

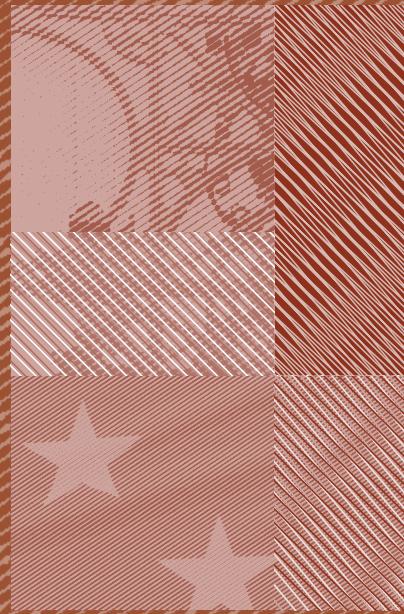
# **THE SPANISH ECONOMY IN EMU: THE FIRST TEN YEARS**

**2009**

Á. Estrada, J. F. Jimeno  
and J. L. Malo de Molina

**Documentos Ocasionales**  
**N.º 0901**

**BANCO DE ESPAÑA**  
Eurosistema



THE SPANISH ECONOMY IN EMU: THE FIRST TEN YEARS

# THE SPANISH ECONOMY IN EMU: THE FIRST TEN YEARS (\*)

Á. Estrada, J. F. Jimeno and J. L. Malo de Molina

BANCO DE ESPAÑA

(\*) This paper has been prepared as supporting documentation for the contribution of the Directorate General Economics, Statistics and Research to the conference commemorating the tenth anniversary of Spain's participation in EMU. It derives from numerous papers drafted in the Directorate General Economics, Statistics and Research in relation to this subject, some with the aim of contributing to this paper. The authors are particularly indebted to Javier Andrés, Ángel Gavilán, Samuel Hurtado, Aitor Lacuesta, Eva Ortega, Sergio Puente, Juan Rojas and Carlos Thomas.

The Occasional Paper Series seeks to disseminate work conducted at the Banco de España, in the performance of its functions, that may be of general interest.

The opinions and analyses in the Occasional Paper Series are the responsibility of the authors and, therefore, do not necessarily coincide with those of the Banco de España or the Eurosystem.

**The Banco de España disseminates its main reports and most of its publications via the INTERNET at the following website: <http://www.bde.es>.**

Reproduction for educational and non-commercial purposes is permitted provided that the source is acknowledged.

## **Abstract**

This paper has been prepared to mark the tenth anniversary of Economic and Monetary Union (EMU). It seeks to give an overview of the Spanish economy's experience in this new institutional setting. It should be viewed as the result of a joint effort by a sizeable group of researchers from the Banco de España Directorate General Economics, Statistics and Research to rationalise the implications of a structural change on this scale. To do this, the paper firstly defines the starting conditions of the Spanish economy, at the time when there was only a commitment to join the Monetary Union as a founding member; in this connection, it sets out the advantages of belonging to the euro area versus the possibility of having remained outside it. Next, it describes the main transformations made in converting this commitment into reality. Further, it reviews developments in the economic variables that best document the main events of the past decade, focusing both on the factors underpinning the expansion and the headway in convergence, and on the imbalances that triggered the start of the adjustment, and assessing the scope of these imbalances. Finally, it describes the basic features of the process of adjustment towards a new path of sustained economic growth, emphasising the difficulties added by the superimposition of the international financial crisis.

**Keywords:** Spanish economy, EMU, international financial crisis

**JEL Classification:** E58, E66, F33, G01

## 1 Introduction

The opening decade of the 21st century will probably occupy a notable place in the history of the European economy. The early years of the decade coincided with the initial years of the culmination of the process of economic and monetary integration, following the launch of the common monetary policy and the single currency in 1999. And its closing years are witness to an international economic crisis of momentous scope and intensity.

The Spanish economy is among those that have most benefited from Economic and Monetary Union (EMU) membership. But the long upturn in which the benefits materialised has ended in a process of adjustment in a markedly adverse setting. From the mid-1990s to 2007, the Spanish economy enjoyed a phase of sustained economic growth in which real convergence with the core EMU member countries advanced notably (GDP per capita relative to the EMU average increased by more than 15 pp from 79% to 95%) and in which the labour force and employment grew by almost 6 million (approximately 35%) and over 7.5 million (almost 60%), respectively.

Yet significant imbalances built up in the period 1999-2007, ultimately resulting in an inevitable adjustment. Firstly, low interest rates and favourable financial conditions prompted strong growth in corporate and household credit and debt. Secondly, the continuous pressure of demand exceeded the responsiveness of the productive system, in spite of the significant structural transformations made and of the notable expansion in the labour factor, generating a positive inflation differential with the rest of the euro area that resulted in a strong appreciation of the real exchange rate, an erosion of price-competitiveness and a sharp increase in foreign debt. Finally, easy credit and demographic pressure fuelled a property boom, with surging house prices and an excessive concentration of productive resources in the construction sector.

These imbalances progressively undermined the foundations of the expansion, leading to a slowdown in economic activity. This started gradually but subsequently became more acute with the outbreak of the international financial crises of 2007-2008. As a result the adjustment became much more severe, as the crisis struck one of the most vulnerable parts of our economy, namely the continuing and growing resort to international funding, which at one point amounted to as much as 10% of GDP per annum. From having posted high growth rates, the economy moved over a brief period into a contractionary dynamic, with a fall-off in activity and job destruction in the second half of 2008.

Assessing the effects of EMU on the behaviour of the Spanish economy over the past decade, from the standpoint both of the factors that underpinned the expansion and of those that have triggered the adjustment, is a complex exercise for many reasons. First, the start-up of EMU coincided in time with significant structural changes in the international economy, namely: i) the generalised use of information and communications technologies (ICTs); ii) the globalisation of economic activity, in a broad sense, i.e. including migratory flows, and iii) an abundance of liquidity and diminished risk aversion. Indeed, for much of the last decade, the spread of ICTs has given rise to growing international integration in trade and finance. And this, along with the greater participation of newly emerging economies in world markets, increased capital mobility and led to a new international division of labour. With globalisation, international flows of goods and services and of capital, together with international migratory movements, increased notably. This occurred while certain structural changes and the greater ef-

fectiveness of macroeconomic policies were providing for a better absorption of economic shocks, with a lesser response by output, employment and inflation. Under these conditions, the integration of capital markets and the emergence of new financial products shaped, for much of the decade, a setting marked by more readily available credit, abundant liquidity and the low cost of risk. This situation would turn around dramatically following the effects of the international financial crisis, which superimposed themselves on the adjustment that the Spanish economy had embarked upon a few quarters earlier, making it more complex and costly. It will thus be very difficult to disentangle the contribution of each process separately.

Secondly, EMU membership was conditional upon compliance with a series of requirements laid down in the Maastricht Treaty, to ensure a high degree of nominal convergence among the member countries. This was the basis for the application of a single monetary policy that would not generate unsustainable monetary and financial pressures, given the appropriate conditions of homogeneity in place.<sup>1</sup> However, in the mid-1990s, Spain was one of the candidates for Monetary Union membership that was furthest from meeting the requirements in the Treaty. Accordingly, significant changes had to be made to the policy stance, along with specific reforms to help achieve the required objectives. This effort meant that some of the positive effects of Monetary Union on the Spanish economy began to be felt before the Union was formally in place. EMU membership aside, nonetheless, it should be borne in mind that the European Union had also developed mechanisms (including the Structural and Cohesion Funds) to facilitate the real convergence of the economies with lower levels of welfare. Thanks to this, Spain was the recipient during this period of a considerable volume of capital transfers, which provided for notable infrastructure development and, moreover, was key to promoting greater convergence in per capita income across Spanish regions [see, for example, De la Fuente (2003)]. Yet now a high degree of real convergence has been attained, Spain's net financial contribution to the European Union has moved to a position of balance, so that this impulse had disappeared at the end of the period.

Lastly, it should be stressed that a full analysis of the impact of EMU on the Spanish economy unquestionably requires a broader time perspective than that provided by the first ten years of membership. Until very recently the Spanish economy was enjoying a lasting expansion that benefited from some of the factors associated with Monetary Union. In the coming years the outcome of the current adjustment will reveal how sound the Spanish economy's structural fundamentals deriving from EMU membership really are, and to what extent these fundamentals are going to allow growth potential to remain high. In this respect, it is worth considering to what extent the increase in debt, the appreciation of the real exchange rate and the concentration of resources in construction may have been excessive and in what way these imbalances may influence future developments in the Spanish economy in the new international setting arising from the financial crisis and the slowdown in the world economy.

This paper analyses the Spanish economy's experience in the first decade of EMU. It is structured as follows. Section 2 defines the starting conditions of the Spanish economy, when there was only a commitment to join monetary union as a founding member. Section 3 describes the main transformations made to attain this objective, and details the advantages of belonging to the euro area compared with remaining outside. Section 4 describes the developments in the economic variables that best represent the main events of the past decade, focusing on the factors underpinning the expansion and the increase in convergence, and on

---

1. Indeed, some of these requirements paved the way for the subsequent setting of a series of fiscal policy rules to ensure budgetary rigour on the part of the member countries. These rules seek to prevent a lack of fiscal discipline distorting monetary policy decisions.

the imbalances that triggered the start of the adjustment. Section 5 attempts to assess the scope of these imbalances using an intertemporal consumption model, a tool frequently used to analyse international macroeconomics issues, explicitly incorporating the behaviour of the real estate sector. Section 6 then analyses the sources of the recent recession, a combination of internal adjustment factors and the effects of the international crisis, and describes the fundamentals of the process of adjustment towards a new path of sustained economic growth. Finally, Section 7 presents the main conclusions of this assessment of the behaviour of the Spanish economy during the first ten years of EMU membership.

## 2 The starting point: adjustments prior to EMU accession

Accession to EMU marked the culmination of lengthy efforts to attain a regime of macroeconomic stability in Spain. This was achieved by a series of transformations that, on balance, shaped the starting point for the long expansion and subsequent adjustment of the Spanish economy within EMU [see Malo de Molina (2005 and 2007)].

In the early 1990s the imbalances that had built up with the sharp – but uneven – expansion in the second half of the previous decade led to a major macroeconomic crisis and to an abrupt and deep recession that meant that the entire convergence strategy had to be reconsidered. The difficulties facing most European countries and widening macroeconomic divergences brought about a delay in the monetary integration timetable that ultimately gave the Spanish economy sufficient time to right its course.

The change in tack of the Spanish economy was based on keeping the monetary policy stance anchored to the objective of joining the Monetary Union as soon as possible, ideally from its creation. This involved implementing structural changes that the economy required, the need for which had been particularly evident during the sharp crisis in the early 1990s, along with a sufficiently ambitious macroeconomic stability strategy based on realistic assumptions. In adopting this stance, it was decided to prioritise the macroeconomic stability that EMU could provide and it was expected that the change in macroeconomic regime would allow the introduction of certain incentives for the structural reforms needed to equip the Spanish economy with the flexibility that participation in a monetary union requires.

The employment adjustments induced by the sharp recession in the 1990s made for considerable productivity gains that enabled mark-ups and profit levels to be restored. The adjustments firstly led to a considerable rejuvenation and to an increase in the educational attainment and skills of workforces which, in many cases, had not been able to adapt to the technological changes that had begun to be introduced into the productive system. In turn, the high financial costs induced by a stability-gear monetary policy requiring high interest rates prompted a reduction in excess external financing, allowing very sound financial positions to be attained. The adjustment was particularly costly in terms of unemployment, which rose to close to 25% of the labour force, but it placed businesses in a very healthy and competitive position. The recession proved relatively short-lived and the start of the recovery, underpinned by the macroeconomic policies set in place and by the structural reforms that were beginning to be rolled out, helped revive employment creation. The experience of the rapid increase in unemployment triggered by the economic downturn prompted a change in the attitude of social agents, who now better appreciated the need for structural reforms in the workings of many markets and institutions, particularly in the labour market, and were somewhat more sensitive to the effects of wage rises on the behaviour of employment and inflation. This change was, at least incipiently, in the direction required to achieve behaviour compatible with a permanent regime of macroeconomic stability.

The relatively short duration of the contractionary phase prior to the start of the expansion had much to do with the role played by the adjustment of the exchange rate. Unavoidable devaluations of the peseta occurred at that time as a result of the markets sanctioning economic policies and price and wage formation practices that were not consistent with exchange-rate stability. Once the markets were aware of the unsustainability of the cumulative losses in competitiveness and of the level of the external deficit that had to be financed, speculative

pressures made it impossible to maintain exchange-rate commitments. When that happened, accepting even a certain overreaction that would eventually lead to EMU accession with a relatively favourable conversion rate became inevitable. The exchange rate adjustment acted as a swift and effective mechanism for absorbing the imbalances that had built up, and was instrumental in engineering the emergence from recession according to the traditional pattern, based on recovery in net external demand and in corporate surpluses, followed by a reactivation of productive investment and of household consumption. The exchange-rate level reached following the successive devaluations provided significant leeway not only to consolidate the dynamism of activity in the sector most exposed to competition but also to subsequently absorb the additional erosion in the behaviour of relative prices. All these factors ultimately contributed positively to shaping a favourable starting point for the success of monetary integration.

Yet such favourable results from the exchange-rate depreciation were only possible because, unlike the pattern of conduct prevailing in the past, under which agents reacted immediately to protect themselves from purchasing power losses and gains in competitiveness were short-lived, the markedly stabilising nature of the convergence policy and the monetary policy inflation targets helped prevent a rapid dissipation of the effect of the parity adjustment. This is a matter of great importance, since integration into the Monetary Union would entail renouncing the use of this instrument in any future processes of adjustment. Indeed, the complexity of the severe adjustment the Spanish economy is undergoing stems not only from the adverse international financial conditions and from the global recessionary setting in which it is taking place, but also from the difficulty and uncertainty inherent in the correction of accumulated imbalances without an independent monetary policy and without the possibility of resorting to the relative price adjustment through an exchange rate realignment. That said, the serious difficulties that certain economies with exchange-rate flexibility and little tradition of macroeconomic stability have experienced have once more highlighted the sizeable protection that euro area membership provides against abrupt financial shocks.

In short, the convergence drive to comply with the criteria laid down for EMU accession proved particularly complex and eventful, although ultimately satisfactory. In turn, the change of tack needed in budgetary policy to curb the growing budget deficit, amid a very marked recession, laid the foundations for resuming the path of consolidation that would contribute significantly to providing the appropriate base from which to attain the convergence targets and to benefit from the stimulating aspects of participation in the euro area.

### 3 The change in macroeconomic regime

From this starting point, and before considering the trajectory of the Spanish economy within the euro area, we may ask what was the scope of the transformations in macroeconomic arrangements entailed by entry into the area. Probably, the most telling consequence of EMU membership is the change in how imbalances and their attendant adjustments manifest themselves. Set against the significance of the external financial constraint existing for countries with monetary sovereignty, strains tend to build up within the euro area mainly in terms of loss of competitiveness and excess debt. And, in respect of adjustment, the impossibility of altering the exchange-rate relationship shifts the response to the weakening of demand and the reduction in debt levels towards flexibility in the functioning of markets and in cost and price formation. If wage and price formation has not become more flexible, adjustment in the face of aggregate shocks will fall on quantities, whereby the process will be slower and, above all, much more costly, given the adverse effect this may have on human capital.

Compliance with the convergence criteria and participation in the euro from the outset entailed attaining a regime of macroeconomic stability that would have hardly been achievable outside the area, as the troubled course of previous stabilisation attempts had demonstrated. On the inflation front a substantial reduction was brought about, despite the fact that, as will be seen below, convergence in terms of price stability has not been fully achieved. On all the studies available, the Spanish economy had comparatively high sacrifice ratios before joining the euro area; accordingly, the reduction in inflation entailed considerable losses in output and higher unemployment which, moreover, had a sizeable permanent component, given that a notable presence of hysteresis was apparent in the behaviour of the Spanish labour market (see Dolado and Jimeno, 1997). However, the same studies associated considerable benefits with reducing inflation that were clearly greater than the attendant costs. In the short run, this was the result of interaction with an unindexed tax system and of a legal system in which all limits are set in nominal terms. And in the long run, because the creation of a setting characterised by confidence conducive to profitable investment allows the potential level of per capita income to be raised.

An essential component of the regime of macroeconomic stability was fiscal consolidation. This was one of the requirements laid down in the Maastricht Treaty and enabled Spain to progress from posting deficits of above 7% in the early 1990s to a surplus position based on broad social consensus on the need for the budget to be in balance over the business cycle. This improved fiscal position allowed the potential crowding-out effects and the risk premiums associated with a lack of fiscal discipline to be sharply curtailed, and macroeconomic management and the very dynamics of public finances benefited accordingly. At the same time, the substantial reduction in Spain's nominal divergences with its main trading partners and the elimination of the speculative component of the exchange rate lessened the costs of trading for firms, increasing their profitability, and reduced the costs of tourism for individuals. The elimination of the risks of a currency depreciation were not only decisive in reducing the risk premiums associated with the dangers of macroeconomic instability; they also prompted a cut in the relative cost of trade with the euro area and contributed to forging closer trading relations with, and to smoothing integration into, this area, allowing comparative advantages to be harnessed.

EMU membership ensures interest rates consistent with the area's price stability standards. The biggest consequence of all these changes was, therefore, a considerable and permanent reduction in interest rates. A return to rate increases characteristic of situations

of macroeconomic and exchange-rate instability, entailing high risk premiums for the Spanish economy, was inconceivable. Accentuating this reduction in rates was the predominantly expansionary monetary policy adopted by the area for most of the period, and the accommodative financial conditions that have prevailed worldwide, meaning that interest rates reached abnormally low levels, even for the area's core countries.

As a result, Spanish households and firms alike saw their borrowing capacity increase. And this had forceful expansionary effects on demand in the economy. Several analyses have sought to estimate the intensity of these effects, distinguishing between the various channels (the substitution effect, income effect and wealth effect) through which they operate. One central aspect of agents' increased borrowing capacity derived from the disappearance of the constraint arising from country-specific macroeconomic risk, given the absence of exchange rate differentiation. Consequently, when attracting the financing flows required, the main determinant was, under normal financial market operating conditions, the return/risk profile of the individual borrower, which permitted a considerable increase in the economy's capitalisation. More recently, international market financing conditions have changed drastically following the abrupt financial crisis, and dependence on external finance has become an unexpected factor of vulnerability, since it involves something of a return to a more local orientation for these markets.

