices so there is a possibility that the divergent trends in consumer prices would not be a problem. Their focus is primarily on the initial transition to the euro and they find that in the run up to the euro there was considerable convergence in producer prices but that after the euro was launched, this process slowed to an annual rate of about 3 percent. Their data only ran through 2005 so it is important to see if we can get additional clues from the later data now available. Chart 4 shows the movements in the euro-zone producer prices for manufacturers. Only for Finland do we see a strong tendency toward convergence

We study the empirical evidence with respect to the Balassa-Samuelson effect beginning in Chart 5 showing the development of each country's Labor Productivity Index. We observe on the average relatively high productivity growth in Ireland, Greece, and Finland while the productivity growth is relatively low in Italy. Charts 1 and 2 showed that Ireland and Greece had relatively high inflation rates. Finland had low CPI-inflation, however, while the CPI inflation in Italy was in the intermediate range. Turning to data for PPI inflation in Chart 4, we observe that Greece had high PPI-inflation as well but Ireland did not. Thus, Ireland's real exchange rate appreciation conforms to the Balassa-Samuelson hypothesis but we cannot say the same for Greece, Spain, Portugal and other relatively high inflation countries. Finland's low inflation is not consistent with this hypothesis. The relatively low productivity growth rate in Italy is combined with intermediate levels of both CPI and PPI-inflation.

Turning to evidence on relative cost levels in production, Chart 6 shows the movement of unit labor costs in manufacturing. These costs have increased relatively

rapidly on the average in Italy, Luxembourg, Spain and Portugal while favorable cost-developments are exhibited by Ireland, Greece, Germany and Finland. Here we see a pattern of mean reversion for Ireland and great variability in Greece. Italy has a strong upward trend that doesn't show in CPI and PPI. In contrast to the behavior of its unit labor cost in manufacturing, Ireland's ULC for the total economy shown in Chart 7 shows a steady rise, again consistent with Balassa-Samuelson.

Reflecting this behavior of economy wide unit labor costs, Chart 8 shows Ireland with the strongest appreciation of the total industry deflated unit labor costs followed by Spain, Italy and Portugal. The depreciating countries in terms of economy-wide ULC are Finland, Austria and Germany. This pattern is consistent with the real exchange rate changes in terms of CPI. As noted, Ireland is the only country clearly consistent with Balassa-Samuelson. For the other mentioned EMU-countries the real exchange rate movements in terms of both CPI and ULC could reflect diverging competitiveness over the period. The indications of mean reversion towards the end of the period are limited. The initial real appreciations of Portugal and the Netherlands have largely ended as has the real depreciation of Austria. The strongest evidence of mean reversion is for Greece whose initial real depreciation quickly ended, although the 2007 data registers the possibility of a beginning trend toward real appreciation. The strong trend real depreciation of Germany shows no signs of slowing, much less reversing.

Italy seems to be a different from the other countries showing real appreciations in terms of ULC in that its CPI and PPI inflation rates are relatively modest. One possible interpretation of the data is that Italian firms have been less able to compensate for cost increases in prices.

In summary, our initial look at the behavior of various prices does not show strong indications of mean reversion although we cannot rule out the possibility of some weak adjustment mechanisms at work. The lack of convergence in some of the indices for Ireland seems to reflect equilibrium adjustment to high productivity growth.

We may be able to gain additional insight into adjustment processes by looking at the behavior of current accounts (see Chart 9). Of course a full analysis would require comparison of the behavior of actual current accounts with estimates of equilibrium current accounts. The latter are of course difficult to estimate with any considerable degree of accuracy. As a first cut we look just at the behavior of the current accounts themselves.

In looking for patterns of intra-euro convergence and divergence in the trade accounts we plan to focus on intra-euro trade balances. Since we have not completed constructing these balances at present, we analyze the developments in the euro-countries multilateral account balances. In the future this will be complemented by analysis of direct investment and other capital flows.

The picture given by aggregate current account balances suggests that there may be considerable cause for concern that intra euro-zone adjustment mechanisms have not worked effectively date. Some trends can be detected. Germany, the Netherlands and Austria seem to have increasing surpluses over the period. Austria and Germany, in particular, are countries with relatively favorable real exchange rate developments. However, there is some suggestion that Germany's surplus has stopped growing and may have begun to reverse towards the very end of the period.

