

# Real Estate Watch

## Spain

Economic Research Department  
July 2008



The real-estate adjustment, widespread and incipient in the OECD ...  
... in Spain results in an intense adjustment in activity, and regional diversity ...  
.... that will only be partially counterbalanced by public works

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## In Summary

An unfortunate combination of factors has made the cyclical adjustment to the Spanish real estate sector more intense than expected. First, the global financial shock has caused a severe deterioration in the international setting. After the bailout of Bear Stearns by JP Morgan with the financial assistance of the Federal Reserve (Fed) last March, financial risk appeared to have lost some of its emphasis. However, the tensions in the financial market have rallied during the past few weeks, and this has had a notable effect on the availability and cost of funding.

Second, a larger-than-expected increase of inflation has eroded the purchasing power of Spanish households. The increase in the price of raw materials entails higher inflation and official interest rates expectations, the latter making housing affordability more costly. In particular, the increase in the price of petroleum is, in real terms, just as intense as at the end of the 70's, and it is particularly damaging in Spain, where energy efficiency is lower.

In this framework, agents' expectations could over-react, triggering a downward correction greater than what is justifiable by the fundamentals of the sector.

### **The real estate adjustment, widespread and incipient in the OECD**

After a decade of continuous increases in real estate prices in many members of the Organization for Economic Cooperation and Development (OECD), combined with a widespread increase in real estate activity, the sector seems to have entered a stage of rapid deceleration, or even a contraction. The increase in official interest rates, which began at the end of 2005, together with a strong deceleration in the United States and in some European countries, and above all the financial crisis that started in the summer of 2007, have been factors that have overturned expectations in a sector where the price levels and real estate stocks had largely surpassed the equilibrium levels. The first countries to experience a drop in prices and activity were the United States, Denmark, and Ireland, although the deceleration is evident in many other countries. Financial factors which have been crucial in the expansion of the past several years are now a source of weakness in the OECD economies. The most vulnerable countries are those where various circumstances coincide, such as a high proportion of mortgage credit at variable rates, a high loan-to-value ratio with long payback periods or a family debt with high finance charges, and a heterogeneous distribution within population groups. The trend of the last three decades seems to indicate that cyclical adjustments in the housing sector can be lengthy. To be specific, the periods of decline in real prices since 1970 have lasted 14 quarters (i.e., 3.5 years) on average, compared to 4.5 years for the ratio of residential investments over GDP.

Evidence indicates that there is a significant margin of correction to prices, but this could be absorbed in approximately four years of drops in real prices, which would be caused by higher inflation. The adjustment in activity will also be important, and it has already started to take place in various countries. The biggest adjustments in both variables could take place in Ireland, Denmark, and Spain.

## **Spain, intense adjustment in activity, with regional diversity**

Since mid-2006 the Spanish residential market has been going through a period of adjustment that has intensified in the last few months. This process has been more intense in quantity than in prices.

In particular, the adjustment in construction activity has been more pronounced since the second quarter of 2007, as shown by the BBVA's Synthetic Indicator of construction activity. Construction permits for new residences have been decreasing since September 2006, showing an accumulative drop of 47% over the last 12 months until May, compared to the same period of the previous year. The number of permits for new construction is to be between 336,000 and 456,000 for 2008, and between 270,000 and 385,000 for 2009.

This negative surprise also occurs in the number of housing transactions, an indicator of housing demand. Latest data, as of March 2008, issued by the Ministry of Housing, show drops of 32% for previously-owned houses and 13% for new houses.

In turn, the adjustment to the strong increase in prices observed during the first few years of the decade, started in early 2005, when the growth rates of the general prices for housing went down to levels below 15%. The dynamics of moderate growth have then continued until the present, with latest data, from June of 2008, showing 2% growth, year-on-year.

An additional characteristic of the real estate adjustment is that, although widespread in the entire national territory, its intensity has been uneven among the autonomous regions. The divergence in the recent real estate market adjustment among the autonomous regions reflects the accumulated imbalances in terms of quantities but not in terms of price. Moreover, the real estate cycle, both at regional and national levels, reacts to the components of households' affordability such as employees per household and real salaries, although not in a uniform way between regions.

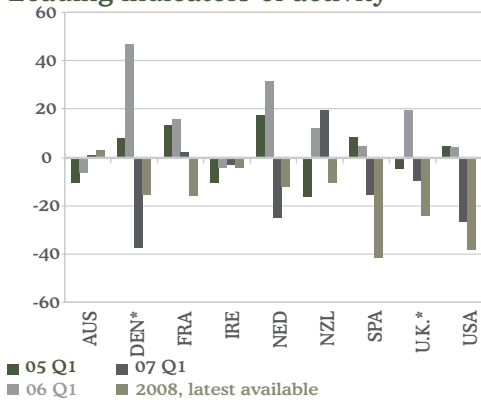
## **A difficult adjustment to be completely counterbalanced by public works**

The empirical evidence in Spain shows that in two of the last three downturns, the investment rate in infrastructures increased, contributing to a softer adjustment. The main infrastructure projects in Spain are included in the Strategic Infrastructure and Transport Plan (PEIT in Spanish).

The results of an increase in PEIT by 0.3% of GDP in three years show that, since the first year of the starting of the works, this measure would add between 0.3 and 0.4 percentage points of GDP each year with respect to the alternative scenario in which this increase in the investment rate would not take place. Moreover, the boost given by public works would allow an increase in employment of a little more than 0.3 percentage points (equivalent to about 70,000 jobs).

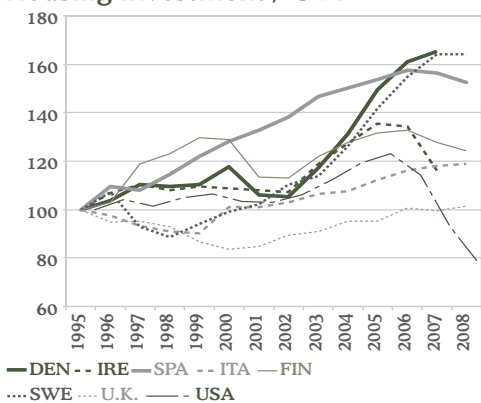
In conclusion, infrastructures would have a positive and significant effect, mainly in the long term. However, as a stabilizing tool for economy, they have a limited impact.

Chart 1.  
Leading indicators of activity



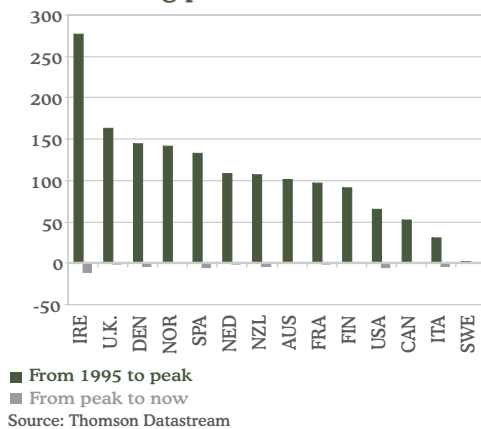
Note: Construction permits, except for countries marked with \* (housing starts)  
Source: Thomson Datastream

Chart 2.  
Housing investment / GDP



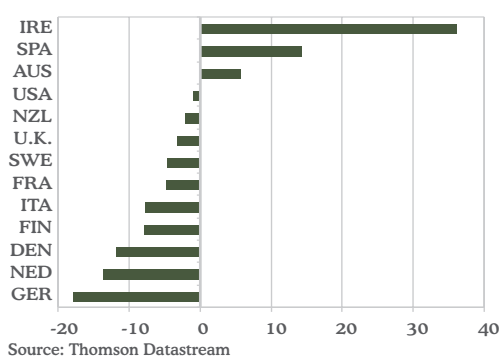
Source: Thomson Datastream

Chart 3.  
Real housing prices



Source: Thomson Datastream

Chart 4.  
Cumulative population growth, age group: 20-39 (1995-2007)



Source: Thomson Datastream

# 1. The global real-estate cycle and the weight of financial factors

## 1.1. Perspectives of the residential sector at the international level

### The real-estate sector is slowing down in a generalized manner

After a decade of uninterrupted increase in real-estate prices in many countries of the Organization for Economic Cooperation and Development (OECD), and of a widespread increase in real-estate activity, the sector seems to have entered in a stage of rapid deceleration, or even a contraction. The subprime mortgage crisis in the United States has only been the most evident episode in the development of a sector that has lived one of the longest cyclical expansions of its recent history. Leading indicators of housing activity have been falling for some time in various countries (Chart 1), and prices have started to slow down, or even fall, in those economies that experienced a strong boost in the past decade. The increase in official interest rates which began at the end of 2005 (a fundamental variable in many real-estate cycles), together with a strong deceleration in the United States and in some European countries, and above all the financial crisis triggered in the summer of 2007, have been factors that have overturned expectations in a sector that was ready for such a change, given the large extent of the upward cycle and the clear sensation that price levels and real-estate stocks had largely surpassed equilibrium levels.

The first countries to experience drops in prices and activity aside from the US have been Denmark and Ireland, although the deceleration is evident in many other countries. This chapter analyzes which real-estate adjustments are likely to occur in those countries that experienced a strong expansion in preceding years. Aside from looking at past cycles and comparing the evolution of key variables (price and activity) with the fundamental factors that explain them, a special emphasis is given on how financial factors, that contributed to the expansion of this sector, can shape its adjustment, given that the likely credit restrictions expected for the next few months can play an important role.

The rapid real-estate expansion was brought about by a wide variety of factors, whose relative influence is difficult to identify, but which turns out to be important to analyze in order to know the margin of adjustment the sector can experience. One of these factors has been the drop in interest rates that began in the second half of the 90's and played a key role in providing financial flexibility to the pressures of demand. Part of this drop has been linked to the globalization process that has exerted downward pressure on the inflation levels at the world level, although it is a process that could have stopped exerting such an intense downward pressure on prices, and that in any case now finds itself hidden by the increase in the price of raw materials. A good part of the drop has also been associated to more independent and credible monetary policies that have contributed to lowering real interest rates. On the other hand, in countries that border the euro zone, the monetary union meant a positive and permanent shock on the interest rates which was key in the cyclical expansion produced beginning from 1995 and which also boosted the real-estate sector.

Aside from the drop in interest rates, two other key factors that contributed to the expansion of the sector were the strong rise in the per capita income during the last decade in the majority of these countries, and the immigration pressure that has contributed to

reinforcing the expansion of the population at household forming age in Ireland or Spain, and to curb the demographic decline in other countries. Both factors, of course, are not independent of the financial element and have been caused in part by the relaxation of interest rates.

The rest of this chapter focuses on evaluating the factors that can affect the downward cycle in those countries that have experienced a major expansion in the last few years: aside from those already cited (Spain, Ireland, the United States and Denmark), the United Kingdom, Australia, New Zealand, France, Italy, Sweden, the Netherlands and Finland are also included. In the following section, the factors of a financial nature that can affect the adjustment will be examined, while in the third, the history of the past real-estate cycles will be reviewed. The end of the chapter is dedicated to the structural factors mentioned above in order to evaluate up to which point the current price and activity levels are above sustainable levels.