Lastly, we should not forget the role played by EMU membership in establishing powerful stimuli to shift the stance of policies that remain under national sovereignty towards a framework of medium-term stability and growth. The fiscal policy rules are, in substance, common to all the EU countries, but EMU membership gives fiscal policy a more decisive role and reinforces the factors favouring an appropriately counter-cyclical and stabilising use of demand. In parallel, structural reform policies take on significant importance for a country belonging to a monetary union. Indeed, given the constraints on the traditional instruments for regulating aggregate demand and the insufficient labour mobility in the area (due, among other matters, to purely cultural factors), such policies become the most effective resource available to the authorities to encourage agents' adaptation to the requirements of the new environment.

Evidently, the disciplining influence of the policies has been key to the behaviour of the core of the public sector (State and Social Security), which moved from sizeable deficits to a surplus position, with the public debt/GDP ratio shrinking substantially. However, the change is not so apparent in the case of the regional and local governments, since these assumed current expenditure commitments on the basis of revenue with a sizeable temporary component, probably due to the fact that the arrangements in place did not involve a sufficient degree of fiscal co-responsibility. In fact, with the adjustment that suddenly began at the end of the period, the high sensitivity of overall general government revenue to the pattern of deceleration and subsequent contraction of the economy was highlighted, so that the structural improvement in public finances can be expected to be ultimately less than thought.

In the case of the structural reform policies, headway has been more uneven across sectors and markets, and has also depended on the territorial distribution of competencies. In the case of certain privatisation and liberalisation policies, some progress has been reported, enabling programmes adopted in previous stages to be furthered. But this has not been the case in certain services branches or, above all, in the labour market. The only relief to the labour market stemmed from the sharp influx of immigrants and from the reduction in hysteresis, evidenced by the notable decline in long-term unemployment and in the NAIRU (non-accelerating-inflation rate of unemployment) in the Spanish economy during the expansion.

The absence of far-reaching labour reforms has left the workings of the labour market largely intact. Such workings are characterised by considerable rigidity in wage-bargaining and wage-setting mechanisms and by a deep-seated dichotomy in hiring arrangements which tends to shift the intensity of the adjustment onto employment, as the explosive rise in unemployment in previous recessions has evidenced. This inefficiency goes unnoticed while conditions conducive to economic dynamism are in place. But it tends to exacerbate and accentuate the virulence of adjustments as employment acts as a mechanism for the spread and amplification of adjustment effects rather than inducing a less costly adjustment in wages.

From this perspective it is worth considering the benefits that have arisen from monetary integration compared with the effects that would have come about had the economy remained outside EMU. Unquestionably, the tendencies towards macroeconomic instability would have been considerably greater outside, so that the economy would not have been capable of the same degree of expansion and convergence, and the costs of stabilising efforts would have been greater. Further, the economy would have not have enjoyed the protection against global and idiosyncratic financial shocks provided by EMU membership. Nonetheless, the tendency for greater specialisation in the economy in some specific industries (such as construction and related activities) might have been less strong and exposure to real asymmetrical shocks outside the area more limited. It is possible, too, that integration may have been conducive to trade with an area whose growth has been very small when compared with the Americas or Asia, which may have contributed to increasing net borrowing.

Finally, it might be ventured that the possibility of building up imbalances would have been less outside the euro area. One risk factor involved in belonging to a monetary area is the possibility that macroeconomic imbalances may be built up and amplified, delaying the necessary adjustment. This is because the disciplining factors that arise from the existence of a market price for the country's macroeconomic risk are absent. Hence it is possible that, in the absence of risks to macroeconomic stability, interest rate cuts are conducive to a larger increase in household and corporate debt than would have been the case had EMU membership not been an option. Seen from another angle, that entails the possibility of reaching a level of net borrowing for the economy as a whole that would not have been possible outside EMU. Before reaching such levels an adjustment of financial conditions, of domestic demand and of the rate of growth would have been triggered by means of exchange rate and long-term interest rate pressures.

## 4 The performance of the Spanish economy in EMU

This section summarises the key features of the Spanish economy's expansion during the period it has been a member of EMU. Firstly, it describes the main macroeconomic variables in terms of the level of economic activity, employment, productivity and inflation, distinguishing between the period prior to EMU entry and the subsequent period, and comparing with other advanced countries and possible areas of reference. Secondly, it analyses the main imbalances that built up during the long expansion – the appreciation of the real exchange rate and the increase in the external deficit, the property boom, and the rise in the levels of corporate and household debt – which would trigger the subsequent process of adjustment.

### 4.1 *The expansionary phase: 1999-2007*

In an initial approach to the performance of the Spanish economy in EMU, Table 4.1.1 shows the annual average growth rates of GDP, population and per capita income (with the corresponding standard deviations) recorded in Spain in the nine years up to the creation of EMU (1990-1998) and in the nine subsequent years (1999-2007).<sup>1</sup> Comparison with the behaviour of other countries (the United States, the three biggest euro area members – Germany, France and Italy – and the euro area itself) in both periods gives a first impression of the potential impact of EMU on the growth of the Spanish economy.

As can be seen, while the GDP growth rate for the United States declined by 0.3 pp from one period to the next and held stable for the euro area, the pace of growth climbed by 1 pp for the Spanish economy, reversing the negative growth differential with the United States before 1999 (0.3 pp) to a positive difference of 1 pp. This increase is particularly notable insofar as the growth gap between the United States and the euro area in the second period was, at 0.5 pp, still considerable.

Also of note was the reduction in the variability of GDP growth, especially in the United States. This appeared to be following on from the structural reduction in business cycle fluctuations that came to be known as the “Great Moderation”.<sup>2</sup> A similar reduction in GDP volatility was perceptible in the euro area, although it did not appear to be extensive to all the member countries. Indeed, in the three biggest euro area economies the fluctuations in output seem to be on a similar scale before and after the creation of EMU. By contrast, in Spain there was a most significant reduction in the volatility of GDP growth: from being the country with the biggest fluctuations it became that showing least volatility. That would suggest that expansionary phases have become longer and more stable, reflecting the materialisation of the structural improvements in macroeconomic workings that was expected from EMU membership.

A very important factor behind the growth of economic activity in Spain during the period 1997-2007 was the notable demographic expansion. Indeed, before 1999, and as in the other European countries, population growth was very small, especially when compared with that in the United States. This gap in population increases actually explains the differences in GDP growth, since per capita income in the euro area was expanding at the same

---

1. The use of these average growth rates over a relatively long period means that the different cyclical positions of the economies at each point in time are not the main determinant of the differences highlighted in the text. 2. See McConnell and Pérez-Quirós (2000), who identify a structural change in US GDP volatility in the mid-1980s.

	GDP		Population		Per capita income	
	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007
United States	3.0 (1.5)	2.7 (1.1)	1.2 (0.1)	1.0 (0.1)	1.7 (1.5)	1.7 (1.1)
EU-3 (b)	1.5 (1.0)	1.7 (1.0)	0.4 (0.3)	0.3 (0.1)	1.1 (1.1)	1.4 (1.1)
Euro area-12	2.1 (1.3)	2.2 (1.0)	0.4 (0.2)	0.5 (0.1)	1.7 (1.2)	1.7 (1.1)
Spain	2.7 (1.9)	3.7 (0.7)	0.2 (0.1)	1.4 (0.4)	2.5 (1.9)	2.4 (1.1)

SOURCE: Eurostat.

- a. The standard deviation is in brackets.  
b. The EU-3 aggregate includes Germany, France and Italy.

pace as that in the United States. In any event, this aggregate development in the euro area masked the differences in the behaviour of the large euro area countries which, in terms of per capita income, were slipping relative to the United States and to the other countries, including Spain, which was posting an annual average increase in per capita income of 2.5% and was narrowing the differences both with respect to the EU-3 and the United States.

From the onset of EMU, the population in Spain acceleration sharply, growing at an annual average rate of 1.4%, 0.4 pp more than in the United States. As earlier discussed in the introduction, this sizeable demographic expansion was the result, above all, of a massive influx of immigrants, but also of the increase in Spaniards' life expectancy which, at present, stands at one of the highest levels for the developed countries. Growth in per capita income in Spain fell by 0.1 pp, while in the euro area as a whole and in the United States the dynamism of the previous period was sustained and in the three biggest countries in the area it was increased. Accordingly, Spain's rate of convergence fell slightly both relative to the euro area (on Eurostat figures the per capita income gap is only 3%) and to the United States (though in this case the gap is 30%). Although the euro area's biggest countries raised the average growth of their per capita income after 1999, this is still far removed from US growth rates.

Table 4.1.2 offers some information on the sources of per capita income growth over the last decade, breaking this growth down into two different factors: labour intensity and productivity. Greater labour utilisation can be achieved either through increases in the employment rate (the proportion of the working-age population in employment)<sup>3</sup> or increases in hours worked per employee. In turn, the employment rate can be broken down into the participation rate (the percentage of the working-age population in employment or actively seeking employment) and (the inverse of) the unemployment rate (percentage of the labour force seeking employment).

As can be observed, labour intensity has been much greater in the United States than in the euro area. Indeed, the US employment rate has constantly maintained a gap of over 6 pp relative to that of the euro area and annual average hours worked are currently 10% higher in the United States. Secondly, the behaviour of the US and European economies before and after the creation of EMU has been radically different. From 1989 to 1998, the employment rates in both areas held stable; however, from 1999 there was a considerable in-

3. To make international comparisons easier, the working-age population is taken to be that in the 15-64 age range.

	Employment rate			Participation rate			Unemployment rate			Average hours		
	1989	1998	2007	1989	1998	2007	1989	1998	2007	1989	1998	2007
United States	73.1	73.8	71.7	77.1	77.3	75.2	5.3	4.5	4.6	1,821	1,867	1,778
EU-3 (b)	59.9	59.2	64.8	65.5	66.6	70.3	8.3	11.1	7.7	1,685	1,641	1,570
Euro area-12	58.5	59.0	65.7	63.7	66.5	71.1	8.2	11.2	7.4	1,722	1,669	1,608
Spain	48.0	51.0	65.6	58.2	62.7	71.6	17.3	18.7	8.3	1,753	1,732	1,635

SOURCE: Eurostat.

a. There may be breaks in the series.

b. The EU-3 aggregate includes Germany, France and Italy.

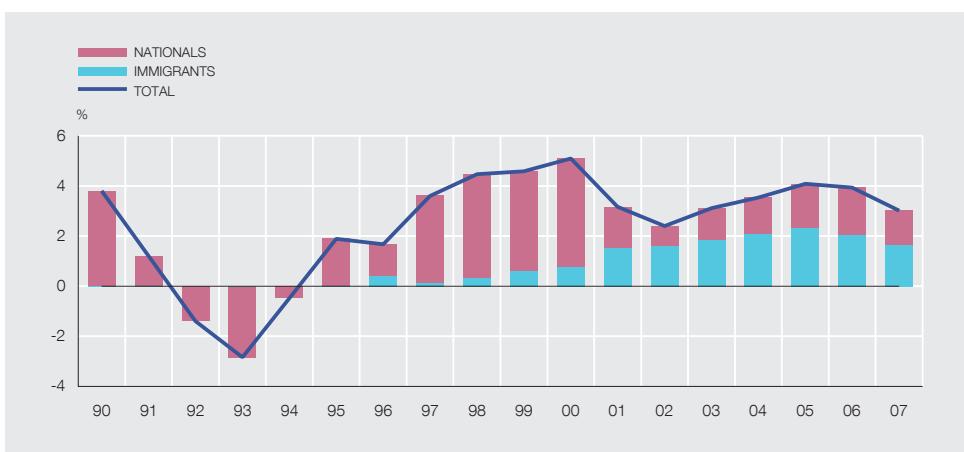
crease in that in the euro area and a reduction in that in the United States. Adding to this the fact that average hours worked in the United States have also fallen over this period (albeit at a much lesser pace than in the euro area) suggests that while the growth of US per capita income after 1999 has been based exclusively on the improved efficiency of the labour factor, in the euro area labour intensity has played a prominent role. Thirdly, in this connection Spain represents an extreme case within the euro area, since from 1999 its labour intensity has increased significantly, the employment rate reaching the euro area average (and exceeding that of the three biggest economies) while, at the same time, it has maintained a positive gap with regard to average hours worked. If we factor in the enormous growth of the population in our country in this period, it is not surprising that Spain has created more than one-third of all employment generated in the euro area during these years.

The strong increase in the Spanish economy's employment rate from the start of EMU to 2007 stemmed in virtually equal proportions from an increase in the participation rate and a reduction in the unemployment rate. The rise in the participation rate was driven by greater female participation and by immigration. As Chart 4.1.1 shows, the inflow of immigrants into Spain began to reach a significant scale in the years immediately before the creation of EMU. Subsequently, immigration became progressively greater so that, from 2002 onwards, its contribution to the growth of total employment was higher than that of nationals. Indeed, although the Spanish economy began to destroy employment at the aggregate level in mid-2008, immigrant employment continued increasing until the end of the year. The enormous influx of immigrants into the Spanish economy can be explained by three types of factors: a) factors responsible for their departure from their country of origin; b) permanent factors of attraction; and c) temporary factors of attraction. Under the first category, the difference between the standard of living of immigrants' countries of origin and that of the developed countries (including both per capita income and the degree of inequality of its distribution) should be highlighted. Under the second category the most significant factors are the presence of other immigrants of the same and of different nationalities in the host country (an effect for which the respective saturation points are estimated, although in Spain they are apparently far from having been reached), and how developed the welfare state is. Temporary factors relate to the higher growth of the Spanish economy relative to the other developed countries, although faced with the worsening of economic activity, return migration flows to home countries or emigration flows to other countries may be expected.<sup>4</sup>

4. A simple simulation shows that if per capita income in Spain had grown the same as in the other OECD European countries, numbers of immigrants arriving since 1998 would be around 400,000 fewer, or 9% less than the actual numbers for 2007. On return migration flows, see, for example, Izquierdo et al. (2008).

**EMPLOYMENT IN SPAIN**  
Annual growth and contributions

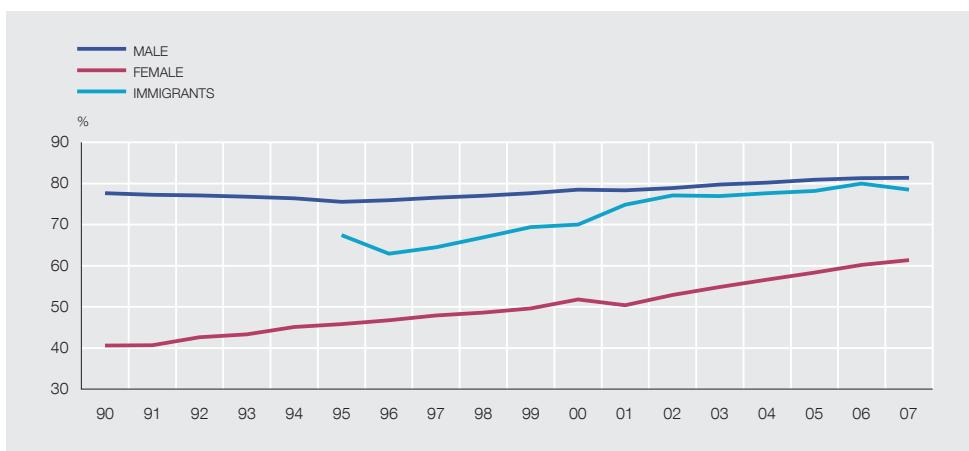
CHART 4.1.1



SOURCE: Instituto Nacional de Estadística (INE).

**PARTICIPATION RATE IN SPAIN**

CHART 4.1.2



SOURCE: INE.

In any event, the increase in national employment has also been very significant in the period in question, due primarily to the notable rise in the female participation rate (Chart 4.1.2).<sup>5</sup> In fact, the average annual reduction in the gap between the female and male rates has been 1 pp, and there is still considerable room for further narrowing both when comparing with the average participation rate of the most advanced countries (61.4% in Spain against 65.1% in the euro area) and bearing in mind the fact that the female cohorts above the minimum working age show significantly lower participation rates than those in which they first enter the labour market. This chart also clearly highlights how immigrants who have come to Spain during these years have done so for purely economic reasons: their aggregate participation rate is practically identical to that of male nationals.

As regards the unemployment rate, it is difficult to quantify precisely the causes of its sharp reduction. Some papers have attempted to assess the extent to which the labour reforms since the early 1990s have contributed to lowering the structural rate of unemployment

5. Some papers have posited a potential relationship between immigration and the increase in the female participation rate [see, for example, OEP (2006)].

**LABOUR AND TOTAL FACTOR PRODUCTIVITY**  
**Average annual rate (a)**

TABLE 4.1.3

	GDP/hour worked		Capital/labour ratio		TFP	
	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007
United States	1.5 (1.0)	2.1 (0.8)	3.1 (1.2)	3.5 (1.2)	0.5 (0.8)	0.9 (0.8)
EU-3 (b)	1.6 (1.0)	1.3 (0.7)	3.3 (0.8)	2.3 (0.9)	0.5 (0.9)	0.5 (0.6)
Euro area-12	2.0 (0.6)	1.3 (0.6)	3.2 (0.8)	2.2 (0.6)	0.9 (0.7)	0.5 (0.5)
Spain	1.5 (1.6)	0.7 (0.5)	3.3 (1.7)	2.3 (0.7)	0.4 (1.4)	0.0 (0.3)

SOURCES: Eurostat, EU-KLEMS and AMECO.

a. The standard deviation is in brackets.

b. The EU-3 aggregate includes Germany, France and Italy.

[see, for example, Bentolila and Jimeno (2006), and Izquierdo and Regil (2007)], although there appears to be some consensus that the scope of these reforms is not sufficient to explain such a large and rapid reduction in the unemployment rate. Thus, other papers attribute part of the reduction to immigration [see, for example, Bentolila, Dolado and Jimeno (2009)], and to the wage restraint during these years prompted, among other factors, by the discipline induced by the process of convergence towards EMU.