Countries with relatively negative developments of current account balances are Spain for the whole period, Finland, Ireland and Greece during the latter half of the period. Italy's current account seems to have a slight downward trend. Among these countries Ireland, Spain and Greece had appreciating real exchange rates and Italy's real exchange rate in terms of ULC was appreciating. We argued above that Ireland's appreciation may have been equilibrating. Nevertheless, Ireland since 2004 is showing signs of a rapidly growing current account deficit.

Spain's deficit leveled off in 2008, but at roughly 10 percent of GDP. Since 2004, Greece has been showing alarming increases with its deficit in 2007 rising to almost 15% of GDP. Finland shows a reversal of its initially growing surplus in spite of continuing favorable real exchange rate developments in terms of CPI, PPI and ULC.

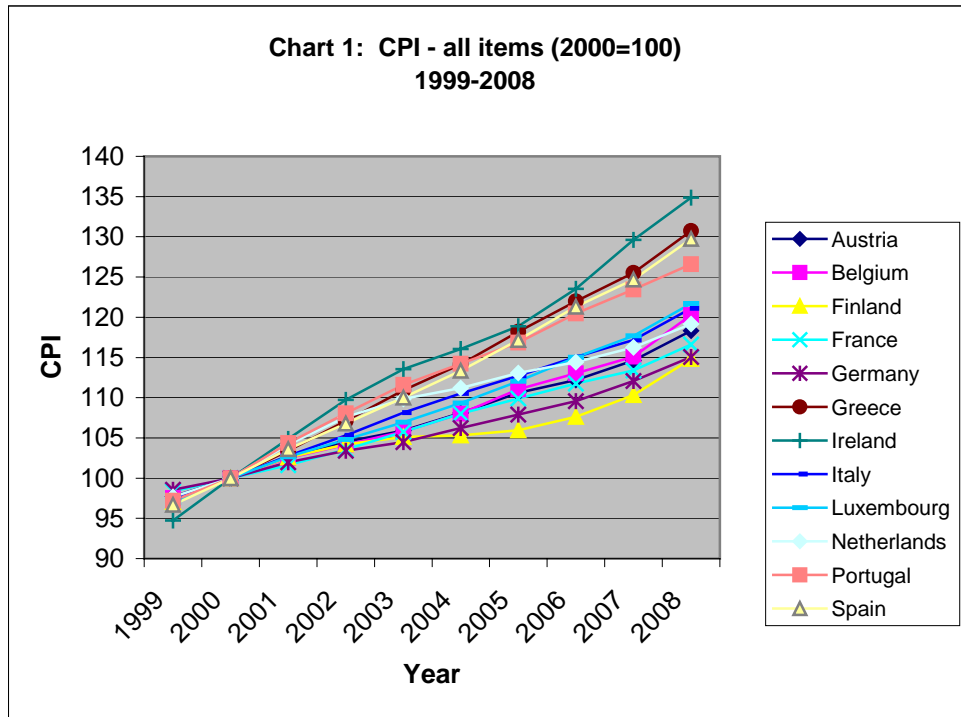
Noteworthy is also that Portugal has shown fluctuations with no particular trend, but within the very high range of deficits of 6 to 10% of GDP.

