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Marek Jarociński

**Nominal and Real Convergence in Spain, Portugal and
Greece During Their Accession to the EMU**

Warsaw, November 2003

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CASE – Center for Social and Economic Research

12 Sienkiewicza, 00-944 Warsaw, Poland

tel.: (48 22) 622 66 27, 828 61 33, fax: (48 22) 828 60 69

e-mail: case@case.com.pl

<http://www.case.com.pl/>

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Marek Jarociński

Marek Jarociński (born 1974) obtained a Master degree in economics in K.U. Leuven, Belgium (1997) and Warsaw University (1998). He specialises in econometrics and macroeconomics. He is an author of publications on macroeconomic problems in countries undergoing economic transformation. Marek Jarociński has worked for CASE since 1997, among others in advisory projects in Georgia and Moldova. Currently he is doing a PhD in economics in Universitat Pompeu Fabra, Barcelona.

Abstract

This paper reports the progress of nominal and real convergence of Spain, Portugal and Greece during their accession to the Economic and Monetary Union (EMU). When the EMU was designed, it was hoped that it would induce nominal convergence (convergence of interest rates and inflation rates) and stimulate investments and economic growth through its positive microeconomic effects. As had been expected, nominal interest rates have converged quite early during the accession, output has been growing fast, and the countries experienced an inflow of foreign direct investments (FDI) and an increase of domestic investment rates. However, once within the EMU, all three countries experienced persistently higher inflation rates, which may be consistent with the convergence of price levels, instead of inflation. While all the above phenomena can be related to the EMU accession, in an econometric estimation for Spain in which we control for macroeconomic policies, we are unable to detect significant microeconomic effects of the EMU. Therefore, we conclude that it is the policies induced by the necessity to satisfy the Maastricht criteria that matter primarily for the macroeconomic performance soon after accession. In any case, the experience of the SPG is encouraging for the new member states facing accession to the EMU in the future.

1 Introduction

The euro has been created in order to bring stability and prosperity to all members of the Economic and Monetary Union (EMU). This overview concentrates on the impact of the EMU accession on only a subset of the union members: Spain, Portugal and Greece (ordered by decreasing size, later referred to as SPG). Only in the mid-1970's all three of them emerged from dictatorships, with highly distortive and inefficient, autarkic economic systems, and their level of economic development still lags behind the European 'core'. Also, until recently, these countries have had inflation rates and fiscal deficits higher than the European average. These features make their experience in the EMU qualitatively similar, and particularly relevant for the new member states (NMS), which are bound to join the common currency soon after the EU accession.

The euro is still a new phenomenon and certainly not all its consequences have manifested themselves yet. The performance of the common currency and of the economies of the euro area countries has been mixed. It is too early for a final assessment, as it is difficult to isolate the effect of the euro from that of other, unrelated economic policies and developments. Nevertheless, many early attempts of an assessment of the effects of the euro are already being made, and some of them are cited below.

It would be incorrect to treat the EMU accession as a one-off act. It entailed a long sequence of political events. The process gained momentum after the Delors Report (1989) which proposed the three stages leading to the EMU and the Maastricht Summit in 1992, which put the implementation of the Report firmly on track. The political events were influencing market expectations and shaping macroeconomic policies as they were emerging. The final, culminative part of this sequence is presented below for later reference:

June 1997	ERM II+Stability and Growth pact
March 1998	Greek drachma included in the ERM II
2 May 1998	Decision by the Council of the EU that 11 Member States fulfilled the conditions for the adoption of euro, fixing irrevocable rates at the level of ERM II rates. The decision was based on the 1997 data.
1 January 1999	Irrevocable fixing of exchange rates
19 June 2000	Decision that Greece fulfilled criteria on the basis of 1999 data.
1 January 2001	Greece enters EMU
January 2002	Euro in circulation.

Source: ECB

2 The expected effect of the EMU

The ex ante expectations of the designers of the EMU, as formulated in the Delors Report (1989) and the One Market, One Money report (Emerson 1992) are following:

2.1 Nominal convergence

1. Disappearance of the exchange rate risk after the introduction of euro will cause convergence of interest rates on similar assets. Even before that, in the ERM phase "... the national currencies will be becoming ever more close substitutes and their interest rates will tend to converge. The pace of this evolution will be determined by the degree to which enterprises, households, trade unions and other economic agents will be convinced about the irreversibility of the decision to fix the exchange rates." (Delors Report, 1989, p.6)

2. Under the common monetary policy inflation rates will converge across countries.

The SPG are in a particularly suitable position to benefit from these two effects, since for them nominal convergence means reduction of both interest rates and inflation rates.

2.2 Real convergence

The main motivation for creation of the EMU is its expected positive effect on economic growth of all its members. "Creation of the single monetary zone will reinforce the potential advantages of the common market as it will reduce the uncertainties related to trade within the Community, diminish the transaction costs, eliminate the variability of the exchange rates and reduce the sensitivity of the Community to external shocks." (Delors Report 1989, p.8). One Market One Money report (ch.3) discusses these mechanisms at length and stresses also that the reduced uncertainty should encourage investment.

While output growth is expected in all member countries, poorer and richer alike, the net impact of the monetary union on the real **convergence** (convergence of real income per capita) is by no means clear. The conclusion depends on which of the alternative economic theories is employed.

The neoclassical growth model in general predicts convergence, driven by diminishing returns to production factors. Capital inflows to poorer countries, unskilled labor outflows to richer ones and trade integration should accelerate the process. The EMU, bringing reduction of the exchange rate risk, should stimulate efficient FDI allocation and trade, and result in an unambiguously faster convergence.