Moving to the second of the per capita income components, labour productivity, Table 4.1.3 presents the two indicators habitually used to measure it: apparent labour productivity and total factor productivity (TFP). This table highlights once again the notable dichotomy between the performance of the US economy and that of the euro area before and after 1999. US labour productivity, which was growing less than in the euro area before 1998, quickened significantly in the subsequent decade, in clear contrast to the slowdown recorded in the euro area; accordingly, its growth was almost 1 pp higher in annual average terms. As a result, the euro area ceased to converge with the United States in terms of the degree of efficiency with which the labour factor is used. From this standpoint, Spain's case is even more accentuated than that of the euro area, since the average increase in labour productivity fell by half following the introduction of the euro, even though it started from lower levels than those of the area.

The higher growth of US labour productivity in the second period considered was the outcome, above all, of the acceleration in TFP (whose annual average growth practically doubled) but also of the step-up in investment, in clear contrast to developments in the euro area and in most of its members. This result is perhaps surprising when it is borne in mind that the weight of gross fixed capital formation in GDP is 27% in Spain, 21% in the euro area and 19% in the United States. Yet it should be taken into account that the stock of capital used to calculate TFP is quality-adjusted, i.e. not all investment goods are considered to be equally productive. Specifically, this reflects the fact that the euro area (and Spain) has fallen behind in incorporating the new ICTs into its productive system and, in Spain's specific case, it shows the strong increase in housing investment. Yet in the euro area, TFP growth has eased in the past 10 years, although not across the board; in fact, Germany has managed to improve its levels, albeit without attaining those of the United States, and France has maintained them at pre-EMU levels, which were similar to those now attained by the United States.

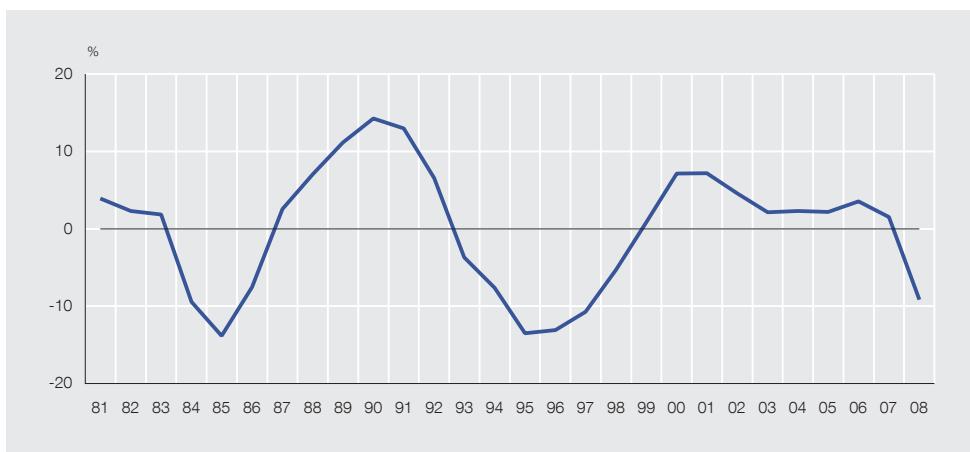
In Spain's case, average TFP growth since the introduction of the euro has been virtually zero. This is surprising since, although there are admittedly still deficiencies in the endowment of factors of production that may explain why Spanish productivity levels are lower than in other European countries (less skilled human capital, a very low stock of technology know-how due to low investment in R&D, a relatively unfavourable business environment owing to the fact that the degree of competition in certain services and labour markets is low, an under-developed enterprise culture, a high administrative burden, etc.), there has also been progress on these fronts that should have resulted in higher productivity growth.

Measurement and estimation difficulties aside, there are in principle several reasons that may explain this slowdown in TFP. First, the bias in growth towards relatively unskilled-labour-intensive activities (construction and services) has brought about a negative composition effect on productivity. However, this composition effect cannot explain in full the slowdown in TFP, since it has been observed practically across the board in all sectors of activity. Further, the higher level of educational attainment and the greater weight in employment of skilled jobs also generate a composition effect of the opposite sign that largely offsets that stemming from the rise in the weight of jobs in lower-productivity sectors. Second, just as labour availability may have been conducive to specialisation in specific productive sectors, it may also have prompted firms to use less advanced technologies. Finally, the complementarity between new technologies and corporate restructuring, a primary source of the TFP gains observed in other countries, may have been hampered in Spain's case by labour regulations that restrict flexible working arrangements at firms to the use of temporary contracts.

The buoyant activity and headway in convergence experienced by the Spanish economy within EMU have arisen from the demand and supply-side conditions that its stability regime favoured. But the information available to date suggests that the strength of demand in the economy may have been too great for the capacity of expansion of the supply side, since the increase in productivity was very moderate and the reduction in the unemployment rate was based, to some extent, on the hiring of lower-skilled workers.

One analytical approach to tackling this question involves estimating the output gap, i.e. the difference between actual GDP and the level of output that could be attained without generating inflationary pressures. It is well known that this potential level of output is not observable, but there are several procedures for estimating it. Apart from the most commonly used options, based on purely statistical techniques which involve filtering the series under study without taking into account any of the conditions imposed by economic theory, there are other, much more informative procedures that introduce specific constraints suggested by economic theory and which are not too controversial among researchers.

For instance, Galí et al. (2007) have developed a procedure that highlights a close relationship between the output gap and the degree of inefficiency existing in an economy. This lack of efficiency is determined by two factors. Firstly, that arising from the non-competitive functioning of the market for goods and services, which is reflected in the behaviour of the mark-up of product price over marginal production cost, i.e. in firms' monopoly power. The basis for this is that, in the absence of market failings, perfect competition in markets reduces the equilibrium level of prices which, under normal conditions, increases the amount of the good produced and traded, which is one of the determinants of the level of consumer welfare. In this way, monopoly power leads to an inefficiently low level of production of goods and services. Secondly, there is the inefficiency that stems from the non-competitive functioning of the labour market, which is reflected in the mark-up of real wages over consumers' valuation of leisure (which is the second determinant of the level of agents' welfare), i.e. the marginal rate



SOURCES: INE and Banco de España.

of substitution between consumption and leisure. In this case, the explanation is that if real wages are higher than the maximum price workers are prepared to pay to increase their leisure time, then an inefficiently low number of workers will be hired at an inefficiently high cost.<sup>6</sup>

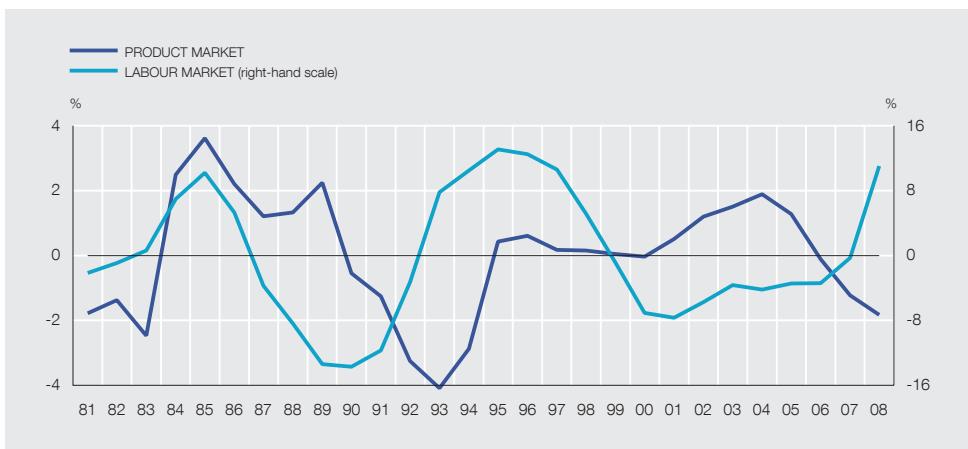
As can be seen in Chart 4.1.3, the inefficiency gap<sup>7</sup> has shown some volatility since the 1980s. This measure of the output gap based on the degree of inefficiency suggests that, since 1980, the Spanish economy has had two clearly recessionary phases (1983-1986 and 1993-1998) and two expansionary phases (1987-1992 and 1999-2007). The results obtained for 2008 involve a considerable turnaround in the economy's cyclical position, comparable only in terms of its intensity to the events that followed the second oil shock in the early 1980s; everything suggests that, in 2009, the inefficiency gap will exceed the historical low reached in 1985.

Chart 4.1.4 depicts the disaggregation of the inefficiency gap into the product market mark-up and the labour market mark-up. Firstly, the fluctuations in the labour market mark-up are much greater than those of the market for goods and services (note that the chart has different scales for each variable), meaning that, as in Galí et al. (2007), labour market inefficiencies (with the sign changed) are the main determinants of changes in the aggregate degree of inefficiency. This might be a consequence of the fact that a substantial proportion of the markets for goods and services are open to international competition, which exerts a very significant disciplining effect on tradeable goods markets. Secondly, the contemporaneous correlation between both mark-ups is not statistically significant. This may be a consequence of the presence of the public sector, which can influence private agents' decisions both through the regulations it imposes on markets and through the taxes and subsidies it sets. Thirdly, the recessions the Spanish economy has undergone appear always to have been preceded by a significant increase in product market mark-ups, so that the increase in monopoly power linked to demand pressure, when the expansionary phase matures, acts as a trigger for such recessions. This process is followed by a significant increase in the wage mark-up which, subsequently, further heightens recessionary processes. Likewise, expansions are also pre-

6. To calculate these mark-ups it is necessary to make assumptions regarding firms' production technology and consumer preferences. In this connection, we follow the recommendations of Galí et al. (2007), with three particularities: i) consumers also obtain utility from the housing they purchase; ii) the wages received by households exclude all types of contributions and direct taxes; and iii) producer prices exclude indirect taxes. 7. Given the definition of inefficiency gap, it might be expected always to be negative; however, for ease of comparison with other methods of calculating the output gap, it is normalised to zero mean in the period considered.

**MARK-UPS IN THE GOODS AND SERVICES MARKET  
AND IN THE LABOUR MARKET**  
As a percentage of GDP

CHART 4.1.4



SOURCES: INE and Banco de España.

ceded by an increase in price mark-ups, once the cyclical adjustment leads to a significant reduction in labour market inefficiencies.

## 4.2 Imbalances

As highlighted, the growth in the Spanish economy in the 1999-2007 period was based on foundations that could not be maintained indefinitely. The notable demand stimulus was only partially accommodated by a quantitative expansion of output, based on an exceptional increase in the rate of employment. This was not adequately matched by an improvement in productivity, since the capitalisation of the economy failed to provide for convergence on the levels prevailing in the more developed countries and gains in efficiency were not sufficiently sharp. A series of imbalances thus began to emerge during this period, undermining the dynamism of the expansion. And, as there were no significant changes in agents' patterns of behaviour, the imbalances led to the need for an adjustment. As is usually the case in economics, all these imbalances are very closely related, given that they are not generated sequentially but jointly and in a mutually reinforcing fashion. For the purposes of presentation, the imbalances have been grouped under three major headings: a) inflation differentials, the appreciation of the real exchange rate and the external financing of the economy; b) property sector developments; and c) household and corporate debt.

### 4.2.1 INFLATION DIFFERENTIALS, APPRECIATION OF THE REAL EXCHANGE RATE AND THE FINANCING OF THE ECONOMY

One of the basic advantages for the Spanish economy of EMU entry was that it could gain the necessary credibility to reduce the average level of inflation without incurring real costs which, owing to the rigidities in the market for goods and services and for labour, might be considerable. Lowering inflation was strictly necessary to reduce the persistent price-increase differential vis-à-vis our main trading partners. The differential entailed recurrent losses in competitiveness that ultimately led to exchange-rate crises and serious episodes of macroeconomic and financial instability involving considerable welfare losses.

As can be seen in Table 4.2.1, before monetary integration Spain had consumer inflation levels that were 0.9 pp and 1.3 pp higher than those of the euro area countries and of the

	HICP (a)		DOMESTIC COMPONENT						IMPORTED COMPONENT	
			GDP deflator		ULC (b)		Mark-up			
	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007
United States	3.1	2.7	2.3	2.4	2.2	2.3	0.1	0.1	-0.6	2.6
EU-3 (c)	2.8	1.8	2.7	1.5	2.4	1.2	0.2	0.4	0.0	1.3
Euro area-12	3.5	2.1	2.3	2.0	2.0	1.5	0.3	0.5	0.3	1.6
Spain	4.4	3.1	4.7	3.8	4.5	2.7	0.2	1.1	1.8	2.1

SOURCES: Eurostat and AMECO.

a. Harmonised Index of Consumer Prices.

b. Unit labour costs.

c. The EU-3 aggregate includes Germany, France and Italy.

United States, respectively. In the subsequent period, Spanish inflation fell significantly (by 1.3 pp), but this did not improve its position relative to the euro area as a whole, since the inflation differential held constant. Nonetheless, a clear improvement relative to the three core euro area countries and, above all, to the United States is discernible, despite the fact that their consumer-price growth rates were also cut after 1999.

The source of the across-the-board reduction in inflation in Europe in the past ten years was not the lower growth of import prices which, except in the case of Spain (as a consequence of the ERM crisis and the subsequent depreciations of the peseta), had not behaved very moderately before the creation of EMU; rather, it was the lower price growth of domestically produced goods. From this standpoint, domestic inflation was reduced in the Spanish economy, despite which there was an inflation differential of almost 2 pp vis-à-vis the euro area (1.4 pp vis-à-vis the United States).

The continued positive inflation differential with respect to the rest of the euro area from 1999 gave rise to a continual appreciation of the real exchange rate. To identify the sources of this appreciation, domestic inflation can be decomposed into two factors: i) the growth of unit labour costs (ULCs) and ii) developments in gross profit margins (the difference between inflation and ULCs). Unlike in the US economy, where margins have held at very low levels, in the euro area they have risen to some extent, with the weight of the inflation adjustment falling on ULCs and, given the aforementioned slowdown in productivity, on nominal (and real) wages. In this respect, Spain is an extreme case in the euro area since the increase in margins steepened after 1999, and nominal wages (and ULCs, all the more so given lower productivity growth) continued growing at above the related euro area average. That suggests that neither wage behaviour nor the formation of business margins appear to have adapted fully to the demands of membership of a monetary union, and this is having an adverse effect on the competitiveness of our economy. This lack of adaptation is a factor of vulnerability whose consequences may be particularly patent if the adjustment coincides with adverse external conditions as at present.

From a more structural perspective, the inflation differential of an economy such as Spain's, which belongs to a monetary union but which started with a lower level of welfare, may be broken down into three elements. First, a real component, associated with convergence on the area's average level of welfare, which should thus be considered as benign. This is what is known as the Balassa-Samuelson effect. The intuition behind this is that the difference in wel-



SOURCES: Eurostat and Banco de España.

fare levels between two countries lies in the different technological level in the manufacture of tradeable goods, while in the production of non-tradeable goods the technologies are much more similar. Conversely, the sale prices of tradeable goods should be equal in the two countries, as there are no restrictions on trade between them. In contrast, the prices of non-tradeable goods may differ and, indeed, they should be lower in the countries with a lower standard of living. As time goes by, the laggard country progressively incorporates the superior technology for producing tradeable goods used in the other country, duly increasing the productivity and, consequently, workers' wages in this branch. But as individuals may work in either the tradeable or non-tradeable products branch, their wages should be identical, whereupon the wages of workers in the non-tradeables branch will also increase. However, as their productivity does not improve, and given a constant mark-up, the attendant prices will be pushed upwards, raising aggregate inflation. Consequently, this model has at least five predictions susceptible to empirical testing: a) countries with a lower level of welfare will have lower price levels; b) convergence in per capita income will entail convergence in price levels, meaning inflation in the country that converges will be higher; c) there will, moreover, be dual inflation, with a higher increase in prices in the non-tradeable sectors; d) convergence should be determined by higher productivity growth in the laggard country; and e) there should also be a productivity growth differential between the tradeable and non-tradeable branches.

The evidence for Spain on the existence of a benign inflation component associated with an increase in citizens' welfare is not overly compelling. True, for the euro area countries there is a positive correlation between price and welfare levels (see Chart 4.2.1). Moreover, in Spain's specific case, the increase in the price level relative to the euro area can be seen to have been accompanied by convergence in the relative welfare level (Chart 4.2.1 tracks the course followed by Spain since 1995).

However, regarding the third prediction of the Balassa-Samuelson hypothesis, namely dual inflation, the conclusions differ (see Table 4.2.2). This table shows how in all the countries and in both periods inflation in the tradeables branches is lower than that in the non-tradeables branches, suggesting there are other mechanisms, besides real convergence, explaining this phenomenon. Further, this is more surprising in Spain's case since, although inflation has fallen following Monetary Union in the tradeables branch, the differential with respect to the euro area has widened. In contrast, in the case of non-tradeables, the reduction in inflation has been greater than in tradeables, and the differential with the euro area has narrowed.

**BREAKDOWN OF DOMESTICALLY GENERATED INFLATION**  
Average annual rate

TABLE 4.2.2

	TRADEABLES						NON-TRADEABLES					
	GDP deflator		ULC (a)		Mark-up		GDP deflator		ULC (a)		Mark-up	
	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007
United States	0.4	0.2	-0.2	-0.6	0.5	0.8	2.7	2.7	3.1	2.4	-0.5	0.3
EU-3 (b)	1.7	0.2	1.7	-0.3	-0.1	0.5	2.7	1.8	2.0	1.5	0.7	0.3
Euro area-12	1.2	0.6	1.4	-0.2	-0.2	0.8	2.4	2.2	2.1	1.8	0.3	0.4
Spain	3.0	2.6	4.9	1.5	-1.9	1.1	5.8	4.3	6.6	3.3	-0.8	0.9

SOURCES: Eurostat and AMECO.

a. Unit labour costs.

b. The EU-3 aggregate includes Germany, France and Italy.