**The financial factors that have been decisive in the expansion of the last few years are now an element of weakness.**

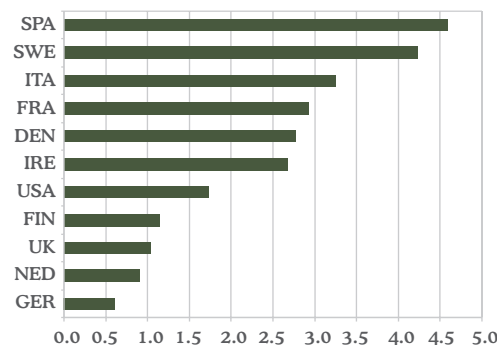
The increase in credit, especially mortgages, experienced during the past few years, has implied high levels of household debt in countries with rapid real-estate expansion, with noticeable differences among them. In relative terms, very high levels of debt over disposable income are registered in Ireland and the Netherlands, as well as in Spain, United Kingdom and Australia. These high levels of debt imply that in case of a deceleration in activity in the majority of the countries considered (which has clearly already reached many of them), the margin left to increase this debt, in order to maintain the same standards of consumption, may be reduced. Besides, the more-than-likely deceleration of credit supply by the financial entities affected by the turbulence in the financial markets contributes to reduce this margin even further. A high level of debt also implies that the risk of increases in finance charges, in case of possible increases in interest rates (either because of prolonged tensions in the liquidity markets or as a result of possible increases in official rates in response to protracted inflationary tensions), could be high. Moreover, one of the traditional ways to face up to the deceleration in the real-estate sector and in the economy in general — such as less restricted financial conditions — could function worse than in past cycles.

Furthermore, some characteristics of the mortgage markets complicate the outlook even more. The process of financial innovation that started in a generalized manner in the 80's, and has reached other market segments and products in the last 15 years, has contributed to the increase in mortgage credit and to the expansion of the real-estate sector. This development could constitute today an element of vulnerability in light of the likely adjustments that will take place in the sector. This innovation was not uniform among countries, and it turned out to be more pronounced in the Anglo-Saxon and Nordic countries. These economies have resorted more to the use of real property assets as collateral in order to increase the scope of their credit (also for consumption). Finally, mortgage loans have also been securitized to increasingly complex products, affecting more or less all countries. To be specific, the following characteristics can be identified as risk factors in the real-estate market.

- High proportion of mortgage credit at variable rates

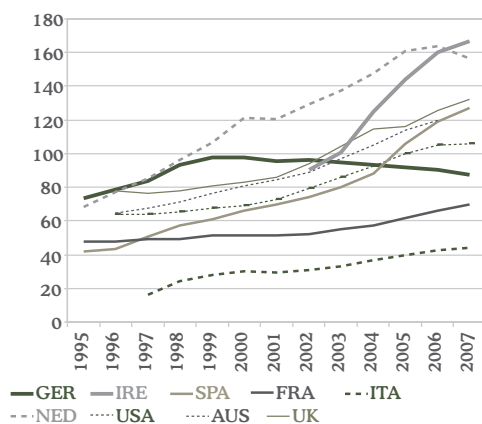
The high proportion of debt at variable rates in some countries at the euro zone borders (Spain, Finland, Ireland, and Italy) helped transfer

Chart 5.  
**Fall in real interest rates**  
bps, between 1994-96 and 2005-07



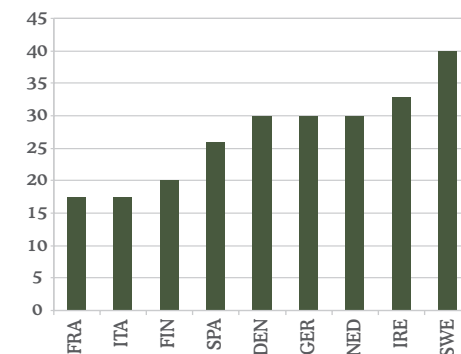
Source: Thomson Datastream

Chart 6.  
**Household debt**  
(% disposable income)



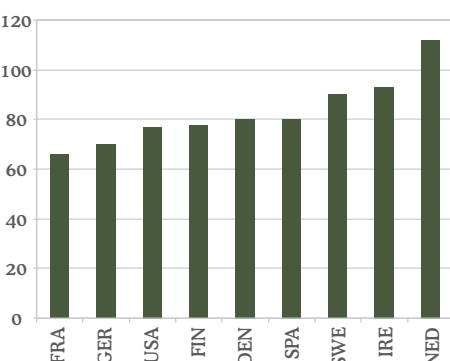
Note: For US, UK and Australia, the ratio excludes short-term non-mortgage loans  
Source: Thomson Datastream

Chart 7.  
**Mortgage term - new loans**  
(years)



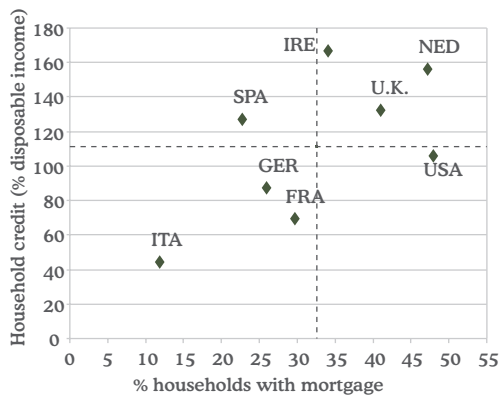
Source: Thomson Datastream

Chart 8.  
**Loan-to-value ratios**



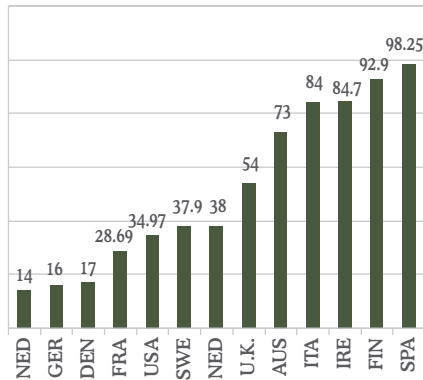
Source: Thomson Datastream and OECD

Chart 9.  
Household debt concentration



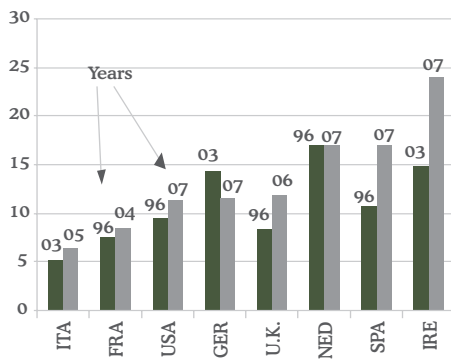
Source: Thomson Datastream and OECD

Chart 10.  
Outstanding mortgages at variable interest rate  
(% of total)



Source: Thomson Datastream and OECD

Chart 11.  
Debt burden (principal and interest rates)  
(% disposable income)



■ 1996 or first available data  
■ Latest available data

Source: Thomson Datastream and OECD

the sharp drops in official interest rates to mortgage rates, reducing the debt service in the first few years of repayment. To the extent that the variable rates may lead to a certain short-sightedness, on the part of home buyers, it is possible that they may have contributed to increase the levels of debt above a sustainable threshold. In a downward cycle, however, and in a context of higher interest rates with risks on the rise owing to high inflation rates, the danger that borrowers cannot meet loan payments or, alternatively, that they face higher charges and, in this way, induce them to reduce their level of consumption, is important. This could lead to higher rates of default on payments in these countries, or making the deceleration associated with the real-estate crisis through reduction in consumption even deeper.

- High loan-to-value ratio and long-term maturities

Two of the most used instruments to provide financing to individuals who have difficulties in meeting their mortgage payments, given the rapid increase in prices, have been the extension of mortgage payment terms for new loans and the granting of mortgages with a value close to the price of the property. The extension of the terms reduces the monthly financial charges but, faced with additional difficulties due to the increase in interest rates (for example, when these are variable) or due to the decrease in income related to the downturn, the margin to extend the repayment terms and thus making the monthly payments less onerous may be reduced. In various countries in northern Europe, together with Ireland and Spain, the duration of mortgages seems to be excessively long.

In the case of loans with a high loan-to-value ratio, it is evident that the risk of default implied by the decline in prices is much greater, most of all if they are recent and with hardly any minimum payments made on the principal. In the Netherlands, Ireland and Sweden this ratio is clearly positioned above 80%. A similar case would be the usage of interest-only mortgages in several countries that permit the payment of interest only, where repayment of the principal is not necessary, a clear example of developing new products to attract clients. In any case, if they are linked to a relatively high loan-to-value ratio, the risk of payment defaults can increase in the face of less favourable conjunctural situations.

- High level of debt and finance charges, and their distribution

This debt has resulted in an increase in financial charges, due as much to the increase in prices as, in the last two years, to that in interest rates. This has two significant consequences: on the one hand, the risk of default on payments is greater and, on the other hand, the financial leeway for families facing the deceleration is also more reduced, which can result to private consumption being less dynamic, reinforcing the possibility of the real-estate cycle spreading to the rest of the economy.

What counts is not only the level of debt but also its distribution. A greater risk of payment default exists in those countries where the debt is more concentrated (as in Spain) or, most of all, in those where the debt lies fundamentally in low-income groups. Debt lies strongly in lower-income households in the United States and New Zealand where more than 50% of the households in the first two deciles of income are in debt and, to a lesser extent, in the United Kingdom and the Netherlands. Also in countries where debt lies disproportionately within the young part of the population there could be significant risks, although in this case there is greater margin to soften the payments by extending the loan terms.

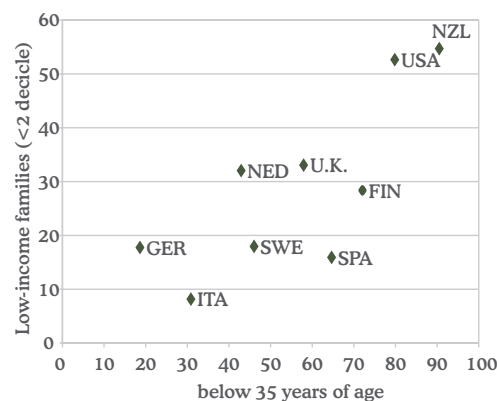
## Although no two cycles are the same, recent history gives an indication of the magnitude of the expected adjustment

A first approximation of the estimated drop in the real market cycle can be carried out by observing the duration and extent of past drops in price and activity. Although the variability among different cycles is considerable (with mini-cycles that take place amid larger cycles), the periods of real price drops since 1970 have lasted 14 quarters (three-and-a-half years) on average, distributed between two or six episodes of declines (according to country), while the average drop in real prices has been 20%, at the rate of 1.4% per year.

Moreover, price variations are usually associated with parallel cycles of activity in the same direction. According to the calculations presented in Table 1, the periods of drops in the Residential-Investment-to-GDP ratio have had an average duration of 4.5 years, meaning a decrease of 1.8 percentage points (four tenths per year) in total. In this case, the variations among average cycles of the different countries are important: in some European countries (France, Italy, Spain) the drop in activity has been historically lower than in the United States, Ireland or the Nordic countries.

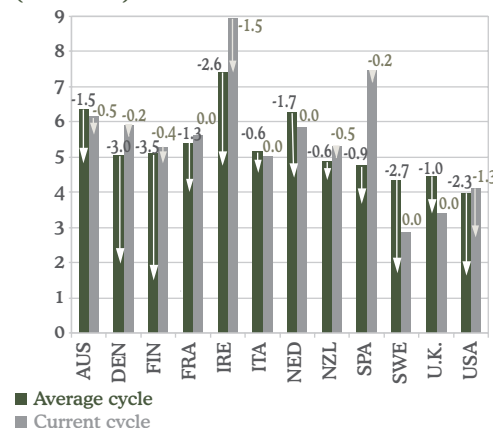
Although what has happened in the past real-estate cycles does not necessarily determine what is yet to come, given the variety of influencing factors in every real-estate cycle and in its relationship with other activity variables, the history of the last three decades seems to indicate that the housing cycle adjustments could be lengthy, and in any case dispels the idea that real-estate prices (not only real but nominal) cannot drop. Given that the recent expansion of the housing sector has been one of the longest and most intense, it is reasonable to expect that also, at an international level, the downward cycle would also be significant. Everything depends, however, on up to which point the recent expansion can be explained by structural factors.