On the other extreme is the prediction of endogenous growth models and economic geography models. These models stress the existence of externalities, agglomeration effects and resulting increasing returns to scale. Consistently with this line of research, the common currency and closer

trade integration will only facilitate and encourage capital outflows from less developed to already successful regions and result in income divergence.

As discussed in Canova and Boldrin (2001) the European Commission seemed to give a measure of support to both views. On the one hand, it touted the EMU as contributing to convergence. On the other hand, it stressed the indispensability of Cohesion Funds accompanying the ever closer integration. The Delors Report (1989, section 29, p.8) said: "The Economic and Monetary union can have beneficial effects on the disadvantaged regions of the Community. For example, regions with low wages will have a possibility to attract modern enterprises and expand the services and manufacturing sectors, for which the choice of location is not primarily determined by the transportation costs, qualifications of the labor force and proximity to the markets. The experience shows, however, that in the absence of compensating policies, the global effect on the peripheral regions could be negative. The transportation costs and economies of scale could displace economic activities towards highly developed regions in the center of the Community, to the harm of the less favored regions, in particular in the peripheries." Consequently, the report advocates doubling of the EU Structural Funds.

The following sections review the available evidence on how the expectations of convergence were being fulfilled so far. The discussion starts with the description of the initial conditions.

3 Initial conditions

SPG had been members of the EU since the 1980's, for a significant time before the emergence of the common currency. Therefore, the initial impact of the EU membership had been already realized and their position in mid-1990's could be characteristic of their medium term situation in the EU. Table 1 shows the snapshot of some macroeconomic indicators in SPG in 1995. With respect to these indicators, the SPG are all in a similar position relative to the average of the euro area.

Table 1. Real per capita income in PPP (estimates of Eurostat and Heston et al. (2002) Penn World Tables), price level and long-term interest rates in Spain, Portugal and Greece in 1995, compared with the euro area average

	GDP ECU mln (1)	GDP PPP pcap % EU avg (2)	CGDP (3)	CGDP (% of euro area)	P (4)	P (% of euro area)	Inflation (5)	Long-term Interest Rate (6)
EuroZone	5 308 886	101.6	19 106	1.00	120.9	1.00	3.0	9.2
Spain	446 882	78.4	15 992	0.84	93.1	0.77	4.7	11.3
Portugal	82 887	70.9	12 907	0.68	83.8	0.69	3.8	11.5
Greece	89 889	66.1	12 218	0.64	92.0	0.76	9.0	17.4

Sources: (1) and (2) Eurostat, (3) Per capita GDP in comparable prices, Penn World Tables Version 6.1 (PWT6.1), Heston, Summers, Aten (2002), (4) Price level of GDP, PWT6.1; (5), (6) Eurostat data after EMI (1996)

The three countries' GDP constituted below 12% of the GDP of the common currency area, compared with their 20% share in terms of population. As Table 1 shows, the reason is both that

their per capita GDP in PPP was lower, and because they have lower domestic price levels relative to exchange rates. Thus, per capita PPP GDP varied between 84% of the euro area average for Spain (by the more optimistic measure) to 64% for Greece (by the more conservative measure). The price level series provided in Heston's et al. (2002) Penn World Tables (PWT) are very volatile, but it is safe to claim that in all three countries price level was consistently below the average for the Euro area.

The inflation rate in the SPG was higher than average, reflecting looser monetary policies and lack of reputation of their monetary authorities for guarding the price stability. Finally, the SPG had higher long term interest rates, which reflects their higher inflations, and, probably, higher risk premia demanded by the financial markets.

Given this starting position at the beginning of the EMU accession, the expected nominal and real convergence should be manifested in a reduction of interest rates and inflation, and a strong economic growth.

4 Economic policies and developments during accession

4.1 Towards meeting of the Maastricht criteria

The Maastricht Treaty, which set institutional foundations for the common currency, included the well-known convergence criteria to be fulfilled by successful applicants to the EMU. The criteria included ceilings on the inflation rate (at most 1.5 percentage points above the average of the three lowest inflation countries), budget deficit (3%), debt/GDP ratio (60% maximum), long-term interest rate (at most 2 percentage points above the average of the three lowest long-term interest rate countries) and the required 2-year period of stability of the exchange rate within the ERM. These strict requirements were watered down somewhat by clauses, which allowed breaching the criteria exceptionally, or even systematically, provided a clear trend towards compliance was observed. Nevertheless, the Maastricht criteria had been shaping the economic policies of the future members at least since ratification (around 1995), and to a large extent already since the Maastricht summit in 1993.

Table 2 below shows countries' performance with respect to inflation, fiscal position and public debt.

Table 2. Inflation rates (CPI and HICP), fiscal balance/GDP and debt/GDP in Spain, Portugal and Greece in 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
Spain								
Inflation CPI	4.7%	3.6%	2.0%	1.8%	2.3%	3.4%	3.6%	3.1%
Inflation HICP	-	3.6%	1.8%	1.8%	2.2%	3.5%	2.8%	3.6%
fiscal balance/GDP	-7.1%	-5.0%	-3.2%	-2.6%	-1.1%	-0.3%	0.0%	-
debt/GDP	64.2%	68.0%	66.7%	64.6%	63.1%	60.4%	57.2%	-
Portugal								
Inflation CPI	4.1%	3.1%	2.2%	2.7%	2.3%	2.9%	4.4%	3.6%
Inflation HICP	-	2.9%	1.9%	-	2.1%	2.8%	4.4%	3.7%
fiscal balance/GDP	-5.7%	-3.8%	-2.7%	-2.3%	-2.2%	-1.5%	-2.2%	-
debt/GDP	65.9%	63.6%	59.1%	54.8%	54.2%	53.2%	55.6%	-
Greece								
Inflation CPI	8.9%	8.2%	5.5%	4.8%	2.6%	3.2%	3.4%	3.6%
Inflation HICP	-	7.9%	5.4%	4.6%	2.1%	2.9%	3.7%	3.9%
fiscal balance/GDP	-10.2%	-7.8%	-4.6%	-2.5%	-1.8%	-0.8%	-0.1%	-0.4%
debt/GDP	108.7%	111.3%	108.5%	105.4%	104.6%	102.1%	107.0%	103.2%

Sources: IFS, EMI (1996), (1998), Central Banks of Spain, Portugal and Greece. Bold face highlights data which was the basis for the qualification for the EMU accession (1997 for Spain and Portugal and 1999 for Greece).