**PRODUCTIVITY IN THE TRADEABLES AND NON-TRADEABLES SECTORS**

TABLE 4.2.3

Average annual rate

	TRADEABLES						NON-TRADEABLES					
	Productivity/hour worked		Capital/hour worked		TFP		Productivity/hour worked		Capital/hour worked		TFP	
	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007	1990- 1998	1999- 2007
United States	3.8	5.3	4.0	4.7	2.5	3.8	0.9	2.0	3.2	3.6	-0.5	0.5
EU-3 (a)	2.9	3.0	4.3	3.1	1.5	2.0	1.8	0.9	3.0	2.1	0.5	0.0
Euro area-12	2.9	3.2	4.3	3.2	1.5	2.1	1.5	0.9	2.7	2.0	0.4	0.0
Spain	1.2	1.9	3.2	2.9	0.2	1.0	-1.2	0.0	2.8	2.4	-2.4	-1.0

SOURCES: Eurostat and AMECO.

a. The EU-3 aggregate includes Germany, France and Italy.

Turning to the determinants, in the case of tradeables a generalised improvement in the margins of all countries can be seen, which is not overly consistent with the fact that EMU entails an increase in transparency and competition among firms. However, this might be the result of globalisation, which causes the activities with most value added (those that are most profitable) to be retained in the country of origin while externalising labour-intensive activities to the developing countries (note that the weight of industry has fallen over these years in all the developed countries). Accordingly, the inflation adjustment has fallen on ULCs, which have declined on average in all countries since 1999 except in Spain. Conversely, in the case of the non-tradeables branches, accelerations in margins can only be seen in the United States and in Spain. In both cases this is the consequence, in particular, of the construction sector. In contrast, the adjustment of ULCs is much more moderate than in tradeable goods. Lastly, the adjustment in the growth of ULCs in the non-tradeables branch in Spain has been considerable, due above all to the fact that most immigrant employment has been directed towards this sector and that the wages of this group are around 20% lower than for nationals; in any event, ULC growth is still far higher than in the euro area countries or the United States.

As earlier highlighted in Table 4.2.3, the growth of both labour productivity and of TFP has been lower than in the more advanced countries. As a result the Spanish economy, which started out some distance back, has moved even further from the standards



SOURCES: Eurostat, EU-KLEMS and Banco de España.

towards which it should aspire to converge. Conceivably, however, this behaviour might be due, rather than to the existence of a benign component in the inflation differential, to a shift in activity in Spain towards branches, like construction, which are less productive. Table 4.2.3 provides some information on this issue. As can readily be seen from a separate analysis of productivity developments in the tradeables and non-tradeables branches, in all countries and in both sub-periods, productivity in the former branch increases much more quickly than in the latter. This suggests, once again, that the Balassa-Samuelson hypothesis is not the only argument to warrant a productivity growth differential in favour of the branches exposed to international competition in countries with a lower welfare level. Furthermore, productivity growth in Spain is lower than that of these countries both in the tradeables and non-tradeables branches, and this is not merely the reflection of a lower rate of capitalisation in the economy. Yet, on the positive side, the differences in growth have been reduced in the EMU membership phase. Lastly, it is also illustrative that the bigger increase in aggregate productivity in the United States in the second sub-period is due to an acceleration in the tradeables and non-tradeables branches, which is consistent with the hypothesis that it is the branches that use and produce ICTs that are responsible for this phenomenon.

A second factor potentially behind this inflation differential between Spain and the euro area is the considerable pressure of demand that the Spanish productive system has had to face. As noted in the previous section, the Spanish economy's output gap has been positive practically since 1999 owing to the reduction in interest rates, the influx of immigrants, the expansion of employment and the rise in the value of real assets, among other factors. Nonetheless, in the euro area demand pressures remained more contained.

To test whether demand pressure may explain part of the Spanish economy's inflation differential, Chart 4.2.2 performs a very simple exercise. Its vertical axis shows the services inflation differential vis-à-vis non-energy industrial goods for the euro area countries (according to the harmonised indices of consumer prices for the 1990-2007 period), and its horizontal axis shows the trend output gap (which is highly correlated with other gaps that take into account the restrictions imposed by economic theory) for these same countries over the same period. The idea behind this exercise is that if demand pressure has an inflation-increasing effect, this should be discernible above all in the price of services, since as these are mostly non-tradeable products, they do not have the potentially unlimited supply that tradeable goods have via imports, at least in the short run. However, developments in non-energy industrial

goods prices should be taken into account in order to normalise (as far as possible) the monetary conditions prevailing in the economy.<sup>8</sup>

As can be seen, there is a positive (and statistically significant) association between these two variables, although most of the observations tend to be in the upper section of the chart, meaning that on average there is a positive inflation differential (of almost 2 pp) between the two products. Initially, in the early 1990s, the Spanish economy had one of the highest differentials of the countries considered; however, the abrupt adjustment in activity in the middle of this decade meant that for two consecutive years (1994 and 1995) this differential turned negative.<sup>9</sup> Subsequently, the behaviour of this differential in Spain has been consistent with the relationship between these two variables in the other euro area countries, although most observations tend to be above the regression line. This suggests, first, that the medium-term inflation differential between these two types of products has been somewhat wider in Spain's case and, further, that demand pressure in Spain has also been greater.

A further factor potentially contributing to the existence of inflation differentials between countries belonging to a common monetary area is that which arises from the combination of expansionary demand shocks (common or specific to each country) with a differing degree of real rigidity in product markets and in nominal price inertia. Andrés et al. (2008) show how countries with a greater level of competition in their markets have a lesser degree of real rigidity in inflation; consequently, in the face of an expansionary demand shock, inflation will tend to increase more in the country with less monopoly power. This is due to the fact that the more competition a firm has to face, the more its profits will diminish if it does not set prices in keeping with its fundamentals. Similarly, the lower the nominal inertia in price setting, the greater the reaction of inflation will be to an expansionary demand shock, since prices are less dependent on past conditions.

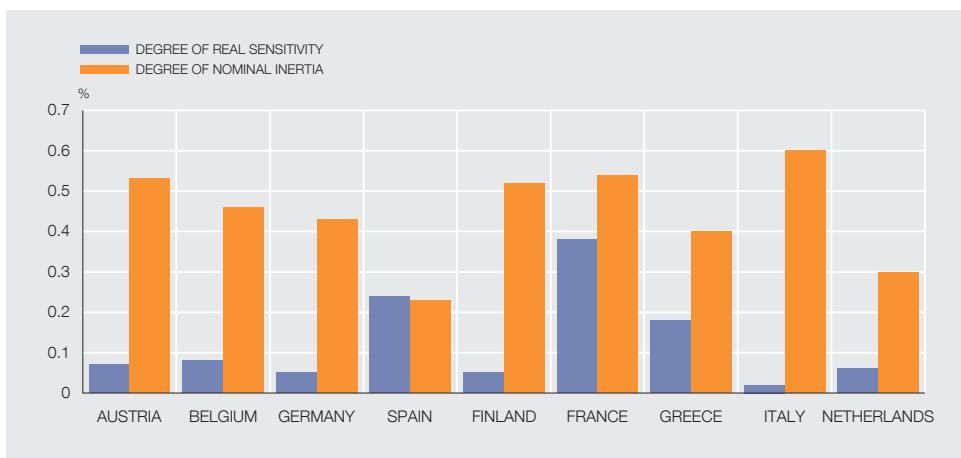
In recent years, many researchers have attempted to analyse whether the euro area countries show differences in this respect, by estimating the so-called "new Phillips curves". One of the most systematic analyses is by Rumler (2005), as part of the Inflation Persistence Network (IPN) created by the European System of Central Banks to analyse this type of issue and to clarify how it might affect monetary policy implementation in the area. The main findings are shown in Chart 4.2.3. Here, the degree of sensitivity of inflation to the real conditions in the economy (i.e. the inverse of the degree of real rigidity) is identified by the parameter that multiplies the marginal production costs, while nominal inertia corresponds to the parameter that multiplies the inflation of the immediately prior period. Evidently, Spain is, with the sole exception of France, the country that shows the greatest sensitivity of inflation to the real conditions in the economy, which suggests that there is a greater degree of competition in product markets, as corroborated in Estrada (2008). Moreover, Spain is the country that has least nominal inertia. This means that, even if all the euro area countries had faced identical expansionary demand shocks, inflation in Spain would have been higher, the result being an accentuation of the differences associated with the fact that the shocks were greater in our case.

---

8. It could be argued that non-energy industrial goods prices in the HICP also have a large non-tradeable component, since they include product marketing margins and trade is (practically) neither imported nor exported. Accordingly, the same exercise was repeated normalising with the producer prices of consumer goods, with qualitatively similar results being obtained. It was deemed preferable to leave the results with the HICP since these series are obtained with a methodology common to all the countries considered. 9. In the past two decades such an adjustment has only been observed in Germany, on the occasion of reunification (1990 and 1991), and in Finland, following the break-up of the Soviet Union (1994 and 1995).

## DEGREE OF REAL SENSITIVITY AND NOMINAL INERTIA OF INFLATION

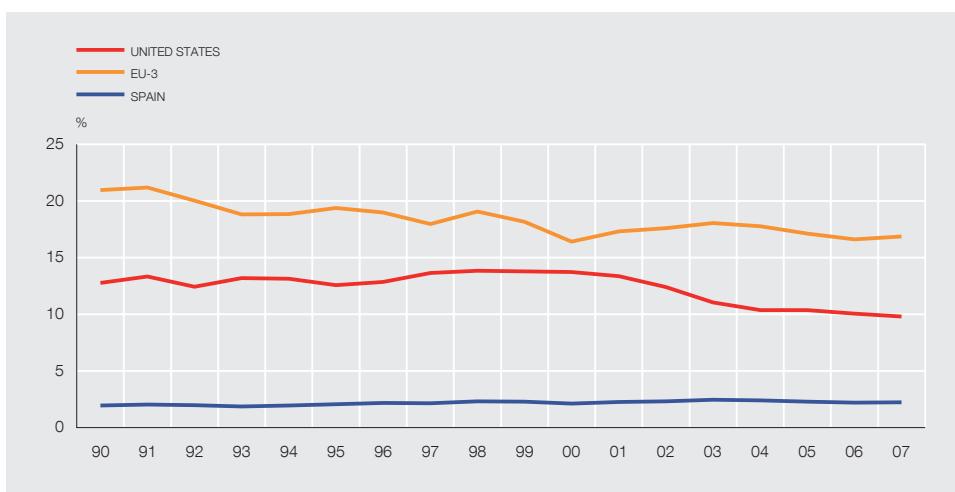
CHART 4.2.3



SOURCE: Rumler (2005).

## EXPORT SHARES As a percentage of world trade

CHART 4.2.4



SOURCES: Eurostat, IMF, INE and Banco de España.

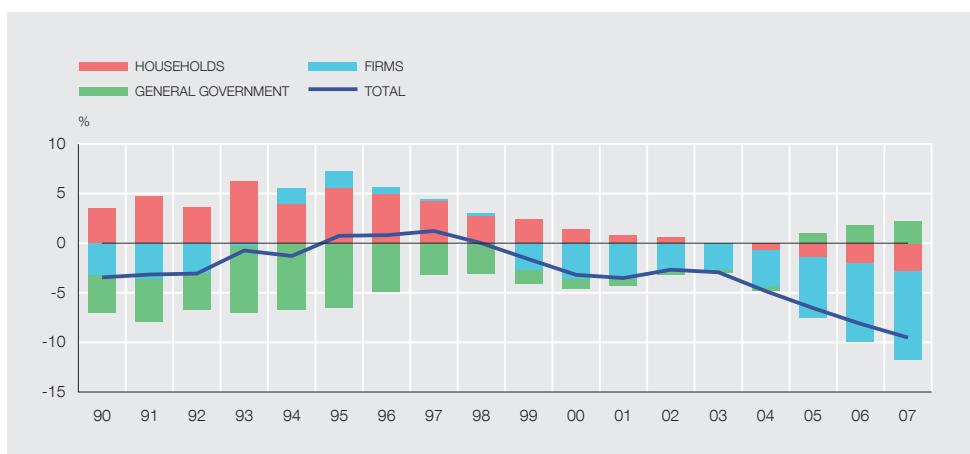
Nonetheless, translating the inflation differential into losses in competitiveness, when a differential cannot be attributed to benign factors, is neither straightforward nor immediate. Chart 4.2.4 shows that between 1999 and 2007, despite the deterioration in the real exchange rate, Spain's world export share held stable, unlike the reduction in the United States (4 pp) and in the three main euro area economies (over 2 pp).<sup>10</sup> Yet it should be taken into account that, controlling for size, Spain's export share in world markets is relatively low by international standards. Hence, Spain should seek to increase significantly its share in world trade.

Competitiveness is not only measured by the efficiency with which Spanish products are sold abroad, but also by the ease with which foreign products are introduced into our economy. From this standpoint the situation is also unfavourable, since the weight of imports in final demand rose from 22% in 1998 to 29% in 2007. This is not surprising given the esti-

10. Specifically, the share held up in Germany, but declined in Italy (0.7 pp) and, above all, in France (1.5 pp).

**SECTORAL FINANCING SURPLUS (+) OR DEFICIT (-)  
As a percentage of GDP**

CHART 4.2.5



SOURCES: INE and Banco de España.

mates in Tables 4.2.2 and 4.2.3, which show how inflation for domestically manufactured goods remained higher than that for imported products.

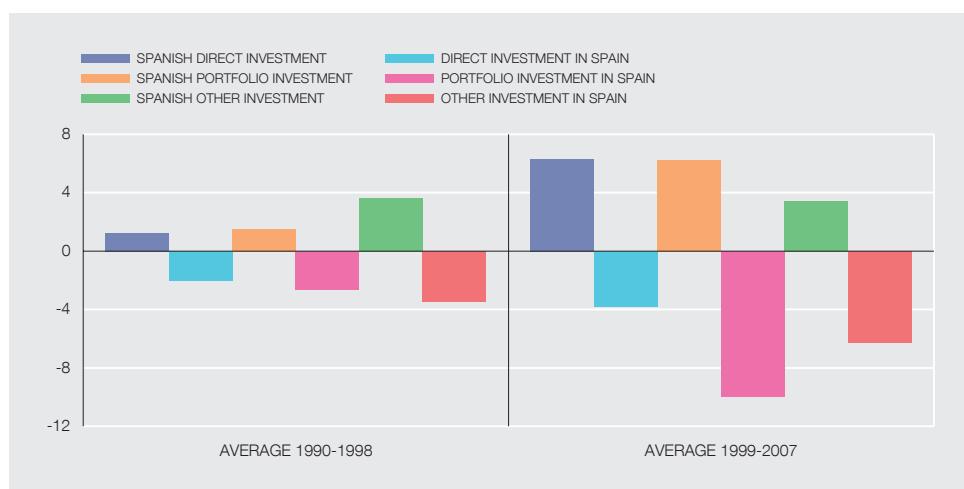
Compounding this deterioration of the trade balance against the background of demand pressures have been other changes that have tended to increase the nation's net borrowing. Such is the case of the reduction in the tourism balance, the fact that – as a result of immigration – Spain has moved from being a net recipient of remittances to a net payer, and the fall in net transfers from the European Union (which at one point accounted for 1% of GDP), in keeping with the convergence achieved. As a consequence, the nation's net borrowing has increased to 10% of GDP, in circumstances marked by the high cost of energy imports, when in the past this figure had averaged around 3% (see Chart 4.2.5).

From a sectoral standpoint, it is households and firms that have been chiefly responsible for the large increase in net borrowing. As a result of the real estate boom, these agents switched from generating funds to demanding them (this is analysed in greater detail elsewhere in the paper). In contrast, the public sector contributed to lessening net borrowing having posted successive surpluses from 2005 to 2007. The latest developments show that this contribution of the public sector was hardly sustainable, since the surpluses were obtained, primarily, due to an increase in revenue that could not be indefinite, since it was closely linked to the over-expansion of the real estate sector; that said, public spending growth continued to outpace nominal GDP in practically every year of EMU membership. At a greater level of detail, both the State and the Social Security system posted significant surpluses, enabling a reserve fund for pension payments (currently at over 5% of GDP) to be created that would offset, at least in part, the effects of the foreseeable future ageing of the population. In contrast, regional and local governments assumed greater current expenditure obligations financed by this extraordinary increase in revenue.

The financing of the external deficit had not posed problems until the international financial crises broke. Country-risk premiums had disappeared in practice and Spain was obtaining more financing than it needed to cover its domestic requirements. Indeed, Spanish firms were able to use funding facilities to press ahead with internationalisation, especially by seizing the opportunities arising in Latin America as a consequence of the privatisation of former State monopolies. As Chart 4.2.6 shows, Spain changed from being a net recipient of foreign direct investment into a net investor.

**FINANCIAL ACCOUNT OF THE BALANCE OF PAYMENTS**  
As a percentage of GDP

CHART 4.2.6



SOURCES: INE and Banco de España.

The substantial resources needed were raised through portfolio and other investment flows, mainly by Spanish financial institutions through the issuance of covered bonds and other simple mortgage-backed securities at relatively long terms and without the moral hazard problems implicit in complex securitisation operations. The functioning of these arrangements highlighted the non-existence of external financial constraints when a country is part of a monetary union, where what counts is the credit confidence of borrowers, without any interference from factors of risk arising directly from the country's macroeconomic equilibrium situation. The absence of this constraint did not, however, mean that the external imbalance was meaningless or that sizeable external net borrowing was not a potential factor of vulnerability. The external deficit reflected determinants of income generation and of spending decisions that entailed a trend of rising debt that could only be financed abroad and which posed risks in terms of sustainability, leaving the economy particularly sensitive to the climate on international financial markets. The coincidence of the adjustment of the Spanish economy with the emergence of a serious international financial crisis would escalate the potential importance of these risks to a level that could hardly have been foreseen.

#### 4.2.2 REAL ESTATE SECTOR DEVELOPMENTS

One of the key factors in the growth of economic activity over the past decade was the real estate boom. Indeed, when analysing the growth of GDP from the standpoint of demand, it is clear that the expansion of the Spanish economy tilted excessively towards investment in housing. As Table 4.2.4 shows, the resources allocated to investment in housing increased by almost 2 pp in Spain, whereas in the United States, where there was also an intense real estate boom, the weight of such resources in GDP held stable.

