BBVA

Real Estate Watch Spain

Economic Research Department
June 2007

Ongoing gradual adjustment:

- in line with other countries at more advanced stages of the cycle
- led by demand
- without a significant impact on the rest of the economy
- with geographical differences depending on income and supply patterns

Index

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Editorial

The process of gradual adjustment in the Spanish real-estate sector continued in the first half of 2007. House prices have undergone a further slowdown, the moderation in demand from households has gathered pace, and the indicators of activity are starting to show some deceleration on the supply side. Comparing the current situation of the real-estate market with that of two years ago, the body of available information lends increasing credence to the idea of an ongoing soft landing in which demand and supply reach sustainable levels in the medium term. It is surprising, therefore, to find a growing tide of opinion predicting that the Spanish real-estate market is heading for a crash.

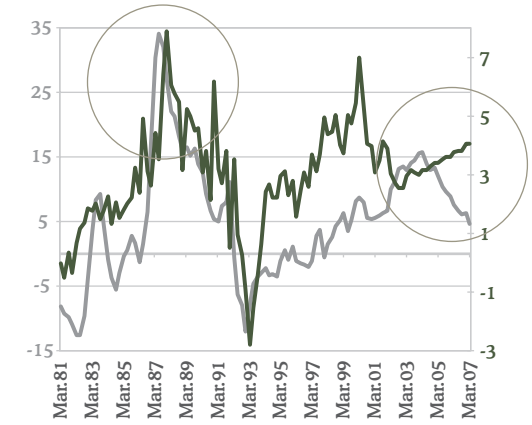
The lessons to be learned from other developed countries, which are examined in detail in this edition, also tend to rule out a disorderly outcome to the current period of expansion, an eventuality which would have high economic costs. In the current economic environment of strength in the labour market and moderate rises in interest rates, the adjustments in the market have been significantly more benign than those that took place in previous decades in less favourable macroeconomic situations. It is also the case that the more gradual the adjustment, the less impact the slowdown in the real-estate market tends to have on the rest of the economy as it allows for the adjustment of expectations of economic agents to the new environment. Previously, slowdowns in economic activity and monetary policy tightening to rein in inflation sat badly with vulnerable and weakly structured real-estate markets. However, these unwanted play-offs are no longer present. This is the case because on the one hand economies today are showing considerable strength, with solid corporate sectors and strong international expansion in trade and financial flows, as well as the absence of inflationary forces which require a hawkish response by central banks. Separately, real-estate markets are benefiting from significant structural support both on the demand and supply sides.

Developments in Spain are in line with this international trend. While slowing, demand for housing is showing considerable underlying strength, underpinned by growth in population, employment and per capita income, along with moderate rises in interest rates within an upward cycle, which is close to running its course. This edition also examines the favourable trend for factors offering structural support to the Spanish real-estate market from a geographical perspective. It comes to the conclusion that differences in price trends at a provincial level are coherently explained in terms of differences between per capita income, the pool of housing, and real interest rates.

As in other countries, the slowdown in demand will gradually be followed by an adjustment in the supply of housing. The first signs of this adjustment are already starting to emerge. The impact of this on the rest of the economy, once again in line with international experience, will be limited. It is true that activity in the construction sector, both in housing as well as other segments, has a knock-on effect on other areas of production, which in certain cases can be quite significant. However, the fallout will be limited precisely because some of the areas of activity which in relative terms depend most on construction also have a significant degree of exposure to the foreign sector in terms of export volumes. One should also not forget the fact that within the construction sector, the prospects for activity linked to corporate demand (non-residential buildings) and the public administrations (public works) are better than those for housing.

House prices and GDP growth

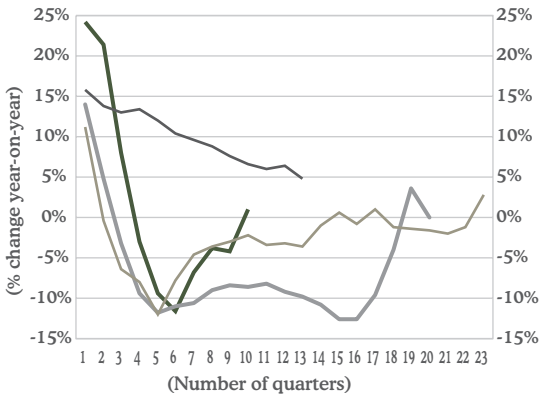
(oya)



GDP (right)
House prices (left)

Source: BBVA Research Department

Slowdowns in real house prices from peaks in Spain

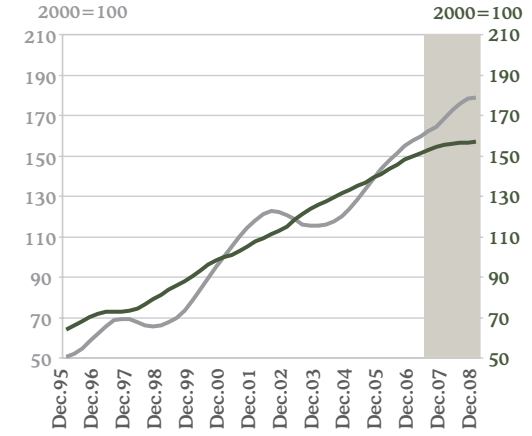


Mar-74/Sep-76
Mar-92/Jun-97
Jun-78/Mar-83
Dec-04/Mar-07

Sources: BBVA Research Department and OECD

Housing

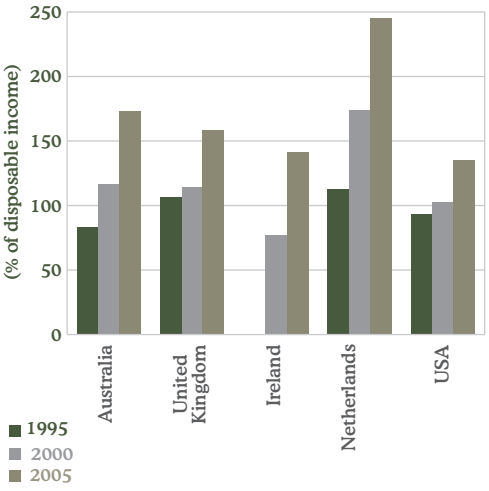
4-quarter moving average



Demand: investment in housing
Activity: houses under construction

Sources: INE, Ministry of Housing and BBVA Research Department

Graph 1.
Household debt



Source: OECD

International experience: Limited impact of housing slowdowns on GDP growth

An analysis of the international experience of slowdowns in the housing sector is a useful way of looking at the prospects for the sector in Spain to assets the final extent of the adjustment currently under way and its impact on the economy. The conclusion that can be reached from an examination of the evidence is that of a more gradual impact than in previous periods of price adjustment, although the outcome is less clear in the case of activity. Also, the more gradual the adjustment in the housing sector, the lower the impact on the economy as a whole, which in general, has been less intense in the most recent adjustments than in previous periods. In addition to the less pronounced nature of corrections in the real-estate sector, economies in general are more flexible, finding alternative forms of support linked to the dynamism of the business sector.

The Anglo-Saxon countries have had the most pronounced phases of expansion in the real-estate sector. The majority of them have already started a period of adjustment in the housing sector.

The expansion in the international real-estate sectors which began more than a decade ago has been more marked than on previous occasions due to a number of different supporting factors. On the one hand, the current cycle of economic expansion has been more prolonged than in previous cycles. On the other hand, real interest rates have been low in comparison with other periods, and have allowed the financing of strong growth in demand for housing, underpinned in many cases by demographic factors, and by a significant increase in employment and per capita income.

Although there has been a generalized real-estate boom, the Anglo-Saxon countries particularly stand out in the expansion cycle, both for a marked rise in prices, as well as for leading the way for the rest of the Western economies. Identifying the reasons behind this would be a complicated task, but part of the explanation undoubtedly lies in greater economic growth and in more innovative financial systems. The United States, Australia, the United Kingdom and Ireland have seen bigger increases in house prices than the majority of countries in Western Europe, and have already experienced falls in prices or in the level of housing activity in the context of a worsening of the financial situation of households as a result of an extended accumulation of financial debt (Graph 1). In the Netherlands, although not an Anglo-Saxon country, the end of the latest real-estate cycle appears to have anticipated that of the rest of Europe, probably due to factors in the evolution of its macroeconomic variables.

The adjustment in housing activity in these countries is varied but has one common characteristic: its limited impact on the economy.

We focus in this chapter on the periods of adjustment in the housing sector in these five countries in an attempt to gauge to what extent falls in real-estate activity which have taken place in the past have had a significant impact on the economy. Obviously, the differences in the way adjustments have taken place between the different countries depend on many factors. In principle, one might reason that the number of households created (as the result of growth in population and

sociological factors such as divorce rates and the age young people leave home) is the variable which determines the long-term trend of the market, while the cycles surrounding this trend are influenced by variables of a more economic nature such as per capita income, the evolution of employment and interest rates. Although we do not analyze these factors here, it is evident that the countries in question have enjoyed increases in population and/or income above those of the average in the OECD, in part due to strong immigration. Other factors, such as the tax treatment of housing, and land regulation are specific to individual countries, and play a far from negligible role in the evolution of the market as we will see later.

Our purpose is not to arrive at a detailed quantitative evaluation of the contribution of these explanatory factors, but simply to describe the periods of adjustment in some countries, both in the current situation as well as previous periods. This description could provide us with some idea of what is to be expected from an eventual adjustment in the Spanish real-estate sector in the medium term. A priori, despite the disparity in the adjustments in activity that have been identified, one conclusion emerges: that the likely extent of the impact on GDP of downturns in residential investment that have taken place in the past, as measured in terms of national accounts, is limited.

The United States has seen a very clear slowdown in prices and a significant drop in residential construction, without this having a notable impact at the macroeconomic level.

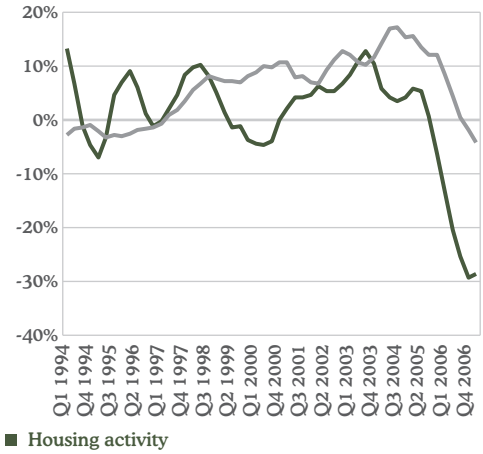
The latest upward cycle in prices in the US economy lasted eight years, and it is now in a phase of adjustment. The slowdown in prices has been from growth rates of 17% in the second quarter of 2004 to rates close to zero at present depending on the chosen reference indicator. The deceleration in activity as measured by housing starts began a year before the parallel process for prices, and hit negative rates at the end of 2005, with negative moving average growth of close to -30% a year later.

Despite the fear that existed in 2006 that the slowdown in the real-estate sector would end up having a significant negative impact in the US economy, initially through a downturn in private consumption, the latest figures show the economy has held up well. Consumption has remained healthy, supported by increases in household disposable income and financial wealth. The very solid ratios of the corporate sector have prevented the contagion of other sectors by the real-estate sector. In February 2007, concern about the situation in the subprime market, where there was a notable pick-up in non-performing loans, was a fresh source of uncertainty. But in reality the contagion of the prime market by the subprime has been limited, according to the latest figures available. Currently, affordability to the housing market has improved after the slowdown in prices and the increase in disposable household income. This could indicate that activity is starting to reach a turning point, and that after making a negative contribution to growth in 2007, residential investment could contribute 0.4% to growth in 2008.

The adjustment in activity in Australia in 2000 was significant, although the latest slowdown in prices was accompanied by a moderate fall in activity.

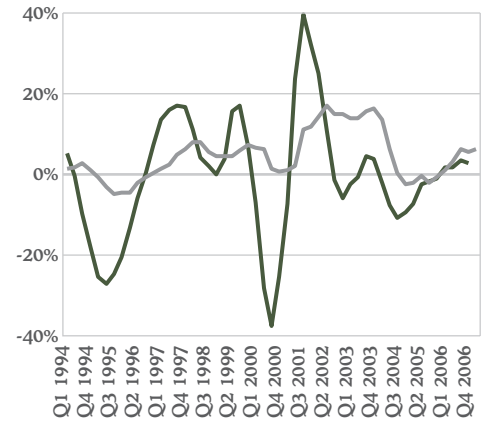
The Australian real-estate market has shown extreme volatility since the mid-1990s, with falls in the number of housing starts of 27.1% and 37.8% in the lowest points of the cycle of activity in 1995 and 2000, respectively, and with a rapid recovery in 2001. Prices, which between the end of 2001 and the start of 2004 grew at rates of around 15%,

Graph 2.
United States: prices and housing activity



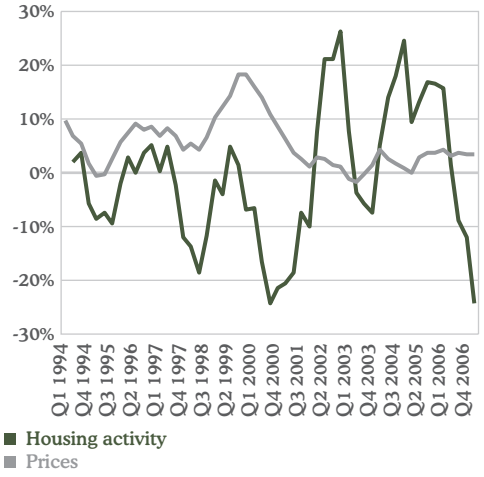
Source: Datastream

Graph 3.
Australia: prices and housing activity



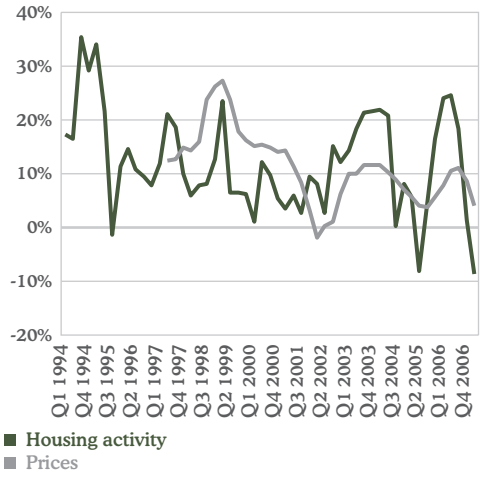
Source: Datastream

Graph 4.
Netherlands: prices and housing activity



Source: Datastream

Graph 5.
Ireland: prices and housing activity



Source: Datastream

stabilized rapidly in 2004 and are now increasing slightly. The adjustment in production in the latest period of price stabilization has also been limited, with falls in activity always less than 10% during 7 quarters, and with very moderate growth at present. In the past 15 years, fluctuations in prices and activity appear to be closely linked to changes in interest rates.

The upward cycle in the Netherlands anticipated that of the majority of western countries. After the strong adjustment at the start of 2000, and a subsequent recovery, we are beginning to see a renewed drop in activity.

The upward cycle in real-estate prices took place in the Netherlands in the 1990s before it did in the rest of the advanced countries, and was in large part due to rigidities in the supply of land[1], while the push from demographic factors has been much less than in other countries. After the slowdown at the start of 2000, growth in real house prices has remained quite moderate (below 6%). Activity (as measured by building permits) underwent an extended adjustment for five years in the period 1997-2002, and has been recovering since then (except for a bad patch in the middle of 2003) to the extent of almost matching the historical levels of the 1990s. Since the end of 2006, and due to the lower push to the market deriving from a gradual deterioration in the funding capacity of households, the number of building permits has started to fall, which is beginning to show itself in lagging indicators of activity (sales and the number of finished houses), which are also entering negative territory.

A fall in activity in Ireland is also starting to be seen. Fluctuations in prices in the recent past have been closely linked to the tax treatment for housing, which has proved to be a strong instrument with which to exert influence on housing activity.

Ireland could serve as an interesting point of comparison with the Spanish real-estate sector, given the common characteristics shared by the two counties: sharp rises in prices and activity since the mid-1990s (a couple of years earlier in the case of Ireland than in Spain), driven by strong growth in income and employment, much above those for the average in Europe, and with immigration constituting a significant underlying driving force in both cases. The basic difference is that the Irish economy has also enjoyed significant growth in labour productivity, which combined with population growth has generated high growth in GDP, while the gains in apparent productivity in Spain have been very scant.

Real house prices in Ireland have tripled since the mid-1990s, the biggest increase in developed countries in the period. Prices have moderated since the start of 2007[2], while activity as measured by the number of housing completions, has dropped in the first half (by an annual -8.6%), after a strong, and almost uninterrupted increase since the mid-1990s.