IV. Conclusion

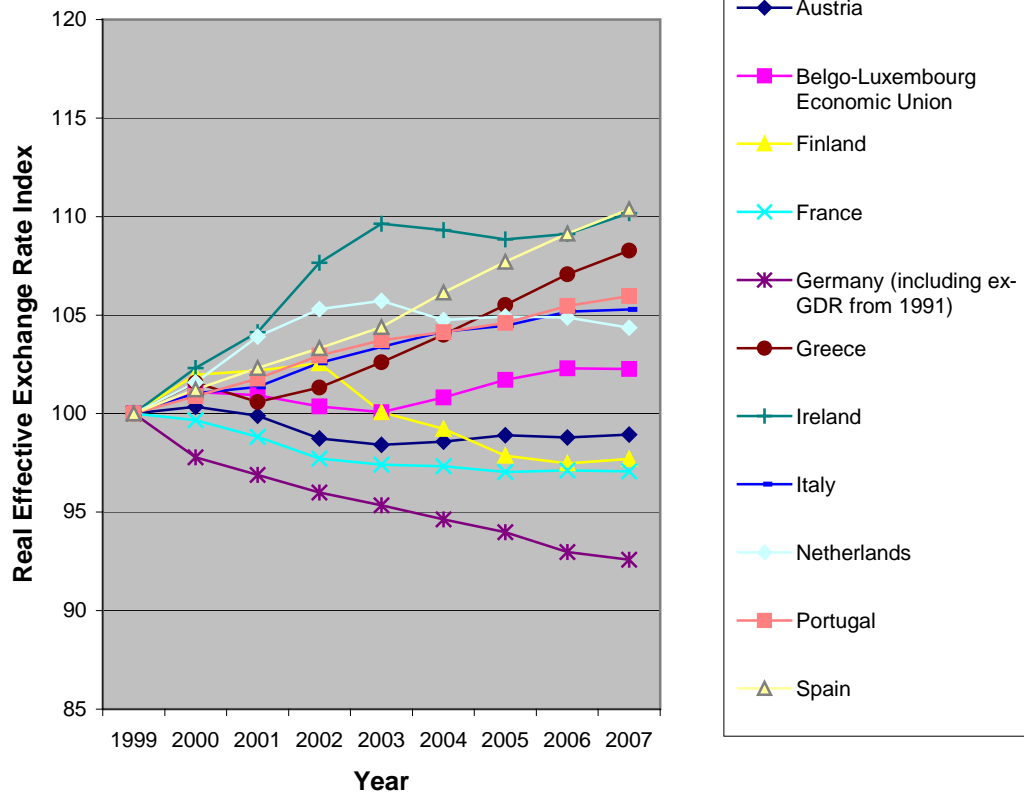
There is little evidence of equilibrating real exchange rate changes with the possible exception of Ireland for a large part of the period. If other developments since 1999 represent disequilibrating real exchange rate changes the EMU is in need of internal relative inflation and cost adjustment. In the long run it is not sufficient that relative price and cost levels have stopped diverging. Strengthening of adjustment mechanisms is required.

Since the movements in real effective exchange rate, price index and other data, suggest that there is little evidence that the internal adjustment mechanisms are operating powerfully in the euro zone, if Asia countries go immediately to create a common currency just based on the view that there are strong endogeneities in the Euro experience, they may face more cost than benefit, especially when Asian countries are less prepared historically in forming monetary integration than EMU countries. Unlike the Euro countries that are joining a broad and far-reaching integration process in the EU, Asian countries have few institutional structures in common (Khoury and Wihlborg, 2008) and are more diversified on the opinions in integration politically. While there have been more and more discussion about Asian integration, the lack of endogeneities evidence in the early years of euro adoption will provide Asian countries valuable reference in making decision on whether or when to adopt a single currency in the future.

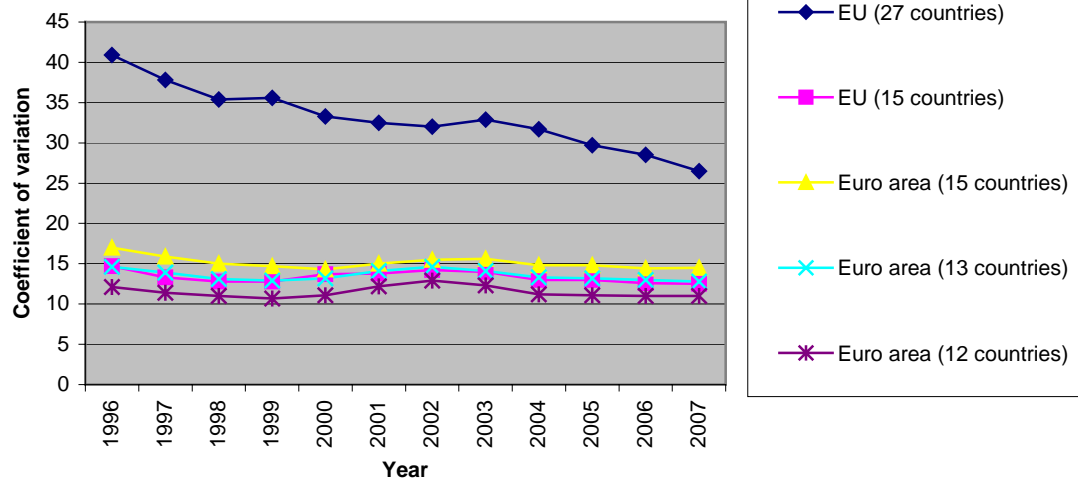
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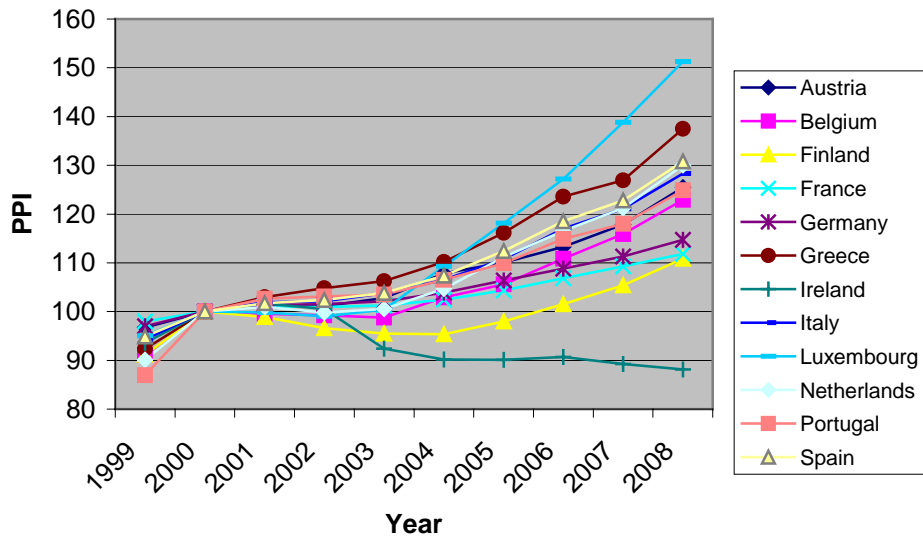
**Chart 2: Real Effective Exchange Rate Index
(CPI Deflated - 12 Euro Countries Group)
1999-2007**