The rise in US external debt was the outcome, above all, of a substantial increase in consumption, while the greater weight of investment in equipment was offset by fewer resources being allocated to infrastructure. In Spain's case, although there was considerable productive investment and, in recent years, infrastructure investment, this did not suffice to check the reallocation of resources towards non-tradeable activities. The corollary of this was the enormous increase in the trade deficit and, consequently, in external debt. Conversely, in other European countries, as in the United States, infrastructure investment was replaced by investment in equipment, but without such expansionary behaviour by private consumption,

## EXPENDITURE COMPOSITION OF GDP

TABLE 4.2.4

Average percentage

	Private consumption		Equipment investment		Housing investment		Investment in other construction		Trade balance	
	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007	1990-1998	1999-2007
United States	67.4	70.3	6.8	9.6	4.4	4.8	5.2	4.5	-0.9	-4.7
EU-3 (a)	58.3	58.2	7.0	7.7	6.1	5.5	5.9	5.1	0.4	1.5
Euro area-12	58.4	57.7	7.0	8.1	5.8	5.7	5.9	5.5	0.5	1.1
Spain	60.1	59.9	6.4	8.0	5.0	6.8	8.1	7.7	-1.2	-5.8

SOURCES: Eurostat and AMECO.

a. The EU-3 aggregate includes Germany, France and Italy.

which resulted in a significant increase in the trade surplus of the euro area as a whole, and above all of the three biggest economies, particularly in Germany.

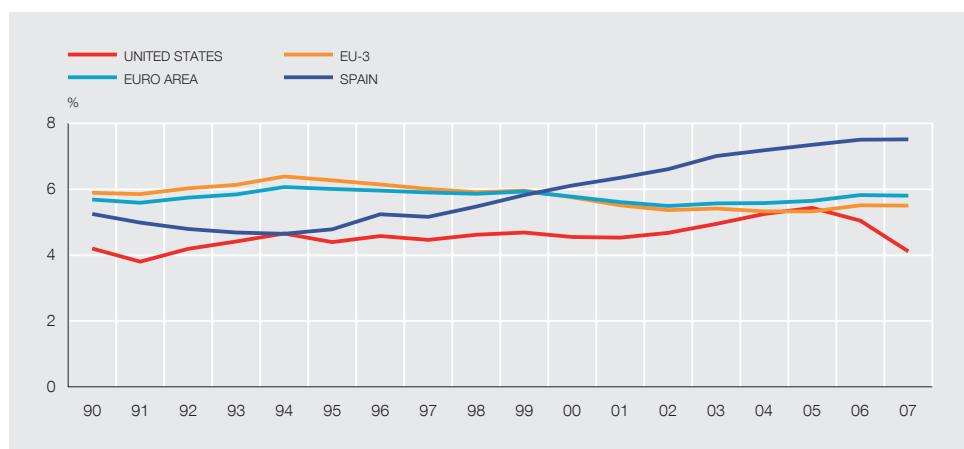
This strong expansion in real estate activity was driven by the availability of abundant credit and unskilled labour. As earlier noted, EMU membership entailed a notable reduction in interest rates and an increased availability of loanable funds, which gave previously excluded groups access to housing and boosted second-home purchases. The buoyancy of credit was particularly intense in sectors such as construction where it is easier to provide an asset as collateral (see Arce, Campa and Gavilán, 2008). This prompted an increase in construction activity and, consequently, an expansion in the demand for labour. Here, Spain had considerable reserves to draw on given its high unemployment rate and low participation rate, which enabled this demand initially to be met by nationals. Very soon, however, the buoyancy of employment triggered, as seen, a sharp increase in immigration, which would re-fuel the demand for residential services.

Yet although supply responded swiftly (Chart 4.2.7 shows how the weight of investment in housing in GDP began to increase sustainably from the mid-1990s), it did not suffice to prevent a notable climb in house prices as from 1999 (see Chart 4.2.8). As a result housing became one of the most profitable and attractive assets, which boosted the demand for it as an investment and led to an excessive expansion of the sector. Specifically, at the height of the boom there were more than 800,000 housing starts per year, more than in Germany, France and Italy combined. The easing of restrictions on construction in response to the expected return on real estate projects, despite the rigidities in town planning processes, meant that the price elasticity of supply of new housing was particularly high (Bover and Jimeno, 2007). As a result, the weight of investment in housing in GDP stood more than 1.5 pp higher than in the euro area (see Chart 4.2.7).

Admittedly, Spain's demographic fundamentals and advantages as a location for non-residents' second homes provide a solid basis for the future demand for housing. But the forceful real estate expansion under particularly lax conditions ultimately generated substantial excesses both in terms of overpricing and over-production. Given the long lead-times for housing and the information shortcomings in this market, the expansion continued even when the short-term determinants had already begun to erode the attractiveness of house purchases. Finished housing would thus reach an all-time peak when demand had fallen off drastically given the widespread perception of the need for an adjustment following such an exceptionally long and intense period of expansion. At the same time, this perception was compounded by an international financial crisis whose roots lay deep in the excesses of the

**WEIGHT OF HOUSING INVESTMENT**  
As a percentage of GDP

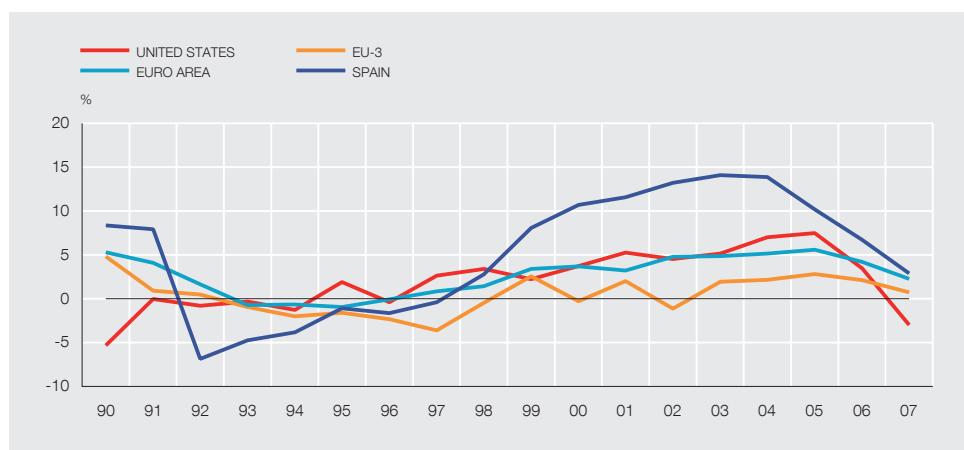
CHART 4.2.7



SOURCES: Eurostat and Banco de España.

**HOUSE PRICES**  
Real rate of change

CHART 4.2.8



SOURCES: Ministerio de Vivienda and Banco de España.

US real estate market. The outcome was the build-up of a large supply surplus that would exert pressure to correct the overvaluation. The adjustment of house prices started the change in trend in Spain a year earlier than in the United States and in the euro area (the starting point was, nonetheless, at a far higher level), although the correction of the overvaluation is following a less pronounced path, reflecting the major differences between the characteristics and fundamentals of the respective real estate markets (see Chart 4.2.8).

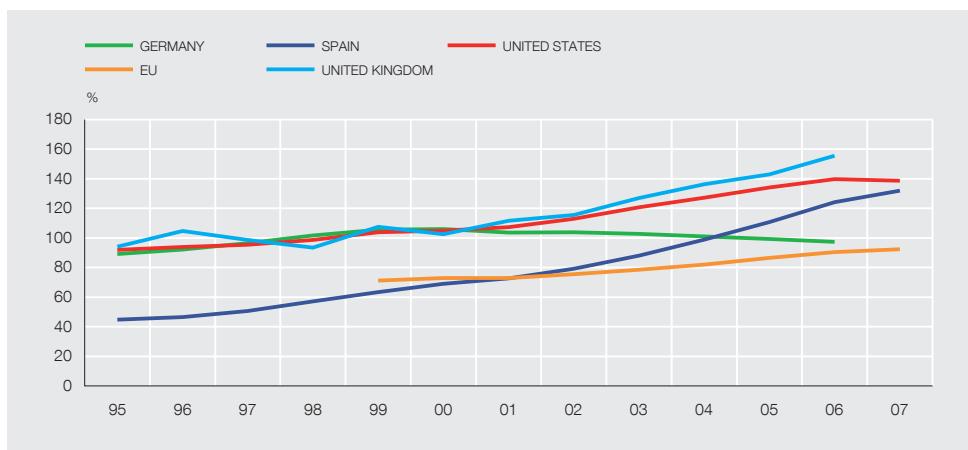
The intensity of the imbalance that built up in the real estate sector ultimately acted as the main trigger for the adjustment and for the recessionary trends that would spread across the whole of the Spanish economy.

4.2.3 HOUSEHOLD AND CORPORATE DEBT

Developments in Spanish household and corporate credit have been closely linked to the real estate boom and to the appreciation of the real exchange rate. The improvement in the Spanish economy's growth expectations as a result of membership of the EU first, and of EMU later, the reduction in interest rates and readier access to credit all boosted the rise in Spanish

## RATIO OF HOUSEHOLD DEBT TO GROSS DISPOSABLE INCOME

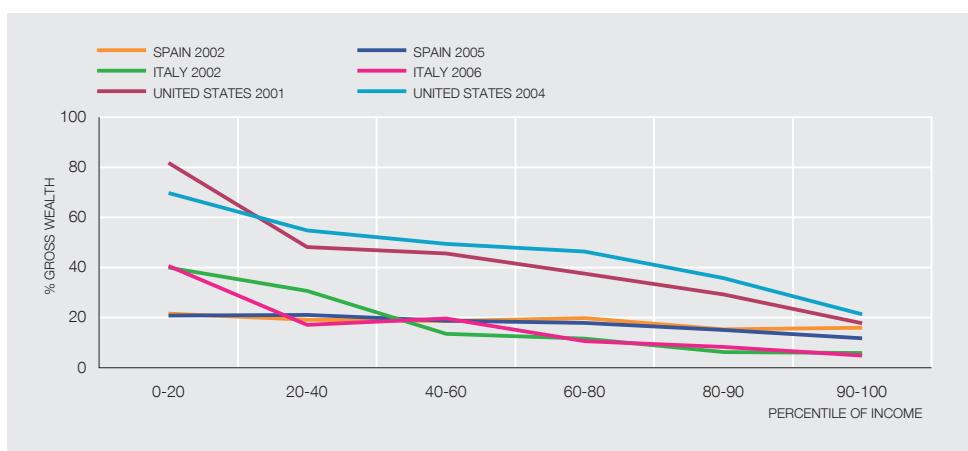
CHART 4.2.9



SOURCES: Eurostat, INE and Banco de España.

## RATIO OF HOUSEHOLD DEBT TO GROSS WEALTH By percentile of income

CHART 4.2.10

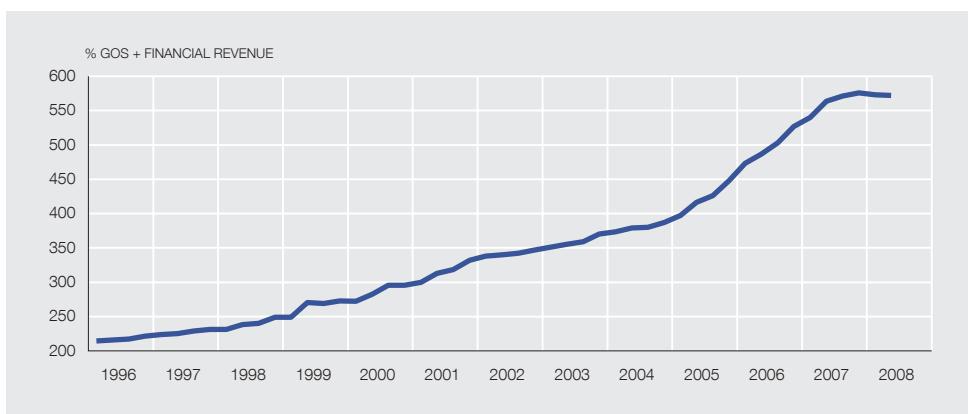


SOURCES: Banca d'Italia, US Federal Reserve and Banco de España.

household debt. Much of the growth of credit was used to purchase real estate assets, which were very attractive under the new macroeconomic and financial conditions, giving rise to a strong increase in house prices and in activity in the residential construction sector. In turn, the rise in real estate wealth generated fresh increases in credit, insofar as real estate acted as collateral for the granting of new loans.

As regards households, the growth of debt was particularly high following EMU entry. As can be seen in Chart 4.2.9, the debt/gross disposable income ratio moved on a rising trend from 1995, which became more pronounced from 1999. In the mid-1990s, Spain's rate of indebtedness was higher than the EU average but still below that of the United States and the United Kingdom.

The availability of macroeconomic data on household income, debt and wealth allows a more detailed analysis of the extent of the growth of indebtedness. Chart 4.2.10 plots the debt/gross wealth ratio against the household income percentile for Spain, Italy and the United States, where these data are available. Regarding Spain, there are two significant facts. First, the growth of debt between 2002 and 2005 is on a scale similar to that of wealth, so that there is scarcely any change in the aforementioned ratio. Second, for the average indebted Spanish



SOURCES: INE and Banco de España.

household, debt accounts for a low proportion of its assets, albeit somewhat higher than in Italy, but lower than in the United States. That said, these differences are greater for households in the lower part of the income distribution.<sup>11</sup>

Very rapid growth is also observed in corporate debt. This is associated with the strong growth of investment in capital goods and in property, and with the acquisition of assets abroad, as part of the internationalisation drive by major Spanish corporations. Chart 4.2.11, which shows debt as a percentage of the gross operating surplus plus the financial revenue of Spanish non-financial corporations as a whole, suggests that, in this case, the growth of debt followed a similar trend to that observed just before EMU entry, accelerating only after 2004.

As with households, the expectations of growth in activity and expansion abroad coupled with the significant reduction in borrowing costs explain much of the trend of credit to non-financial corporations. In this respect, Marqués, Nieto and del Río (2005) estimate an elasticity of credit with respect to activity that is similar to the estimates for other countries. However, their estimates suggest that the semi-elasticity of non-financial corporations' credit with respect to the interest rate is higher. This finding may be related to the changes brought about in European capital markets by the introduction of the euro, which have led to an increase in the weight of debt issues in the liabilities of European financial institutions [see, for example, Hartmann et al. (2003), De Bondt (2002), and Rajan and Zingales (2003)] and, therefore, to the fact that credit is more sensitive to the cost of financing.

**11.** The discrepancies in the levels of this ratio from country to country are partly the result of differences in the composition of debt, particularly the high weight of real estate assets in the Spanish household wealth portfolio, and the significance of loans to fund investment in education in the United States (see Bover, 2005 and 2008).

## 5 An assessment of the imbalances: intertemporal substitution in consumption

In order to identify the extent to which the growth of the Spanish economy's indebtedness and the property expansion over the period 1999-2008 ended up generating imbalances that made an adjustment essential, this section presents a simulation based on a model designed for a small open economy. The model used is the literature benchmark for international macroeconomic studies (see, for example, Campa and Gavilán, 2006), in which the economy's representative agent has access to the international capital market and attempts through its consumption and saving decisions to maximise present and future utility, in a setting of uncertainty regarding its future income. As in the classic permanent income model, the agent of this economy uses saving in order to avoid fluctuations in its long-term level of consumption.

Chapter 2 of the 2006 Annual Report of the Banco de España presented an initial analysis of this question that did not take into account the real estate sector. The results indicated that the increase in debt during this period could only be justified, according to this approach, on the basis of very optimistic growth expectations, which assumed that growth would remain at above the Spanish economy's potential rate. In fact, the expectations on which the spending and debt decisions were based only made sense if real convergence with the income levels of the core euro area countries of the were going to proceed apace. This standard model is now extended to incorporate the real estate sector explicitly. Thus, a two-sector economy is considered, with one sector dedicated to the production of tradeable non-durable consumer goods and the other to the production of real estate properties, which are non-tradeable durable goods. In each sector there is a representative firm that hires labour and takes investment decisions on a competitive basis.

The representative household of the economy obtains utility from consumer goods ( $C$ ) and housing ( $H$ ), has access to international capital markets at the exogenous interest rate  $r$  and has a unit of time that it supplies inelastically to the labour market, receiving a wage  $w$ . Specifically, the agent solves the following intertemporal optimisation problem:

$$\max E_t \sum_{s=t}^{\infty} \beta^{s-t} U(C_s, H_s)$$

subject to

$$C_s + p_s H_{s+1} + Q_{s+1} = w_s + (1 + r_s) Q_s + p_s (1 - \delta_H) H_s - T_s \quad \forall s \geq t$$

where  $Q_s$  denotes the financial wealth of the agent at the beginning of period  $s$ ,  $T$  denotes the fixed-sum taxes that it must pay the government and  $\delta_H$  is the rate of depreciation of housing.

For its part, the representative firm operating in the consumer goods sector seeks to maximise the discounted present value of its expected profit flow and, to do so, must invest ( $I$ ) and hire workers ( $L$ ). Accordingly, its problem is as follows:

$$\max E_t \sum_{s=t}^{\infty} \left( \prod_{j=t+1}^s \frac{1}{1+r_j} \right) \left[ F(K_{Cs}, L_{Cs}) - \left[ 1 + \frac{\mu_C}{2} \left( \frac{L_{Cs}}{L_{Cs-1}} - 1 \right)^2 \right] w_s L_{Cs} - \left[ 1 + \frac{\gamma_C}{2} \left( \frac{I_{Cs}}{I_{Cs-1}} - 1 \right)^2 \right] I_{Cs} \right]$$

subject to

$$K_{Cs+1} = (1 - \delta_{KC}) K_{Cs} + I_{Cs} \quad \forall s \geq t$$

where  $\delta_{KC}$  denotes the rate of depreciation of capital in this sector and  $\mu_C$  and  $\gamma_C$  provide a measure of the convex adjustment costs faced by the firm when it wishes to adjust its level of employment and investment, respectively.