We see fiscal deficits being reduced every year prior to the decision on accession (1997 for Spain and Portugal, 1999 for Greece). As a result of this, tight monetary policy and stable exchange rates, inflation was squeezed below the reference rates. Debt ratios were also falling, albeit with some slippage in the case of Spain in 1996. Not all of the countries actually achieved the 60% threshold (in Greece it never fell below 100%), but the progress in reducing debt ratios was judged by the Council of EU to be satisfactory.

Fiscal position remained tight also after the accession. This is a particularly valuable indirect effect of the EMU, especially in light of the proposition of Perotti (1996) and references cited there, that persistent fiscal adjustments tend to have positive effects on growth already in the short term. Inflation rates rebounded after the accession. This phenomenon is discussed in more detail in section 5.2.

4.2 Investments and Balance of Payments

Table 3 below illustrates the behavior of Balance of Payments and national investment rates in the SPG.

Table 3. Current Account Balance and FDI as a share of Exports (goods and services) and GDP, Investment share in GDP

	1995	1996	1997	1998	1999	2000	2001	2002
Spain								
CAB/Exports	0.6%	0.3%	1.7%	-1.9%	-8.3%	-11.3%	-9.3%	-8.4%
FDI/Exports	4.7%	4.6%	4.2%	7.4%	9.4%	21.8%	15.8%	11.3%
CAB/GDP	0.1%	0.1%	0.4%	-0.5%	-2.3%	-3.4%	-2.8%	-2.4%
FDI/GDP	1.1%	1.1%	1.1%	2.0%	2.6%	6.6%	4.8%	3.3%
I/GDP	22.0%	21.6%	21.9%	22.8%	24.1%	25.3%	25.0%	25.4%
I/GDP PWT	22.0%	23.2%	23.2%	24.0%	24.6%	25.5%	-	-
Portugal								
CAB/Exports	-0.4%	-15.5%	-19.4%	-22.7%	-28.5%	-33.0%	-30.5%	-24.7%
FDI/Exports	2.1%	5.1%	7.6%	9.1%	3.6%	20.3%	17.1%	11.5%
CAB/GDP	-0.1%	-4.7%	-6.1%	-7.0%	-8.5%	-10.4%	-9.4%	-7.5%
FDI/GDP	0.6%	1.5%	2.4%	2.8%	1.1%	6.4%	5.3%	3.5%
I/GDP	23.1%	23.2%	24.1%	24.7%	28.3%	29.2%	28.1%	25.8%
I/GDP PWT	23.8%	23.7%	25.4%	26.6%	26.5%	27.2%	-	-
Greece								
CAB/Exports	-18.5%	-29.9%	-32.7%	-	-29.1%	-33.4%	-31.3%	-34.6%
FDI/Exports	6.8%	6.9%	6.6%	-	2.3%	3.7%	5.3%	0.2%
CAB/GDP	-2.4%	-3.7%	-4.0%	-3.2%	-4.1%	-6.9%	-6.0%	-6.6%
FDI/GDP	0.9%	0.9%	0.8%	-	0.5%	1.0%	1.4%	0.0%
I/GDP	18.6%	19.5%	19.8%	21.1%	21.7%	22.6%	22.8%	23.0%
I/GDP PWT	19.5%	20.4%	20.8%	21.8%	21.3%	22.8%	-	-

Sources: IFS, except investment share in GDP at comparable prices (I/GDP PWT) PWT6.1.

Prior to the accession, Spain has had an almost balanced current account, while Greece and Portugal have had significant deficits. Current account balance as a share of exports is sometimes used as a rough proxy for the devaluation that would be needed to attain equilibrium (assuming unit export elasticity, as e.g. Gros (2002)). On this crude measure, Spain entered the EMU with a roughly correct parity, while Greek drachma and Portuguese escudo were considerably (20-30%) overvalued, in spite of the drachma devaluation in 1997.

The SPG had a positive inflow of foreign direct investments throughout the period, but for Greece and Portugal it was far from covering the current account deficit, which had to be financed

also by more risky short term capital. This, however, did not prevent them from smoothly entering the EMU, without much feared speculations like those that broke up the ERM in 1992.