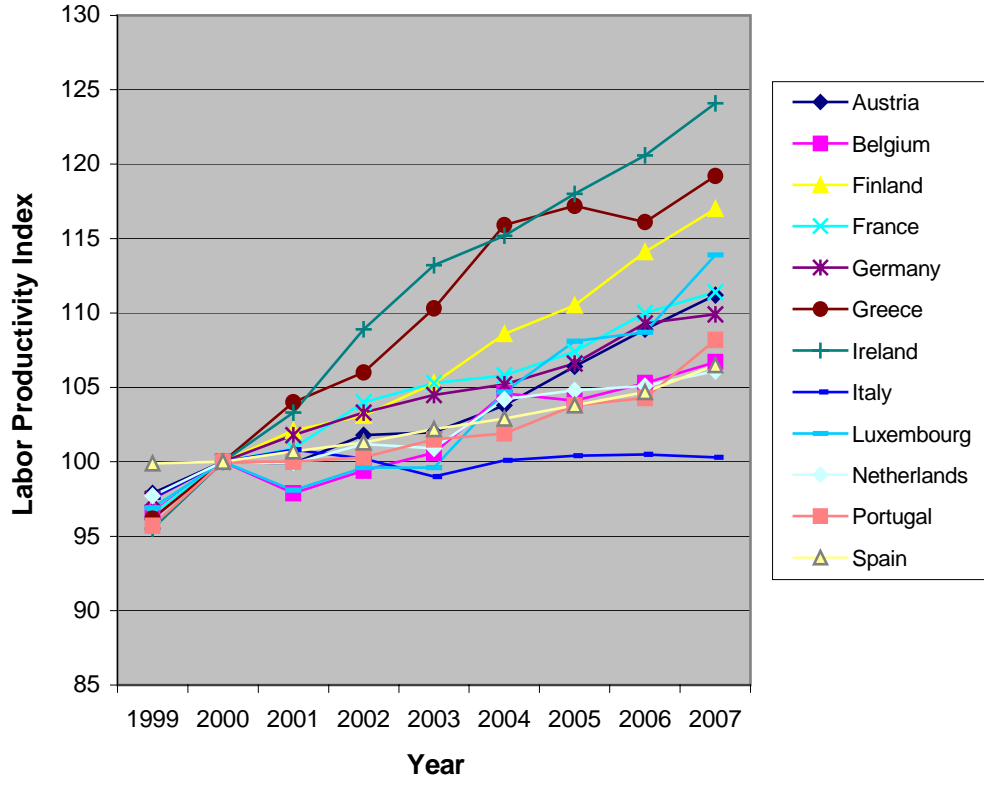
**Chart 3: Comparative Price Convergence Between EU Member States
1996-2007**