Chart 12.  
Debt by vulnerable group of population  
(% indebted households)



Source: Thomson Datastream

Chart 13.  
Residential investment / GDP: Fall from cyclical maximum  
(% of GDP)



Note: Local maximum in last cycle beginning in 2002 (Australia), 2005 (Ireland, US), 2006 (Finland, Spain, United Kingdom, Denmark).  
Source: BBVA ERD

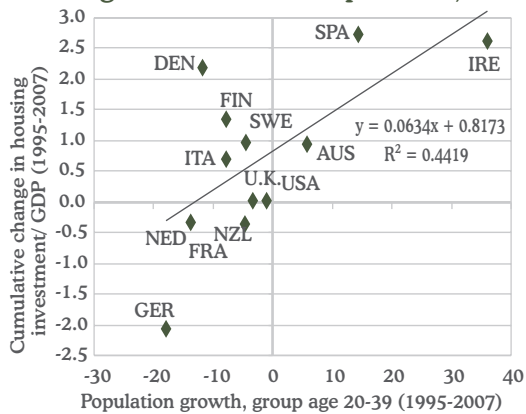
Table 1. Cycle in property sector

	Falls in real prices				Associated change in housing investment		
	No. Cycles	Average fall in real prices	Average no. quarters	Avg quarterly fall	Average duration of cycle (years)	Average accumulated fall in investment housing/GDP	Average fall in investment/GDP per year
<b>Australia</b>	6	-9.1%	9.2	-1.0%	2.2	-1.5%	-0.4%
<b>Denmark</b>	4	-24.2%	12.0	-2.0%	4.0	-3.0%	-0.9%
<b>Finland</b>	2	-40.3%	22.0	-1.8%	9.5	-3.5%	-0.4%
<b>France</b>	2	-10.3%	13.5	-0.8%	5.3	-1.3%	-0.2%
<b>Ireland</b>	3	-11.2%	12.3	-0.9%	4.0	-2.6%	-0.8%
<b>Italy</b>	4	-35.5%	15.8	-2.3%	4.0	-0.6%	-0.2%
<b>Holland</b>	3	-19.0%	12.0	-1.6%	5.0	-1.7%	-0.4%
<b>New Zealand</b>	5	-12.8%	11.6	-1.1%	2.3	-0.6%	-0.3%
<b>Spain</b>	4	-18.7%	15.5	-1.2%	3.8	-0.7%	-0.2%
<b>Sweden</b>	3	-22.9%	16.0	-1.4%	5.0	-2.7%	-0.5%
<b>United Kingdom</b>	3	-24.9%	16.3	-1.5%	4.8	-1.0%	-0.3%
<b>US</b>	3	-10.3%	16.3	-0.6%	4.0	-2.3%	-0.6%
<b>Non-weighted average</b>	<b>3.5</b>	<b>-19.9%</b>	<b>14.4</b>	<b>-1.4%</b>	<b>4.5</b>	<b>-1.8%</b>	<b>-0.4%</b>

Source: BBVA ERD

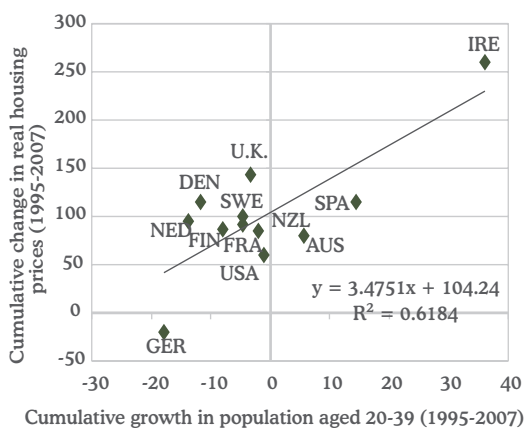


Chart 14.  
Housing investment vs Population, 20-39



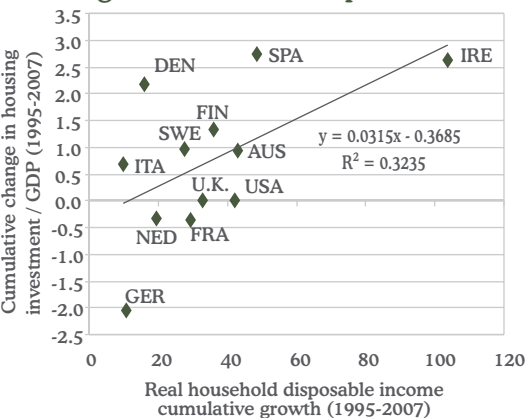
Source: BBVA ERD

Chart 15.  
Housing prices vs Population, 20-39



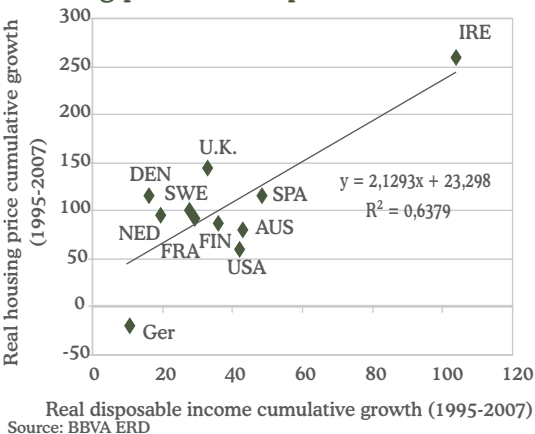
Source: BBVA ERD

Chart 16.  
Housing investment vs Disposable income



Source: BBVA ERD

Chart 17.  
Housing prices vs Disposable income



Source: BBVA ERD

### Altitude sickness: What is the margin in the drop of price and activity?

There are several factors that can determine the development of housing supply and demand, some of them cyclical and others structural. Among the most important are variations in the population ageing or immigration flows; changes in sociological factors, like the variations in divorce rates or in the “emancipation” age, which affect the number of individuals per household; the development of fundamental economic variables, such as that on production and income, on the unemployment rate or on interest rates; changes in consumer preferences towards certain locations or types of housing; restrictions on the supply side, perhaps produced by legal changes, etc.

In the analysis that follows we focus on three fundamentals cited in the introduction which are considered more meaningful in explaining the growth of the sector in the past decade: the evolution of the population at the age of setting up homes (in our case, it is extended up to 29-30 years, since this is the age range at which the majority of immigrants arrive in the country), and the increase in per capita income, and the variation of interest rates.

In the attached graphs, two fundamentals are presented: the accumulated values in the variation of population and income, between 1995 and 2007, coinciding approximately with the period of the sector’s expansion compared against the variation over the same period in real housing prices and residential-investment-to-GDP ratio. The regression lines of the graph do not correspond to a formal model to determine prices or activity, and are merely indicative of up to which point price or activity could have overshoot the fundamental variables, although only in relation to what has occurred in the other countries included which, one must not forget, have all experienced a strong expansive real-estate cycle. At first glance, it seems, for example, that the Spanish real-estate activity has grown beyond what is implied by the high population, growth rates in age of setting up homes, or by the increase in the per capita income, whereas the increase in prices has not been so excessive. In the Scandinavian countries, price and activity have grown excessively compared to the fundamentals and in relation to other countries; however, in the United States, despite having been one of the first countries to experience a decline, it seems that fundamentals explain the process of expansion relatively well. Nevertheless, this is probably one of the countries where the weight of the financial factors (in aspects such as prudential supervision in granting loans, which is difficult to capture with quantitative indicators, but are reflected in high levels of indebtedness in low income households presented above) is very important, as demonstrated by the mortgage crisis of the past year.

To formalize this analysis, price and real-estate investment equations have been estimated according to the model developed by the International Monetary Fund and included in the latest World Economic Outlook (in this case only for prices), to calculate the margin in the price or activity decline, i.e. the degree of overvaluation in the prices or excess in activity above the levels explained by the fundamentals. The equations have been estimated separately for each country, with quarterly data from 1980. The estimates have been realized in differences, such that the accumulation of the equation residuals at one point considered of equilibrium (in this case 1995) represents an estimate of the excess in price or activity in the sector. For each country, the lags in the explanatory variables have been selected according to the significance of an information criterion, but for purposes of comparability an effort has been made to maintain a common model for all countries.

The results are presented in the attached graphs. The charts indicate that the real prices would be clearly overvalued in Ireland and considerably less in the rest of the countries considered. Spain would be in the low-to-medium level with an imbalance in real prices below 15% which could be absorbed in a few years through stability or small declines in nominal prices, letting inflation play a role.

The estimates for imbalances regarding the investment equations are smaller in percentage terms for almost all of the countries, and they only equal or surpass 10% in Sweden, Denmark and Spain. However, it should be noted that in the United States a considerable part of the adjustment in activity has already taken place in the last two years, and that Ireland has also already experienced important drops in investment. In the case of Spain, the results are compatible with a descent in residential-investment-to-GDP ratio from the current 7.5% to 6%, or even less in certain periods, if we take into account that the excess of accumulated supply during the years of over-investment would have to be absorbed.

**Conclusion: The adjustment in real price will be necessary, but it can be absorbed in good part by small declines in nominal prices; the adjustment in activity could be important in countries like Spain.**

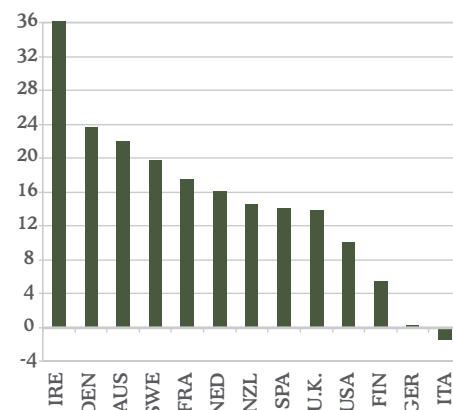
The real-estate market is complex since the role of housing as a provider of a fundamental service comes together in it, with a very important role as an investment asset for a large number of households. Long lags in construction, together with high transaction costs, can cause the key variables in this market to be far from balanced for several years, and make expectations play an important role. That is why forecasting cycles linked to housing is not an easy task.

Despite this, the analysis presented here seems to point out that there is a margin of price correction that is not insignificant, but that could be absorbed in about four years with a descent in real prices, which would be brought about mainly as a consequence of an increase in inflation. The correction in activity will also be necessary, and it has already started to take place in various countries, as it is reflected by the leading indicators of activity. The highest price corrections could take place in Ireland, Australia and some of the Nordic countries, while the greatest activity adjustment would take place in Spain and also in the Scandinavian countries, despite Ireland and Spain clearly being countries where fundamental factors have had a more prominent role in the expansion experienced in the last decade.

The financial weakness of many households, expressed by high levels of debt and some high and badly distributed finance charges, excessively sensitive to variations in interest rates, could magnify the impact of the real-estate sector crisis over the rest of the economy. This relative financial frailty, most of all within the context of turbulence in the markets, high differentials and a more-than-possible limitation in the credit supply, will cause the actual downward cycle in the real-estate sector to be more difficult to overcome than in past episodes.