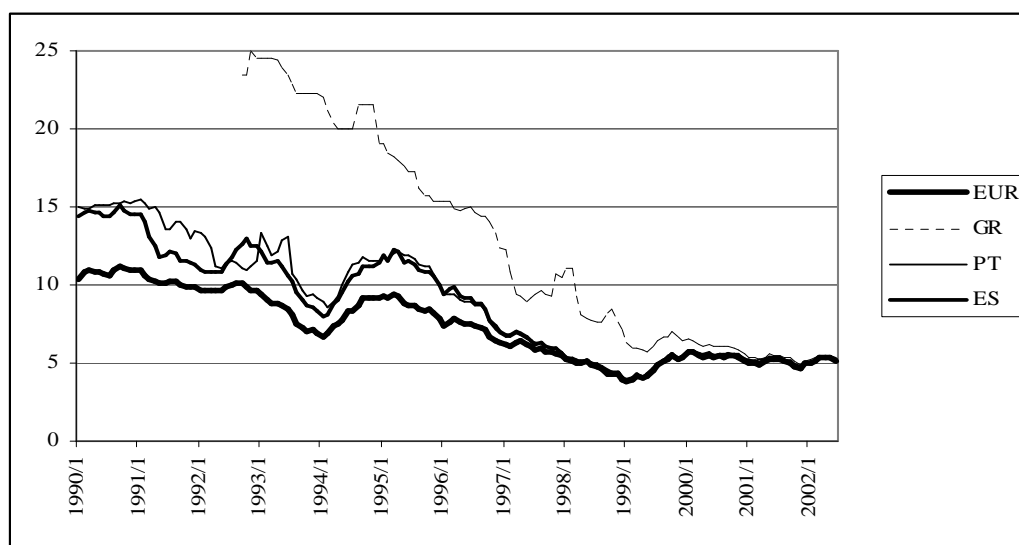
After the adoption of the euro all three countries slipped into larger external deficits. This could at first glance be interpreted as a signal of problems of country industries competing in the more competitive euro area market. However, the FDI inflow as well as domestic investments clearly increased (except Greece where FDI performance was mixed). Although FDI usually constitute a small part of total domestic investments, they tend to be positively correlated and both are perceived as a signal of good growth perspectives. Higher investment adds to the domestic demand and tips the current account into deficit. The broad picture is therefore more compatible with the investment revival triggered by the opportunities of the EMU membership.

5 Nominal Convergence

5.1 Interest Rates (T-bonds and retail interest rates)

Figure below illustrates the behavior of the long term interest rates, which are the subject of one of the Maastricht criteria.

Figure 1. Long term interest rates of SPG and EuroZone average, monthly averages, 1990-2002



Source: Eurostat - General Statistics - Financial Statistics – Government bond yields, 10 year (average) (%)

The most striking feature of the graph is the convergence of the interest rates prior to or on the date of the EMU accession. The differences that do remain once in the Euro area (although hardly visible on the graph) result from different valuation by markets of country default or EMU exit risks, or possibly from institutional imperfections of the individual markets. These are dwarfed by the exchange rate risk, which had determined interest rates prior to the accession, and disappeared afterwards.

The clear trend towards convergence of the interest rates started sometime in 1996, prior to the creation of the ERM II and the Stability and Growth Pact. By May 1998, when the membership of Spain and Portugal was formally approved, their long term interest rates had already been very

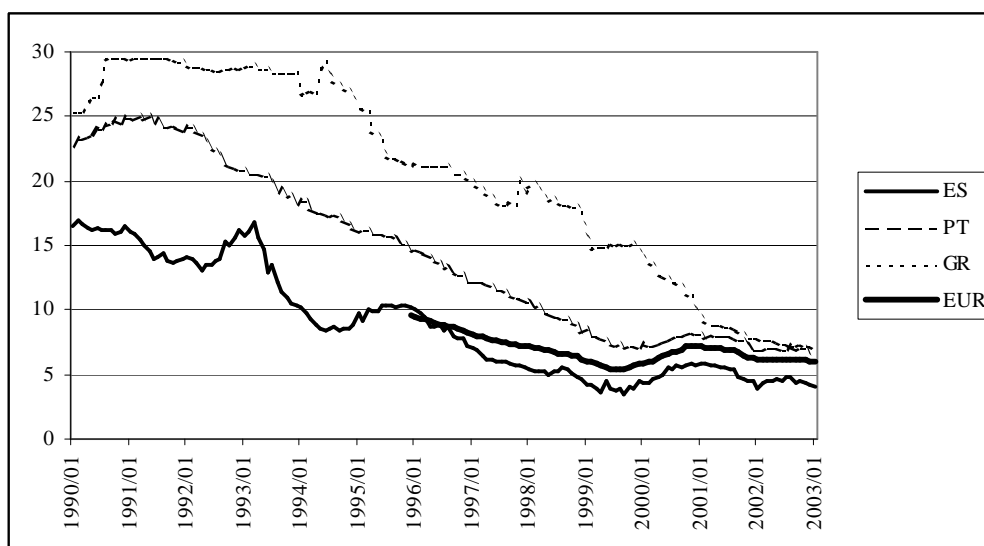
close to the euro area average for a few months. The political news could have been discounted by the markets for some time before. Also in Greece a significant long term interest rate convergence predates the admission to the EMU.

Prior to the accession, two parallel effects reducing interest rates have been at work. First, fiscal tightening reduced the supply in the bond market. Second, both the fiscal reforms and subsequent political steps towards EMU membership had been increasing the market confidence in the successful accession and future disappearance of the exchange rate risk. It is hard to disentangle these two effects without an econometric framework, which would allow estimation of the credibility effect induced by the political steps towards EMU membership, while controlling for the country economic policies and in addition for global conditions. So far, the conclusion is that some combination of the economic policies and anticipation of the political events by market agents caused the significant interest rate convergence prior to the accession.

The interest rates are directly linked to the foreign exchange markets by the uncovered interest rate parity: an expected depreciation should increase the interest rate by the same amount. In a study of volatility of the exchange rates Wilfling (2001) finds a regime switch in the volatility of the European FOREX markets in the late 1997. He concludes that this would be the moment when market expectations switched towards a successful launch of the euro.