One striking feature of the Irish real-estate market in the past few years has been the impact changes to the tax treatment of housing have had on investment, which could be a point of reference for other countries currently considering amendments to taxes affecting the sector (such as the case of France). In 1998: a fiscal package was designed including,

[1] See OECD (2004), Economic Survey of the Netherlands, Paris.
[2] According to the Irish Environment Ministry indicator, an alternative to the ESRI indicator presented in the graph, house prices have stabilised since the end of 2006.

among other measures, a hike in stamp duty (similar in this case to Spain's capital transfer tax) on the sale of non-owner-occupied houses, as well as the scrapping of tax breaks for rental income. These measures proved reasonably successful in cooling the market from the end of 1998 onwards, perhaps to too great an extent, and they were consequently abolished in the 2002 budget. Simultaneously, other measures introduced in 2000 were aimed at slowing rental investment, including a new stamp duty of 9% on houses purchased for letting purposes. This measure also had a significant effect, but when it led to a rise in rents, it was removed the following year. Stamp duty was cut again in the 2005 budget on houses purchased by first-time buyers, which may also have contributed to the sharp upturn in activity that began in the third quarter of that year. Further cuts in stamp duty have been promised by the winning party in the recent elections.

Changing market conditions in the United Kingdom have affected prices more than activity, which has fallen back moderately since the beginning of 2006.

The UK real-estate market has experienced sharp swings in activity in the past, but the latest cyclical expansion has been marked much more by house price rises (a peak of 25% year-on-year was recorded at the beginning of 2003, while the cumulative increase since the start of 1997 is 250%) than by the expansion in activity (growth peaked at 11% at the end of 1997). Constraints in land supply are a key factor in the inelasticity of housing supply to strong market signals, as stressed in the Barker review in 2003[3]. Since the start of 2006 the number of housing starts has fallen by 10%, while prices which stabilised at the end of 2005 in real terms after a sharp deceleration, have begun to pick up once again and currently are rising at rates of over 5%.

The slowdowns in all of these countries during previous cycles show that a fall in housing activity reduces GDP by between 0.2 and 0.7 points annually for a period of time that varies across countries and from cycle to cycle.

In order to assess the economic impact of housing slowdowns, it is useful to analyse the cyclical changes in prices experienced by these countries from the 1970s onwards, and to focus on the price decelerations and falls in activity associated with them. Activity is measured in terms of the change in residential investment in the national accounts and its direct impact on GDP. This is then used to calculate its direct impact on GDP as the change in residential investment multiplied by its share of total demand, without taking into account the possible second-round effects via demand that the real-estate sector can have on other sectors.

Table 1 reveals the enormous variability in the different real-estate cycles both in terms of their duration and the magnitude of the changes in price and quantity variables. At first glance, all of the countries have experienced slowdowns in investment, with different impacts on GDP. In any case, a fuller study of the impacts would require a detailed case-by-case analysis of the determinant variables (demographic and economic) of real-estate supply and demand outlined in the introduction, a detailed description of which is beyond the scope of this section. However, the information in Table 1 gives an idea of the order of magnitude of the slowdowns to be expected in the eventuality of a reversal in the current cycle:

[3] See Kate Barker (2004), "Review of Housing Supply. Final Report", HM Treasury, London. http://www.hm-treasury.gov.uk/media/E/4/barker_review_execsum_91.pdf

Graph 6.

United Kingdom: prices and housing activity

Source: Datastream

- The period of price adjustment, defined as that in which real house prices are falling, has a duration of approximately 4 years, but with high levels of variability, whereas the associated adjustments in real-estate activity (falls in residential investment around this drop in prices) are much shorter (around 2.5 years).
- The average (median) intensity of the adjustments is a fall of -18% (-12%) in prices and -19% (-19%) in activity.
- The episodes of adjustment have had an impact on GDP of between 0.2 and 0.7 percentage points per year.
- The periods of price adjustment are not associated with falls in aggregate employment, except in the case of the United Kingdom, although the effects in any case are difficult to distinguish from the impact of other variables.

To sum up, the past experience of countries with the most dynamic real-estate markets seems to suggest that activity can be expected to moderate at the low points of the cycle, but that if the pattern of previous cycles is repeated, these falls do not by themselves bring about a recession or even any significant slowdown in GDP.

Table 1. Adjustments in the real-estate market

Period	Quarters	Price change	Associated period	Years	Accumulated change in residential investment	Impact on GDP	Average impact on GDP
EEUU							
Q376-Q379	12	11.3%					
Q479-Q183	13	-10.0%	78-82	4	-40.6%	-2.17%	-0.54%
Q484-Q488	16	14.0%					
Q489-Q197	33	-8.2%	88-91	3	-19.9%	-0.88%	-0.29%
Q197-Q205	36	59.7%					
			05-07	2	-16.8%	-0.79%	-0.39%
AusQralia							
70Q1-74Q1	16	36.3%					
74Q1-78Q4	19	-14.7%	74	1	-20.9%	-1.2%	-0.62%
78Q4-81Q4	12	12.8%					
81Q4-83Q3	7	-11.0%	81-82	2	-22.3%	-1.6%	-0.80%
83Q3-85Q1	6	12.4%					
85Q1-87Q1	8	-7.9%	85-86	2	-10.0%	-0.6%	-0.32%
87Q1-89Q2	9	35.6%					
89Q2-90Q4	6	-9.2%	89-90	2	-13.5%	-0.9%	-0.46%
90Q4-94Q3	15	6.1%					
94Q3-96Q1	6	-6.2%	95-96	2	-13.9%	-0.9%	-0.44%
96Q1-00Q2	17	23.4%					
00Q2-00Q4	2	-1.8%	00	1	-21.7%	-1.3%	-0.64%
00Q4-04Q1	13	49.9%					
04Q1-05Q3	6	-4.3%	04-05	2	-8.3%	-0.6%	-0.29%
05Q3-07Q1	6	25.9%					
Países Bajos							
70Q1-74Q1	16	17.2%					
74Q1-74Q3	2	-2.5%	73-75	2	-17.19%	-1.34%	-0.67%
74Q3-78Q2	15	73.7%					
78Q2-85Q3	29	-50.4%	82-78	4	-15.44%	-1.06%	-0.26%
85Q3-89Q4	17	24.1%					
89Q4-90Q4	4	-3.9%	89-91	2	-7.72%	-0.45%	-0.23%
90Q4-02Q3	47	128.0%					
02Q3-03Q3	4	-1.4%	01-03	2	-9.99%	-0.56%	-0.28%
03Q3-07Q1	14	31.4%					
Irlanda							
Q276-Q381	21	45.3%					
Q381-Q387	23	-27.2%	81-88	7	-17.15%	-1.27%	-0.18%
			86-88	2	-17.95%	-1.40%	-0.70%
Q288-Q290	8	19.2%					
Q290-Q392	9	-3.8%	93	1	-10.03%	-0.68%	-0.68%
Q393-Q107	54	441.7%					
			07	1	-1.00%	-0.10%	-0.10%
Reino Unido							
70Q1-73Q3	14	64.9%					
73Q3-77Q3	16	-33.7%	73-74	2	-7.6%	-0.36%	-0.18%
77Q3-80Q1	10	28.4%					
80Q1-82Q1	12	-13.4%	80-81	2	-23.3%	-0.90%	-0.45%
82Q1-89Q3	30	99.6%					
89Q3-95Q4	25	-27.8%	89-91	3	-27.7%	-1.08%	-0.54%
95Q4-07Q1	45	201.9%					

Source: BBVA Research Department

Is Spain vulnerable to a subprime event similar to what has taken place in the US?

Subprime mortgages are products offered to customers who do not have access to mortgage financing through traditional channels as a result, for example, of having a bad credit record or being unable to demonstrate sufficient income This specialized market has taken off in the US over the past decade. Financial innovation through the spread of the securitization market to higher-risk products has allowed growth in this type of funding to account for 20% of new housing loans granted in 2006 and 7% of outstanding mortgages.

The increase in the number of agents granting credit through aggressive marketing policies has been underpinned on the one hand by ceding the management of such loans to other entities. The other source of support is benign market conditions with historically low interest rates and sharp price increases. The change in the bias of monetary policy and the subsequent slowdown in the real-estate market exposed the excessive leniency of these marketing policies. This has been reflected in a strong pick-up in defaults for this type of loans, which in turn led at the start of the year to a significant downturn in the sector (with the bankruptcy or acquisition up to now of 86 entities specialized in this type of products).

Currently, there are no financial products of a similar nature available in Spain. The nearest thing to what are regarded as higher-risk products are loan-unification or refinanced mortgages which have only been made available in the past few years by only some specialised credit institutions (SCIs).

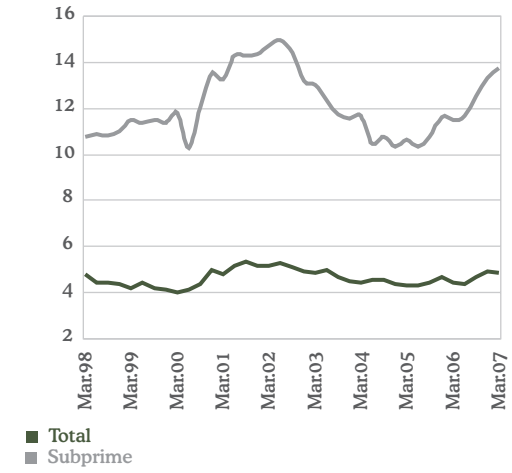
Such products have a higher non-performing loan ratio due to their higher risk profile, and as such are more exposed to the cycle. This is evident in the latest figures published by the Spanish Mortgage Association which showed that the non-performing loan ratio of SCIs stood at 3.3% in the first quarter of 2007, compared with 0.46% for the whole of the system. While the non-performing loan ratio of SCIs is upwardly skewed due to the securitization of part of the credit portfolio, there is an underlying upward trend which contrasts with the more stable nature of non-performing loans in the mortgage portfolio of the financial system as a whole.

It is also difficult in this situation to gauge to what extent the increase in non-performing loans of SCIs is due to the increase in the share of higher risk products in mortgage portfolios or results from households finding it more difficult to meet payments. The latter case would be more negative since it could be read as a forewarning of the risk facing the business for the system as a whole. Although interest-rate hikes have put upward pressure on the financial burden of households, the favourable trend in disposable income has allowed them to adjust to the new financial situation.

In addition, the financial tightening in household budgets as a result of higher borrowing costs has to a large extent already made itself felt. On balance, therefore, the non-performing loan ratio of the Spanish financial system is expected to remain one of the lowest among developed countries.

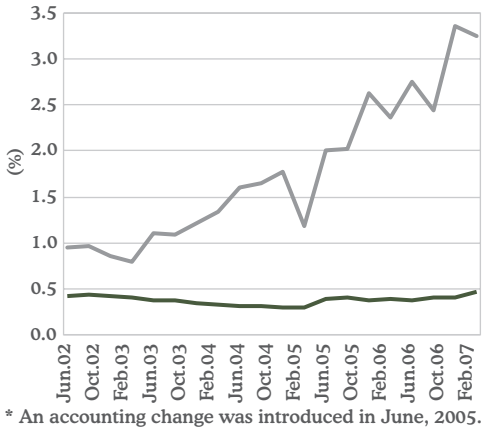
In any case, the potential impact on the Spanish financial system of a crisis in one of these entities would be very limited. On the one hand, while it is difficult to gauge the exact proportion, only a part of the mortgages granted by SCIs would have a high-risk profile. Separately, the total outstanding balance of mortgage loans held by this group of entities scarcely comes to 1% of the total, seven times less than for subprime loans in the US.

Graph 1.
USA: non-performing loan ratio
(subprime and rest)



Source: MBA

Graph 2.
Spain: non-performing loan ratio
(total and SCIs)



* An accounting change was introduced in June, 2005.

Source: AHE

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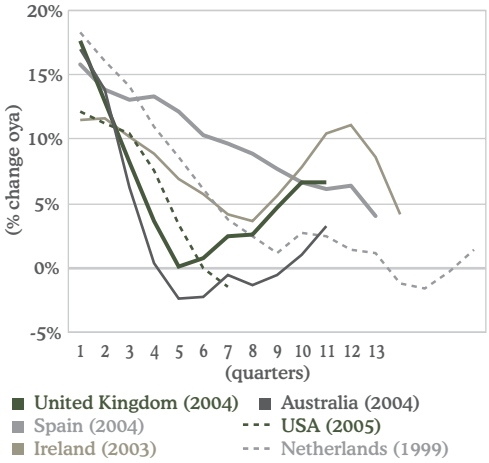
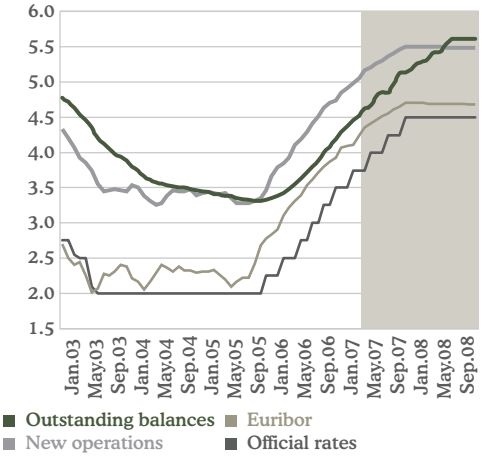
Graph 1.
Slowdown in real house prices from highs



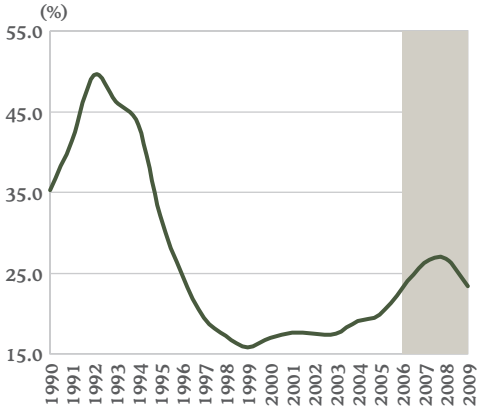
Sources: BBVA Research Department and OECD

Graph 2.
Euribor and average interest rates for house purchases



Source: BBVA Research Department

Graph 3.
House affordability in Spain
Financial burden as % of weighted income adjusted for tax



Source: BBVA Research Department

In Spain: A gradual adjustment in the housing sector with limited impact on the economy as a whole

A review of the experience of elsewhere shows that the two characteristics in common of the different countries considered were gradual adjustments in the housing sector accompanied by a limited impact on activity as a whole. These two characteristics are also the case for Spain, and even to a greater extent. The gradual adjustment in prices and demand in the Spanish housing sector, which is allowing economic agents to adapt their expectations to the new environment, stems from the existence of long-term support factors in the shape of population and income growth. Also, the knock-on effect on the rest of activity will remain limited in a phase of expansion increasingly underpinned by a favourable foreign environment and corporate dynamism. All of this will help to absorb possible adjustments, even more so when put into the perspective of the current ongoing adjustment in the Spanish real-estate sector having its roots in a very moderate erosion in affordability.

The erosion of affordability is dragging on demand for housing on the part of Spanish households after an extended period of high spending on housing in the Spanish economy.

The positive evolution of the euro-zone economy has led the European Central Bank to gradually reduce the accommodative tone of monetary policy. The indicators of activity point to growth in the EMU in 2007 of 2.7%, close to the level of 2006 (2.8%). Growth will also remain above potential in 2008. This scenario is also based on the contribution of investment, which is expected to continue to show relatively high levels of growth given the positive climate for business and good earnings prospects.

On the other hand, the most recent indicators of inflation point to a higher probability of European prices moving slightly above the ceiling of 2%. In a context of a positive output gap, demand could put upward pressure on prices, while wage claims could start to pick up due to the favourable situation in the labour market.

The ECB is, therefore, expected to maintain a tightening bias in its monetary policy in the second half of 2007, raising official interest rates to 4.5% by the end of the year.

The rise in official rates has been passed on to mortgage rates. Thus, the APRC in April of new credit operations for the acquisition of housing stood at 5.05%, 112 basis points above the rate that applied a year earlier. In line with the expected increase in official rates, mortgage rates in what remains of the year are forecasted to increase on average by half a percentage point, stabilizing at around 5.5% in 2008.

The increases in interest rates and house price levels have exceeded those for household income, which, despite slightly longer-term loans being granted, has led to an ongoing erosion in housing affordability ratios. The financial burden on average of households from mortgage repayments under current market conditions stood in the first half of 2007 at 25% of disposable income, 4 percentage points more than in 2006.

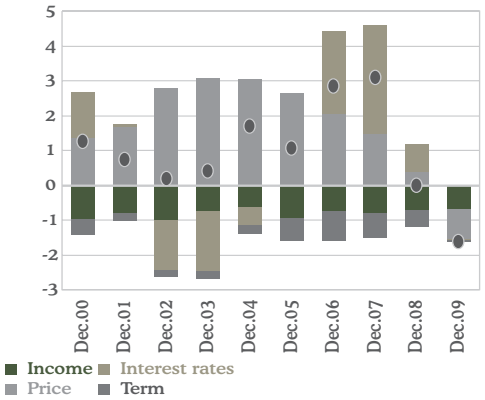
As can be seen in Graph 3, this trend of deterioration will remain in place throughout the year, peaking in the last quarter of 2007 at 26.7%. Steady interest rates and lower house price inflation will bring about a slight improvement in this indicator throughout 2008, with a bigger fall expected in 2009.