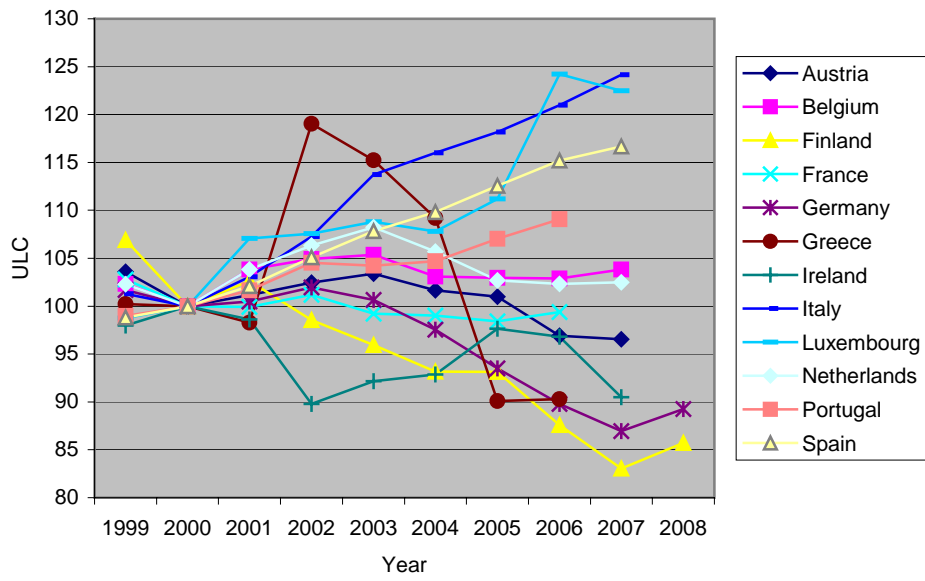
**Chart 4: PPI - manufacturing (2000=100)
1999-2008**



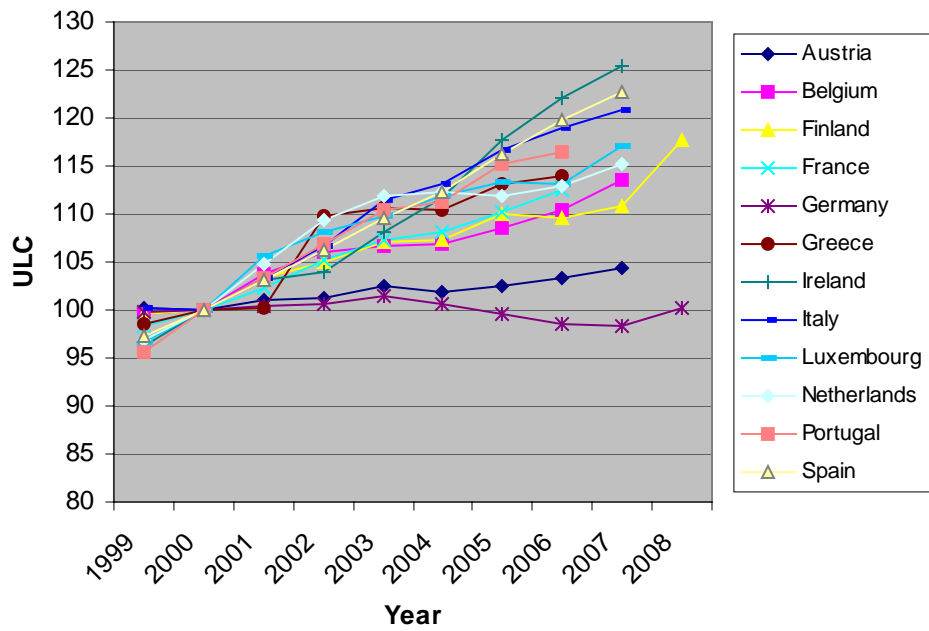
**Chart 5: Labor Productivity Index
(GDP per hour worked, 2000=100)
1999-2007**