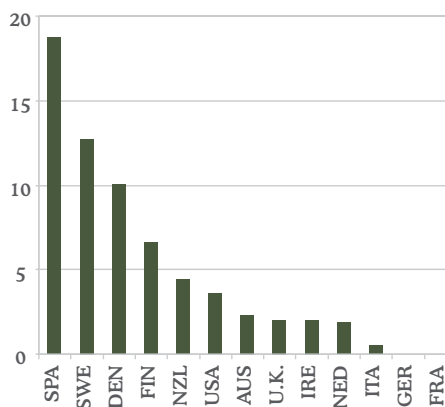
Table 2 summarizes the elements of financial vulnerability in the different countries, as well as the margins in the real-estate market adjustment, both in prices and in quantities. The last column is a simple recount of the number of vulnerable elements in each country. The table does not intend to provide a ranking of the most problematic countries but simply to provide an indicative guide of where the weaknesses in the real-estate sector of each country can be.

Chart 18.  
Real prices deviations  
(% excess over explained price)



Source: BBVA ERD

Chart 19.  
Residential investment deviations  
(% excess over explained investment)



Source: BBVA ERD

Table 2.

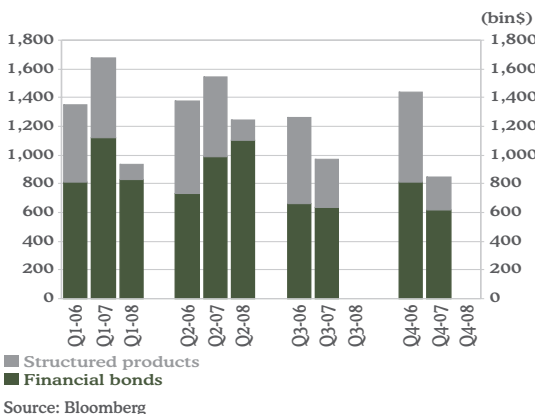
	Financial factors				Fundamentals		No.
	Debt	Debt distribution	Variable interest rate debt	LTV ratio	Excess Price	Excess Activity	
Ireland	↓	?	↓	↓	↓	=	4
Netherlands	↓	=	=	↓	↓	=	3
Spain	↓	=	↓	=	=	↓	3
Sweden	=	=	=	↓	↓	↓	3
Denmark	?	?	=	=	↓	↓	2
United Kingdom	↓	=	↓	?	=	=	2
Finland	=	=	↓	=	=	↓	2
Australia	↓	?	↓	?	↓	=	2
United States	↓	↓	=	=	=	=	2
New Zealand	=	↓	=	?	=	=	1
Italy	=	=	↓	?	=	=	1
France	=	?	=	=	↓	=	1
Germany	=	=	=	=	=	=	0

Note: Grey arrow, very vulnerable; ?, no indicator exists; =, not very vulnerable  
 Source: BBVA ERD

Chart 20.  
 Implicit Official Rates in EONIA and FED Funds Dec-08 Futures



Chart 21.  
 Global issuance: Financial institutions bonds, ABS, CMBS, CMO. (bln\$)



Source: Bloomberg

## International outlook

### The global financial shock is back in the spotlight

The world economy continues to be immersed in significant uncertainties, focused in the developed economies. Without doubt, there is a remarkable interaction among the principal factors responsible for this situation and the exceptionally high volatility observed in financial markets. These factors are three: the adjustment in the real-estate cycle, the global financial shock and the escalating price of raw materials. After the bailout of Bear Stearns by JP Morgan with the financial assistance of the Federal Reserve (Fed) last March, the financial risk appeared to have been put somewhat under control and the attention of the markets focused on the new highs recorded for the price of raw materials. In this way, the latest inflation data reflect this increase in raw material prices that led to a rise in expectations in inflation and in the official interest rates in developed and emerging countries. The increase in the price of crude oil is, in real terms, comparatively as intense as the one that took place in the late 70's and which may have been triggered, to a greater or a lesser extent, by the growing role that crude oil plays as a financial asset.

Despite the fact that in the United States the real-estate market and growth showed a strong deceleration, the Federal Reserve had to end its downward cycle of official interest rates due to inflationary pressures, pausing at the level of 2%. In Europe, the change in expectations was more meaningful, and the European Central Bank (ECB) decided to implement an increase in rates in July. Although additional increases in rates were disregarded, in the current global context it does not seem that one can anticipate that this increase will start a new upward cycle in rates. On the contrary, a decrease in rates in 2009 cannot be ruled out, as the activity decelerates in the region.

The fact that the downward uncertainties over growth continue to be high, together with the new losses in the financial sector and the problems in the government sponsored agencies in the U.S., confirm the prominence of the financial shock. One year after the start of this episode, the liquidity tensions continue to be very high, as shown by

the fact that the differentials in the interbank markets are maintained at maximum levels. In fact, in the case of the primary markets, the risk premium has increased again, at the same time that the window of opportunity seems to be closing itself off to issue what was produced after the bailout of Bear Stearns. In this way, issuance is slowing down in view of the increase in costs and the profile continues to be oriented towards the short-term. We find a more concrete example of this behaviour in the Spanish market of mortgage certificates, where this register is most used. The stagnation in the issuance of structured products hasn't changed.

Regarding secondary markets, credit spreads continue to be in high levels and arguments that support a change in the short-term do not seem to exist. In this setting, the risk (approximated by the development of the Credit Default Swaps – CDS's) has increased to level previous to the Bear Stearns bailout.

The length of the financial crisis is affected, among other factors, by the capacity of the financial entities to face a process of deleveraging, either through an increase in capital or through a decrease in assets, since losses reduce capital and impose a restriction on its activity. The first phase of losses has been partially mitigated through capital increases. In this setting, the impact of the second round of this crisis (linked to the increase in levels of defaults in lieu of recording them at market value of the structured products) will be the focus of attention during the next few months. However, the latest recapitalizations are encountering difficulties to position themselves, owing to the gradual withdraw of sovereign funds due to their bad experiences. In fact, in the last few months a growing negative signal has been observed, in the sense that the risk of the entities that issue capital increases is higher than the risk of those who do not in order not to be perceived as more vulnerable. Going forward, the second round impacts will deepen the necessity of many agents to deleverage themselves, which will affect even more the availability and cost of the economic agents' financing. Historic experience shows that these periods of capital ratio recomposition by financial entities are normally relatively long. All this makes one think that financial conditions are not as ample as they used to be in the last few years.

Consequently, growth in developed countries will show lower dynamism, with a balance of risks clearly slanted downward. In this way, U.S. growth will be 1.2% by the end of 2008 and 1.0% in the next year. In Europe, growth showed a certain resistance at the start of 2008, but the symptoms of deceleration are noticeable. The Economic and Monetary Union (EMU) could grow at 1.6% in 2008, below its potential growth, decelerating towards 1.0% in the next year.

Long-term interest rates have a limited route going up. In the U.S. they will remain at levels close to 4%, or slightly below, while in the EMU it could take some time to observe levels below 4%. Having said that, it is foreseeable that the deceleration in the euro area ends up favoring lower interest rates both short- and long-term.

In the context described, the upward route of the euro seems to encounter some limits. After being pressured downwards in the short-term, in the medium-term, helped by the increase in the flows of the Foreign Direct Investment (FDI) towards the North American economy, the dollar could recover some of its value in relation to the European currency. Likewise, the divergent paths in the official rates that are forecasted for both areas (increase in 2009 by the Fed and decreases by the European Central Bank - ECB) should also favor the dollar. In any case, the uncertainties will remain in the short-term.

Chart 22. EMU: senior bank debt yield breakdown, 5 year

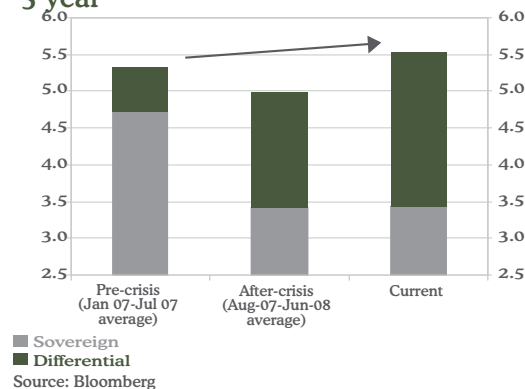


Chart 23. US: senior bank debt yield breakdown, 5 year

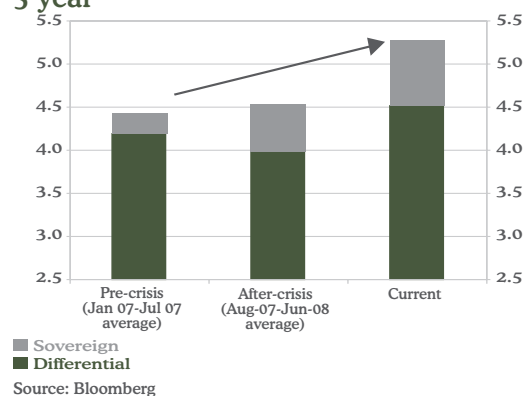


Chart 24. Spanish Covered Bonds Issuance: Average Cost and Maturity

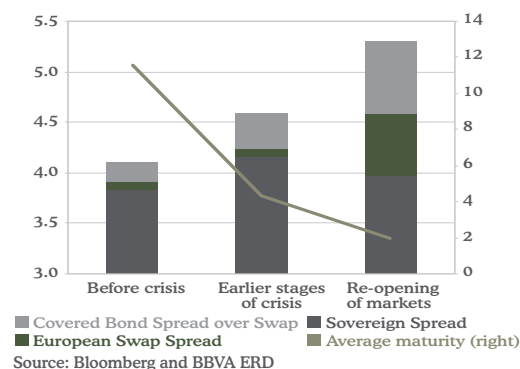
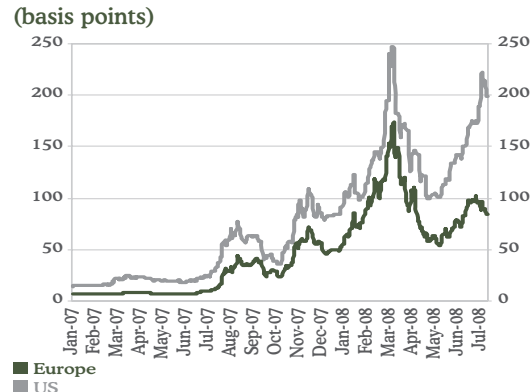


Chart 25. Bank credit risk: 5-year CDS (basis points)



Source: Bloomberg and BBVA ERD. Simple average of 5-year Senior CDS Europe: Barclays, RBS, HSBC, Lloyds, Standard Chartered, Allied Irish Bank, BNP Deutsche, ING, Unicredit, UBS, Credit Suisse, Credit Agricole, Intesa, BBVA and Santander. US: JP Morgan, Citigroup, BoA, ML, MS, GS, LB, Wells Fargo and Wachovia

Chart 26.  
Current-account balance  
(Percentage of GDP)