The slowdown in demand is being reflected in the stagnation of the number of housing transactions for new homes and a fall in those for existing homes.

The deterioration in affordability is reflected in the more subdued tone of demand for housing as manifest in longer periods required to complete house sales, and stagnation in housing transactions. In fact, the latest transactions figures from the Housing Ministry show zero growth in sales in the last quarter of 2006.

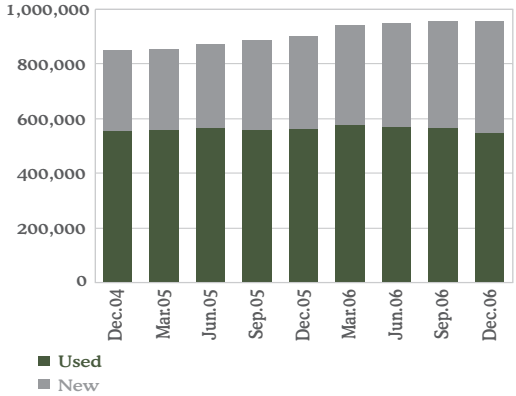
However, where there is a clearer indication of the slowdown in demand is in transactions for existing homes, which are a better reflection of the current state of the market. In the final quarter of last year, existing home sales fell by 13%. Also, the evolution in the different autonomous regions in 2006 was similar. With the exception of the Balearic Islands, where there was a notable pick-up in the second half of 2006, there were increases in the number of existing home sales in only six regions, but with moderate rises in these cases of less than 5%. Meanwhile, in the rest of the regions there were falls ranging from 1% in Asturias to 20% in Cantabria.

Graph 4.
Contribution to change in housing financial burden



Source: BBVA Research Department

Graph 5.
Open-market house transactions

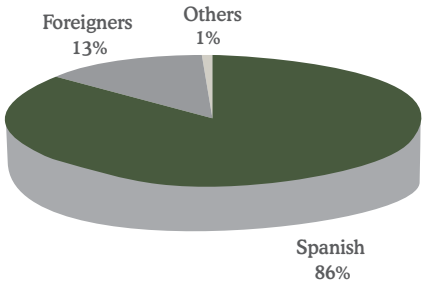


Source: Ministry of Housing

Who bought homes in 2006?

The latest transactions figures by type of resident show the increasing importance of the immigrant population and non-resident foreign demand in house sales. In 2006, foreigners accounted for 13% of total transactions, compared with 1% for others (real-estate investment funds etc.), while resident nationals accounted for 86%.

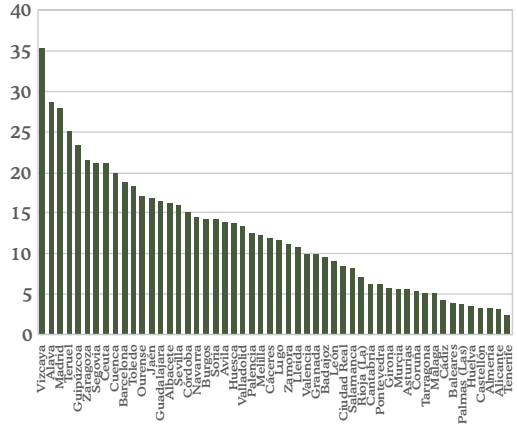
Graph 6.
Real-estate transactions in 2006



Source: Ministry of Housing

The figures also offer information on transactions carried out by residents in other provinces, which could be taken as an approximation for second-home sales (acquired by residents in the same province). In 2006, 14% of the transactions were carried out in provinces other than those of the main residence of the purchaser. The percentages for Madrid and the three provinces of the Basque Country were particularly striking, with the residents of these areas accounting for 25% of the transactions in other provinces. It is true that some of these purchases could be for the normal place of residence (purchases which take place in neighbouring provinces such as Toledo, Guadalajara, and Cantabria etc), but the great majority are purchases of second homes.

Graph 7.
% of transactions in other provinces

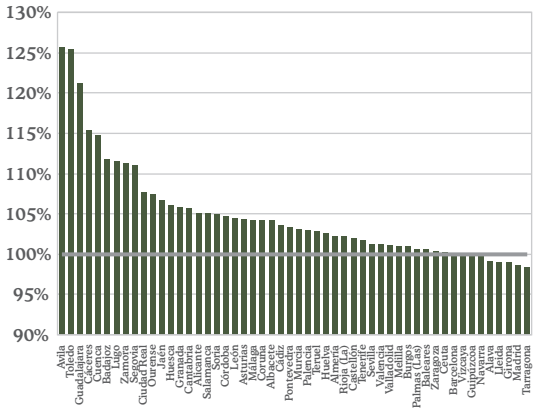


Source: BBVA Research Department

Separately, information is also available on where the house purchaser in each province is from, and as a result the differences which exist between the income of the house purchaser in each province and the per capital income of the residents where the purchase is made. This is a very relevant point given that this could create affordability problems for resident households in provinces where there is significant demand from non-residents of the province in question. The proportion of demand by national residents from other areas is highest in Ávila, Huesca and Segovia at levels of between 25% and 35% of total demand. Meanwhile, the provinces with most foreign demand in 2006 were Malaga, Almeria and Tenerife. By contrast, low demand from non-residents in the provinces of the Basque Country, Madrid and Barcelona mean that prices are more in keeping with the economic fundamentals of each region[1].

We have calculated the income of the purchaser in each province weighted according to the income of the place of residence of the purchaser. A comparison with the disposable income of the host province, shows that in Avila, Toledo and Guadalajara there are differences of over 20% between the disposable income of the host province and the income of the purchasers of housing in these provinces. Although the information available has improved, it would useful to have a longer historical series in order to gauge what impact this type of transaction could have on each area.

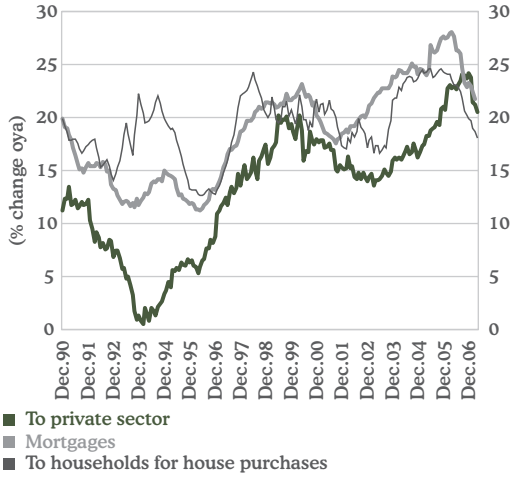
Graph 8.
Income of homebuyers/ per capita income



Source: BBVA Research Department

[1] See Section "In Depth" in this edition.

Graph 9.
Credit under management



Source: Bank of Spain

Graph 10.
Bank lending survey
Housing credit

Source: Bank of Spain

Credit is reflecting reduced demand pressures and the tighter loan conditions imposed by credit entities.

The slowdown in the demand for housing is also evident in the evolution of credit. The amount of new housing loans granted in the first four months of the year fell by an annual 6%. The slowdown in outstanding loans is much more moderate due in part to lenders granting longer-term mortgages. In all, growth slowed from 24% in April 2006 to 18% in the same month of 2007.

Also, the slowdown in the demand for credit has been accompanied by credit entities taking a less lax stance when it comes to granting housing loans. In fact, according to the latest survey of bank loans published by the Bank of Spain, credit entities have tightened their policies in offering housing loans. This has been implemented basically by lowering the size of the loan granted in relation to the value of the property, and by asking for more guarantees. The main reason given by financing entities for being more restrictive when it comes to lending is the deterioration in the prospects for the housing market. According to the Bank of Spain, credit entities expect these trends to continue in the second quarter of the year.

In all, the slowdown under way in housing prices is the least brusque seen in the history of the Spanish economy and is much less intense than that experienced by other countries.

The slowdown in demand is showing itself in a moderation in house price inflation. House prices in the first quarter of 2007 were up an annual 7.2%, a drop of more than 11 percentage points from the high in December 2003 of 18.5%. This fall has been largely across the board, and with the exception of Murcia, all of the regions have shown

price increases in the first quarter of 2007 below those of the previous year.

From an historical point of view, the current moderation in the housing market compared with previous slowdowns is the most moderate seen in the past 30 years. While previous phases of a deceleration in prices went from peaks to falls in less than three quarters, in the current period there have been 13 consecutives quarters of slowing prices without falls. This is due mainly to the fact that while historically periods of expansion in the housing market were cut short by an adjustment in the economy in general with job losses, sharp rises in interest rates, a deterioration in household expectations, etc, on this occasion the slowdown in the housing market has coincided with a very favourable economic context.

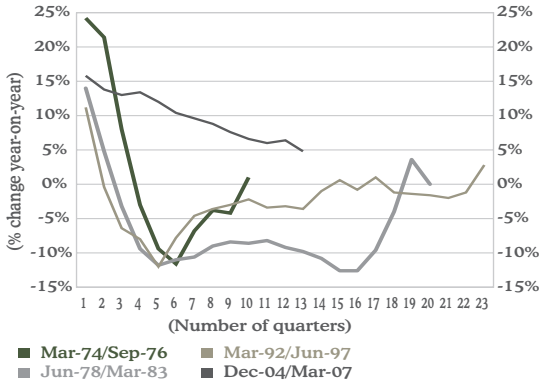
The gradual adjustment under way in the Spanish housing sector is the consequence of the economic environment in which it is taking place. Economic growth in 2007 and 2008 will remain above 3%, underpinned by the dynamism of the foreign sector. For the first time, a property slowdown has not coincided with a general economic adjustment.

Thus, one of the factors which sets the current adjustment in the housing sector aside from adjustments that took place previously is the macroeconomic conditions of the Spanish economy this time around. On one side, what stands out is that the current process of adjustment in real estate has not been accompanied by a significant erosion in the general evolution of the economy. Rather, the opposite has been the case, with growing support coming from foreign demand, which has driven exports, and by corporate investment. In previous periods, expansion in the housing market was cut short due to an economic adjustment with job losses, sharp rises in interest rates, and a fall in household income. In contrast, in the current period the start of the slowdown in house price inflation has not coincided with a cyclical slowdown in the pace of economic growth, but has taken place rather in a phase of full expansion of the Spanish economic "without construction".

Therefore, the economy as a whole will continue to sustain a solid pace of growth. In effect, the economy achieved its highest rate of growth in the first quarter of 2007 since 2001 (4.1%), after a practically uninterrupted process of strengthening growth since the end of 2003. However, the most recent information points to a gradual slowdown in the level of activity, which suggests that the current economic cycle in Spain may have already reached a turning point. This shows up in the BBVA Activity Indicator (IA BBVA) in comparing the estimates for activity at different points in the first half of 2007. In this sense, the forecast for the rest of the year points to a slowdown in the growth rate from the high reached in the first quarter to around 3.5% in the last part of the year. This slowing trend will continue in 2008, with the impact somewhat greater on household consumption as the increase in the financial burden of households drags on spending. This, however, will be compensated in part by the dynamism of corporate spending in an environment of growing exports and investment on capital goods.

Graph 11.

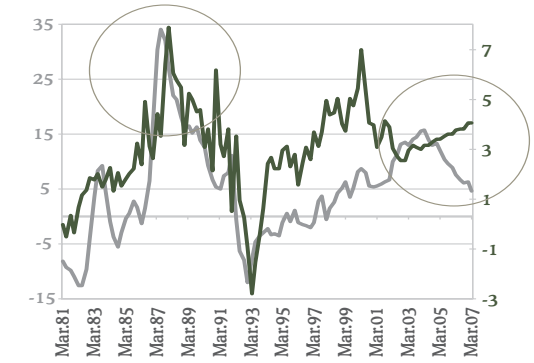
Slowdowns in real house prices from peaks in Spain



Sources: BBVA Research Department and OECD

Graph 12.

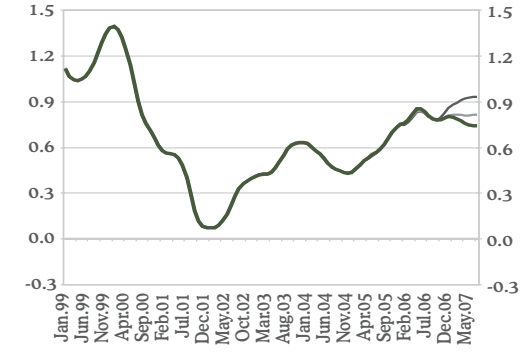
House prices and GDP growth (oya)



Source: BBVA Research Department

Graph 13.

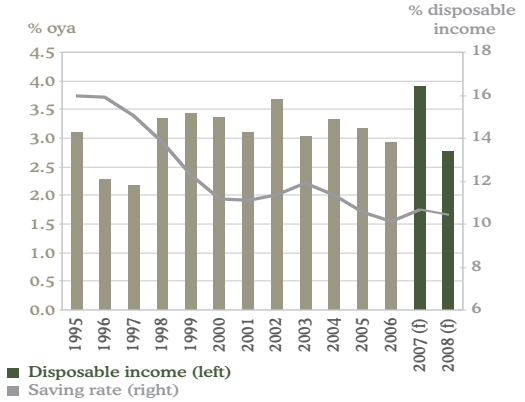
BBVA IA activity indicator
(excluding erratics)



Source: BBVA Research Department

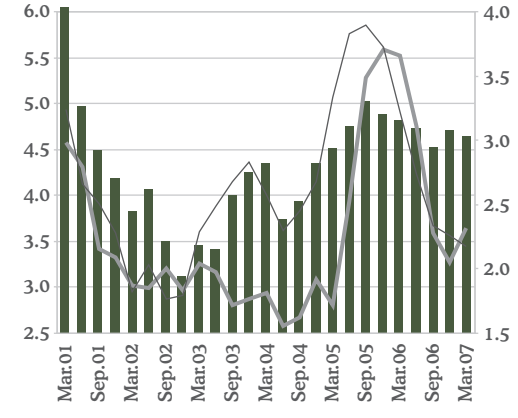
Graph 14.

Household income and saving



Sources: INE and BBVA estimates

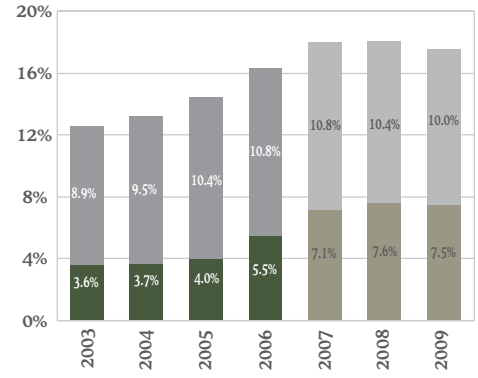
Graph 15.
Employment indicators (oya)



■ Nat. accounts: full-time equivalent jobs (right)
■ Soc. Sec. registrations (oya, quarterly ma)
■ EPA employment

Source: BBVA Research Department

Graph 16.
Financial burden of Spanish households



■ Interest
■ Principal

Source: BBVA Research Department

Table 1. Spain: GDP (base year 2000)

% oya	2001	2002	2003	2004	2005	2006	2007	2008
Household consumption	3.4	2.8	2.8	4.2	4.2	3.7	3.3	2.9
Public consumption	3.9	4.5	4.8	6.3	4.8	4.4	4.3	4.1
GFCF	4.8	3.4	5.9	5.0	7.0	6.4	5.7	4.2
Equipm. and other	1.9	0.0	5.3	4.4	8.4	7.2	7.7	6.1
Equipment	0.1	-2.9	2.5	3.7	8.8	9.5	10.4	6.7
Other products	6.0	5.0	7.7	4.4	7.7	3.3	3.0	5.0
Construction	6.8	6.2	6.3	5.5	6.0	5.8	4.1	2.4
Housing	7.5	6.9	9.4	5.9	5.8	6.4	3.8	1.0
Other	7.7	5.7	3.4	5.0	6.2	5.3	4.3	3.7
Inventories (*)	-0.1	0.0	-0.1	0.0	0.0	0.1	0.0	0.0
Domestic demand (*)	3.9	3.3	3.9	4.9	5.2	4.8	4.4	3.8
Exports	4.2	2.0	3.7	4.1	1.5	6.3	4.9	4.9
Goods	4.0	3.7	5.2	5.1	0.0	5.7	4.8	5.0
Imports	4.5	3.7	6.2	9.6	7.0	8.4	5.4	5.5
Goods	4.0	4.3	6.7	9.7	6.6	8.0	5.6	5.5
Net trade (*)	-0.2	-0.6	-0.9	-1.7	-1.7	-1.0	-0.6	-0.7
GDP mp	3.6	2.7	3.0	3.2	3.5	3.9	3.8	3.1
Memorandum items: Households								
Real disp. income	3.1	3.7	3.0	3.3	3.2	2.9	3.9	2.8
Nominal disp. income	6.5	6.5	6.2	6.8	6.5	6.5	6.5	5.5
Saving rate (% income)	11.1	11.4	11.9	11.4	10.6	10.1	10.7	10.5

(*) contribution to growth
Sources: INE and BBVA estimates

An increase in employment and the creation of disposable income will continue to underpin household spending, while the financial burden deriving from the increase in debt in a high interest-rate environment will put a drag on it.