The representative firm operating in the real estate sector solves a similar problem to the previous one because, apart from employing labour and capital, this firm also acquires on the market land ( $U$ ) at price  $p_U$ :

$$\max E_t \sum_{s=t}^{\infty} \left( \prod_{j=t+1}^s \frac{1}{1+r_j} \right) \left[ F(K_{Hs}, L_{Hs}, U_{Hs}) - \left[ 1 + \frac{\mu_H}{2} \left( \frac{L_{Hs}}{L_{Hs-1}} - 1 \right)^2 \right] w_s L_{Hs} - \left[ 1 + \frac{\gamma_H}{2} \left( \frac{I_{Hs}}{I_{Hs-1}} - 1 \right)^2 \right] I_{Hs} - p_{Us} U_{Hs} \right]$$

subject to

$$K_{Hs+1} = (1 - \delta_{KH}) K_{Hs} + I_{Hs} \quad \forall s \geq t$$

The model is closed with market-clearing equations for labour, housing and land.

Given future paths for interest rates and productivity in the two sectors of the economy and households' preference for house ownership, this model can be used to analyse jointly the behaviour over time of households, in terms of consumption and saving, of firms, in terms of employment and investment, of house prices and of the current account balance. This model can thus determine the extent to which the recent expansion in Spain of debt and of the real estate sector can be explained by the impulses and shocks that have arisen since EMU entry.

Table 4.3.1 presents the results of the exercise (the Appendix gives model calibration details and the characteristics of the paths assumed for the population and interest rates). As can be seen, the model reproduces the most prominent characteristics of the period of expansion rather well: in response to interest rate developments and demographic growth (see Charts A1 and A2), external debt rises and a real estate expansion occurs: real estate wealth and house prices increase, as does also the weight of the construction sector, in terms of both GDP and employment. The model also predicts an increase in rates of investment in both sectors. According to these results the main changes recorded were in the direction that would have been expected in view of the behaviour of the fundamental determinants.

However, the model's quantitative predictions regarding the changes in these variables are somewhat smaller than the data actually observed in the Spanish economy during the first decade of EMU. Thus, both the stock of external debt and the current account balance reached significantly higher levels in 2007 than those that might be warranted assuming an optimal and rational reaction by domestic agents to the new credit and growth conditions arising from entry into the euro area, according to this calibrated version of the model of intertemporal substitution in consumption. External debt has exceeded the level explained by the model, although the deviation is around 10%. In the case of house prices, the calibrated model is capable of explaining only 55% of the price actually observed. Even when the limitations with which a model of these characteristics can approximate asset valuations are taken into account, this indicates the presence of a component of overvaluation not very different

	DATA	MODEL
External debt/GDP (2007)	-78%	-70.1%
Current-account balance/GDP (2007)	-9.6%	-4.9%
Housing wealth/GDP (Dec 2004)	509%	393%
Δ House prices (Dec 1998-Dec 2007)	105.8%	57.2%
Δ Weight of construction in GDP (1998-2007)	4.3 pp	4.26 pp
Δ (Capital investment/GDP) (1998-2005)		
<i>Construction</i>	0.7 pp	0.41 pp
<i>Rest of the economy</i>	5.47 pp	0.28 pp
Δ Weight of employment in construction (1998-2007)	2.87 pp	1.90 pp

from that estimated by another type of model designed specifically to estimate the contribution of the determinants of real estate prices. For example, Ayuso and Restoy (2006) estimated at the beginning of the decade a difference between the observed price of housing and its “fundamental value” of around 30%. Finally, as regards the reallocation of productive resources towards the construction sector, the model also enables excessive expansion of the real estate sector to be identified, since it can only rationalise about 60-66% of the increases actually observed in the investment rate and employment in the construction sector.

Subject to the caveats appropriate to a quantitative exercise of this nature, its results suggest that the increase in household and corporate debt and the real estate expansion experienced by the Spanish economy during the first few years of EMU are phenomena linked to the new opportunities created by membership of a monetary union. In short, as this model indicates, it should come as no surprise that in a setting of more accessible credit, low interest rates and expectations of future income growth, stimulated by a process of intense employment creation, Spanish households and firms should increase their indebtedness. Neither is it strange that part of this debt should be used for the acquisition of real estate assets, given that the formation of new households increased notably and the availability of credit was greater for acquisitions of this type of asset. Apparently, however, excessive optimism regarding the future generation of income gave rise, at the same time, to excessive indebtedness and house price growth beyond, according to the calibration of this model of intertemporal substitution for the Spanish economy, what would have been compatible with the actual paths of interest rates and economic growth. All this, moreover, led to an excessive allocation of productive resources to the construction sector, relative to what could be warranted by this model.

The importance and scale of the excesses identified by this exercise made it inevitable that the Spanish economy would undergo an adjustment process to steer the behaviour of indebtedness, the dynamic of real estate asset prices and the allocation of resources to this sector towards sustainable paths. There was great uncertainty surrounding the scope and intensity of this adjustment, given that it had to take place for the first time under the specific restrictions of EMU membership. It was assumed that certain factors arising from the structural transformations made in the Spanish economy during its transition to a regime of macroeconomic stability would help to cushion its possible consequences. However, unfortunately, once the adjustment had begun, at around the beginning of 2007, the international financial crisis substantially changed the international economic environment, making the unwinding of the imbalances accumulated during the expansion more difficult and costly.

## 6 The crisis and the adjustment of the Spanish economy

The strong growth of the Spanish economy in EMU gave way to a sharp slowdown, somewhat more gradual in 2007 and gathering pace in 2008. GDP growth rates turned negative in the second half of 2008 and a global recession commenced in a contractionary international climate dominated by exceptional financial strains. The drastic change on the economic front is partly attributable to the unavoidable correction of imbalances generated during the expansion, but also to the exceptional conditions in which the adjustment is to be made. The origin of the adjustment under way in the Spanish economy is described below, along with the main factors involved.

### 6.1 *The dual origin of the crisis*

The crisis has two focal points: the first domestic and related to the excesses accumulated during the expansion; and the second external and due to the effect of the successive international financial shocks dating back to July 2007.

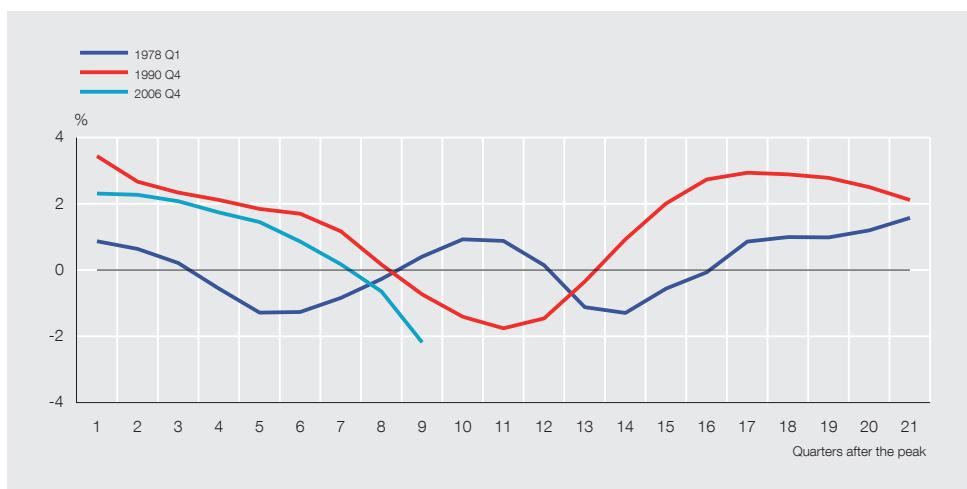
As regards the domestic origin of the crisis, the exercise presented in Section 5 is suitably illustrative. The greater availability of credit due to EMU membership and the excessively optimistic expectations of rapid per capita income growth led Spanish households and firms to take on debt briskly. When, following this initial situation, growth expectations became more realistic and credit conditions tightened, consumption and investment decisions had to adjust sharply to correct a debt dynamic which proved to be unsustainable. Given the focus of spending and debt on acquiring real estate assets, which had pushed house prices and residential investment sharply higher, beyond long-term sustainable values, this adjustment also brought a considerable curtailment of construction activity and the reallocation of substantial productive resources to other sectors.

This correction, in itself sharp enough given the scale of the cumulative imbalances, was magnified by the consequences of the serious international financial crises, which led to a widespread rise in financing costs for final borrowers and triggered a deleveraging of financial institutions with the resulting notable global credit shortage. These conditions drastically altered the scenario of world growth, pushing most economies, especially the more developed ones, into deep recession. The Spanish economy, though not directly affected by the shocks and weaknesses which set off this process, could not escape its consequences, especially since it coincided with a deep domestic adjustment linked to debt reduction and to over-investment in real estate. Thus, the financial crisis acted through various channels to accentuate the slowdown in consumption and investment and led quite swiftly to a recession in the second half of 2008. The worsening of the financial crisis in 2008 Q4 added deep contractionary shocks to consumer and business confidence, and tightened and restrained credit conditions for agents heavily reliant on borrowed funds. Furthermore, the global nature of the recession deprived the Spanish economy of the support of external demand, which under normal conditions could have been relied on to soften the impact that the necessary adjustment of domestic demand will have on growth.

In view of the sharpness of the recession, it is worth analysing the similarities and differences of the current downturn with respect to other episodes in which activity also weakened significantly. For this comparison, two other phases in the last 30 years when GDP fell in

**PER CAPITA GDP**  
Year-on-year rate of change

CHART 6.1.1



SOURCES: INE and Banco de España.

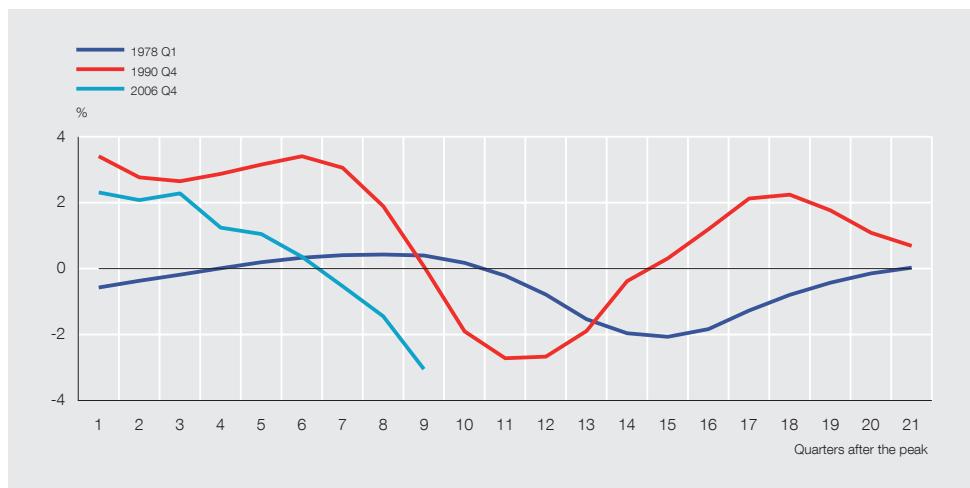
various quarters were selected as references (1979-1981 and around 1993). As is customary in this type of study, the accompanying charts compare the annual growth of certain relevant variables over the 20 quarters following the quarter in which GDP peaked in each selected phase (1978 Q1, 1990 Q4 and 2006 Q4).

Chart 6.1.1 shows per capita GDP growth in the three periods selected; in this case population is used as a normalisation variable, since it is a basic determinant of an economy's growth potential. While at the end of the 1970s its rate of increase was slightly above 1%, at the beginning of the 1990s it had fallen to just 0.1% and in the last three years considered it recovered to nearly 2%. As can be seen in this chart, the two full recessions considered differed in depth and length. Thus, at the end of the 1970s, per capita GDP fell somewhat more than 1% in only four quarters, which moreover were separated by nearly two years. In contrast, at the beginning of the 1990s activity fell by nearly 2% in some quarters, but the rise in per capita GDP started to take root only one and a half years after the adjustment began. Until 2008 Q3 the intensity of the recession seemed most similar to that of the early 1990s, although in 2008 Q4 GDP plummeted. Also, certain factors indicate that it may last longer, since many of the factors which enabled activity to resume significant growth rates by 1995 (gains in the competitiveness of Spanish exports, world growth and readily available financing) are hardly likely to be seen this time.

Moving on to the various components of aggregate spending, Charts 6.1.2 and 6.1.3 compare the performance of per capita private consumption and housing investment, also normalised using population. In this case the differences between the various recessions are much sharper. Specifically, the adjustment in private consumption is much sharper in 2007 and 2008; in fact, as early as 2008 Q2, this variable began to fall off in comparison with the same period of the preceding year. This slowdown seems to be a logical consequence of the high household debt built up, of the financial crisis affecting the world economy and of the financial asset price adjustment, which significantly diminished household wealth. Conversely, in the 1990s the adjustment of private consumption was in line with that of GDP, suggesting it must have been influenced most by the behaviour of disposable income, and in the late-1970s recession the adjustment of private consumption was delayed until 1981, precisely when the onset of the second oil price shock significantly eroded agents' purchasing power.

**PER CAPITA CONSUMPTION**  
Year-on-year rate of change

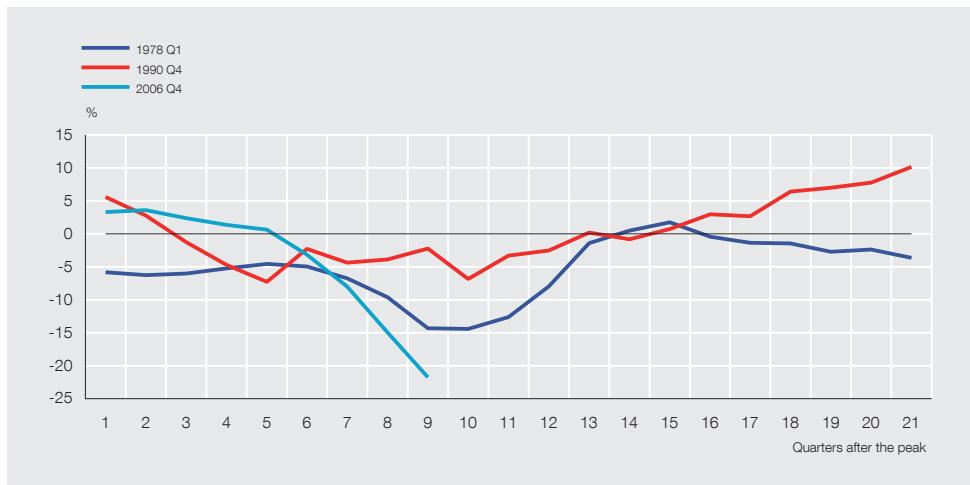
CHART 6.1.2



SOURCES: INE and Banco de España.

**PER CAPITA HOUSING INVESTMENT**  
Year-on-year rate of change

CHART 6.1.3

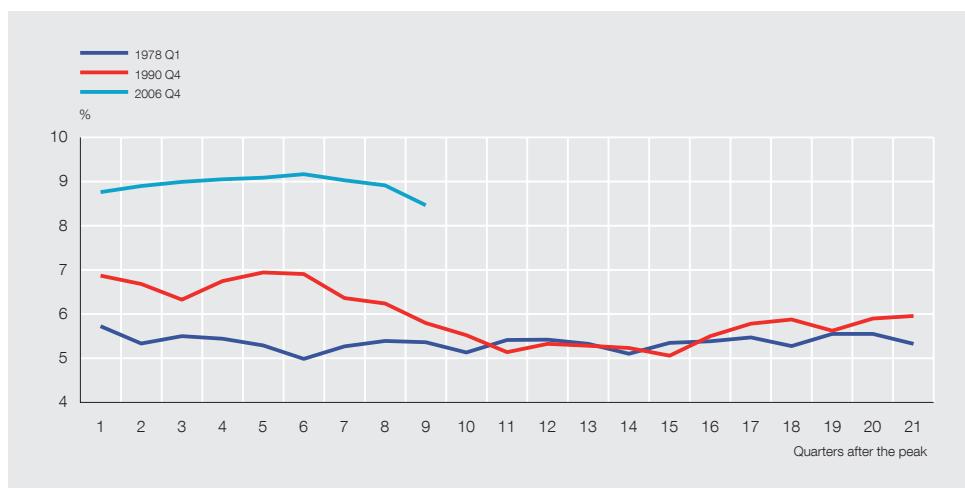


SOURCES: INE and Banco de España.

If these three recessions have anything in common, it is to be found in housing investment, although this is not always preceded by a significant expansion; in fact, in the 1970s, residential investment had been falling since 1975. In the present cycle, this variable initially took longer to react than in the 1990s, although it has plummeted to such an extent in the last four quarters that the deceleration now exceeds that seen in the whole of the previous recession. The explanation for this initial higher inertia probably lies in the way this variable is recorded: on the one hand, every house built is considered as sold (i.e. there is no change in inventories), and, on the other, only the part of the house built in that quarter is considered as investment. However, the data for the last four quarters indicate that a large number of unfinished housing developments are being abandoned because so many finished homes remain unsold. This means that this component of household demand will take some time to recover because the finished homes currently held by developers must first be absorbed. But there is evidence that, geographically, they are concentrated in coastal provinces, which are not the areas of future demand for primary residences.

**RATE OF INVESTMENT IN EQUIPMENT**  
As a percentage of GDP

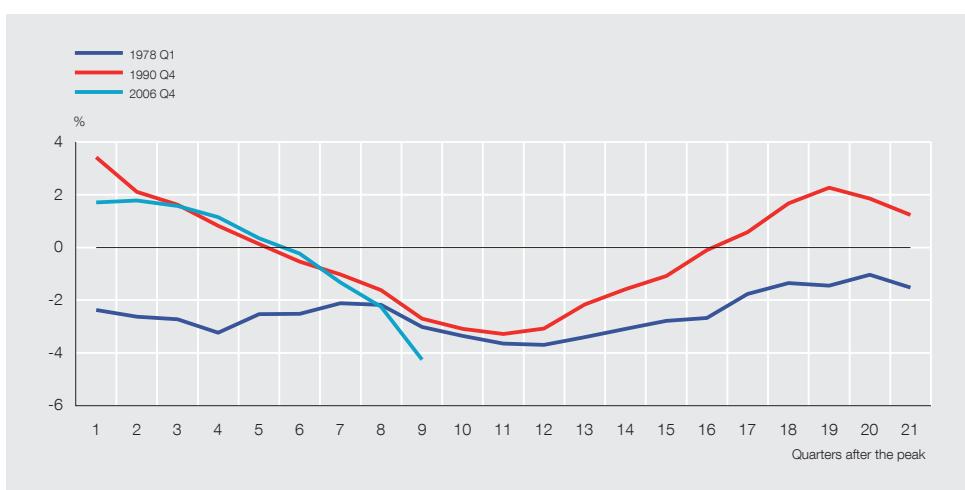
CHART 6.1.4



SOURCES: INE and Banco de España.