How quickly did the reduction of the interest rates on government bonds translate into lower retail rates? Figure 2 below shows the retail interest rates on short term loans to enterprises in SPG and euro area averages.

Figure 2. Retail interest rate on short-term loans to enterprises, SPG and Euro area average, 1990-2003



Source: ECB, Statistics, Retail interest rate statistics, euro area retail interest rates and National Retail Interest Rates.

Overall, the picture is similar to the situation with the interest rates on long term government bonds. In Greece and Portugal the EMU participation resulted in a significant reduction of the retail interest rates towards the euro area average. Spain is a different case here, since its retail short term interest rates had been below the European average for some time before the common

currency. The picture for rates on long term retail loans to enterprises is similar, except that Spain also converges to the average from above.

5.2 Consumer Prices

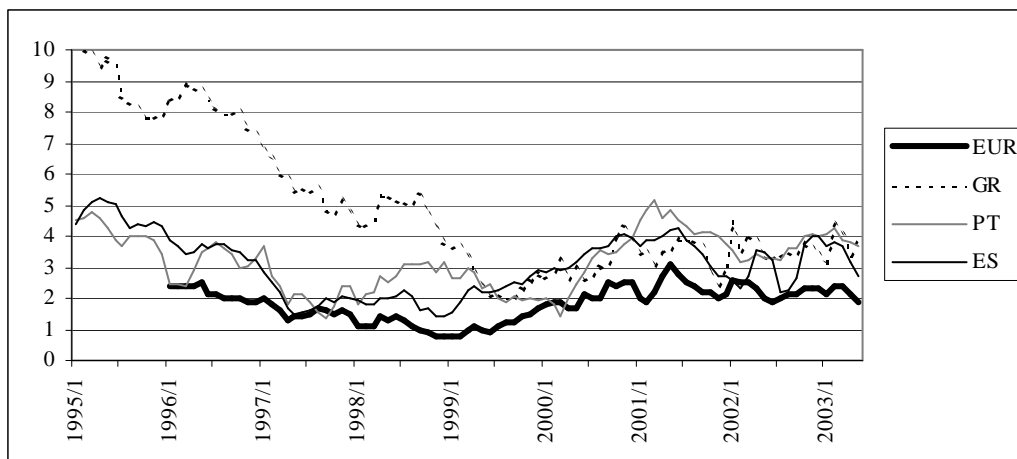
As a precondition to the EMU accession, the participating countries had to achieve a high degree of convergence of inflation rates (at most 1.5 percentage points above the average of the three lowest inflation countries). A characteristic feature of the EMU experience of the SPG since then has been a slight rebound and then persistence of the resulting inflation differentials (see Figure 3). Annualized inflation rates in the SPG are around 1.5-2 percentage point above the euro area average.

There are two main competing views on the nature of the persistent inflation differentials in the EMU. The first links them to the real convergence and the accompanying Balassa-Samuelson effect. According to this view, as poorer countries catch up with the richer ones, the productivity growth is faster in the tradable sector. Higher productivity raises wages in the tradable sector and in the nontradable one as well. This wage growth causes the 'dual inflation', which is however neutral to the export competitiveness of the country, since it only reflects the productivity increase. The second view is that higher inflation in some countries reflects domestic demand pressures in presence of economic rigidities. As a result of rigidities, such as excessively protective labor market legislation or lack of competition in some sectors, demand pressures result in a growth of prices, instead of a growth of output.

If the inflation differentials observed in the EMU, in particular higher inflation rates in the SPG countries, result from the Balassa-Samuelson effect, they pose no threat to economic stability and should be welcome as signals of real convergence. (This scenario has been envisaged in the One Market, One Money report, although the authors dismissed the importance of the quantitative effect on inflation). However, if they result from economic rigidities, they will result in a gradual loss of international competitiveness in those countries and current account deficits. The particular danger of the monetary union is that the exchange rate devaluation cannot restore the equilibrium, and, in addition, external deficits are easier to be financed by external borrowing from other countries, since the exchange rate risk does not prevent them from lending. This would facilitate protraction of imbalances and unsustainable buildup of foreign debt.

These dangers spurred interest in the subject among economists. The above views on inflation differentials and empirical evidence for either of them are discussed at length e.g. in Alberola (2000) and Ortega (2003). Overall, it is still early for a final empirical assessment, but Alberola (2000) finds a measure of support for both views in the case of Spain. Ortega (2003) links Spanish inflation to a growth of markups, which would suggest insufficient competition in an important part of the economy.

Figure 3. Annual rate of change in consumer prices in SPG and euro area average, monthly, 1995-2003