The macroeconomic environment facing the real-estate sector in the immediate future can be characterized by three aspects which support expectations of a gradual adjustment. Firstly, economic activity will remain dynamic, with GDP growth of over 3% at least in 2007 and 2008. Secondly, although household spending will drop, the slowdown in consumption will be light since spending will continue to be supported by an increase in income, which will compensate for the lower contribution of the property wealth effect on growth in consumption and the negative contribution the increase in interest rates in 2007 will have. In fact, real disposable income will grow in 2007 at its highest rate in the past few years, with the sustained increase in employment backed by the impact on income stemming from the reform of personal income tax, and a smaller drop in real wages. Thirdly and finally, the pace of job creation (a key aspect among the support factors for the sector) will remain very dynamic at rates of close to 3%. This, given the expected slowdown in population growth (basically due to lower inflows of immigrants and as the incorporation of women into the labour market gradually runs its course), will lead to further falls in the unemployment rate in 2007 and 2008 to its lowest levels since 1979.

Disposable income and employment will provide strong support for household spending, offsetting the increased financial burden in an environment of higher interest-rates and sharp rises in debt levels. However, the forecasts point to the financial burden stabilizing after the increase that will take place in 2007 in such a way that there will be no further erosion in spending capacity in 2008.

The combination of all of this will allow the adjustment in the real-estate sector to take place in particularly favourable macroeconomic conditions. The expected slowdown in the economy will not produce further significant falls in activity in the sector nor sharp corrections given that it is starting to take place when the adjustment in the real-estate sector has already gone part of the way towards reaching equilibrium based on fundamentals. To sum up, the gradual change in economic fundamentals and the existence of alternative support factors for spending on housing will ensure the adjustment that takes place in the real-estate sector will be gradual, and the impact on the economy in general moderate.

The slowdown under way in prices and housing transactions has to be followed by a more intense adjustment than has been seen in activity.

The slowdown in the housing demand indicators contrasts with the greater strength shown by those for activity, although it is true that the latter always move with some degree of lag, and are already showing the start of a slowdown.

The BBVA synthetic housing indicator, which combines different supply indicators in a single serie[2], is showing the latest figures to be lower

[2] For a full description of the indicator, see Box, "Synthetic Indicator of Investment in Housing", Situación Real Estate Watch, January 2007.

than the levels previously expected. Also, as can be seen in Graph 17, positive above-trend levels are being maintained. This backs up the idea of a sector where the levels of activity have started to slow, albeit slightly, and will continue to do so in the immediate future. The slowdown in the synthetic indicator is coherent with the scenario of a forecast slowdown in investment in housing, with real growth of 6.4% in 2006 falling to 4% in 2007.

One of the components of the synthetic indicator with the clearest downward trend is the consumption of cement. Its significant slowdown would appear to indicate slower construction activity, although it is also influenced by the electoral cycle and by weather conditions. Likewise, the order-book indicator has slowed significantly from 600 days of guaranteed work to below 500 days in the first five months of 2007.

On the other hand, the slowdown seen in building permits for new homes is less than forecast. During the first three months of the year, permits were issued for a total of 227,000 projects, almost 6% more than in the same period a year earlier. This was due mainly to the large number of permits granted in March, once again influenced by the Building Technical Code (CTE) coming into effect[3]. It was precisely at the end of this month that the new code came fully into effect, creating another "bureaucratic upward bias". There was an unusual pick-up in the number of permits granted in March in half of the Spanish provinces.

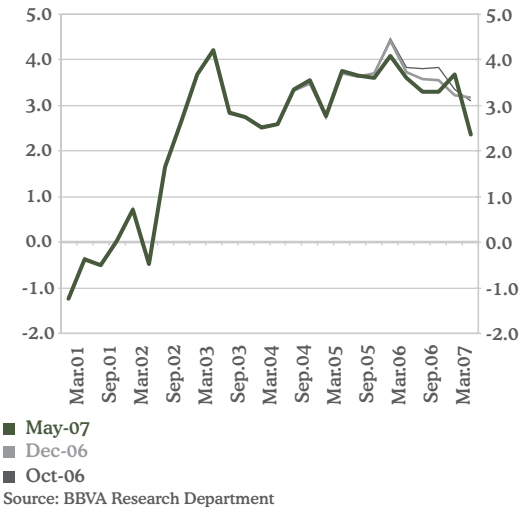
The number of early requests for building permits due to the CTE is estimated at just over 100,000, of which 76,000 were brought forward mainly to August and September of 2006 and slightly more than 25,000 to March 2007. A much clearer slowdown in the supply of houses is expected in the next few months as a result of the end of the process of bringing building permit applications forward. Because of this, housing starts will drop back towards levels more in keeping with the actual tone of demand, thus avoiding a build-up in the stock of houses for sale which could affect the pace of the adjustment that is under way.

In any case, building permit levels in coming quarters need to return to levels more in keeping with the trend supports for demand for housing.

Even so, the current levels of housing starts are very high in relation to estimated potential demand. According to the estimate made by the BBVA Research Department of the number of houses under construction[4], if all of the houses for which building permits were granted in the past year were built, the gap between residential supply and demand would increase progressively, although it would remain at acceptable levels. If this is not the case, then the probability of a scenario of more brusque adjustment increases. A slowdown in building permits (including those for reforms) is expected from the 911,000 granted in 2006 to a figure of 700,000 in 2007, with the deceleration continuing into the following years.

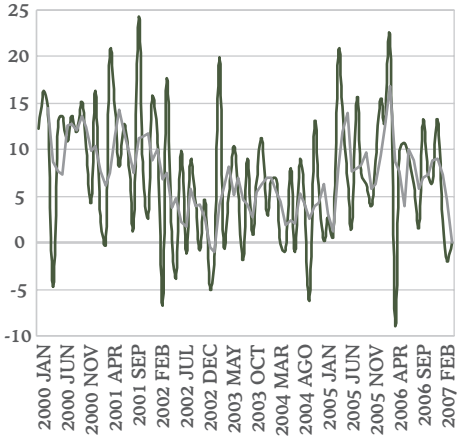
[3] The Building Technical Code introduces higher quality standards for housing with an accompanying increase in costs estimated at between 6% and 10%. It came into effect gradually with two transition phases which ended in September and March.
[4] The estimate for houses under construction was arrived at by applying a histogram of the time needed to finish a building (two years on average) to the number of building permits for new houses.

Graph 17.
Synthetic indicator of investment in housing



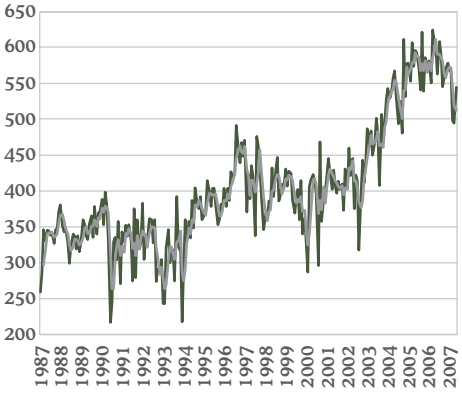
Source: BBVA Research Department

Graph 18.
Consumption of cement (oya)



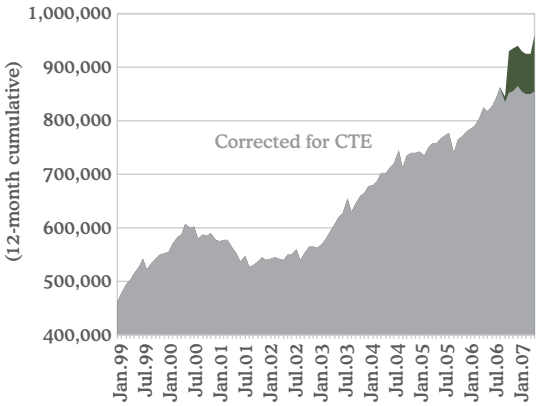
Source: Ministry of Industry, Commerce and Tourism

Graph 19.
Guaranteed working days



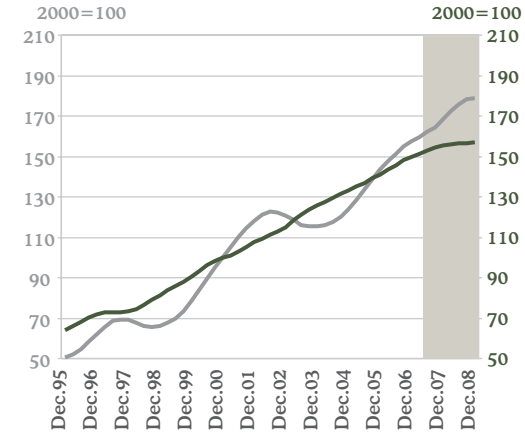
Source: Ministry of Industry, Commerce and Tourism

Graph 20.
Housing permits



Sources: Ministry of Development and BBVA

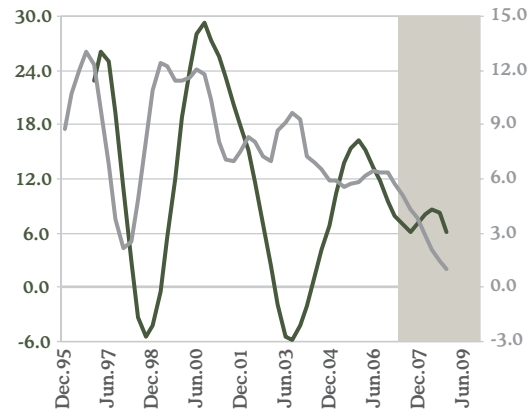
Graph 21.
Housing
4-quarter moving average



■ Demand: investment in housing
■ Activity: houses under construction

Sources: INE, Ministry of Housing and BBVA

Graph 22.
Housing
4-quarter moving average



■ No. of houses under construction
■ Investment

Source: INE, M. Vivienda y SEE BBVA

An evaluation of the estimate of trend supports for demand for housing in Spain.

We gave an estimate in our February 2006 issue[5] for the gross creation of households in the period 2006-2011 of about 500,000, while the number of households disappearing was estimated at close to 250,000. As we explained then, this is unlikely to offset household formation. To this one should add demand for 100,000 houses annually from foreign tourists.

Evaluating the figures for 2006 one can see the estimate for last year fell short of the actual figure. According to figures from the EPA, the number of households last year rose by a net 500,000. The difference could be assigned to the difficulty of trying to predict social changes (increases in single-parent households and the number of divorces etc). Separately, the immigration estimates taken from the projections drawn up by the INE appear also to have been short of the mark, with the accumulated difference since the projections were made amounting to a half a million immigrants.

On the contrary, demand from foreign residents could have been lower than was estimated. However, while according to the latest balance of payments figures, 2006 was the year with the lowest entry of foreign investment, since the second half of last year there has been a notable pick-up in investment consistent with the recovery in the economies of Spain's main tourist markets. In the first quarter of 2007, entries of foreign investment flows in property increased by 19% from the same period a year earlier.

Given the inherent inertia of activity (the average time it takes to finish a building is two years), the adjustment in this and in employment in construction will start to be seen in the middle of 2008.

One of the biggest sources of debate in the past year has been the impact the forecast slowdown in housing construction could have on employment in the sector, and its effect, therefore, on the general economy. Employment in construction accounts for 14% of total employment in Spain, with no breakdown available of how many jobs are taken up by housing construction and by other segments of the industry. However, the more labour-intensive nature of housing construction leads one to believe that this sub-sector accounts for a greater proportion of the total number of jobs than does spending on housing in relation to total investment in the sector.

An analysis of employment in construction in relation to investment in housing and in the rest of the construction sector shows the relationship with both two variables to be contemporaneous. But there is also a relationship with past investment in housing. This is due to the fact that the average time it takes to build a house, as noted above, is two years, and that housing construction becomes increasingly labour intensive over time. Therefore, the fall in housing starts will not have a significant impact on employment until the end of 2008. In fact, it is expected that growth in employment in construction will slow from the 7.5% seen in 2006 to rates of 3.7% in 2007 and 1.3% en 2008. This means that the sector will continue to be a net generator of employment over the next two years.

[5] For more information, see Box "Demand for housing in perspective", Situación Real Estate Watch, February 2006.

Although spending on housing accounts for 7.5% of Spain's GDP volume, the importance of construction as a whole in the economy goes beyond investment in housing, and it is these activities which have relatively better prospects. In addition, while final demand in construction has important knock-on effects on the rest of the economy, these will be offset by the positive effect of higher foreign demand.

Growth of demand for new housing is outstripping the pace of expansion of the Spanish economy as a whole. As a result, in volume terms investment in housing has reached 7.5% of GDP, close to 2 percentage points above its historical average, given that the long-term fundamentals that underpin it - population and disposable income - have also been trending upwards. This suggests that household spending on housing will slow in 2007 and 2008, a fall-off expected to be intense but without turning negative in real terms. Investment in housing is therefore expected to fall back from a growth rate of 3.8% in 2007 to 1% in 2008. This will mean a negative contribution to GDP growth in both years from construction of new housing of between approximately 0.2 and 0.3 points.

However, the final production of the different branches of economic activity, as is the case of construction, is not only used to meet the change in the final demand of households, companies, public administrations and the rest of the world. Rather, implicitly, it also involves the realisation of a series of purchases and intermediate inputs from the other branches of activity[6]. Construction sector demand (overall, housing and other) has significant knock-on effects on the production of other branches of economic activity, as described in Box 2 at the end of this Section. This is particularly true for certain branches of activity linked to industry (metal products, metallurgy and chemicals) and services (other business activities, wholesaling and transportation).

In this situation, a scenario of lower demand for new housing from households will reduce final production in those activities most closely linked to construction, though this will not be the only impact registered in these activities. Some of the branches most heavily reliant in relative terms on demand in the construction sector are precisely the ones that also have a significant degree of exposure to foreign demand due to the fact that a significant volume of their total production is exported. Finally, it should be stressed that within the construction sector, the activities linked to business demand (non-residential building) and the public administrations (civil works) have a brighter outlook than housing.

Graph 23.
Growth in employment

Source: SEE BBVA

[6] In sum:
Production+Imports=Resources=Uses=Intermediate Consumption+Consumption Demand+ Investment+Exports

An analysis of the relationship between construction and other branches of activity

Input Output Tables (IOTs) reflect the flows of goods and services among different sectors of the economy. They allow one to gauge to what extent changes in demand deriving from a certain sector impact on other sectors and on the economy as a whole, a phenomenon known as the backward knock-on effect. They also make it possible to calculate how total production of a certain branch of the economy is affected by changes in the production of the economy as a whole (forward knock-on effect). However, it should be taken into account that the results obtained from IOTs show limitations inherent in the assumptions made in drawing them up[1].

Backward knock-on effects on output

Using the information derived from IOTs (published by the INE for 2000), one can classify the branches of activity according to the extent of their impact on others through intermediate consumption. For the construction sector, these backward knock-on effects are 2.6 units for every unit of the increase in final demand. That is to say, an increase (decrease) in the final demand of construction of one unit increases (decreases) total output of the economy by 2.6 units. An impact of this magnitude ranks construction in position 31 of the 73 branches of activity considered.

As can be seen in Table 1, the branches with the greatest knock-on effect capacity due to increases in final demand are Recycling and Manufacture of Motor Vehicles, with 3.5 and 3.6 points respectively.

For the Real-estate Activity branch, the multiplier is 1.6, which places this activity among those with the least knock-on capacity on total output in the case of increases in demand. (ranked 66).

[1] $x_i = x_{i1} + x_{i2} + \ldots + x_{in} + y_i$, with x_i being the output of the sector i, x_{ij} intermediate consumption and y_i the final demand of sector j.

With the technical coefficient being $a_{ij} = \frac{x_{ij}}{x_i}$, the ratio between the intermediate consumption of sector j from i to the total production of sector j, in matrix notation it can be written that:

$[X] = [A]*[X] + [Y]$; $[X] = [I - A]^{-1} * [Y]$, that is to say, the final output of a sector of the economy depends on the technical coefficients and final demand. In this situation, if one assumes the technical coefficients are fixed over time, $[\Delta X] = [I - A]^{-1} * [\Delta Y]$. That is to say, one can calculate the implied change in the output of a sector (the economy as a whole) deriving from the change in final demand of a sector (the economy as a whole).