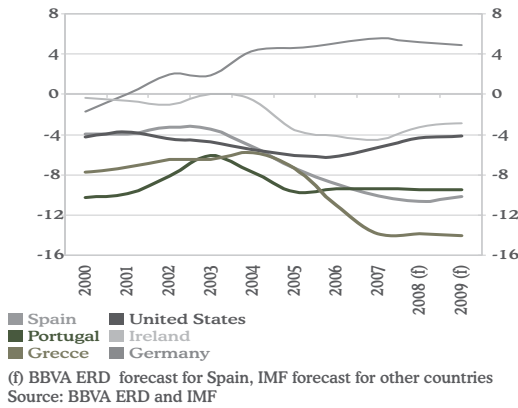


Chart 27.  
IA-BBVA, Spanish Economy Activity Indicator

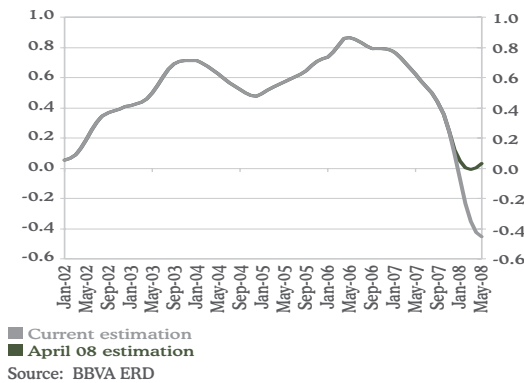


Chart 28.  
Spain, Employment (LFS)  
(Quarterly change in thousands, Seasonally-Adjusted)

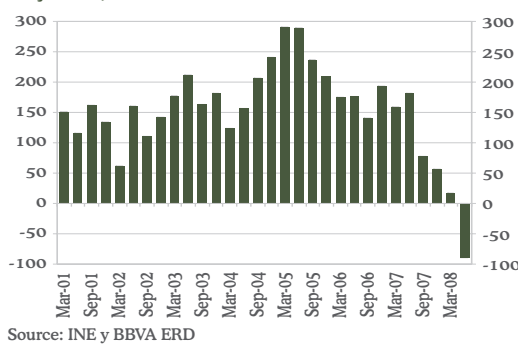
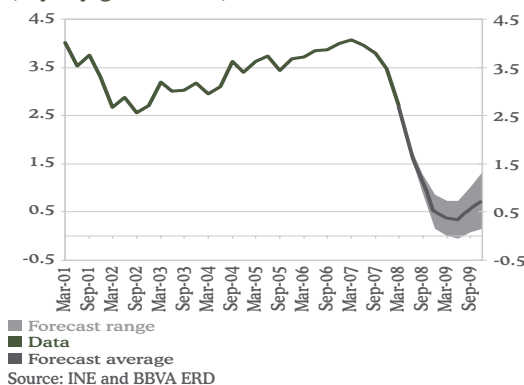


Chart 29.  
Spain, GDP  
(% y-o-y growth rate)



The exterior setting described is affecting the Spanish economy, which is adjusting at higher speed boosted by the persistence of the turmoil existing on a global scale. These shocks hit aspects in which the Spanish economy is especially vulnerable. On the one hand, in a scarce liquidity context those economies which have higher funding needs are more affected. This is the case of Spain, whose current account deficit has quadrupled in the last four years, reaching up to 106,000 million euros in 2007, 10.1% of the GDP for 2007, only surpassed in level by the U.S., and as a percentage of GDP by Greece (-13.9%) and Iceland (-15.6%). A reflection of this situation relating to the Spanish economy is the considerable displacement of financial instruments with short-term maturities as a consequence of the lower demand of assets by international markets. On the other hand, the Spanish economy makes a more intensive use of crude oil than the neighbouring economies. Therefore, Spain remains vulnerable to a greater extent to the current tensions in the price of energy. The intense recovery in the price of energy in the first quarter, above what was forecasted, causes a greater drainage in the real income of households and businesses.

In view of the deterioration experienced in the global economy, it is not surprising that the data on the situation show an intense deceleration in the Spanish economy, especially for the indicators on consumption and on employment, it is higher than what was anticipated. In general, the cyclical indicators have been deteriorating slowly since 2007, but in the first half of 2008 their moderation worsened. The indicator of activity IA-BBVA, that synthesises into a single signal the information on 45 partial cyclical indicators, clearly illustrates this situation. Not only does it show a clear trend towards moderation in activity since the latter part of 2006, but also that with the latest update it presents a level widely below zero (that is, below its trend), already clearly below the one registered during 2001-2002. The deterioration of the consumption indicators has been especially relevant, in particular for durable consumption, with drops that are more and more intense. This is the result of the development of its fundamentals. On the one hand, the consumer's real income shows lower dynamism, derived from the impact of inflationary pressure and of the moderation in the creation of employment. The labor market is living two simultaneous phenomena. First, the economy has been slowing down in the creation of employment in a manner that is in line with the intense deceleration in GDP. Second, data relative to the Labour Force Survey of the second quarter showed that, once the seasonal effects were corrected, the economy has stopped creating employment for the first time since 1994. The growth numbers of the active population have remained in extraordinarily high levels, close to the maximum reached in the expansive phase of the cycle, that is why the unemployment (and the unemployment rate) is increasing with great intensity. Moreover, wealth and interest rates are helping the expansion of consumption less than expected. The real-estate component of households wealth is affected by the development of housing prices, while the stock market declines limit the financial component.

Overall, the Spanish economy is experiencing an intense deceleration that will foreseeably continue in the next few quarters. According to our estimates, the quarterly advance in GDP during the second quarter of the year was 0%, a level around which it will fluctuate in the next few quarters. The change in the global stage leads to a review of the growth perspectives for Spain. In this manner, it is now predicted that the Spanish economy will grow between 1.3% and 1.7% in 2008 while its growth will not exceed 1.0% in 2009, without ruling out the possibility of a 0.0% growth rate. Employment will suffer a deterioration according to this intense deceleration. It is predicted that it will remain practically stagnant in 2008 (barely 27,000 jobs, after more than 600,000 created in 2008), while a destruction of 275,000 is predicted in 2009.

## 1.2. The drag effect of the construction on the economy: impact on GDP and on employment

The impact of the real estate adjustment on GDP and employment will be higher in 2009 than in 2008. This result is consistent with the evidence according to which the countries where the construction of multi-family or block houses is important, the residential investment has more inertia. Therefore, the effect of the adjustment will be higher in the medium-term than in the short-term. The effect on employment is higher than the effect on activity, as the construction sector and the sectors closely related to it are labour-intensive.

The slowdown of activity in the real estate sector, which until the middle of the past year was moderate, has worsened since the second quarter of 2007, gaining in intensity as new information arrives, just as the BBVA Synthetic Indicator of Housing Activity (Chart 30) shows. The adjustment in the construction activity started to destroy employment (in seasonally adjusted terms) in January 2008. The employment destruction process will intensify as the deterioration in residential construction intensifies, reaching up to -2.1% month on month in June. The growth in recorded unemployment will accelerate, surpassing 7% in the second quarter of 2008 (Chart 31).

Although the stagnation of the real estate sector has a significant direct impact on economic growth and employment, its indirect effects on the rest of the economy caused by the drag of the reduction in activity and, consequently, in demand, are still more relevant. As such, according to the latest Input-Output Tables available (IOT 2000), a decrease of one million euros in the final demand of the construction sector, would cause a reduction of 0.98 million in the Gross Value Added (GVA) of the economy, of which 63.3% corresponds to the deterioration of the GVA in the remaining branches of activity induced by the real estate shock<sup>1</sup>.

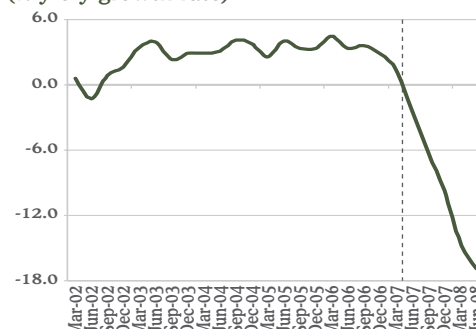
However, the study of the effects caused by one sector on the others via the IOT has to take into account two considerations. First, it is a static analysis that does not add information about the evolution of the drag on other sectors over time. Second, the change that has occurred in the Spanish productive structure in the past decade makes the extrapolation of the results obtained for 2000, the year of the last IOT, difficult.

For these reasons, continuing with the work initiated in the *Spain Watch* April 2008, we estimate a model<sup>2</sup> to analyze the existing relation between production and employment in the construction sector, housing prices, production and employment in the rest of the economy, the price of consumer goods, and interest rates. The direct and indirect impacts of the intensification of the real estate adjustment are estimated by comparing the growth rates of GVA and employment if the residential investment continued in its long-term path ("moderate slowdown") with the resulting growth of two possible scenarios for the residential investment. In the first one, the housing investment decreased a 6.4% in 2008 and a 13.8% in 2009 due to a drop in the number of housing

<sup>1</sup> See: "An analysis of the relationship of construction with other branches of activity". *Real Estate Watch*, June 2007, 16-20, BBVA ERD

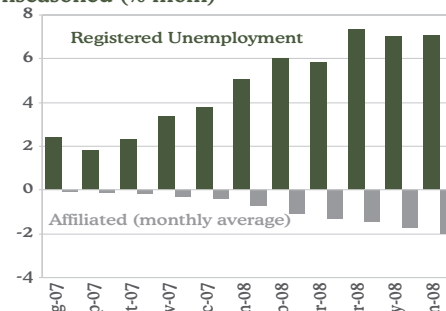
<sup>2</sup> It is a Bayesian Vector Autoregressive Model with Time Varying Coefficients (TVC-BVAR). For a more detailed explanation of the methodology, see Doan, T., R. Litterman and C. Sims (1984), "Forecasting and conditional projection using realistic prior distributions", with discussion, *Econometric Reviews*, 3, 1-144, and Canova, F. (2007): *Methods for Applied Macroeconomic Research*. Princeton University Press.

Chart 30.  
Spain, Synthetic Indicator of Construction Activity (housing) (% y-o-y growth rate)



Source: BBVA ERD

Chart 31.  
Construction. Social Security Affiliates and Registered Unemployment Unseasoned (% mom)



Source: BBVA ERD and Ministry of Labour and Immigration

Table 3. Residential Investment and Housing Permits 2008-2009

	Residential Investment		(% yoy)		Long Term
	Upper limit Current	Lower limit Apr-08	Upper limit Current	Lower limit Apr-08	
2008	-6.4	(-5.5)	-8.3	(-9.5)	3.3
2009	-13.8	(-11.3)	-19.2	(-17.7)	3.1

	Housing permits, accumulated (thousands)				Long Term
	Upper limit Current	Lower limit Apr-08	Upper limit Current	Lower limit Apr-08	
2008	456	560	336	440	450
2009	385	380	270	265	440

Source: BBVA ERD

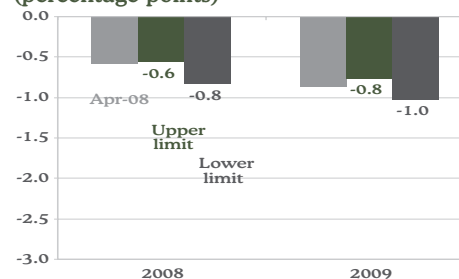
Table 4. Impact on Gross Value Added and Employment according to TIO 2000

Residential Investment Scenarios (% yoy)	Impact on GVA (% yoy)	Impact on Employment (% yoy)
-6.4	-0.9	-1.0
-13.8	-2.0	-2.2
-8.3	-1.2	-1.3
-19.2	-2.8	-3.0

Source: BBVA ERD

Chart 32.  
Impact of real estate adjustment on total GDP

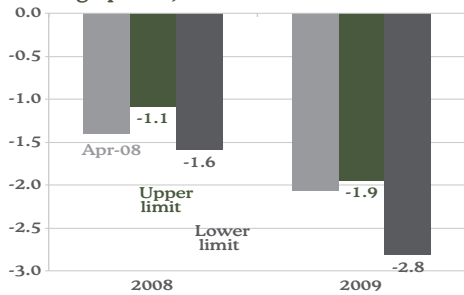
Difference with respect to assuming that construction investment follows its long term path (percentage points)