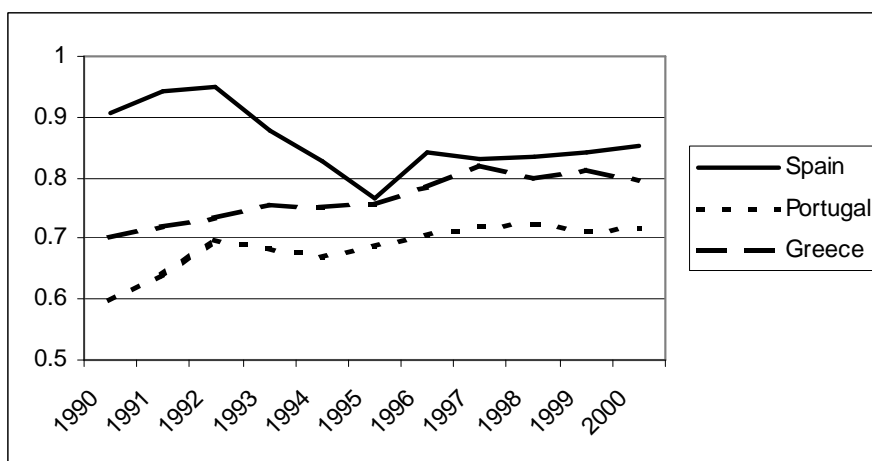


Source: IFS, ECB

A force less stressed in the theoretical work on the monetary unions (also absent in the One Market, One Money and the Delors reports) is that of price levels (of tradable goods) convergence across countries. The common currency facilitates cross-border price comparison and arbitrage. There is some early evidence of trade acceleration between euro area countries (De Nardis, Vicarelli 2003 estimate the impact of euro alone on trade, controlling for the effect of the reduced exchange rate volatility, to be between 2.6% and 6.1%). Deeper trade integration is likely to contribute to gradual prices convergence. The convergence should not be expected to ever be full, after all a degree of price variation exists also inside countries, but it is likely to become deeper within the EMU.

Rising markups in the cheaper countries of the euro area, found by Ortega (2003), may also result from an increase of foreign demand, driven by tradables price differentials. In this case, the inflation differentials would also be undisruptive and their impact on the external balance should be positive and neutral in the long run.

Figure 4. Price level of GDP in Spain, Portugal, Greece as a ratio of the euro area average, 1990-2000



Source: PWT6.1, Heston, Summers, Aten (2002).

Figure 4 shows the dynamics of price levels of GDP (calculated in the Penn World Tables) of the SPG countries, relative to the euro area average, over the past decade. The price level series are very volatile, which suggests serious measurement problems. As it is, the picture shows a gradual convergence of country price levels towards the euro area average, at least in the second half of the 1990s.

6. Convergence of per capita GDP

It is impossible to conduct a meaningful empirical study of per capita income convergence triggered by the EMU alone since the available data is too short. The monetary union is an important enhancement of the common market. However, even if one believes in the overall positive effect of the common market on convergence, there is no compelling reason to expect from it too much of a qualitative change. More likely is a broad continuation and gradual acceleration of any convergence that might have already been underway.

Empirical studies of real convergence have been conducted on various datasets with many units observed on many periods. Most international studies fail to detect unconditional convergence, only the *conditional* one (Mankiw et al. 1992, Barro and Sala-i-Martin 1995), which implies that generally a reduction of inequality is not advancing. Similarly, studies of European regions (Barro and Sala-i-Martin (1995), Canova and Marcet (1995)) conclude that regions converge to their individual and widely varying steady states. Boldrin and Canova (2001) find convergence only in *growth rates*, which is a strongly negative message for real convergence, as it implies freezing of the existing income differences. Overall, neither convergence nor, for that matter, divergence has been empirically confirmed as a general phenomenon.

Table 4. Real GDP, annual growth rate in Spain, Portugal, Greece and Eurozone average, 1995-2002

	1995	1996	1997	1998	1999	2000	2001	2002
Spain	2.3	2.4	4.0	4.3	4.2	4.2	2.7	2.0
Portugal	2.3	3.3	3.7	4.7	3.8	3.7	1.6	0.5
Greece	2.1	2.4	3.5	3.4	3.6	4.2	4.1	4.0
Euro area	-	1.6	2.8	2.8	2.6	3.5	1.4	0.8

Sources: National Banks, ECB.

In the recent years the SPG have been growing faster than the euro area average (except for Portugal in 2002) and the real convergence of these countries to the rich European core seems to be underway, whether interpreted as a part of the general process or as an exception from the rule. Earlier discussion of the trends in foreign and domestic investments in SPG confirms this picture and seems to give the EMU, after all, an important potential role in inducing real convergence. However, the definitive answer of the impact of the EMU membership on growth has to wait until more observations are available.

7 Isolating the effect of the euro

Previous sections report noticeable changes in a number of macroeconomic variables during the process of EMU accession. However, it remains unclear to what extent these trends are caused by direct, microeconomic effects of the euro, its macroeconomic effects, effects of the economic policies accompanying the accession, and finally external, unrelated factors.

The microeconomic effects of the common currency have been described in the Emerson et al. (1992) One Market One Money report. Most prominently, increased credibility of the monetary policy and the reduction of the exchange rate risk are supposed to permanently improve the investment climate. In addition, smaller costs of international transactions should boost overall efficiency of the economy.

On the other hand, lower interest rates constitute a macroeconomic shock, which could equivalently be generated by the expansionary policy of the central bank. What makes the difference is the permanence of this shock. In theory, we could decompose the effect of lower interest rates into the usual effect of monetary expansion, and the remainder, which we would ascribe to the improved long term business climate and classify together with the aforementioned microeconomic effects.

Macroeconomic policy accompanying the accession, in particular the fiscal tightening in order to bring inflation and debt in line with Maastricht criteria, constitutes another factor behind the observed developments. Politically, this policy has been the result of the EMU accession, but it is a reasonable policy option also in absence of any monetary union prospects. Finally, the observed behavior of the economies of the accession countries is influenced by usual dynamics of international business cycles.

In this section we try to isolate the direct, microeconomic effect of the EMU. Therefore, in assessing this effect we have to control for the usual impact of lower interest rates, fiscal tightening and for international conditions. In order to accomplish this, we consider the econometric model used in Mountford and Uhlig (2002) to analyze responses of the US economy to fiscal, monetary and business cycle shocks. We estimate a similar model for Spain, augmenting it with a dummy variable indicating the EMU accession. Therefore, we hope that the coefficient of this variable captures the pure effect of the EMU after taking into account the impact of fiscal, monetary and business cycle shocks.