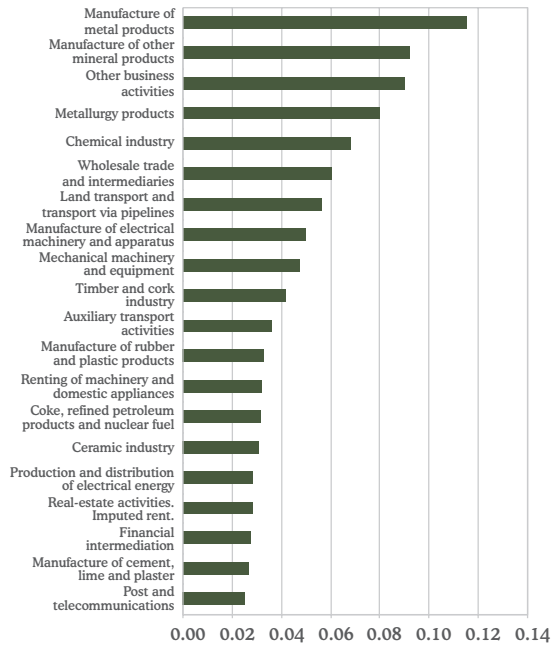
Table 1. Backward demand multipliers

IOT 2000		
Recycling	3.61494	1
Manufacture of motor vehicles and trailers	3.46610	2
Office machinery and computers	3.20324	3
Coke. refined petroleum products and nuclear fuel	3.18942	4
Manufacture of electronic equipment	3.00858	5
Other food industries	3.00131	6
Manufacture of beverages	2.96969	7
Leather and footwear industry	2.94427	8
Metallurgy products	2.92230	9
Chemical industry	2.90358	10
Manufacture of electrical machinery and apparatus	2.89459	11
Manufacture of other transport equipment	2.89286	12
Dairy industry	2.88766	13
Meat industry	2.85472	14
Textile industry	2.81678	15
Construction	2.56075	31
Real-estate activities. Imputed rent.	1.57375	66

Source: BBVA Research Department

Graph 1.

Backward linkages of the construction sector



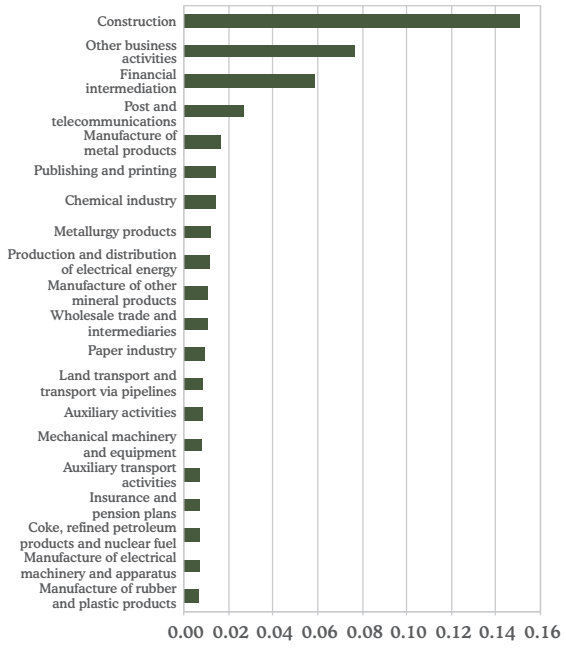
Source: BBVA using 2000 Input-Output Table (INE)

IO analysis also allows us to know the interrelations between sectors; that is to say, the knock-on effects of each of the branches of the economy on the rest of the branches. Focusing the analysis on construction, one can see that the sectors on which it has the biggest impact are the manufacture of metal products, other mineral products and other business activities. The output of these branches should

increase by 0.11, 0.09 and 0.08 units, respectively, in order to meet an increase in final demand of construction of one unit[2].

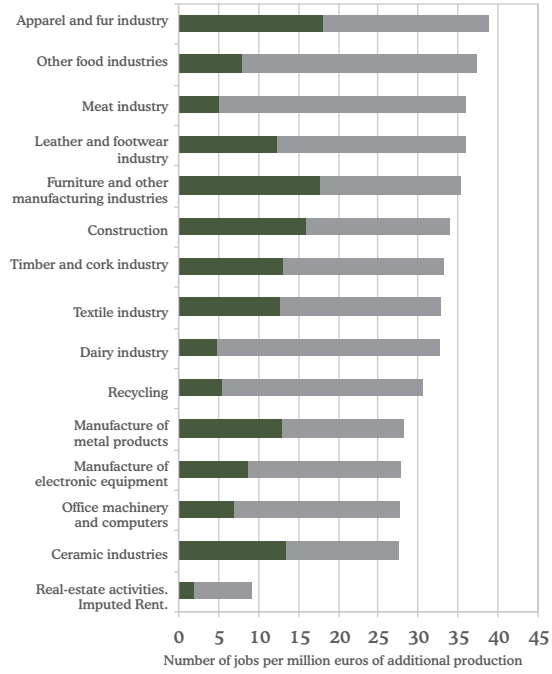
Real-estate activities, which have a much lower knock-on effect than construction, impact as well as on construction (0.15), on branches that come within the services sector, such as business activities (0.07), financial intermediation (0.05), and post and telecommunications services (0.02).

Graph 2.
Backward linkages of real-estate activities



Source: BBVA using 2000 Input-Output Table (INE)

Graph 3.
Effects on employment of selected industrial activities



Source: BBVA using 2000 Input-Output Table (INE)

Thus, according to the data for the IOTs for 2000, an increase of a million euros in the final demand of construction, would require 16 new jobs in the sector and 19 more in the rest of the branches of the economy, which makes a total of 34 new jobs. As regards GVA, an increase of a million euros in the final demand of construction would create an increase of 980,000 euros in the total GVA of the economy, shared out between 370,000 for the GVA of construction and 620,000 euros among the rest of the sectors.

In the case of Real-Estate Activities, the total effect on employment of the same increase in demand would be only nine new jobs, while the impact on GVA would be greater, at 990,000 euros, of which more than 70% would be in the sector itself.

When it comes to evaluating these results, and making a projection of figures for the current moment, we should remember that these techniques bear certain limitations deriving from the basically static assumptions on which they are based; they assume constant technical coefficients. That is to say, they assume there are no changes to the efficiency of the use of the factors of production. However, the information provided by the IOTs for 2000 does show us that the effect on employment of an increase in final demand is more accentuated in some labour-intensive industrial branches such as the clothing sector, furniture and other manufacturing industries.

Backward knock-on effect on GVA and employment

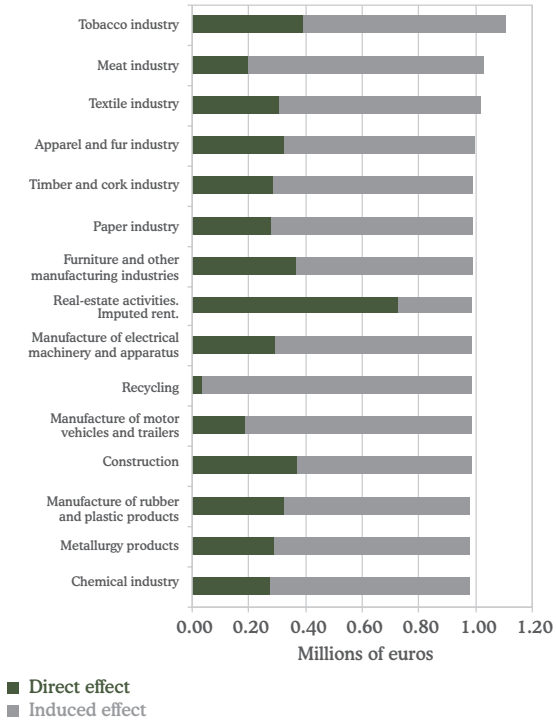
As with output, an IOT approach allows us to know the direct effect of the change in the final demand of a branch of activity on GVA and employment in the same sector, its impact on other branches, and therefore, on the economy as a whole[3].

[2] However, it is surprising that construction does not have a very big impact on activities such as cement production, the ceramics industry and the wood and cork industry.

[3] Direct effect on employment $e_i = \frac{L_i}{x_i}$, where L_i is total employment in branch i and x_i its output.

Total effect on employment = $\sum_i a_{ij} e_i$, where the summatory is the multiplier of demand.
The indirect effect is obtained by subtracting the direct effect from the total effect.

Graph 4.
Effects on GVA of selected industrial activities



Source: BBVA using 2000 Input-Output Table (INE)

Forward knock-on-effects

This approach also allows us to calculate so-called forward knock-on effects, that is, the change in total output of a branch of activity deriving from changes in the final demand of the economy. In the ranking for this, construction has a multiplier of 3.4, which classifies it in 15th place in terms of the branches of activity most exposed to final demand. The branch where total output increases the most as a result of increases in final demand is other business activities, with 9.5 units for every unit of increase in final demand.

As in the case of the backward knock-on effect, the branches of activity with greater forward linkages belong, with the exception of the branch of other business activities, to the industrial sector (chemicals industry, metallurgy products and the manufacture of metal products). Industry as a whole constitutes a key sector of the economy both in terms of its ability to affect the total production of other activities as well as the increase it undergoes in cases of increases in the final demand of the economy.

Thus, we can classify branches of activity according to their relative capacity to impact on (benefit from) the total output (final demand) of the economy[4]. In this way we can classify the different sectors into four groups:

- Key sectors: those with an above-average forward and backward knock-on capacity.
- Strategic sectors: high forward linkage and little backward linkage. These are sectors which can create tensions in the economy, given that they need to grow at above average rates to allow growth in the economy as a whole.
- Driver sectors: those with strong backward knock-on effects, but with limited forward knock-on capacity.
- Independent sectors: activities which do not affect and are not affected in a significant way by the economy as a whole.

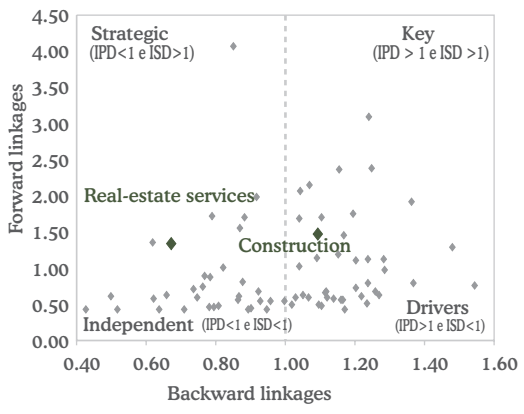
Table 2. Backward demand expansion multipliers

IOT 2000		
Other business activities	9.53673	*1*
Chemical industry	7.25045	*2*
Metallurgy products	5.56014	*3*
Manufacture of metal products	5.54194	*4*
Extraction of oil and natural gas Mining of uranium and thorium ores	5.04241	*5*
Auxiliary transport activities	4.85386	*6*
Land transport and transport via pipelines	4.65556	*7*
Coke, refined petroleum products and nuclear fuel	4.47883	*8*
Paper industry	4.11517	*9*
Wholesale trade and intermediaries	4.01350	*10*
Agriculture, livestock and hunting	4.00589	*11*
Mechanical machinery and equipment	3.97578	*12*
Production and distribution of electrical energy	3.94075	*13*
Post and telecommunications	3.62439	*14*
Construction	3.44851	*15*
Real-estate activities. Imputed rent.	3.12647	*18*

Source: BBVA Research Department

[4] The classification was made by using Rasmussen indexes, which measure the capacity of each branch of activity to spread or absorb production activity respectively. The classification is done on a unitary basis in such a way that higher (lower) values reflect the spread/absorption capacity of production activity above (below) the average.

Graph 5.
Sectoral classification by linkages
Rasmussen indices. IOT 2000



Source: BBVA Research Department

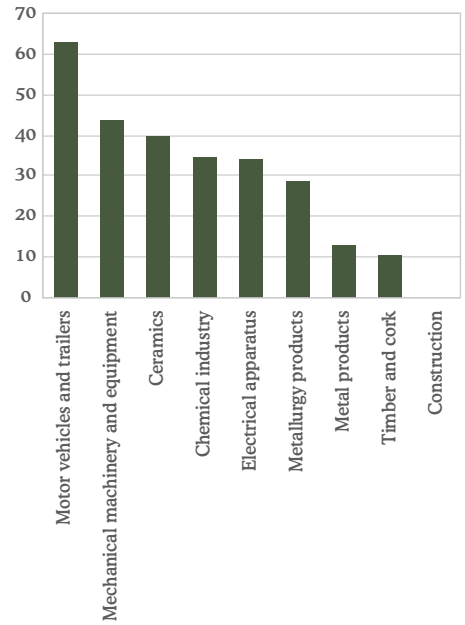
As can be seen in Graph 5, construction is a key sector of the economy, with considerable capacity to drive production in the rest of the sectors and also benefiting itself from increases in final demand. For their part, real-estate services constitute a strategic sector whose production benefits to a significant extent from a rise in final demand in the economy, but which generates relatively small increases in production in the rest of the sectors.

However, it is the branches of economic activity in the industrial sector that provide the biggest impulse to total production in the economy. This is the case of metallurgy products, the chemical industry and motor vehicle manufacturing, all of which are branches in which exports account for an important proportion of total production. This acts as a support factor for expectations of growth in view of the sustained strong growth momentum of the external environment, most notably in Europe.

One must also bear in mind that just over 10%[5] of intermediate consumption in the construction sector takes the form of inputs imported by the other branches of economic activity. In an environment of weaker construction activity, this would therefore also result in slower growth of imports. The 3 branches with the highest levels of imports to meet the demand for intermediate consumption in the construction sector are: other business activities, the rubber industry and metallurgy products. Finally, in the case of real-estate activities, the negative impact of a fall in demand in this sector would only be mitigated by external demand, since it imports barely 1.4% of its intermediate inputs.

[5] According to the imported symmetrical table for 2000.

Graph 6.
Exports of selected branches of industry
% of total production



Source: BBVA using 2000 Input-Output Table (INE)

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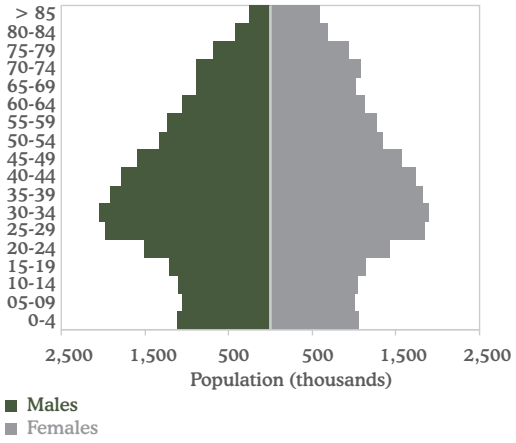
Reverse Mortgage: When the bank is the one who pays

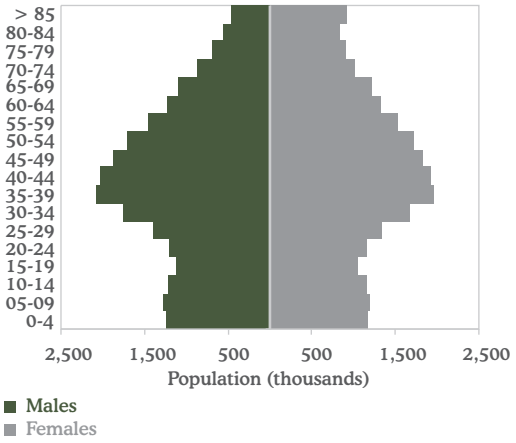
In Spain, as in other continental European countries, a series of changes have taken place which favour the introduction of the reverse mortgage. First, the process of population ageing that has taken place is a demographic phenomenon without precedent in Spain. Among the reasons for this are the increase in life expectancy (from an average of 65 years in the 1950s to more than 80 years at present) and the sharp fall in the birth rate in Spain (from 2.5 children per woman in the 1950s to under 2 at present). In fact, the projections point to the percentage of the population over 80 years old rising within eight years to 5.9% in 2015 from 4.4% at present.

Graph 1.
Population pyramid for 2006
Municipal census as of 1 January



Source: INE

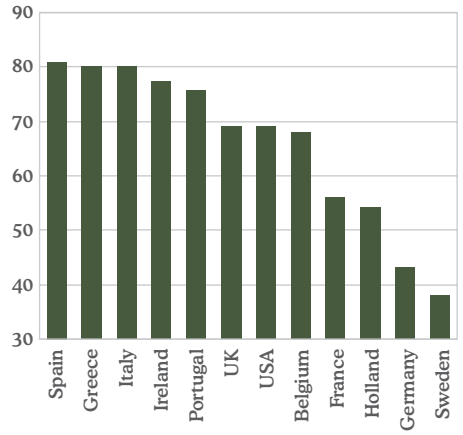
Graph 2.
Population pyramid for 2015
Municipal census as of 1 January



Source: INE

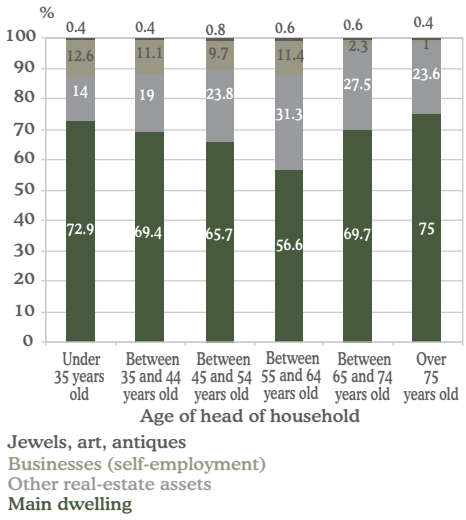
Other factor supporting the introduction of the reverse mortgage in Spain is the high propensity to accumulate real-estate wealth tipical of the country. Given that over 80% of Spanish households own their own home, freeing up these savings would be a boon for those households with liquidity problems but with high real-estate wealth. The situation is more devious among the older population. In fact, 84% of heads of households over 75 years old own their main dwelling, which in average is worth 126,000 euros.