Source: BBVA ERD

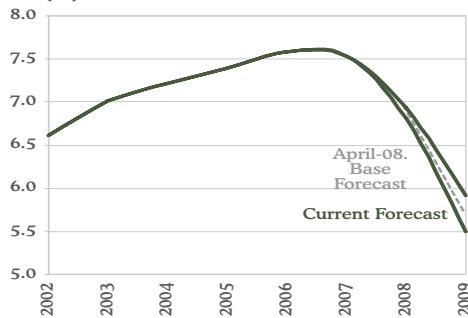
**Chart 33.**  
**Impact of real estate adjustment on employment**

Difference with respect to assuming that construction investment follows its long term path (percentage points)



Source: BBVA ERD

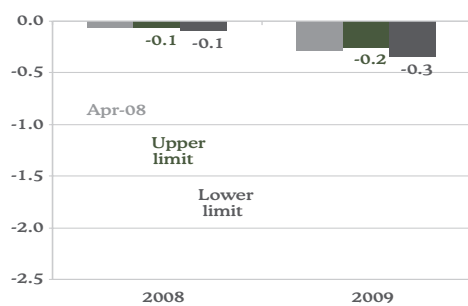
**Chart 34.**  
**Housing Investment as a percentage of GDP (%)**



Source: BBVA ERD and INE

**Chart 35.**  
**Impact of real estate adjustment on GDP (excluding construction)**

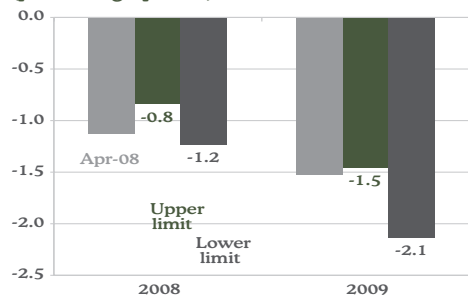
Difference with respect to assuming that construction investment follows its long term path (percentage points)



Source: BBVA ERD

**Chart 36.**  
**Impact of real estate adjustment on employment (excluding construction)**

Difference with respect to assuming that construction investment follows its long term path (percentage points)



Source: BBVA ERD

starts, which are 456,000 and 385,000, respectively (around 100 million houses less in 2008 and 50,000 less in 2009). In the second scenario, the reduction in residential investment reached 8.3% in 2008 and 19.2% in 2009 as a consequence of a more intense decrease in the number of housing starts (336 million in 2008, i.e., 40,000 houses less than predicted in April, and 270,000 in 2009) (see Table 3).

The main results of the model can be summarized in two. First, the impact of the real estate adjustment on GDP and employment will be higher in 2009 than in 2008. This result is consistent with the evidence according to which in countries where construction of multi-family or block houses is important, residential investment has more inertia. Therefore, the effect of the adjustment will be higher in the medium-term than in the short-term<sup>3</sup>. Second, the effect on employment is significantly higher than the effect on activity, as the construction sector and the sectors closely related to it (the manufacture of metallic and non-metallic products, other business activities, metallurgy and metal products, the chemical industry, commerce, financial intermediation, etc.) are labour-intensive<sup>4</sup>.

Given that the deterioration in residential investment is higher than the forecasted GDP deceleration, the Residential Investment over GDP ratio (Iv/GDP) is expected to decrease both in 2008 and 2009. Therefore, if housing investment deviates from its long-term trend according to what was expected in the upper range of economic growth, the Iv/GDP ratio will be reduced to 6.8% in 2008 and 5.5% in 2009. If the real estate adjustment is even higher (lower range), then the ratio will fall 0.1% more in 2008 (up to 6.9%) and 0.4% more in 2009 (5.9%).

If the direct impact on its own sector is deducted from the total effect of the real estate adjustment on the economy, we obtain the induced effect. The results suggest that the effect of the non-real estate economy on economic growth is moderated, both in the short-term (-0.1 percentage points, pp) and in the medium-term (-0.2 pp; -0.32 pp). On the contrary, the consequences on the employment of the rest of the economy are higher: between -0.8 pp and -1.2 pp in 2008 and between -1.5 pp and -2.1 pp in 2009 (see Chart 36). Again, this result is due to the higher intensity in the use of the labour factor in the branches of activity on which the induced effect is higher. Thus, given the results obtained, one can conclude that a certain decoupling exists in Spain between the real estate sector and the rest of the economy in terms of activity, but not so much in terms of employment.

However, the adjustment that will finally take place in employment, in the real estate sector as well as in the rest of the economy, could be higher than expected. This will happen if the number of housing starts and, as a result, the residential investment are from their expected long-term path. The adjustment could also be softer in the case the projected Subsidized Houses have a positive impact, as it is analyzed in Section 3.

<sup>3</sup> See *Real Estate Watch*, December 2007, 7-8, for a detailed analysis of the effect of the type of construction on the real estate adjustment in other developed economies.

<sup>4</sup> The IOT 2000 already indicated that the impact of a deterioration of the investment in housing like the proposed has a more negative impact on employment than on GVA (Table 2)

## Effects of Credit Conditions Tightening on Housing Investment

The decrease in real interest rates between 2001 and 2007, and the development of financial markets have allowed for a more favourable access to credit, which has had an effect on levels of households' indebtedness, which is relatively high in Spain (see Chart 37). This rapid increase in indebtedness, which has possibly been the optimal response of households to favourable financial conditions and optimistic expectations of future income, may be a problem in the face of a rapid change in the macroeconomic environment like the one that has occurred since the middle of 2007. A worsening of financial conditions will undoubtedly affect the investment decisions of households. Likewise, the eventual deterioration in the real estate sector will also have effect on the consumption patterns of households via a negative wealth effect<sup>5</sup>.

With the objective of analyzing the impacts of a financial shock on the behaviour of consumers in a manner consistent at a macroeconomic level, a multi-equation econometric model of the Spanish economy has been developed<sup>6</sup>. The model includes an equation of the investment in residential housing in the form of a mechanism for error correction. In the long-term, the investment in housing will depend positively on the households' disposable income. As Chart 38 shows, the ratio between the investment in housing and the disposable family income has registered a significant increase. A second factor also crucial for the housing decisions is the cost of external funding. Chart 38 shows a measure of this financing cost that was constructed taking into account the mortgage interest rate in real terms, weighted with the households' debt burden, defined as the ratio of credit over disposable income

Together with these determining factors in the long-term, in the equation of investment in housing it is considered that the dynamics in the short-term is determined by the evolution of the households' disposable income and, moreover, by the amount of credit. This last variable tries to gather the possible direct effect of a restriction in credit on the investment in residential housing.

The model also allows quantifying the effect that a drop in residential investment has on households' consumption via a possible effect on real estate wealth. The models includes a consumption equation wherein the short-term dynamic is driven by aside the evolution of the households' disposable income, real estate wealth, real interest rates weighted by households' debt burden (ratio of consumption over income) and by availability of credit.

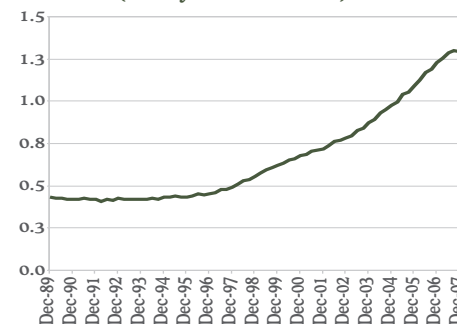
We present the results of a series of simulation exercises carried out with the model. This has the objective of quantifying the effects of the tightening in the financial markets that affect the cost and the availability of credit. The first simulation gathers the impact on the investment in residential housing and on households' consumption triggered by a negative financial shock associated with the increase in the interest rate spread which occurred since August 2007, approximately 80 basis

<sup>5</sup> See the work of Aron, Muellbauer and Murphy "Housing Wealth, Credit Conditions and Consumption" presented in the conference «Household Finances and Housing Wealth», Bank of Spain April, 2007.

<sup>6</sup> The starting point is the model developed in the BBVA ERD by Broto, Cubero and Escrivá "Decisions on expense and credit in Spanish households and interest rates", *Spain Watch*, November 2005.

Chart 37.

### Spain, Ratio of loans / disposable family income (Yearly Accumulated)



Source: BBVA ERD

Chart 38.

### Housing Investment, Households' Disposable Income and Interest Rates



Source: BBVA ERD

Chart 39.

### Spain, Mortgage Interest Rate

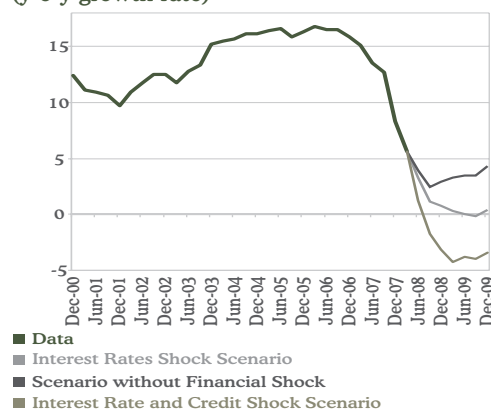


Source: BBVA ERD

Chart 40.

### Spain, Household Credit (real)

(y-o-y growth rate)



Source: BBVA ERD



Chart 41.  
Residential Housing Investment

(% y-o-y Growth Rate)

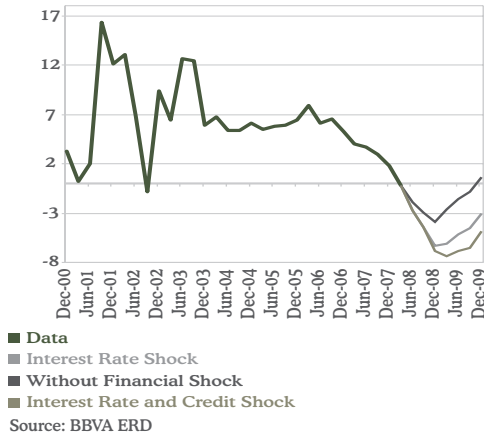


Table 5. Impacts of financial shock

Interest rate shock	2008	2009
Mortgage interest rates	0.8	0.8
Household credit	-1.0	-3.5
Private consumption	-0.3	-0.4
Housing investment	-1.2	-3.6

Interest rate + credit shock	2008	2009
Mortgage interest rates	0.8	0.8
Household credit	-3.2	-7.5
Private consumption	-0.3	-0.7
Housing investment	-1.3	-5.3

Note: All the variables are expressed in real terms, except for the interest rates. The figures indicate deviations from the average year-on-year growth rate of a shock-free scenario.  
Source: BBVA ERD

points, as it is shown on Chart 39. As can be observed in Chart 40, the increase in interest rates reduces credit in a significant way: one percentage point (pp) on average in 2008 and 3.5 pp in 2009. The tightening of financial conditions has also a negative effect on residential housing investment, which decreased an average of 1.2 pp in 2008 and 3.6 pp in 2009. The deceleration that this financial shock implies directly impacts housing investment, as illustrated in Chart 41. The drop is approximately 1.2 pp on average for the year 2008 and 3.6 pp in 2009. The impact of the financial shock has also effects on households' consumption, both directly and via lower real estate wealth. Therefore, consumption decreased approximately 0.4 pp on average in 2008 and 2009, even reaching negative year on year growth rates in early 2009.