In particular, we estimate a vector auto-regression (VAR) for Spain (fiscal data for Greece and Portugal was insufficient) with government revenues, expenditures, real GDP, CPI and interbank interest rate (and optionally gross fixed capital formation and narrow money)¹. As exogenous variables we add current and lagged world price of oil, constant term and a dummy variable which takes a value of zero in the beginning of the sample, and one after a specified cutoff date, and which is supposed to capture the effect of the EMU. The coefficient of interest is the one on this dummy variable. Since the responses to the structural shocks are out of scope of this analysis, it is

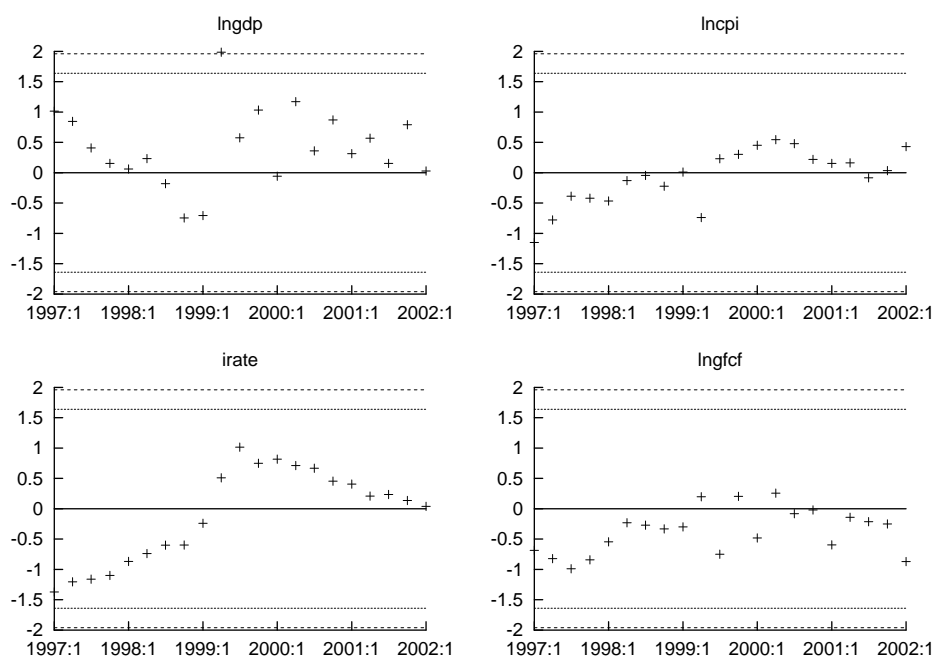
¹ Quarterly data in logs, except for interest rates in levels.

not necessary to identify the structural model, as in Mountford and Uhlig (2002). The effects of the fiscal and monetary shocks are already taken account of in the above reduced form model which can be estimated by the OLS. Therefore, the coefficient on the dummy variable captures the persistent impact of any events at the cutoff date, purged from the effects of the usual interaction between the macroeconomic variables.

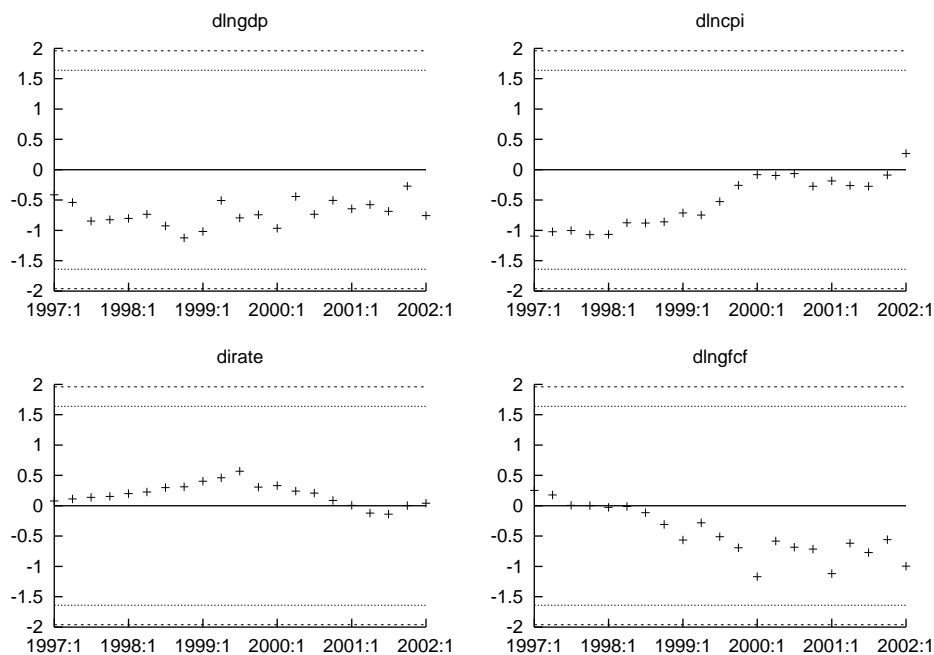
Similar approach to measuring the effect of the euro was applied in De Nardis and Vicarelli (2003) who estimate the coefficient of the dummy variable in a dynamic (panel) model explaining trade. An alternative would be to search for a change in the slope coefficients, but this approach would require more data points after the EMU accession and is currently infeasible.

It is not clear which of the important steps towards the EMU accession, listed in Table 1, was the economically most important one. Additionally, any of them could have been anticipated or could work with a lag. Therefore, we take an agnostic approach and try to include, one by one, dummies starting in each quarter from 1997Q1, 1997Q2 etc. up to 2002Q1. The figure below plots their t-statistics together with the 90% and 95% two sided critical values, against the starting date of the EMU dummy.