Graph 3.
Owner occupation (%)



Source: EMF and UBS

Graph 4.
Value of real household assets (%)
2006



Source: Bank of Spain

Third, the reverse mortgage could serve as a complement to state pensions, which in April 2007 stood at an average of 670 euros per month. In addition, taking into account that a number of studies question the sustainability of the state pension system[1], the reverse mortgage could supplement the income of the elderly.

Last, as the Dependence Law[2] points out, the number of people with some type of disability or restriction already totalled 9% of the population in 1999 (more than 3.5 million

[1] Economic Watch, BBVA Research Department: Prospects for the contributory pension system in Spain, March 2006.
[2] Personal Autonomy and Dependent Care Law, January 2007.

people), with most of them in the older segments of the population. The same law refers to the participation of the private sector in dependency caring as well as the contribution of the beneficiaries according to their economic capacity. In this sense, the reverse mortgage could help finance health and care costs for dependents.

The reverse mortgage consists of a loan with a mortgage guarantee which finishes when the subscriber of the loan and his partner die. At that moment the heirs to the property can unwind the operation by making a cash payment, selling the house or asking for a mortgage, in order to pay off the loan capital plus interest whilst retaining the extra amount. In exchange, the subscribers of the loan receive an income, generally for life, whose maximum amount would be the value of the property. In this case, as in conventional mortgages, the payment guarantee is the property. The reverse mortgage also has the tax breaks associated to mortgages and in some counties additional tax breaks such as the deductibility of interest and life insurance payments.

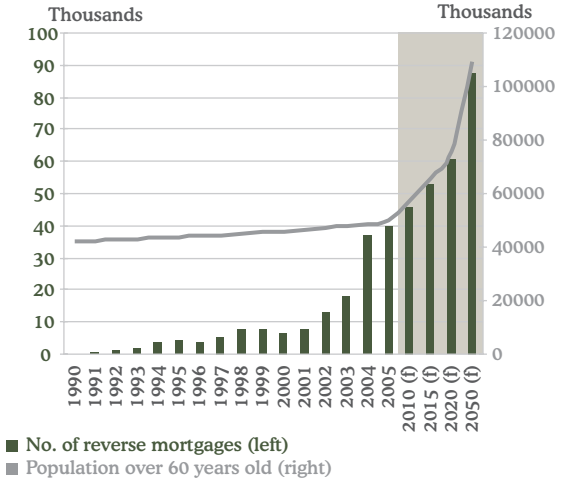
Despite these factors, the current use of the reverse mortgage is way below its estimated potential, being successful only in a limited number of countries. Currently, there are 800 registered reverse mortgages for every million inhabitants over 60 years old in the United States and some 9,500 in the United Kingdom. In other countries such as Spain this product has barely made its mark. What are the reasons for this relatively scant level of acceptance?

On the one hand, current **legislation** is either new or still does not exist in the majority of European countries, which creates uncertainty on the part of banks and potential customers. The development of reverse mortgages requires unblocking some legal, administrative and tax obstacles (particularly regarding the registration of the mortgage) which do not exist in Anglo-Saxon countries. In Spain the "Draft Law on Modernizing the Mortgage Market", which covers reverse mortgages, is currently going the Congress. However, legal aspects such as the possible direct allocation of the guarantee have not been sufficiently clarified.

On the **supply** side, the management of this type of mortgage is more complicated than traditional mortgages as the result of the accumulation of different types of risk. First, as in any fixed-rate loan, there is **interest rate risk,** which implies the need to manage interest rate movements. The development of hedging instruments facilitates the management of the risk. However, one of the features of this type of mortgage is that the amount of the debt could exceed the value of the property (what is known as "negative equity"), a situation which could be caused by different reasons. The **mortality risk** means that the loan holder could live longer than forecasted according to actuary calculations, possibly creating a negative equity situation. On the contrary, if the loan holder lives less than forecasted actuarially the situation is equivalent to the early amortization of the loan for the bank. Also, **fluctuations in the real-estate market** could be negative in the sense that if house prices do not rise as much as expected a situation of negative equity could arise. Likewise, because of what is known as **moral risk,** the owners (or the tenants if this is the case) may not be motivated to maintain the property in optimal conditions.

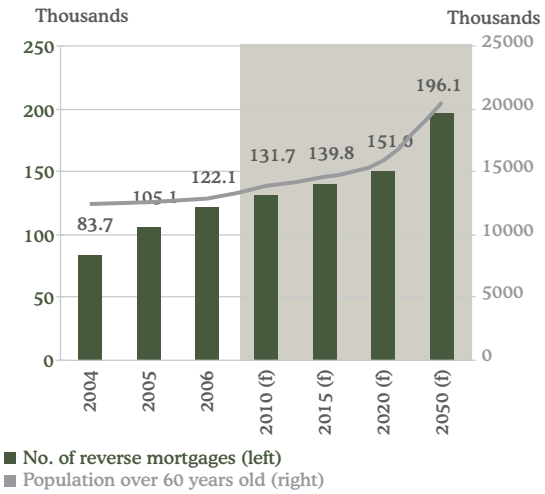
However, the main problems in developing the reverse mortgage lie on the demand side. Firstly, **cultural factors** have acted against a greater penetration of the product. While in Anglo-Saxon countries there is a culture of

Graph 5.
United States: reverse mortgages



Source: HECM, Census Bureau and BBVA

Graph 6.
UK: reverse mortgages



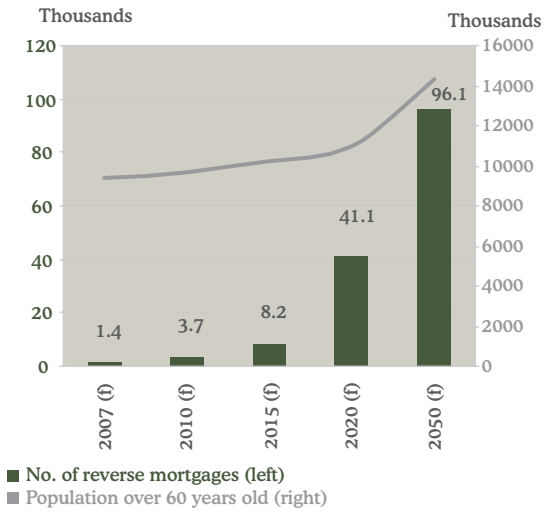
Source: HECM, Census Bureau and BBVA

indebtedness, this is not the case in Continental Europe. People fear excessive indebtedness, losing the property, or not being able to leave it as an inheritance. Beside, the **cost** of reverse mortgages is higher than of conventional mortgages, given that they entail more risks. Achieving higher sophistication in hedging techniques for these risks, and a critical mass of loans would help bringing costs down. Likewise, in Continental Europe the full effect of the deterioration of the ratio of older persons to the employed population **has not yet been perceiver**. Particularly in countries such as Spain where the pension system is pay-as-you-go, and the relative fall which could occur in the amount of pension received is still not visible.

Taking into account all of these obstacles, assuming the same process of development of the reverse mortgage in Spain as in the United States and the United Kingdom, and taking the projections for the Spanish population by age, we can arrive at a forecast for the penetration of this product in Spain for the next few years. Thus, there could be some 41,000 reverse mortgages contracted in Spain in 2020.

However, these figures are only achievable when there is sufficient demand, that is to say when borrowers view the reverse mortgage as a way of making their savings liquid. Such a change in mentality would unleash a virtuous cycle since the progressive refinement of the regulation of this product would be accompanied by an improvement in the management of the risks specific to it, which in turn would lead to a lowering of its cost. This is what should be the constitute financial innovation, a process in which the banks become more flexible in order to adapt themselves to the changing needs of the population.

Graph 7.
Spain: reverse mortgages



Source: HECM, Census Bureau and BBVA

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In depth: Analysis of house prices in Spain from a provincial perspective

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Galo Nuño Barrau[1]
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1. Introduction

The development of the real-estate sector in Spain over the past decade as measured in terms of spending, activity, employment and income generated has been definitely considerable. This upsurge has been underpinned both by long-term structural factors, as well as by those of a more cyclical nature. Among the former, one should highlight demographic trends, the increase in employment, the gradual incorporation of women into the labour market, and Spain's entry into the euro zone. As regards cyclical factors, what stands out on the one hand is interest rates falling to exceptionally low levels, as well as the dynamism of activity. However, a breakdown of the figures at the provincial level clearly shows that population growth, income developments, and financial situation characteristics have not been homogenous. The aim, therefore, of this current study is to analyze the differences in performance from a geographical point of view in order to try to explain differentials in the evolution of house prices in different parts of Spain.

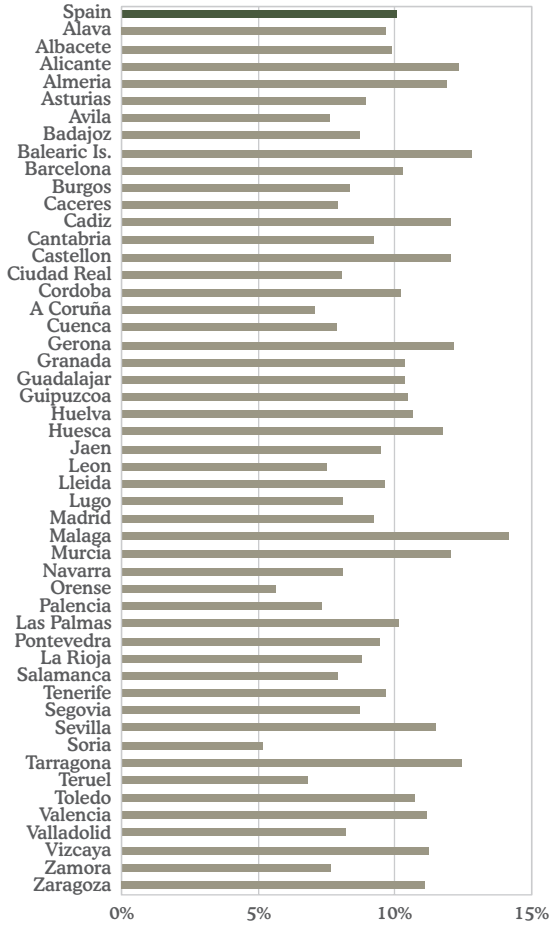
At first sight the series of prices per square metre of housing in the open market in the period 1995-2006 shows that while the average increase in prices in Spain was 10%, the figure was higher in some provinces such as Malaga (14%) and the Balearic Islands (13%, and lower in others such as Orense (6%) and Soria (5%). Likewise, Barcelona (10%) and Madrid (9%) are close to the national average.

From the point of view of time, what stands out is that the growth cycle for house prices has not been synchronized at a provincial level[2]. As can be seen in Graph 2, the contribution of the central area to real growth in house prices between 1996 and 1997 was negative, but was positive in 2001 and 2002. On the other hand, the interior of the country has been increasing its contribution to growth in prices since 2002. Finally, the Mediterranean coast has maintained a relatively constant contribution to house price inflation since 2000, similar to its contribution to national GDP (around 30%), thus reflecting growth more in line with the pace of the Spanish economic cycle.

In order to explain this uneven evolution in the price of housing among the different Spanish provinces, we have divided this study into two parts. In the first part, we provide a descriptive analysis of the possible economic variables which could help to explain this trend. In the second part, we provide the results of an empirical analysis using econometric methods. Finally, we provide a series of conclusions drawn from the study carried out, as well as some appendixes with information of a more technical nature.

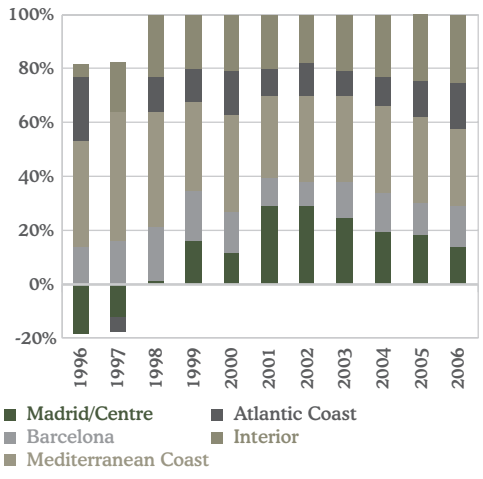
[1] The main results of this article, particularly as regards the econometric part, are taken from Álvarez-Lois and Nuño-Barrau (2007). The authors would like to thank the contribution of Sebastián Guevara in obtaining and verifying the data.
[2] The areas have been defined as: Centre (Madrid and surrounding provinces), Mediterranean Coast (all of the Mediterranean coast and the Atlantic coast in Andalusia), Atlantic Coast (all of the coastal provinces in the north) and Interior (rest of Spain). The contribution to the price of housing is given in Graph 2 as an average in terms of their relative GDP.

Graph 1.
Average annual growth rate of square metre prices of open-market housing in the period 1995-2006



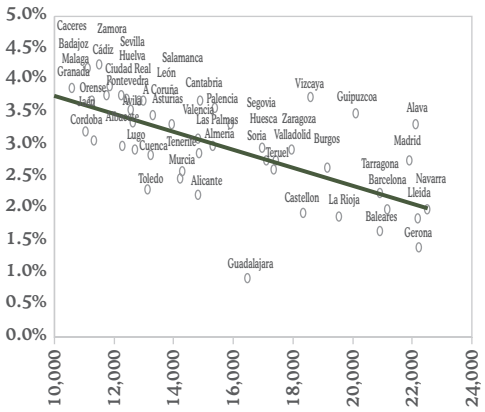
Sources: Ministry of Housing and BBVA

Graph 2.
Contribution to price growth by region
(averaged according to regional GDP)



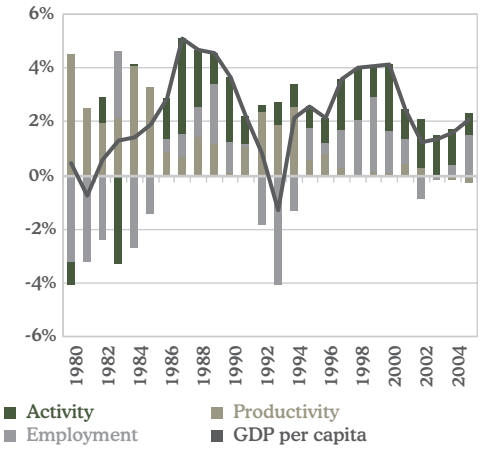
Source: BBVA Research Department

Graph 3.
Convergence in Spain: Real GDP per capita in 1995 and average growth rate in 1995-2006



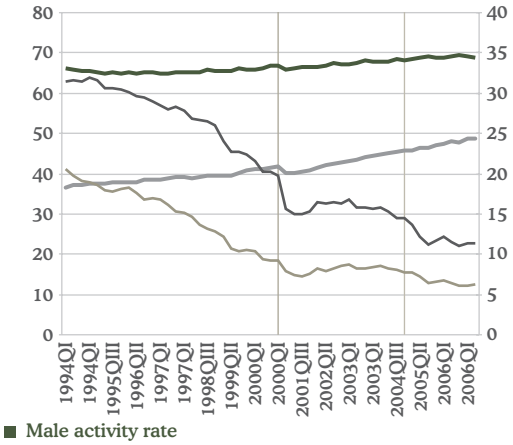
Source: BBVA using INE data

Graph 4.
Growth in real GDP per capita by component
(corrected by GDP deflator)



Source: BBVA using European Commission data

Graph 5.
Activity rates and unemployment (%)



Source: BBVA using INE data

2. The fundamental determinants of the price of housing

Housing is an economic good that serves a double purpose: on the one hand it acts as a consumer good, and on the other can be used as an investment good (or savings instrument). In this way, and using a study carried out by the OECD (2006), it is possible to identify five variables which a priori should have a significant impact in determining the price of housing:

1 Household disposable income
2 The supply of housing in relation to the number of households
3 Real interest rates
4 The price of alternative sources of investment (stock market)
5 The prices of consumer substitutes (rented housing)

2.1 Household disposable income

Spain has enjoyed a sharp increase in GDP per capita as result of the economic bonanza which has taken place. However, the impact of this has not been homogeneous. As can be seen in Graph 3, Spain has undergone a process of regional convergence in GDP per capita in such a way that some of the poorest provinces in 1995 - Zamora, Malaga and Seville - have enjoyed growth more than double that of the richest provinces such as the Balearic Islands and Gerona. On the other hand, the three provinces in the Basque Country and Madrid stand out for their strong growth, despite starting from a high base.