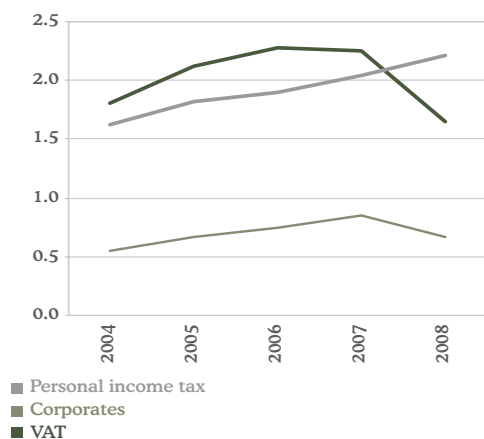
In the second simulation, we considered a scenario in which it was assumed that aside from the shock in interest rates there is also a reduction in the availability of credit. Specifically, the year on year credit growth rate, in real terms, in the last two years was considered to be 3 pp less with respect to the previous scenario. In this case, the simulations show that the negative impact on residential investment and consumption is intensified. Thus, with respect to housing investments, the decrease for 2009 is more than 5 percentage points in relation to the situation where there was no financial shock. Consumption would fall one percentage point with respect to the same scenario.

## Box 1: Fiscal revenues related to construction and the real estate sector

The current economic deceleration is slowing down the revenue growth in the Public Administration. According to the last figures on the execution of the State budget in June 2008<sup>1</sup> a decrease in the accumulated non-financial revenue of 4.8% has been observed with respect to the period January-June 2007. This drop is more noticeable in tax revenues, in particular in Value Added Tax and in Corporate Taxes, which have experienced a 21% and 26% decrease, respectively, compared to the same period in the previous year.

Chart 1.  
Central Government: Main revenue figures  
Cash Criteria

Accumulated balance in June of every year.  
In percentage of GDP



Source: BBVA ERD based on MEH

The decrease observed in tax revenues is not only due to tax discounts and calendar effects, but also due to the contraction of economic activity, in particular noticeable regarding real-estate and construction.

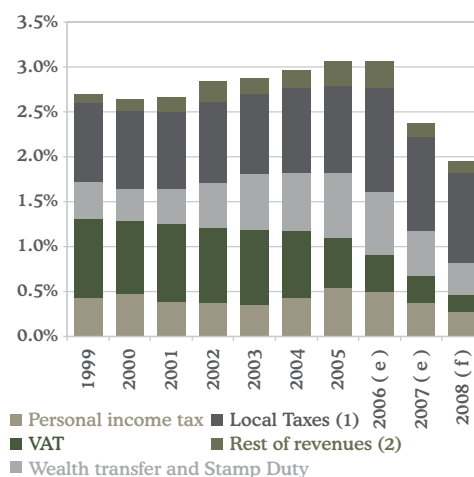
This adjustment in the real estate market had a first impact on taxes directly related to this activity<sup>2</sup> in 2007. In fact, revenues directly related to real estate were 24,831 million euros, a 17% less than in 2006. The drop has been more intense in those taxes which, by their nature, are more sensitive to the situation of the sector such as Wealth Transfer Tax and Stamp Duty, which accounted for 0.7% of GDP in 2006 and 0.5% in 2007; and the VAT, which has been moderating since 2005 and accounted for 0.3% of GDP in 2007 (0.1% less than in 2006). The deceleration has also

<sup>1</sup> State revenues only, excluding regional and local governments and Social Security.

<sup>2</sup> The revenues directly related to construction and real estate are the part of the income tax related to wealth increases, VAT, Wealth Transfers, Stamp Duty, local taxes (ICIO, IVTNU and IBI) and revenue derived from special contributions, sale of land and real estate income. For further information see Real Estate Watch, January 2007, "The impact of real estate on public finances".

affected the rest of the taxes which, although together they hardly represent 1.4% of GDP, have registered a drop in their collection by 0.2% with respect to 2006.

Chart 2.  
Public revenue directly related to construction  
activity  
(% of GDP)



(1) ICIO, IVTNU and IBI;  
(2) Special contributions, Real-estate income and Sale of land  
Source: BBVA ERD

Among the rest of real-estate revenues, the most affected have been those coming from the sale of land, which have been reduced by more than half, accounting for 0.1% of GDP in 2007, while in 2006 they represented 0.3% of GDP.

The forecast for these revenues for 2008, in a scenario of a more intense adjustment of the housing sector, confirms a higher decrease of collections, reaching 21,500 million euros, or 2% of GDP, 0.4% less than in 2007.

To this direct impact we should add the portion of tax revenues that comes from construction and the real estate sector via business profits; employment creation and higher payroll. We can estimate this impact using the proportion that construction represents on the total economy in terms of Gross Value Added, employment, and wages<sup>3</sup>.

In total, the construction and real estate sectors accounted for 28,250 million euros, which represents 2.7% of GDP and 6.6% of the non-financial revenues in 2007. The tax calendar causes a delay in the effects of the real estate

<sup>3</sup> The estimation of construction and real estate related revenues has followed the following criteria: income tax, according to the ratio of employees in the sector divided by total employment and their wages; corporate tax, according to the ratio of collections related to the sector divided by the total (see the "Report on National Accounts IS" by AEAT); social contributions according to the ratio of construction divided by GDP.

adjustment on these taxes. Therefore, taking into account the development of economic variables related to their tax bases; during 2008 these resources will decrease by approximately 0.2%, up to accounting for 2.5% of GDP by the end of the year. The drop in collections will be higher in 2009 when the Personal Income Tax (IRPF) and Corporate Taxes will be due.

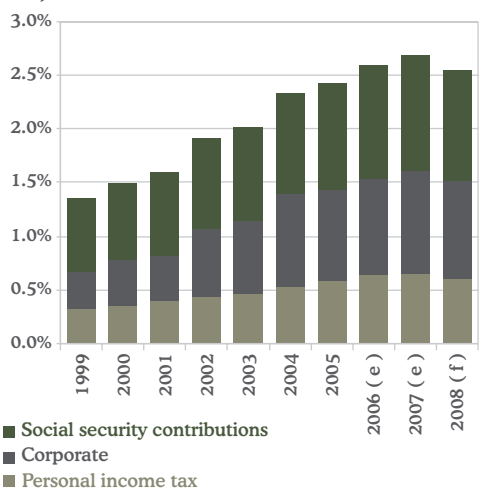
Among them, the most affected taxes will be the Wealth Transfer Tax and Stamp Duty, whose collection belongs exclusively to the autonomous regions. Nevertheless, the impact on regional budgets will be limited, these taxes only account for 7.5% of their non-financial revenues.

The local corporations, with 30% of their non-financial resources related to the sector, are those that will suffer the most. However, the impact will be less severe than expected, given that approximately 50% of the real-estate revenues comes from the real estate tax (IBI), which is not related to the economic cycle.

In summary, we forecast that tax revenues will fall in 2008 up to 37% of GDP, 0.8% less than in 2007. Of this decrease, 0.6% can be attributed to the deceleration in construction and real estate markets, due to their direct as well as indirect effects.

**Chart 3.**  
**Public revenues indirectly related to real estate activity**

(% of GDP)

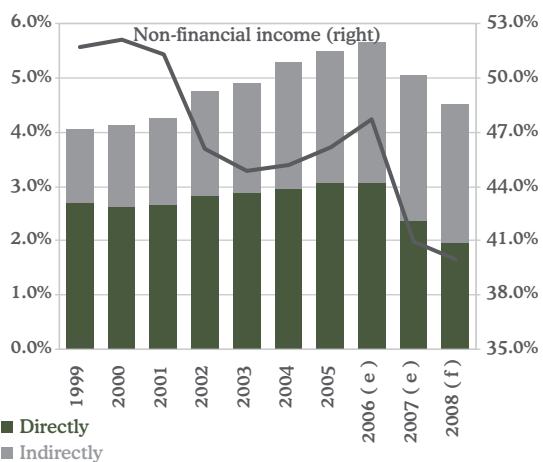


Source: BBVA ERD

Summing up two effects, direct and indirect, construction and real estate sectors will account for 11% of total non-financial revenues of the Spanish Public Administration in 2008, which represents 4.5% of GDP, 0.6% less than in 2007 and 1.2 percentage points less than in 2006.

**Chart 4.**  
**Public revenues related to real estate activity**

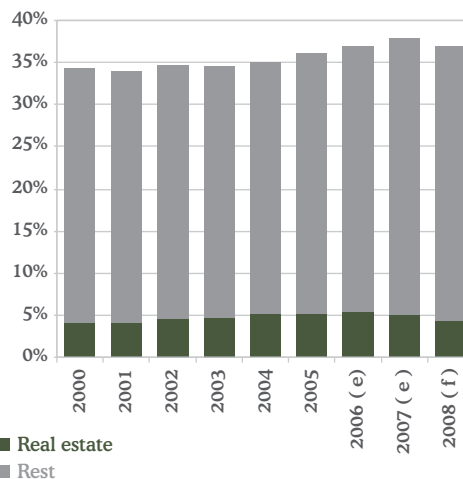
(% of GDP)



Source: BBVA ERD

**Chart 5.**  
**Tax revenue of the Public Administration**

(% of GDP)



Source: BBVA ERD

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## Box 2: The real estate and construction sectors according to their M&A operations

The Mergers and Acquisitions (M&A) activity has experienced a strong deceleration at international level since mid-2007. The combination of higher premiums in the interbank markets, and the subsequent tightening of credit conditions, has substantially reduced Leveraged Buy Outs (LBO). Besides, the worsening of cyclical perspectives has also contributed to making the non-organic growth alternative less attractive.

Spain has also followed this international trend, a situation that is not surprising given the close links between Spanish and global developments. However, in Spain sensitivity is higher, such that in a good cyclical moment corporate activity grows more in Spain than in the rest of the world and it deteriorates more in times of uncertainty, as it is the case now. Moving forward, the low volume of M&A operations could continue in a medium-term horizon, in Spain and in the rest of the world, due to the difficulties that the financial sector is going through.

In this box we will try to show the real estate and construction sector perspectives according to their developments during the last few years. In a framework of uncertainty due to the real estate sector adjustment and the deterioration of the Spanish economic situation, the construction sector is better positioned than the real estate sector to face the current scenario.

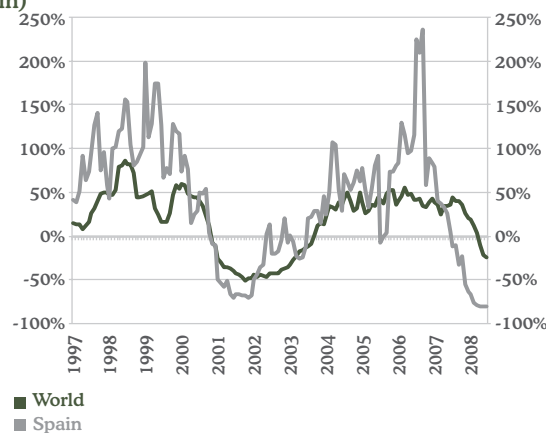
The dynamism of sectors related to housing in Spain was reflected in the protagonism of construction and real estate sectors in mergers and acquisitions during the last few years. M&A originated in Spain reached a maximum in 2006. In this period there were some very important operations which affected the aggregate numbers and that perhaps caused an excessive deviation over what could have been a more sustainable growth trend. Thus, the moderation in the activity of both sectors in 2007 could be interpreted as a return to the average level of the last few years. Corporates involved in recent acquisitions are now consolidating these operations.