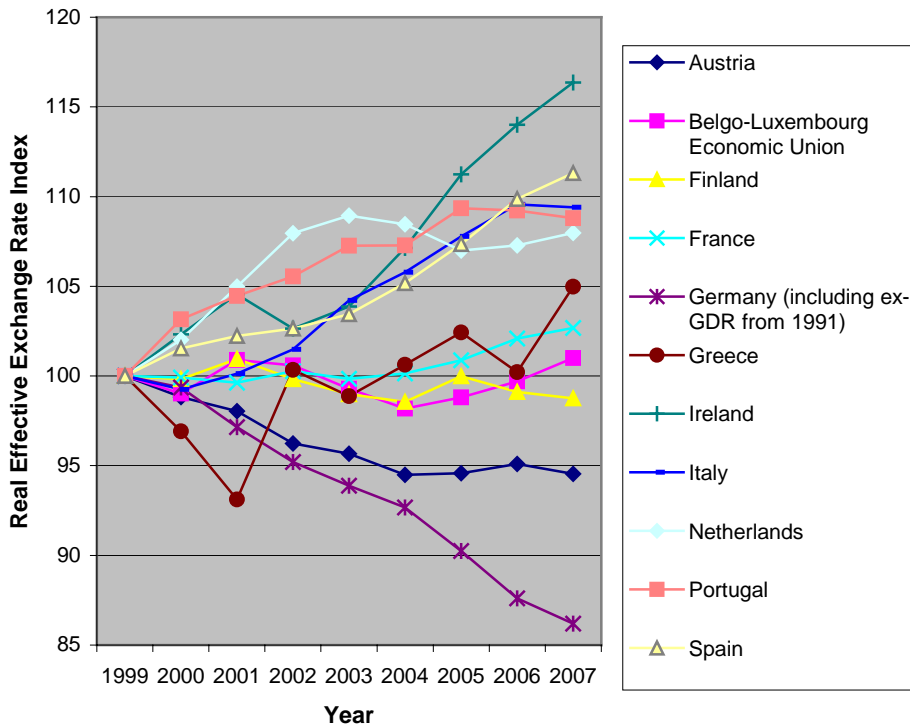
**Chart 6: Unit Labor Cost - manufacturing (2000=100)
1999-2008**



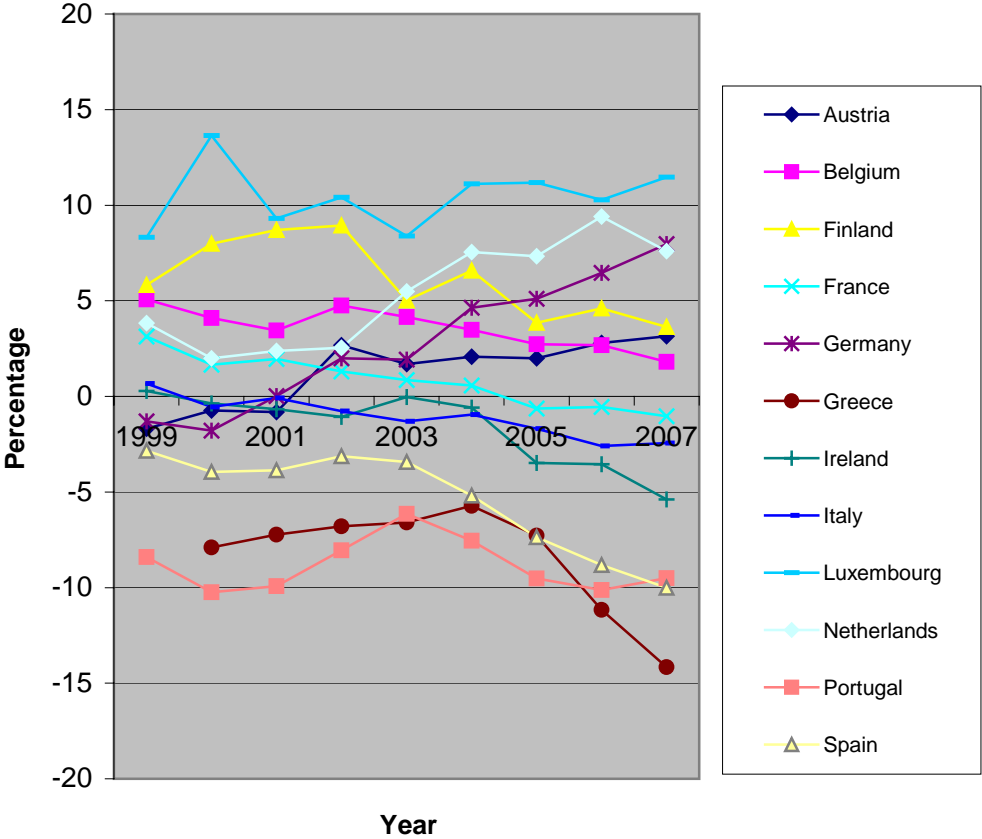
**Chart 7: Unit Labor Cost - total economy (2000=100)
1999-2008**



**Chart 8: Real Effective Exchange Rate Index
(UCL- total industry Deflated, 12 Euro Countries Group)
1999-2007**



**Chart 9: Current Account as Percentage of GDP
1999-2007**



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