Due to the problem of obtaining historical series of sufficient length at the provincial level, we have decided to use GDP per capita instead. As can be seen in Graph 4, Spanish GDP per capita has grown in the past 10 years as a result of the massive incorporation of workers into production (less unemployment and greater labour participation) rather than an improvement in apparent labour productivity. The strong fall in female unemployment (from 31% to 11%) and the increase in the percentage of women in the active population (from 37% to 48%) reflect the entry of women into the labour market, which has allowed a significant increase in income per household.

With regards to the impact of an increase in income on the price of housing, the empirical evidence is not conclusive, although a number of recent studies attribute unitary elasticity to this variable (for example, Holly, Pesaran and Yamagata 2006). That is to say, they believe a percentage increase in income leads to an equal percentage increase in the price of housing. This would account approximately for an average rise in real house prices of 40% since 1995, since this was the increase in household per capita income. We will discuss this issue again later in the light of the results of the model developed.

2.2 The supply of housing in relation to the number of households

The strong dynamism in house construction in Spain should be put within the context of the changes that have taken place in the period under analysis in the level and structure of the population. On the one hand, the typical structure of the household has been affected by the fall in the birth rate, and the increase in the number of divorces, as well as growth in the number of single-member households. All of the above tends to reduce the number of members per household, increasing, therefore, demand for housing. On the other hand, massive inflows of immigrants since the end of the 1990s have increased demographic pressure on the property market. At the same time, citizens from the rest of the EU have chosen coastal areas in which to retire or spend their holidays.

Given that the two variables, the supply of housing and population have had strong asymmetrical evolutions, we have constructed the variable *average occupancy*, defined as the average number of people living in a house. This ratio reflects the degree of demographic pressure on the available supply of housing. As can be seen in Graph 6, occupancy varies considerably from province to province, reflecting, for example in the case of Malaga, the existence of a considerable number of second homes.

2.3 Real interest rates

The third element to consider is that of real interest rates, whose levels and volatility underwent structural change when Spain joined the euro zone. As can be seen in Graph 7, real interest rates dropped from 7% in 1995 to negative levels in 2005. While there has also been a drop in real interest rates at the global level combined with an increase in liquidity, which has promoted investment in real assets (particularly property), the size of the fall has been bigger in Spain.

If one adds to this effect strong competition in the banking sector, which has led to a lowering of differentials and longer-dated loans being granted, one can conclude that real-estate investment in Spain has enjoyed a strong stimulus. The *semi-elasticity* of house prices to interest rates varies in the literature between -1% and -9%, which would account for about between 7% and 60% of the increases in house prices in the period under consideration.

2.4 The price of alternative sources of investment (stock market)

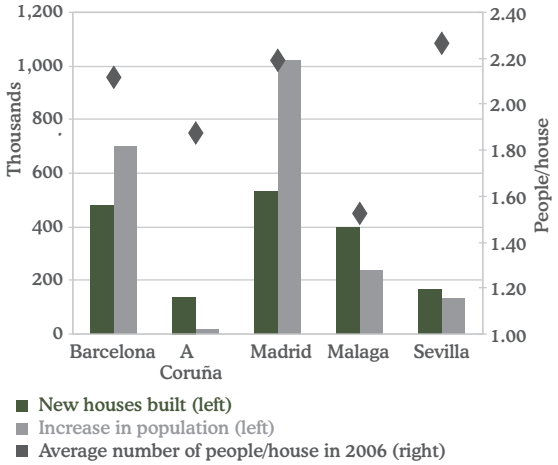
The dual nature of housing in that it is not only a consumer good but also an investment asset means that its price is sensitive to investment alternatives. The effect of financial investment in fixed-income financial assets is captured by the real interest rate, which reflects the opportunity cost of money. As regards alternative investments, we can use as an approximation the evolution of the Spanish stock market, without losing sight of two important considerations. On the one hand, from a methodological point of view, it is difficult to select the assets which should be used as representative of alternative investments to property. Investors have easy access to investing in not only the Spanish stock market but also any other in the world through the numerous investment funds which exist. There is, therefore, a multitude of investment assets which are not necessarily correlated. On the other hand, the data in Graph 8 show that investment by Spanish households is centred mainly in property assets, while the percentage of financial investment (both in fixed-income as well as stocks) is low. Therefore, and as the empirical results confirm, the impact of the stock market on house prices is relatively limited in this period.

2.5 The prices of consumer substitutes (rented housing)

Finally, in order to analyze the evolution of house prices it is also necessarily to analyze the level of prices in the rental market, given that many studies (such as for example Nagahata *et al*/2004) consider that house prices are determined by an arbitrage condition in which the costs of maintaining an owner-occupied house (mainly mortgage payments) should equal rental revenues plus the expected increase in the price of the house in the period under evaluation.

Graph 6.

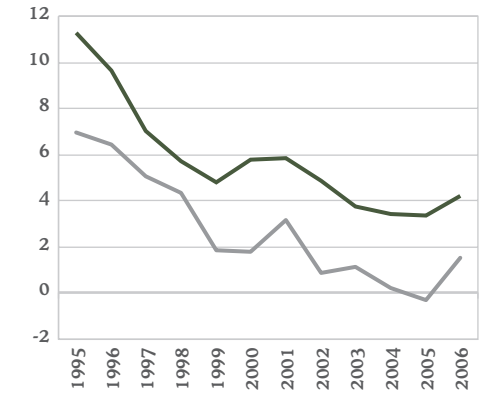
Population increase and housebuilding in the period 1995-2006. Average number of people living in a house in 2006.



Source: BBVA using INE and Ministry of Housing data

Graph 7.

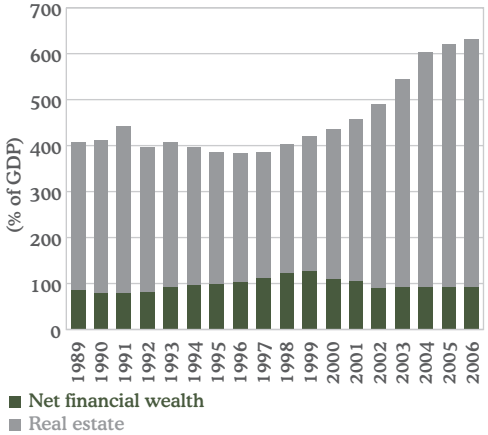
Nominal and real mortgage rates
(corrected by CPI)



Sources: INE, Bank of Spain and BBVA

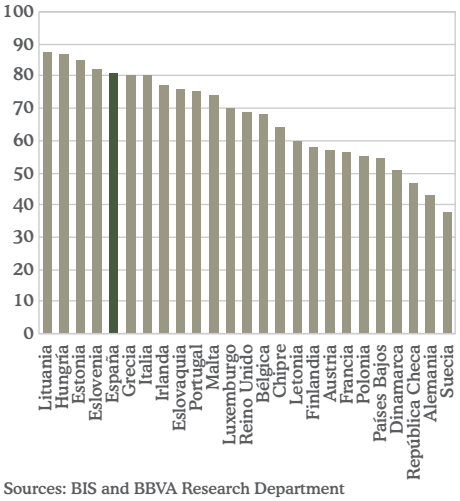
Graph 8.

Household wealth in Spain



Source: BBVA using Bank of Spain data

Graph 9.
% of owner-occupied housing in 2002



Sources: BIS and BBVA Research Department

Table 1. Fundamental equation of house prices

$$p_t^h = \gamma c_t + \lambda h_t - \beta r_t + \eta E_t\left(p_{t+1}^h\right)$$

p^h_t	Log of house prices
c_t	Log of consumption of goods per capita
h_t	Log of average number of people per house
r_t	Real interest rates
$E_t\,(p^h_t)$	Expectations of next period prices

While this is a faultless argument from a conceptual point of view, in the case of Spain there exists the possibility of an inverse relationship. As Graph 9 shows, the Spanish housing market is strongly skewed in favour of ownership, with the official stock of rentals low, compared with other European countries. This lack of liquidity in the rental market could bring about a situation in which instead of house prices being set by rental levels, it is the rental market which moves according to the monthly cost of maintaining an owner-held house (monthly mortgage payments plus costs). The empirical results show that the impact of growth in the rental price[3] on the price of housing is hardly significant, which would confirm this hypothesis.

3. A model of house prices based on their economic fundamentals

As a first step in analyzing in the Spanish market from a territorial point of view, we have put together a theoretical model which formalizes the main existing links between the real price of housing and some of the fundamental economic variables mentioned in the previous section (see Álvarez-Lois and Nuño-Barrau, 2007). The model allows us to analyze in detail decision-making by the main economic agents[4]. A key element of the model is the choice of demand for housing by households. In order to determine this demand, it is assumed individuals obtain satisfaction both from the consumption of goods as well as the ownership of a home. In this way, households must decide at every moment whether to invest in fixed-income assets (with the return being the real interest rate), invest in housing or consume goods. On the other hand, the economy is made up of two sectors, one which produces consumer and capital goods, and the other dedicated to construction[5]. From the theoretical model one obtains a fundamental equation for the real price of housing which is reported in Table 1.

An important element in the fundamental equation is the last term, which refers to the *expected* price for housing in the following period. Under certain circumstances, the expected price is directly related to the economic variables described above in such a way that the price of housing is completely determined by observed variables. However, the theoretical possibility exists of price expectations not depending on economic fundamentals, which could bring about price movements not induced by these fundamentals. In this way, the theory shows that the impact of the expectations component on the price of housing could be either "anchored" to the historical evolution of fundamental variables or evolve on the basis of other factors not considered in the model. An empirical evaluation is necessary to go further into this issue.

4. Results of the Empirical Analysis

Below, we make an empirical analysis of the determinants of house prices in the Spanish provinces as well as their long-term evolution over the past decade. In order to do so, we use the co-integration econometric method with panel data. This approach allows us to determine whether a stable relationship exists between house prices and their economic fundamentals. For this study, we have used the annual figures for the period 1995-2006[6].

[3] Given the limited data on rental prices, we have drawn up the series on the basis of the spending on rentals component of the CPI.
[4] The model is based on the work of Heathcote and Davis (2005).
[5] The model allows for reassigning workers between the construction sector and the rest of the production sectors. This assumption is consistent with the results of Bover and Jimeno (2007).
[6] The Appendix provides more information on the data and sources used in this study.

The panel data methodology makes use of disaggregated information at the provincial level, and as a result allows for the correction of possible shortfalls linked to the use of a sample with a relatively short timeframe. The economic fundamentals used are GDP per capita, the average occupancy (number of individuals per house) and real interest rates.

According to the results of the estimates carried out, the figures show there is a stable relationship between the price of housing and the fundamentals of the Spanish provinces[7]. These results are robust to different econometric specifications, and as a result, allow us to conclude that the presence of a persistent imbalance in the real-estate market does not appear to be supported by the empirical evidence. This outcome does not mean to say that house prices may not be above or below the " long-term fundamental" price.

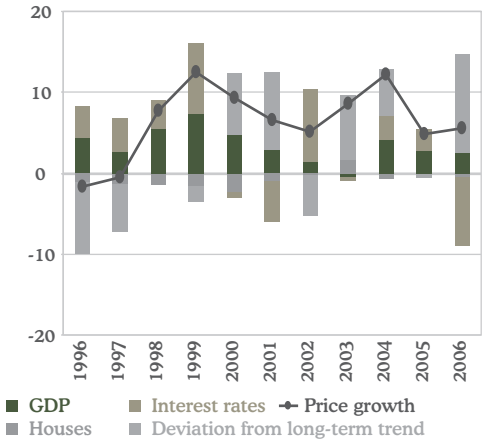
In this sense, Graph 10-12 show the contribution of the fundamental variables to growth in the price of housing for the whole of the Spanish economy, as well as for the provinces of Madrid and Barcelona. As can be seen, from 2001 the price of housing has grown more than what would be indicated by its fundamentals, reflecting both optimistic expectations, as well as rigidities in the provincial real-estate markets. Both of these factors brought about persistent increases in prices. In other words, the econometric analysis confirms the existence of a long-term relationship between price and economic variables, without ruling out the existence of periods in which the price may be above (or below) its "equilibrium" value.

Below, we analyze the response coefficients of the real price of housing for each of the economic fundamentals under consideration[8]. This gives us an elasticity for per capital income of approximately 1.7. That is to say, for each percentage point increase in per capita income, the price of housing should increase by 1.7 percentage points. This value is in line with the literature, being slightly higher than Holly, Pesaran and Yamagata (2006), who obtained an elasticity of 1. In this way, about 50% of the increase in the real price of housing is explained by an increase in household income. Graph 13 shows the strong increase both in income and the price of housing in Malaga, as well as the coastal provinces, the Balearic Islands, Tarragona, Alicante, Castellon and Murcia, which have seen a greater increase in the price of housing relative to the increase in GDP per capita.

This highlights a potential limitation of this approach: the existence of purchases of second homes by residents of other provinces or by foreigners. Given that these have different incomes from those of "locals", the results of the model could be skewed in those provinces where the effect of this is greatest. Graph 14 shows the provinces which registered the biggest increases in transactions by non-residents in 2006. As proof of its robustness, the model has been re-estimated removing those provinces where more than 25% of the transactions were by non-residents. The results obtained are not substantially different from the previous ones, which suggests the coefficients are not greatly affected by this limitation, in terms of the national average.

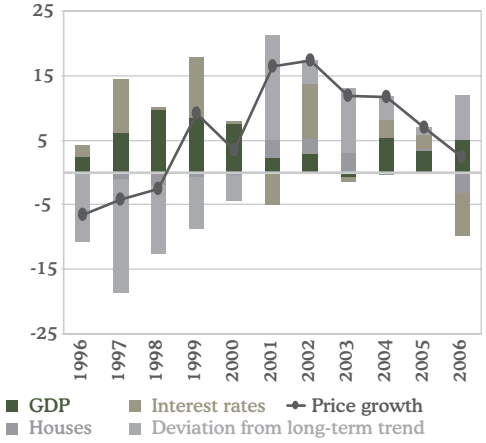
[7] Specifically, the methods used indicate a relationship of cointegration at the provincial level between the real price of housing and economic fundamentals. The Technical Appendix provides more detailed information on this.
[8] See the Technical Appendix for more detail.

Graph 10.
Contributions to house price growth Barcelona (%)



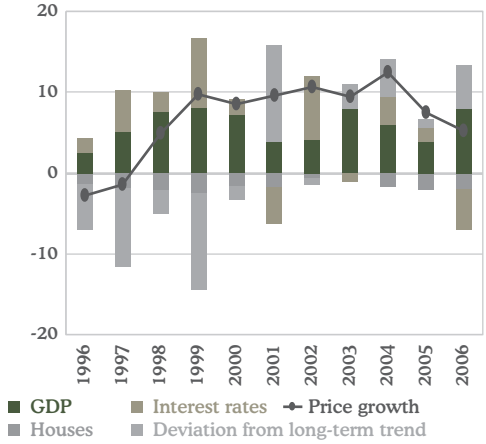
Source: BBVA Research Department

Graph 11.
Contributions to house price growth Madrid (%)



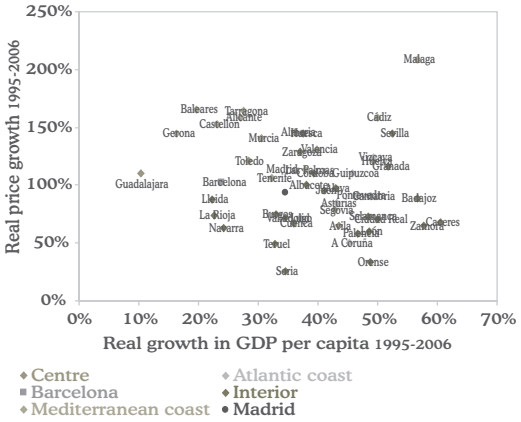
Source: BBVA Research Department

Graph 12.
Contributions to house price growth Spain (%)



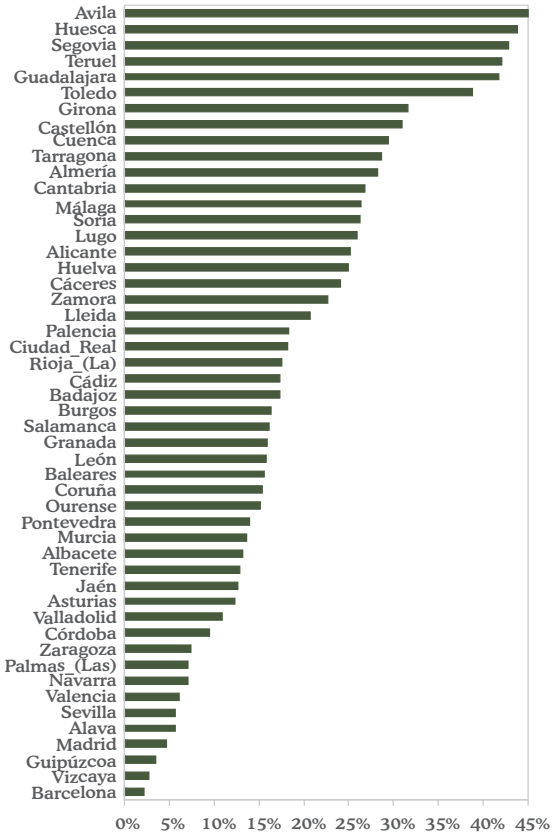
Source: BBVA Research Department

Graph 13.
GDP per capita and house prices



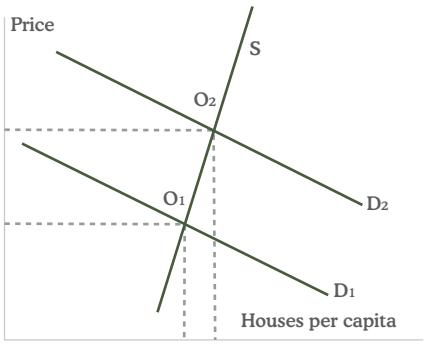
Source: BBVA Research Department

Graph 14.
Non-resident transactions by province in 2006 (%)



Source: BBVA Research Department

Graph 15.
Impact of demand shock



Source: BBVA Research Department

Average home occupancy, meanwhile, as measured by the number of individuals per house, seems to have had only a small impact on house prices. Our estimates show that an increase in occupancy of one percentage point should push up prices by approximately 1.8 percentage points. This elasticity is slightly below the average range of values found in the literature. Given that average occupancy has fallen in Spain from 2.1 to 1.9 people per house, this should have brought about a fall in prices of 10-15%. This effect reflects the relative price rigidity in the supply of housing in Spain in the past few years, as is schematically shown in Graph 15. Here, the shift in the demand curve that took place over the period considered (due to income, interest rates and demographic factors) shows itself more in a larger rise in real prices (around 100%) than in an increase in the supply of housing per capita (up by only 10%). This rigidity is attributable to several factors: first, the supply of urban land changes according to urban development plans that take a long time to mature; and, second, the average time required to build new housing is of considerable length, not only for construction of the building *per se*, but also for the provision of basic infrastructure (light, water etc).