**EMPLOYMENT RATE**  
Year-on-year rate of change

CHART 6.1.5

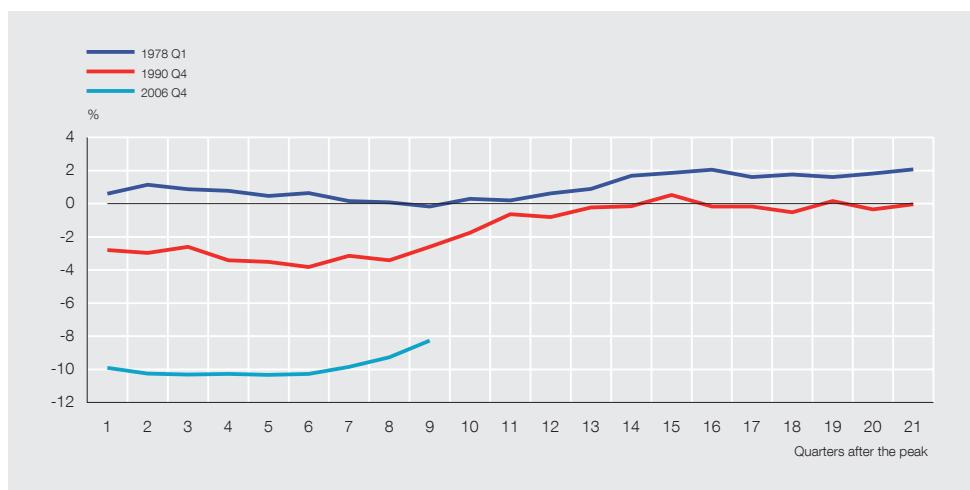


SOURCES: INE and Banco de España.

Charts 6.1.4 and 6.1.5 show the rate of investment in capital goods (i.e. the ratio of investment in capital goods to GDP) and the growth of the employment rate (i.e. growth of employment less than that of the population, which can be considered an approximation of the inverse of the unemployment rate). As can be seen, the financing raised in the Spanish economy in the last few years was not used only for building homes, but also for notably stepping up investment in capital goods, which are much more productive. In fact, in comparison with the first half of the 1990s, the rate of investment in capital goods is 2 pp higher, and 4 pp up on the end of the 1970s. Also, capital goods investment seems to have been much more resilient, at least initially. Indeed, in the first nine quarters of economic deceleration, the investment rate even rose slightly, unlike at the beginning of the new millennium or in the early 1990s. In any event, the outlook is not favourable since this variable is very sensitive to business expectations and relies heavily on borrowed funds, which is precisely where the global crisis is concentrated. As for the employment rate, the ongoing loss of dynamism (and even decline in the last three quarters) does not seem to be sharper than that in the 1990s, although at the end of 2008 it intensified notably. Comparison with events in the 1970s is much more complex. In that cycle

**TRADE BALANCE IN REAL TERMS**  
As a percentage of GDP

CHART 6.1.6



SOURCES: INE and Banco de España.

the adjustment of employment began much earlier due to structural changes in the Spanish economy (the definitive exodus from the countryside) in combination with higher oil prices, which rendered certain activities obsolete, and the change of political regime, which meant the end of the trade-off between harmonious industrial relations and employment stability.

In any event, the distinguishing feature which best summarises the excesses of the Spanish economy in the most recent phase is apparent in Chart 6.1.6, which plots the trade balance in real terms as a percentage of GDP in the selected periods. It shows that in the first half of the 1990s the trade deficit climbed to 4% of GDP, but following the marked slowdown in activity and the devaluation of the peseta (which unlike other exchange rate adjustments was very successful and permitted notable gains in competitiveness), a situation of external equilibrium was reached which lasted until practically mid-1998. At the end of the 1970s, the trade account was virtually in balance. However, this was the result of the Spanish economy's serious difficulties in attracting external funds, given the problems of confidence raised by the delicate political and economic situation. Evidence of these difficulties is that in spite of this external equilibrium, the peseta had to be devalued in 1982, which resulted in a widening of the trade surplus. By contrast, at the beginning of the current recession, the external deficit stood at 10% of GDP. Obviously, this reflects the fact that the excess demand of the Spanish economy in these years has been much larger than is reflected in traditional calculations of the output gap (probably due to difficulties in separating the growth of supply in the Spanish economy from that of demand), but it also indicates that there is a problem of competitiveness.

It has become considerably harder to sustain this imbalance, even in the short run, because of the difficulty in financing it on reasonable terms due to the nature of the global crisis. The need for a domestic adjustment, in the form of a downward adjustment in relative prices (competitiveness) or in quantities (real income) or a combination of the two, has thus become more pressing. This adjustment has in fact already been set in train in the last two quarters, sharpening drastically in 2008 Q4 when housing investment plummeted and private consumption and capital goods investment could hold up no longer. Although, unlike in the previous two slumps, the devaluation of the currency is not available as a means of reducing this imbalance, there are two factors which will make this adjustment somewhat less painful: first, the significant interest rate cuts worldwide, which will reduce the external debt burden by nearly 2 pp relative to GDP (the Spanish gross external debt is around 80% of GDP), and second, the drop

in oil prices, which represents another 2 pp of GDP, since Spain uses this commodity intensively. All this does not obviate the need for a lasting improvement in the competitiveness of the economy to lay the foundations for a sustained recovery in activity, since both these cushioning factors will return to higher levels when the international situation improves.

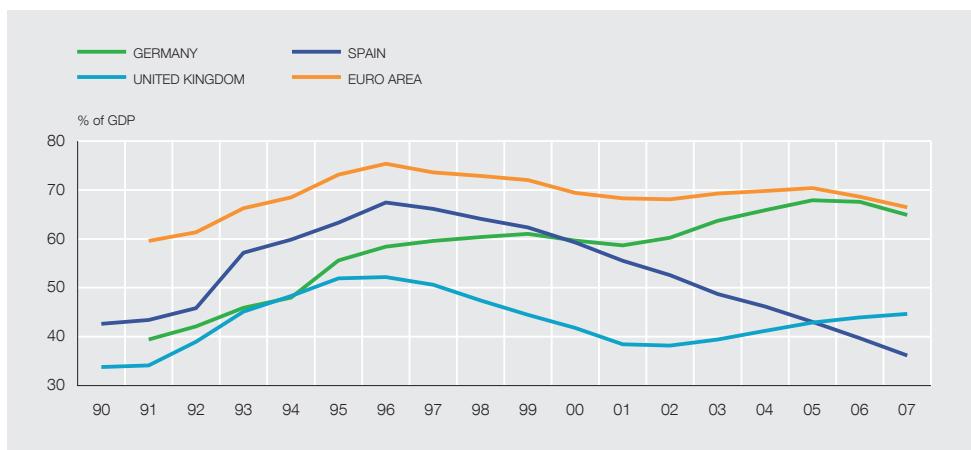
## **6.2 The nature of the adjustment of the Spanish economy**

The scale and intensity of the prevailing contractionary trends reflect the great importance of the adjustment needed by the economy and the role played here by Spanish EMU membership and by the structural conditioning factors derived from the transformations and reforms made. The specific characteristics of the adjustment process within a monetary union are well known [see, for example, Blanchard (2001) and Muscatelli et al. (2005)]. When a country belonging to a monetary union grows faster than the other members due to an increase in domestic demand and a positive inflation differential (and hence a real appreciation of the exchange rate and a worsening of the external deficit), the domestic and external balance has to be restored using fiscal policy to control domestic demand growth and through reform of the price- and wage-setting mechanism to limit real exchange rate appreciation.

Spanish fiscal policy during the expansion, although enabling some fiscal consolidation and budget surpluses, was not sufficiently countercyclical. Chart 6.2.1 shows public debt in terms of GDP in various euro area countries. As can be seen, although in Spain it decreased significantly, and in fact more than in other European countries, government saving did not increase enough to offset the sharp rise in the debt of domestic private agents.

It was thus not until mid-2006 and, more visibly, during 2007, that the strong growth of domestic demand began to be corrected. At first the moderation was from the construction sector, where activity levels began to flag as the high price rises dampened demand for housing. However, as earlier analysed, the adjustment of domestic demand was soon widespread and rapidly in train due to the linkage of domestic imbalances with the global financial crisis. This meant that the framework defining the possible contribution of fiscal policy to the adjustment was drastically altered. The scenario of necessary moderation of domestic demand gave way, in the space of a few months, to one of severe contraction, with a serious deterioration of confidence and widespread curtailment of spending decisions. The overriding consideration in this setting was the contribution that fiscal policy could make to sustaining domestic demand.

In this vein, the approaches proposed to tackle the crisis at the international level include ambitious, coordinated fiscal stimuli, albeit tailored to the conditions and leeway existing in each country. Spain, which had recorded some surplus in its public finances during the expansion and where public-sector debt had been notably reduced, initially enjoyed some headroom to stimulate consumption and investment through increased government spending and tax cuts. In fact, this leeway enabled it to take expansionary fiscal measures fairly early. However, the budgetary effects of these measures have coincided with the emergence of a strong impact from the cyclical slowdown and, above all, from the real estate-related fall in tax revenue, which has shown a much higher sensitivity than commonly assumed [see De Castro et al. (2008)]. The potential margin for manoeuvre initially available for fiscal stimulus seems to have been largely exhausted. In any event, any action is constrained by the need to preserve medium-term budgetary stability. Otherwise, a sizeable public deficit could build up and become an additional handicap to negotiating the recession, given the possible impact on confidence and country-risk premiums which may activate Ricardian mechanisms leading public expansionary impulses to be offset by the possible crowding-out of private spending.



SOURCES: Eurostat, INE and Banco de España.

In any event, the contraction of demand does not change the nature of certain essential aspects of the necessary adjustment of the Spanish economy. In the short run, emerging from the crisis depends essentially on the normalisation of financial markets and on the length and depth of the international economic recession. However, over a longer time horizon, once normality has been restored, the adjustment of the Spanish economy will depend basically on the existence of a competitive position enabling the sustained growth of domestic and external demand. In a monetary union where the currency is shared with the other euro area countries, the decisive factors in making this possible will be the future course of productivity growth and the response by production costs to market conditions.

The growth rate of productivity is important for many reasons. First, higher productivity growth enables, for a given growth rate of production costs, firmer containment of inflation and thus an improvement in the real exchange rate and in the contribution of external demand to the generation of value added. This is important not only for the shift needed during the process of adjustment, but also in order to achieve a more balanced growth pattern. Moreover, more vigorous productivity is the only way to underpin expectations of higher future income for households and firms that will make the existing level of debt assumable and enable domestic spending to be resumed on a sustainable basis. Finally, an increase in productivity in some sectors may be decisive for creating the jobs needed to accommodate surplus construction workers.

The behaviour of production costs and of the structural and institutional factors involved in their formation will play a major role in absorbing the real appreciation, particularly given the slowness with which productivity gains attributable to genuine improvements in the economy's efficiency rather than merely to the results of the employment adjustment may be achieved. Leaving the entire drive to realign relative prices between countries to active or passive productivity improvement, i.e. that achieved by destroying jobs, may turn out to be very slow and costly in both economic and social terms, since it shifts most of the costs to those who lose their jobs or cannot find one. The effective containment of production costs and of business margins so that they grow more slowly than in the rest of the euro area, reversing at least partially the imbalance that built up during the expansion, may substantially alleviate the depth and length of the adjustment, particularly in regard to job destruction, and significantly contribute to the recovery of activity and to the correction of the external deficit.

In principle, an adjustment based largely on improved productivity and on the containment of costs and mark-ups involves considerable difficulties. Fortunately, certain features of the Spanish economy derived from changes during the past decade suggest that such an adjustment may be less costly now than it would have been in the past. First, EMU membership makes it easier to sustain a pattern of macroeconomic stability based on a common monetary policy and on budgetary discipline rules which, though relaxed temporarily to allow a fiscal response to the current situation, reduce the risk of fiscal measures being taken that jeopardise the sustainability of public finances. Second, the demographic change driven by immigration and the definitive incorporation of women into the labour market not only have consequences for future consumption and investment, but also seem to have made for more flexible behaviour of the labour market. Nevertheless, structural problems in the functioning of some markets persist. These derive from regulation which does not sufficiently encourage the required competition and flexibility, and will require more ambitious reforms to resolve them.

## 7 Conclusions

Spain's participation in EMU has been a major achievement from the standpoint of the historical performance of the macroeconomic determinants of growth. It has set in place the regime of stability needed to modernise the economy and assimilate the patterns of the more advanced European countries. Also, some of the factors which had recurrently stifled economic dynamism have been eliminated. EMU membership has borne fruit in the form of the longest expansionary phase in recent economic history and a big step forward in the degree of convergence with the income and welfare levels of the euro area. The experience, however, has not been free from constraints in the form of a build-up of imbalances leading to a necessary correction, which has finally come about under the adverse conditions of a serious international crisis.

Most of Spain's EMU membership experience has been notably influenced by considerably accommodative international monetary and financial conditions, as a result of the perception that the prevailing macroeconomic stability was sustainable, a view finally shown to have little basis. Also, the global financial imbalances, with large capital flows moving from emerging countries and commodity producers to more developed countries and financial system regulation insufficiently focused on economic cycle stabilisation, led to an international climate of risk undervaluation and rapid debt growth which encouraged levels of leverage never previously witnessed. Moreover, in the euro area, interest rates remained predominantly lower than at any other time in the past, conditioned by the structural weaknesses of central European countries which curbed their spending and growth rates.

In the case of the Spanish economy, the effects of the financial laxity were magnified by the low initial level of indebtedness, associated both with the considerable corporate and household financial restructuring induced by the early-1990s recession and with the significant risk premiums that had been borne by an economy such as Spain, which had used currency devaluation as a rebalancing tool. Further, the nominal adjustment of the economy and the ever-firmer expectations of joining EMU as a founding member pushed interest rates progressively lower from 1995. This shifted the demand for credit to variable-rate debt, which enabled the advantages of economic convergence to be rapidly exploited. Those years saw many opportunities for Spanish firms to expand internationally, since the privatisation of state-owned firms allowed them to undertake numerous highly leveraged acquisitions.

All these factors heightened the risks associated with the surge in debt and gave rise to a spending structure and, consequently, a specialisation of the economy that would prove insufficiently competitive in the medium term. In particular, on the demand side there was a considerable expansion of consumption and residential investment to the detriment of net exports and productive investment. Much of the increase in consumption did not give rise to higher domestic production, but rather to imports from abroad, while domestic productive resources were increasingly redirected towards construction. Despite notable expansion of the housing supply, house prices rose sharply, prompting an overvaluation which impacted the balance sheets of all institutional sectors (households, firms and the public sector).

Against this background, immigration probably mitigated to some extent this considerable demand pressure because it expanded supply somewhat, but it also caused other imbalances. First, migrants' low level of skills and, consequently, low wages added to the Spanish economy's tendency to over-specialise in construction activities and low-value-added services. In addition, these low wages and the magnitude of the migratory flow masked at ag-

gregate level the fact that the more stable core of the labour market was enjoying higher wage growth than was compatible with nominal stability of the economy and that, therefore, an adjustment was required. Consequently, the flexibility provided by immigrants may have acted as a substitute for the institutional reforms needed to adjust the labour market to macroeconomic shocks, especially through changes in relative labour prices (i.e. real wages), rather than in quantities (unemployment) as has hitherto been the case.

From the standpoint of the public sector, the specialisation in these economic sectors and the asset overvaluation made for a sharp increase in tax revenue which facilitated the budgetary adjustment. Obviously, the fiscal consolidation and the reduction of general government debt made the Spanish economy more resilient; but taking into account the composition of its growth and the dynamic of widening domestic and external imbalances, the effort should have been greater. That safety margin is thus rapidly being exhausted. Specifically, local and regional governments should have posted a positive contribution to the public-sector surplus instead of taking on new spending obligations of a permanent nature to be met from income whose previous growth rate they were unable to maintain.

The intensity and length of the expansionary phase enjoyed by the Spanish economy made other structural reforms in the goods and services markets and in the corporate area less pressing. Before and for a time after Spain joined EMU, the need for reforms gave rise to resolute action which subsequently petered out. This was probably a result of the strong progress towards real convergence, which masked the fact that it rested on temporary foundations (the rise in the employment rate), while productivity remained notably weak. In fact, the policies to improve the efficiency of the economy were adopted belatedly.

Although this key determinant of the competitiveness of the economy was not making sufficient headway, the ease with which the growing external imbalance could be financed induced a tolerance of this phenomenon which led to the over-indebtedness of the private sector of the economy.

All these factors combined to delay the impending adjustment in the Spanish economy until end-2006, and it was only undertaken gradually in 2007. The eruption of the international financial crisis in summer 2008 and the subsequent global recession made it very difficult for Spain to keep financing its external deficit. This ruled out the possibility of a “soft landing” and precipitated a brusque adjustment which swept the economy into a recession deeper than that seen in the first half of the 1990s.

The seriousness of the financial and contractionary trends led, as in all countries, to emergency measures to alleviate the consequences of the financial tightening and prevent a sudden paralysis of spending. They are necessary measures but are per se unlikely to produce a change in trend. The outcome of this complex situation depends largely on whether the world economy will be able to emerge from the global recession and restore the intermediation function of the financial system. The Spanish economy, however, faces the challenge of an adjustment within the euro area in particularly adverse circumstances. The means available to it are its demographic dynamism and the flexibility achieved through certain structural reforms implemented in the past, particularly in the field of privatisation and market liberalisation. But it has yet to undertake other reforms in the area of services and, above all, in the labour market, where the continuing basic inefficiency of adjustment is leading to rampant unemployment, as in previous recessions, which propagates and magnifies the contractionary forces. Structural measures are the main instrument the authorities have to prevent the recession turning into a long deviation from the potential growth achievable by the Spanish economy within the EMU regime of stability.