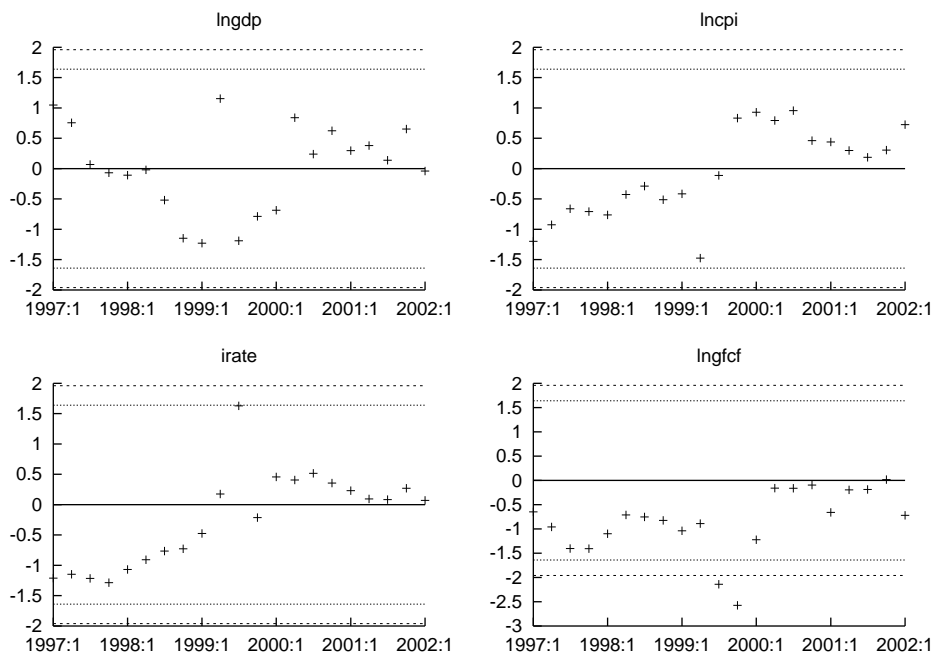
Figure 5. T-statistics of the euro indicator variable in the equations GDP, CPI, interest rate and gross fixed capital formation, for various specifications, plotted against the starting date of the EMU dummy.



A: sample 1975Q1-2003Q1; data in log levels; each equation contains lags 1-2 of government revenues, expenditures, GDP, interest rate, CPI; exogenous controls: lags 0-2 of log oil prices.



B: as in panel A, except: data in log first differences.



C: as in panel A, except: 3 lags of each variable

The main feature of the plot is the lack of significance of the EMU dummies in explaining real GDP, prices, interest rates and investment dynamics. This finding is generally robust to reducing or increasing the number of lags, including or excluding narrow money and gross fixed capital formation among the endogenous variables of the VAR, including or excluding the linear trend or performing the analysis in first differences. It should be kept in mind that each of the points on the plots corresponds to one estimated regression, so figure 1 presents results of t-tests from 252 regressions and we find only 3-4 significant ones among them.

Concluding, we find no robust evidence that the introduction of the euro per se was the driving force behind the economic developments in this period. We see significant changes in

macroeconomic variables during the accession, which are easy to logically associate with some of the steps towards EMU accession. However, the econometric analysis shows that these changes can be sufficiently forecast by lagged values of macroeconomic indicators. Therefore, we can't reject the claim that it is the policies accompanying the introduction of the euro, and not microeconomic effects of the common currency, that matter in the case of Spain.

8 Conclusions

Although the common currency is being partly blamed for the current slowdown and tensions in the EMU, the impact of the accession on the poorest and less stable countries has been quite beneficial. Convergence, which for SPG means faster growth, lower interest rates and more stability, has been progressing, if not accelerating, under the new monetary regime.

The requirements of the EMU membership helped these countries to perform a lasting fiscal adjustment and, as a result, bring their external debt on a more sustainable path. The EMU accession seems to have helped them to attract more foreign direct investments. Interest rates have roughly converged from quite high levels down to the euro area average already months prior to the actual EMU accession. This helped strengthening domestic investment rates too. Growth performance of the SPG has been better than the euro area average.

However, some tensions are also appearing. It seems that instead of the convergence of inflation rates, price levels of the SPG have been converging to the euro area averages, which meant higher than average inflation. Current account deficits widened significantly. More research is needed to determine the nature of those processes, but any rigidities, especially resulting from labor market regulation, should be exacerbating those problems.

A question arises, to what extent the EMU accession has a positive impact directly: by its credibility effects, reduction of exchange rate risk and costs, and to what extent the accession is a political device that forces countries to adopt sound economic policies, in particular to revamp their fiscal policies. The econometric analysis for Spain suggests that it is the policies that matter.

In any case, the experience of the SPG is encouraging for the new member states facing accession to the EMU in the coming years. Judging by this experience, if policies leading to satisfying the convergence criteria are firmly on course, the benefits can start to be reaped already before the accession. This concerns particularly the reduction of interest rates, both on government debt and retail loans, and probably also the accelerated FDI inflow. The evidence for Spain notwithstanding, it is not inconceivable that microeconomic effects are stronger for the new member states. In this case, stability imported from EMU would be expected to stimulate investments and growth.

Deeper deficits of the current account and upward pressure on prices may also be inevitable. They may result from the growth acceleration and Balassa-Samuelson effect, or from some overheating of domestic demand coupled with weak competition and labor market rigidities. Overall, the EMU accession should be viewed as a powerful positive force complementary to the domestic fiscal adjustment, competition enhancing and labor market reforms, but not as their substitute.

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