Finally, the relationship between real interest rates and house prices is clearly worth stressing. For every percentage-point rise in interest rates, house prices should fall by between approximately 4% and 8% percentage points, depending on the estimation procedure used. This is mainly due to the fact that a rise in the cost of money reduces access to mortgage credit, which in turn makes the purchase of a house more difficult and lowers demand. For the period under consideration, in which Spanish households have enjoyed a reduction in interest rates of over 5 percentage points, the empirical results seem to explain between 20% and 40% of the increase in house prices. The reduction in interest rates, as a result of nominal convergence with the European Union, has helped to push up house prices throughout most of the period. In contrast, the increase in interest rates that took place in 2006 has been the main factor working to slow house price inflation.

In order to understand the whole price cycle, it is necessary to examine aspects relating to the dynamics of the adjustment in prices of each province to levels suggested by fundamentals. Extending the econometric model to understand the short-term dynamics allows us therefore to explain most of the growth in house prices in terms of the behaviour of fundamentals[9]. Likewise, given that observed prices seem to have distanced themselves from long-term fundamentals in a number of provinces, it would be natural for this gap to close over the coming years. This does not necessarily imply that real prices will fall while the fundamental supply and demand variables continue to make a positive contribution to prices growth that is greater than the effect of this adjustment. With interest rates expected to rise further, support for prices growth should come from both continuing growth in per capita GDP, as well as by a slower rate of housebuilding.

Finally, Graph 16 shows an estimate of the divergence between observed house prices and those that would result if we only consider the long-term fundamentals in 2006. This is therefore a measure of the potential adjustment in the real-estate market at a provincial level. The results show that most of the Spanish provinces exhibit positive divergence ratios. In general, it can be seen that the Mediterranean

[9] How much is the most? The adjusted R^2 statistic takes on a value of 0.73, which is a relatively high value for a sample of panel data.

coastal provinces, together with provinces close to the Madrid region, tend to have high positive ratios, whereas the provinces in the interior and the north-west tend to be the ones with the lowest divergence. This would appear to confirm the price cycle developments mentioned at the beginning of this paper, which has seen prices in the central parts of the country and the Mediterranean coast begin to slow before those of the interior. The results obtained for the real-estate market indicator should nonetheless be considered with some caution. As mentioned in the previous paragraph, price divergence does not necessarily imply sharp corrections in prices, since this depends on the future behaviour of the fundamental variables. In addition, one must not forget the impact of the income of non-resident house purchasers on a province's house prices.

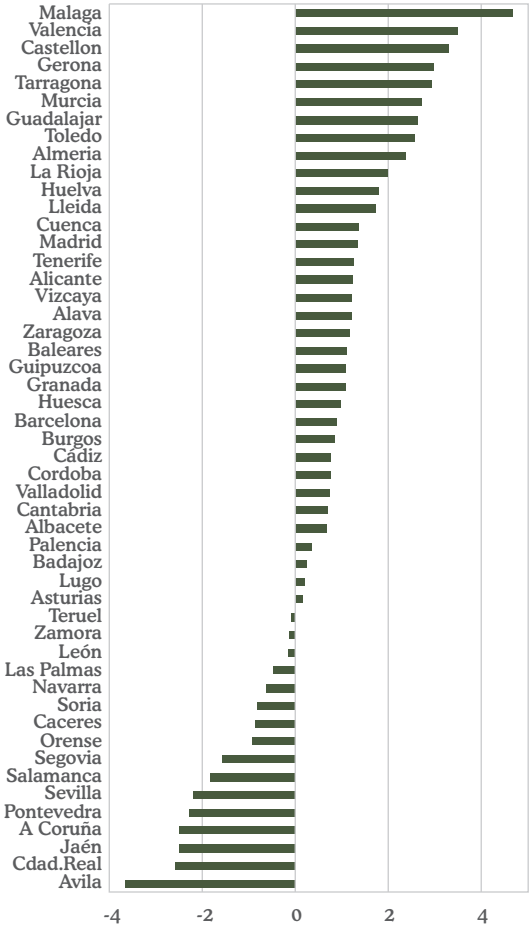
5. Conclusions

On average, although economic fundamentals explain the behaviour of house prices, there is considerable divergence largely as a result of factors at a provincial level. The creation of employment, the incorporation of women into the labour market, massive inflows of immigrant labour, as well as a rental market that is insufficiently large, have contributed to intensify the run-up in house prices that is part of a worldwide phenomenon, underpinned by lower interest rates and higher liquidity. In the case of Spain, the asymmetrical nature of a number of these factors has led to price cycles varying from province to province.

One of the main contributions of this article is an empirical study of the economic determinants of house prices in the Spanish provinces. In this regard, an analysis is made of the development of house prices together with their fundamentals by using panel data cointegration procedures. This approach enables us to determine the existence of a stable relationship between this set of variables and house prices in the period 1995-2006.

The estimation of the model identifies provincial income, as measured in per capita terms, as the main driver of the increases in house prices observed over recent years. This result is robust to considering the effects of secondary homes, as well as to different econometric methods. The contribution of real interest rates as an explanatory variable of price developments is also noteworthy in the period analysed. Clearly, to the extent that the economic fundamentals of the Spanish economy remain relatively unchanged, any adjustment process in the housing market will be mild, although this is likely to differ from province to province.

Graph 16.
Indicator of divergence between observed and fundamental price (2006)



Source: BBVA Research Department

References

Álvarez-Lois, P. and G. Nuño-Barrau (2007), "A Panel Cointegration Analysis of the Real-Estate Market: Theory and Evidence from Spanish Provinces", Working Paper, BBVA Research Department.

Bover, Olympia and Juan F. Jimeno (2007), "House Prices and Employment Reallocation: International Evidence", Working Paper No. 0705, Bank of Spain.

Breitung, Jörg and Hashem Pesaran, "Unit Roots and Cointegration in Panels", forthcoming in: L. Matyas and P. Sevestre (eds), The Econometrics of Panel Data: Fundamentals and Recent Developments in Theory and Practice, Kluwer Academic Publishers, 2006.

Heathcote, J. and M. Davis (2005), “Housing and the Business Cycle”, International Economic Review, 46 (3), pp. 751-784.

Holly, S., H. Pesaran and T. Yamagata (2006), “A Spatio-Temporal Model of House Prices in the US”, IZA Discussion Papers 2338, Institute for the Study of Labor (IZA).

Kao, C. and M. Chiang (2000), “On the Estimation and Inference of a Cointegrated Regression in Panel Data”, Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Advances in Econometrics, 15, JAI Press, pp. 179-222.

Nagahata, T., Y. Saita, T. Sekine and T. Tachibana (2004), “Equilibrium land prices of Japanese prefectures: A panel cointegration analysis”, Bank of Japan Working Paper Series, 04-E-9.

OECD (2006), “Recent House Price Developments: The Role of Fundamentals”, OECD Economics Department Working Papers, 475.

Pesaran, M. H. (2006), “Estimation and Inference in large Heterogeneous Panels with a Multifactor Error Structure”, Econometrica, 74, pp. 967-1012.

Pesaran, M. H. (2007), “A Simple Panel Unit Root Test in the Presence of Cross Section Dependence”, mimeo, University of Cambridge.

Stock, J. and M. Watson (1993), “A Simple Estimator of Cointegrating Vectors in Higher Order Integrated Systems,” Econometrica, 61, 783-820.

Technical Appendix

In this section we provide technical details of the econometric methods used in this study. These methods come within the field of non-stationary panel data analysis with co-integration. The procedure applied is as follows: firstly, a series of unit root tests are used to determine the stationarity of the data used. Once the presence of unit roots in the data is established, we estimate two econometric models, one uni-equational and the other multi-equational. Likewise, we carry out different tests to determine the existence of co-integration between the variables under consideration in this analysis; that is to say, the real price of housing, p_{it}, GDP per capita, y_{it}, the stock of housing per capita, h_{it}, and real interest rates, r_{it},.

In order to determine the level of stationarity of the data, we apply the unit roots test proposed by Pesaran (2007) known as CIPS. This test corrects for possible cross-sectional effects present in the data for which traditional tests are not valid. To detect the presence of cross-sectional effects, we apply the CD test also formulated by Pesaran (2006). The results of Table A.1 show that the degree of cross-sectional correlation is statistically significant. As a result, we apply the CIPS unit roots test. The results shown in Table A.2 show that for the real price of housing, per capita income and the stock of housing per capita the hypothesis of the existence of a unit root cannot be rejected. The results are less conclusive for the real interest rate.

The following step in the analysis is to estimate a uni-equational model for the long-term relationship between the price of housing and its fundamentals. This specification takes the following form:

$$p_{it} = \alpha_i + \beta_1 y_{it} + \beta_2 h_{it} + \beta_3 r_{it} + u_{it}, \quad i = 1,2,\dots,N; \quad t = 1,2,\dots,T,$$

-where the error term is taken to be

$$u_{it} = \sum_{k=-1}^{1} \gamma_k' \Delta \mathbf{x}_{i,t+k} + v_{it}.$$

With **x** being the vector of fundamental variables. This specification is in line with the Dynamic Ordinary Least Squares (DOLS) model proposed by Kao and Chiang (2000). This method has shown itself to be more efficient than other alternatives when the time dimension of the panel data is relatively short. The results are shown in Table A.3. The coefficients are significant and are within the range of those obtained in the literature, although the elasticity of housing prices to real interest rates is relatively high. Separately, the CIPS test for stationarity applied to the residuals of the estimate point to a stable relationship between the price of housing and its fundamentals.

One limitation of the DOLS model is that it does not correct for the possible effects of cross-sectional dependency. As an alternative we applied the multi-factorial decomposition analysis proposed by Pesaran (2006) which does take these effects into account. However, the results were not completely satisfactory, perhaps due to the large number of parameters to be estimated combined with the small size of the sample available.

Finally, we estimate a multi-equational model. Specifically, and following Breitung (2005), we used a vector error correction model (Panel-VECM).

Table A.1: CD Test for Cross-section Dependency

	ADF(1)	ADF(2)
p_{it}	7.09	6.75
y_{it}	20.95	12.00
h_{it}	15.79	8.60
r_{it}	88.29	80.63

Note: ADF(p) refers to the Augmented Dickey-Fuller statistical test of the order p, calculated for each cross-section separately. For all of the variables except the real interest rate there is a constant and a linear trend.

$CD = \sqrt{2T/N(N-1)} \sum_{i=1}^{N-1} \sum_{j=1}^{N-1} \rho_{ij}$ tends to have a normal standard distribution under the null hypothesis of non-cross-sectional dependency. r_{ij} refers to the correlations between the residuals of the ADF regressions.
See Pesaran (2006).

Table A.2: Panel Unit Root Test

	CIPS	CIPS*
	Constant and Trend	
p_{it}	-2.36	-2.11
y_{it}	-2.06	-1.73
h_{it}	-1.89	-1.89
	Only Constant	
r_{it}	-0.67	-0.71

Note: The data obtained are in line with the CIPS(1) statistics proposed by Pesaran (2007), and are an average of the Cross-sectional Augmented Dickey-Fuller statistics. CIPS* refer to a truncated version of the CIPS statistics more appropriate for small samples. The critical values significant at 5%/10% for the CIPS statistic are -2.86/-2.71 in the case of the constant and linear trend, and -2.19/-2.07 in the case of constant only. The critical values significant at 5%/10% for the CIPS* test are -2.75/-2.73 in the case of the constant and linear trend, and -2.16/-2.05 in the case of constant only. "**" "*" indicates that the test is significant at 5 and 10 percent respectively.

Table A.3: Estimated DOLS Uni-Equational Model

y_{it}	1.44 (0.18)
h_{it}	-1.38 (0.25)
r_{it}	-7.75 (0.77)
R^2	0.94
CD	20.53
CIPS	-1.98***
*CIPS**	-1.98***

The coefficients were estimated using the procedure described by Kao y Chiang (2000). The standard errors are those within brackets and have been re-scaled using the Stock and Watson (1993) model, with the resulting *t* statistics asymptotically normal. R^2 is the adjusted R-squared statistic. CD is the transversal dependency statistic which tends to have a N (0,1) distribution under the null hypothesis of non-transversal dependency. CIPS and CIPS* are the standard and truncated statistics obtained as transversal averages of the Cross-sectionally Augmented Dickey-Fuller CADF(1) statistics for the case without constant and without trend. The critical values significant at 1% for the CIPS and CPIS* statistics are -1.78 and -1.77 respectively. "***" indicates that the test is significant at 1 and 10 percent.

Table A.4: Estimated Panel VECM Model

y_{it}	1.74 (0.18)
h_{it}	-1.72 (0.06)
r_{it}	-3.50 (0.94)
CD	-2.05
CIPS	-2.5***
*CIPS**	-2.2***

The coefficients were estimated using the procedure described by Breitung (2005). CD is the transversal dependency statistic which tends to have a N (0,1) distribution under the null hypothesis of non-transversal dependency. CIPS and CIPS* are the standard and truncated statistics obtained as transversal averages of the Cross-sectionally Augmented Dickey-Fuller CADF(1) statistics for the case without constant and without trend. The critical values significant at 1% for the CIPS and CPIS* statistics are -1.78 and -1.77 respectively. "***" indicates that the test is significant at 1 and 10 percent.

The estimate was arrived at using a two-stage procedure which is computationally efficient. The model takes the following form:

$$\Delta Z_{it} = \alpha_i \beta' Z_{it-1} + \Gamma_{ij} \Delta Z_{it-1} + u_{it}$$

where Z is a vector that includes house prices as well as the fundamental variables. It should be noted that the coefficients of the cointegration vector β are the same for all of the provinces, whereas the adjustment factor α is different. The results are shown in Table A.4. The coefficients for GDP and occupation are significant and relatively similar to those found using the uni-equational model. However, the elasticity of interest rates is substantially lower in this case. With respect to the stability tests of the residuals of the long-term equation corresponding to the price equation, the CIPS obtained are significant, therefore validating the hypothesis of the existence of a cointegration relationship between the variables considered in the analysis.

Data Appendix

To carry out this study, we constructed a database covering information for the 50 Spanish provinces. The price of housing, in real terms, refers to the average price per square metre of open-market housing provided by the Ministry of Housing. This price was deflated using the Consumer Price Index (CPI). The CPI data are the ones released by the National Statistics Institute (INE).

The housing stock data have been compiled on the basis of the housing stock in 2001, according to INE data, and adding the annual flows of new houses coming on the market using the Ministry of Housing data.

Provincial Gross Domestic Product (GDP), deflated by CPI, comes from the Regional Accounts data published by the INE. The population data are also those published by the INE.

Nominal interest rates are the average mortgage rates released by the Bank of Spain in its Statistical Report. Real interest rates are, in turn, constructed using the provincial CPI provided by the INE.

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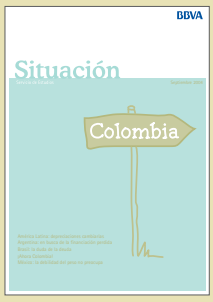

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