**APPENDIX: A model of intertemporal substitution of consumption calibrated for the Spanish economy (1999-2008)**

**1 Functional forms**

- Utility function  $U(c_s, h_s) = \frac{c_s^{1-\sigma}}{1-\sigma} + Z \frac{h_s^{1-\ell}}{1-\ell}$
- Production function in C  $F(K_{Cs}, L_{Cs}) = K_{Cs}^{\alpha_C} (A_{Cs} L_{Cs})^{1-\alpha_C}$
- Production function in H  $F(K_{Hs}, L_{Hs}, U_{Hs}) = [K_{Hs}^{\alpha_H} (A_{Hs} L_{Hs})^{1-\alpha_H}]^\theta U_{Hs}^{1-\theta}$
- Investment adjustment costs  $AC(I_{js}, I_{js-1}) = \frac{\gamma_j}{2} \left( \frac{I_{js}}{I_{js-1}} - 1 \right)^2 I_{js} \quad j = C, H$
- Labour adjustment costs  $AC(L_{js}, L_{js-1}) = \frac{\mu_j}{2} \left( \frac{L_{js}}{L_{js-1}} - 1 \right)^2 L_{js} \quad j = C, H$

**2 Calibration**

The model parameters take the following values:

- Discount factor  $\beta = 1/(1+0.03)$
- Risk aversion  $\sigma = \rho = 2$
- Weight of housing in utility  $Z = 0.987$
- Weight of capital in production of C  $\alpha_C = 0.375$
- Weight of capital in production of H  $\alpha_H = 0.20$
- Weight of land in production of H  $1 - \theta = 0.10$
- Capital depreciation ratio in C  $\delta_{KC} = 0.05$
- Capital depreciation ratio in H  $\delta_{KH} = 0.09$
- Housing depreciation ratio  $\delta_H = 0.018$
- Investment adjustment cost in C  $\gamma_C = 70$
- Investment adjustment cost in H  $\gamma_H = 70$
- Labour adjustment cost in C  $\mu_C = 5$
- Labour adjustment cost in H  $\mu_H = 70$

Rationale behind the values used:

- The value of Z,  $\delta_{KC}$ ,  $\delta_{KH}$  and of the initial foreign bonds is fixed so as to reproduce in the steady state of the economy the following ratios observed in 1998:

1	Real estate wealth/GDP	277%	(BdE)	277.7% (model)
2	Sector C investment/GDP	22.4%	(BBVA-IVIE)	22.25% (model)
3	Sector H investment/GDP	0.62%	(BBVA-IVIE)	0.68% (model)
4	IIP/GDP	-29.7%	(BdE)	-29.6% (model)

- The value of the parameters reflecting investment and labour adjustment costs is set so that there are smooth transitions in these variables in both sectors.
- The other parameters are set at standard values from the literature.

In the steady state of this economy, in addition to the values of ratios 1-4, we have:

— Sector H GDP/GDP	6.7%	(BdE)	5.0% (model)
— Sector H employment/			
Employment	10.3%	(BdE-EPA)	5.72% (model)
— Private consumption/GDP	58.7%	(BdE)	53.18% (model)
— Government spending/GDP	18%	(BdE)	18% (model)
— Current account/GDP	0%	(BdE)	0% (model)

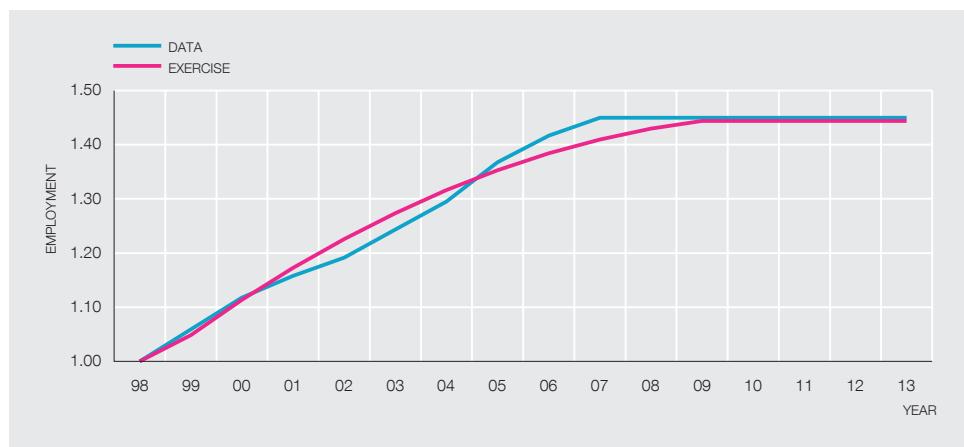
### 3 Exercise

Starting from the steady state (calibrated to resemble the Spanish economy in 1998), it is assumed that the economy receives the following shocks:

- 1 The blue line shows employment in Spain between 1998 and 2007 according to the Spanish Labour Force Survey (1998=1). It is assumed that after 2007 employment remains unchanged at the level reached in 2007. In the exercise a smoothed version of the observed data is used (pink line).

**EMPLOYMENT**

CHART A.1

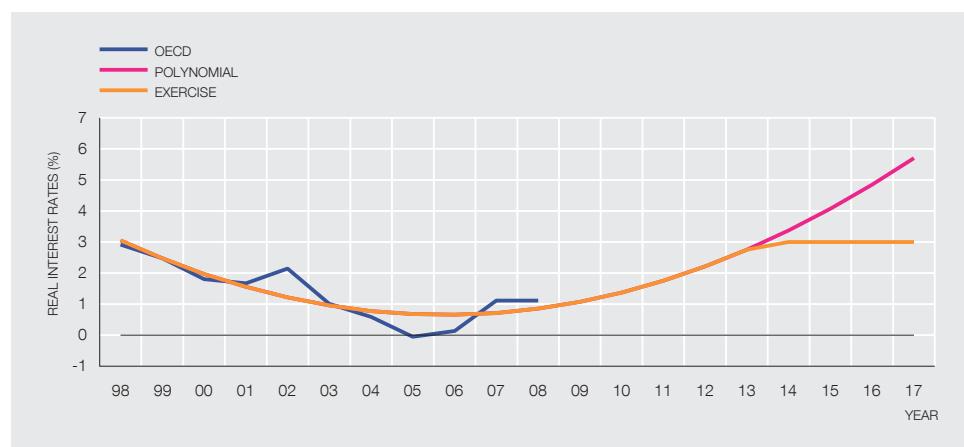


SOURCE: Banco de España.

- 2 Interest rates behave as follows in the data and in the exercise:

**INTEREST RATES**

CHART A.2



SOURCE: Banco de España.

In 1998 the interest rate was 3% in both the steady state and in the short-term real interest rates reported by the OECD. From 1998, interest rates behave basically in line with the smoothed data of the OECD until 2008, and rates are considered to return to 3% between 2008 and 2014.

- 3 From 1998, the amount of land, which is created exogenously in the economy in each period and is used to produce dwellings, falls by 10% per annum until it reaches a new steady state value. This value assumes half of the steady state value in 1998.

- 4 To reflect the fact that in the period the household structure has changed towards one which demands more dwellings (smaller households, etc.), it is assumed, as a reduced-form representation of this phenomenon, that there is an increase in the parameter governing the weight of housing in utility.

Specifically, Z is assumed to rise from 0.987 to 1.25, which means that in the steady state of 1998 the equilibrium housing stock is (approximately) 10% higher. In other words, it is assumed that the changes in the household structure (or in the preference for a second residence) would, on their own, have entailed a rise of 10% in the housing stock.

## REFERENCES

- ANDRES, J., E. ORTEGA and J. VALLÉS (2008). "Competition and inflation differentials in EMU", *Journal of Economic Dynamics and Control*, 32 (3), pp. 848-874.
- ARCE, O., J. M. CAMPA and Á. GAVILÁN (2008). *Asymmetric collateral requirements and output composition*, Working Paper No. 0837, Banco de España.
- AYUSO, J., and F. RESTOY (2006). "House Prices and Rents: An Equilibrium Asset Pricing Approach", *Journal of Empirical Finance*, 13, pp. 371-388.
- BENTOLILA, S., and J. F. JIMENO (2006). "Spanish unemployment: the End of the Wild Ride?", in M. Werding (ed.), *Structural Unemployment in Western Europe, Reasons and Remedies*, MIT Press.
- BENTOLILA, S., J. J. DOLADO and J. F. JIMENO (2009). "Does immigration affect the Phillips curve? Some evidence for Spain", *European Economic Review*, forthcoming.
- BLANCHARD, O. (2001). "Country Adjustments Within Euroland. Lessons After Two Years", in *Monitoring the European Central Bank*, CEPR, Londres.
- BOVER, O. (2005). *Wealth effects on consumption: microeconometric estimates from the Spanish survey of household finances*, Working Paper No. 0522, Banco de España.
- (2008). *Wealth inequality and household structure: US vs. Spain*, Working Paper No. 0804, Banco de España.
- BOVER, O., and J. F. Jimeno (2007). *House prices and employment reallocation: international evidence*, Working Paper No. 0705, Banco de España.
- CAMPA, J. M., and Á. Gavilán (2006). *Current accounts in the euro area: an intertemporal approach*, Working Paper No. 0638, Banco de España.
- DE BONDT (2002). *Euro area corporate debt securities market; first empirical evidence*, ECB Working Paper No.164.
- DE CASTRO, F., Á. ESTRADA, P. HERNÁNDEZ DE COS and F. MARTÍ (2008). "Una aproximación al componente transitorio del saldo público en España", *Boletín Económico*, June, Banco de España, pp. 71-81.
- DE LA FUENTE, A. (2003). "El impacto de los fondos estructurales: convergencia real y cohesión interna", *Hacienda Pública Española*, 165, pp. 122-129.
- DOLADO, J., and J. F. JIMENO (1997). "The Causes of Spanish Unemployment: A Structural VAR Approach", *European Economic Review*, vol. 41:7, pp. 1281-1307.
- ESTRADA, Á. (2008). *The mark-ups in the Spanish economy: international comparison and recent evolution*, forthcoming as Banco de España Working Paper.
- GALÍ, J., M. GERTLER and J. D. LÓPEZ-SALIDO (2007). "Mark-ups, gaps, and the welfare costs of business fluctuations", *The Review of Economics and Statistics*, 89 (1), pp. 44-59.
- HARTMAN, P., A. MADDALONI and S. MANGANELLI (2003). *The euro area financial system: structure, integration and policy initiatives*, ECB Working Paper No. 203.
- IZQUIERDO, M., and A. V. REGIL (2006). "Actualización de las estimaciones de la tasa de desempleo estructural de la economía española", *Boletín Económico*, September, Banco de España, pp. 55-62.
- IZQUIERDO, M., A. LACUESTA and S. PUENTE (2008). *Los flujos de entrada y salida de inmigrantes en España*, mimeo.
- MALO DE MOLINA, J. L. (2005). *Una larga fase de expansión de la economía española*, Occasional Paper No. 0505, Banco de España.
- (2007). *Los principales rasgos y experiencias de la integración de la economía española en la UEM*, Occasional Paper No. 0701, Banco de España.
- MARQUÉS, J. M., F. NIETO and A. DEL RÍO (2005). *Una aproximación a los determinantes de la financiación de las sociedades no financieras en España*, Working Paper No. 0535, Banco de España.
- MCCONNELL, M., and G. PÉREZ-QUIRÓS (2000). "Output Fluctuations in the United States; What Has Changed Since the Early 1980s?", *American Economic Review*, 90-5, December, pp. 1464-1476.
- MUSCATELLI, V. A., T. ROPELE and P. TIRELLI (2005). *Macroeconomic Adjustment in the Euro-Area: The Role of Fiscal Policy*, mimeo.
- OFICINA ECONÓMICA DEL PRESIDENTE (2006). *Inmigración y Economía Española: 1996-2006*, Oficina Económica del Presidente, Publicaciones e Informes.
- RAJAN, R., and L. ZINGALES (2003). *Banks and markets: the changing character of European finance*, CRSP Working Paper No. 546.
- RUMLER, F. (2005). *Estimates of the open economy new Keynesian Phillips curve for euro area countries*, European Central Bank Working Paper Series, No. 496.
- TIMMER, M., M. O'MAHONY and B. VAN ARK (2008). *The EU KLEMS Growth and Productivity Accounts: An Overview*, University of Groningen & University of Birmingham, March.

## BANCO DE ESPAÑA PUBLICATIONS

### OCCASIONAL PAPERS

- 0501 JOSÉ RAMÓN MARTÍNEZ-RESANO: Size and heterogeneity matter. A microstructure-based analysis of regulation of secondary markets for government bonds.
- 0502 ALICIA GARCÍA-HERRERO, SERGIO GAVILÁ AND DANIEL SANTABÁRBARA: China's banking reform: an assessment of its evolution and possible impact.
- 0503 ANA BUISÁN, DAVID LEARMONTH AND MARÍA SEBASTIÁ BARRIEL: An industry approach to understanding export performance: stylised facts and empirical estimation.
- 0504 ANA BUISÁN AND FERNANDO RESTOY: Cross-country macroeconometric heterogeneity in EMU.
- 0505 JOSÉ LUIS MALO DE MOLINA: Una larga fase de expansión de la economía española.
- 0506 VÍCTOR GARCÍA-VAQUERO AND JORGE MARTÍNEZ: Fiscalidad de la vivienda en España.
- 0507 JAIME CARUANA: Monetary policy, financial stability and asset prices.
- 0601 JUAN F. JIMENO, JUAN A. ROJAS AND SERGIO PUENTE: Modelling the impact of aging on Social Security expenditures.
- 0602 PABLO MARTÍN-ACEÑA: La Banque de France, la BRI et la création du Service des Études de la Banque d'Espagne au début des années 1930. (There is a Spanish version of this edition with the same number.)
- 0603 CRISTINA BARCELÓ: Imputation of the 2002 wave of the Spanish Survey of Household Finances (EFF).
- 0604 RAFAEL GÓMEZ AND PABLO HERNÁNDEZ DE COS: The importance of being mature: The effect of demographic maturation on global per-capita income.
- 0605 JUAN RUIZ AND JOSEP VILARRUBIA: International recycling of petrodollars. (The original Spanish version has the same number.)
- 0606 ALICIA GARCÍA-HERRERO AND SERGIO GAVILÁ: Posible impacto de Basilea II en los países emergentes.
- 0607 ESTHER GORDO, JAVIER JAREÑO AND ALBERTO URTASUN: Radiografía del sector de servicios en España.
- 0608 JUAN AYUSO, ROBERTO BLANCO AND FERNANDO RESTOY: House prices and real interest rates in Spain.
- 0701 JOSÉ LUIS MALO DE MOLINA: Los principales rasgos y experiencias de la integración de la economía española en la UEM.
- 0702 ISABEL ARGIMÓN, FRANCISCO DE CASTRO AND ÁNGEL LUIS GÓMEZ: Una simulación de los efectos de la reforma del IRPF sobre la carga impositiva.
- 0703 YENER ALTUNBAŞ, ALPER KARA AND ADRIAN VAN RIXTEL: Corporate governance and corporate ownership: The investment behaviour of Japanese institutional investors.
- 0704 ARTURO MACÍAS AND ÁLVARO NASH: Efectos de valoración en la posición de inversión internacional de España.
- 0705 JUAN ÁNGEL GARCÍA AND ADRIAN VAN RIXTEL: Inflation-linked bonds from a central bank perspective.
- 0706 JAVIER JAREÑO: Las encuestas de opinión en el análisis coyuntural de la economía española.
- 0801 MARÍA J. NIETO AND GARRY J. SCHINASI: EU framework for safeguarding financial stability: Towards an analytical benchmark for assessing its effectiveness.
- 0802 SILVIA IRANZO: Delving into country risk. (There is a Spanish version of this edition with the same number.)
- 0803 OLYMPIA BOVER: The Spanish survey of household finances (EFF): Description and methods of the 2005 wave.
- 0804 JAVIER DÍAZ-CASSOU, AITOR ERCE-DOMÍNGUEZ AND JUAN J. VÁZQUEZ-ZAMORA: Recent episodes of sovereign debt restructurings. A case-study approach.
- 0805 JAVIER DÍAZ-CASSOU, AITOR ERCE-DOMÍNGUEZ AND JUAN J. VÁZQUEZ-ZAMORA: The role of the IMF in recent sovereign debt restructurings: Implications for the policy of lending into arrears.
- 0806 MIGUEL DE LAS CASAS AND XAVIER SERRA: Simplification of IMF lending. Why not just one flexible credit facility?
- 0807 MIGUEL GARCÍA-POSADA AND JOSEP M.<sup>a</sup> VILARRUBIA: Mapa de exposición internacional de la economía española.
- 0808 SARAI CRIADO AND ADRIAN VAN RIXTEL: Structured finance and the financial turmoil of 2007-2008: An introductory overview. (There is a Spanish version of this edition with the same number.)
- 0809 FRANCISCO DE CASTRO AND JOSÉ M. GONZÁLEZ-MÍNGUEZ: La composición de las finanzas públicas y el crecimiento a largo plazo: Un enfoque macroeconómico.
- 0810 OLYMPIA BOVER: Dinámica de la renta y la riqueza de las familias españolas: resultados del panel de la Encuesta Financiera de las Familias (EFF) 2002-2005.
- 0901 ÁNGEL ESTRADA, JUAN F. JIMENO AND JOSÉ LUIS MALO DE MOLINA: The Spanish economy in EMU: The first ten years. (The original Spanish version has the same number.)

BANCO DE **ESPAÑA**

Unidad de Publicaciones  
Alcalá 522; 28027 Madrid  
Teléfono 91 338 6363. Fax 91 338 6488  
e-mail: [Publicaciones@bde.es](mailto:Publicaciones@bde.es)  
[www.bde.es](http://www.bde.es)