However, the behaviour of these two sectors during the years of easy funding has not been the same. For example, in both sectors the bulk of operations were done within the national territory, although some construction sector operations were international. However, both sectors are different in terms of the sector of the acquired company. While the real estate sector operations are mainly within its own sector, construction has preferred to diversify towards other sectors, mainly energy-related.

Therefore, we have two very different sectors: i) real estate, which is very concentrated in its own sector, and ii) construction, which was already a more diversified sector, and is now even more diversified due to its M&A operations.

Chart 1.  
M&A operations

(yoy growth of operations originated in the world and in Spain)

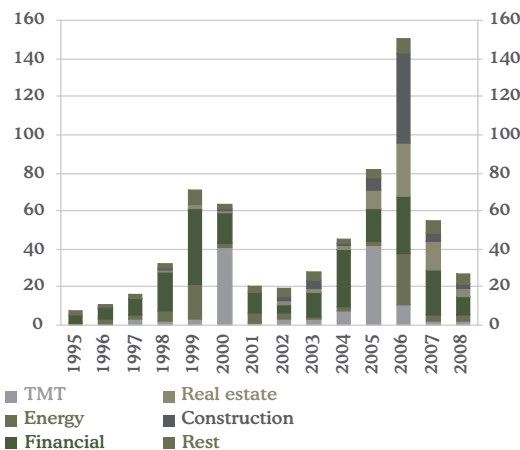


Source: Thomson One

Chart 2.

### Spain: completed M&A

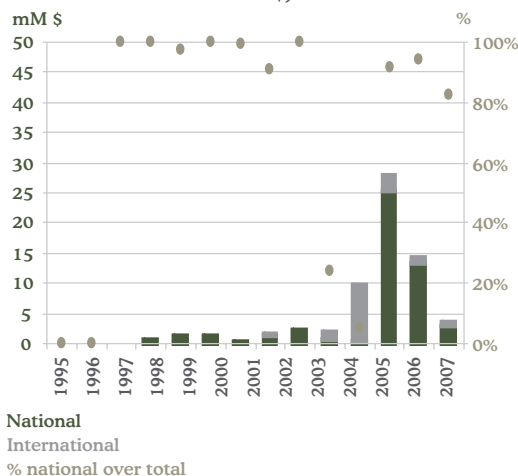
(disaggregated by sector of the bidder in bn \$)



Source: Thomson One

Chart 3.

### Spain: completed M&A by the real estate sector (disaggregating by nationality of the target firm. 12 months accumulated in bn \$)



Source: Thomson One

We should also take into account the M&A received, as it can be a support for these sectors. Have the Spanish real estate and construction sectors been net receivers or net issuers of flows? At first sight, the fact that the real estate sector has been a net receiver of M&A flows in the last few years should constitute a support, but a deeper analysis reveals that the numbers have been influenced by the recent sporadic sale of real estate properties by certain financial entities. Thus, it is not a factor that we can expect to be permanent. Regarding the construction sector there is no clear pattern, apart from the fact that the purchase in 2006 of the British Airports Authority (BAA) by Ferrovial made the sector look like a net issuer of flows. In any case, the construction sector does not seem to be very much influenced by the negative view that the world may have on Spain.

In this framework, the real estate sector could be considered more vulnerable going forward. First, real estate companies have a significant national presence and they are highly concentrated in their own sector. Therefore, they have a higher exposure to a sector that is going through a strong adjustment process and to one of the countries where GDP forecasts for 2009 have been revised downwards. Second, it does not seem likely to be receiving flows from outside while our international image continues to be so negative. The different episodes of difficulties recently experienced by real estate companies reflect the deceleration of the sector. In the current context of liquidity scarcity, we do not forecast significant M&A operations in the sector in the short term. The most likely scenario could be a consolidation process starting from the trough of the cycle.

On the other hand, the construction sector has a higher international presence and a higher diversification in terms of sectors, which allows it to face the current situation in a better position. Thus, the perspectives for the construction sector are better, in particular taking into account the operations related to the energy sector that are taking place at the moment. New developments in the sector could allow construction companies to undertake new investments and to continue playing a key role in the economy.

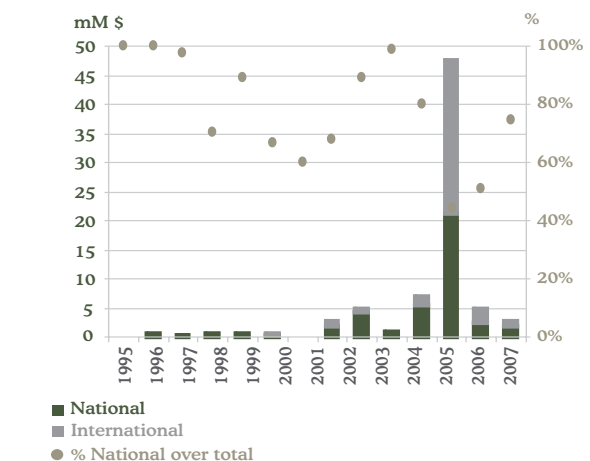
Nicolás Trillo  
BBVA Economic Research Department

Chart 4.  
**Spain: completed M&A by the real estate sector**  
(disaggregating by the sector of the target firm.  
Accumulated 12 months in bn \$)



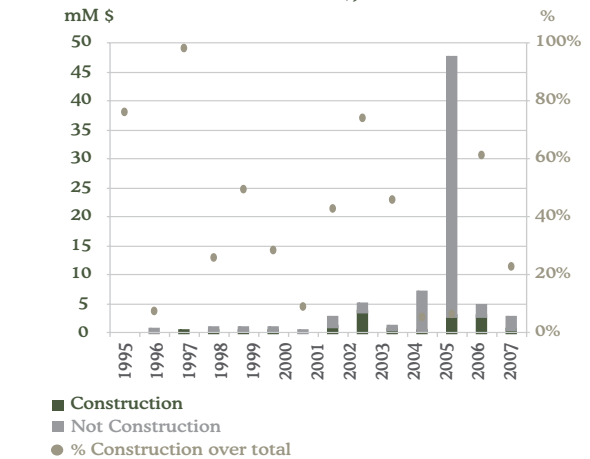
Source: Thomson One

Chart 5.  
**Spain: completed M&A by the construction sector**  
(disaggregating by nationality of the target firm.  
Accumulated 12 months in bn \$)



Source: Thomson One

Chart 6.  
**Spain: completed M&A by the construction sector**  
(disaggregating by nationality of the target firm.  
Accumulated 12 months in bn \$)



Source: Thomson One

## 2. The Spanish residential sector, a heterogeneous adjustment

### A more intense than expected adjustment in terms of quantity but not in terms of prices

Since mid-2006 the Spanish residential market has been going through a period of adjustment; after a long phase of strong growth. However, during the last few months the adjustment is becoming more intense than expected both in terms of housing permits and transactions, but not in terms of prices.

In particular, the adjustment in construction activity has been more pronounced since the second quarter of 2007, as shown by the BBVA's Synthetic Indicator of Construction Activity. This indicator forecasts the dynamics of supply variables such as housing investment and new housing permits.

Housing permits reached a peak in September of 2006, due to the new Spanish Technical Building Code (CTE). From that moment, permits have been decreasing, showing an accumulated drop, in the last 12 months until May, of 47% compared to the same period of the previous year. Adjusting for the CTE effect, the permits for May fell about 39%.

This growth in construction permits is not only the lowest of the historical data but it is also below expectations. Thus, the figures of May are below the lower range of our forecasts. The number of permits for new construction is estimated to be between 336,000 and 456,000 for 2008, and between 270,000 and 385,000 for 2009.

This negative surprise also occurs in the number of housing transactions, an indicator of housing demand, in a framework of deteriorating consumer expectations. In fact, housing demand started to moderate since the end of 2005, when the cycle of the monetary policy of the ECB changed. The adjustment has been more intense in existing houses than in new houses. Thus, the former started to decline in 2006 while the latter recorded the first negative growth rates during the third quarter of 2007. Latest data, as of March 2008, issued by the Ministry of Housing, show drops of 32% for existing houses and 13% for new houses. The fact that a high proportion of new houses were acquired before construction helps explaining this delay in adjustment.

This drop in transactions has been reinforced by the increase in the effort that households have to make to acquire a house. In 2007 this effort was estimated at 29% of annual households' disposable income, the highest level in the last 10 years. However, this upward trend is expected to change by mid year, so that the level of households' affordability index will be lower by the end of 2009 than at the end of 2007. This change will be due to the behaviour of housing prices and by the path of the official interest rate, which is expected to start decreasing in 2009.

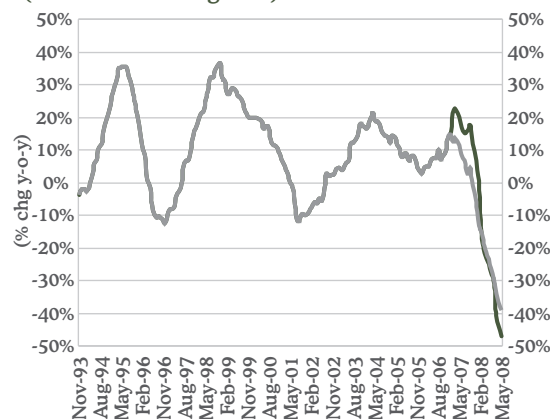
In turn, the adjustment to the strong increase in prices observed during the first few years of the decade, started in early 2005, when growth rates of general housing prices went down to levels below 15%. The

Chart 1.  
Spain, Synthetic Indicator of Construction Activity (housing)  
(% yoy growth rate)



Source: BBVA ERD

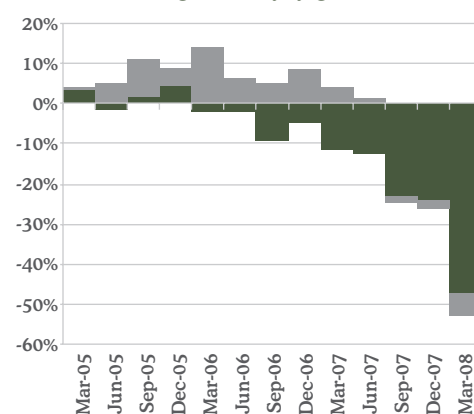
Chart 2.  
Housing permits  
(12 month moving sum)



■ Original  
■ Corrected CTE

Source: BBVA ERD and Ministry of Public Works

Chart 3.  
Housing transactions  
(3 month moving sum % yoy growth rate)

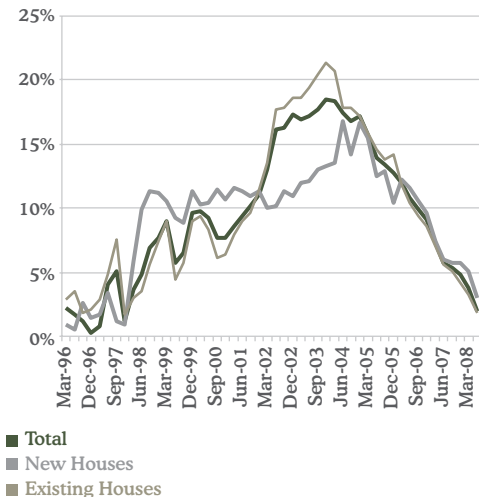


■ Existing housing  
■ New housing

Source: BBVA-ERD and Ministry of Housing

Chart 4.  
Spain: housing prices

(% yoy growth rate)



Source: BBVA-ERD and Ministry of Housing

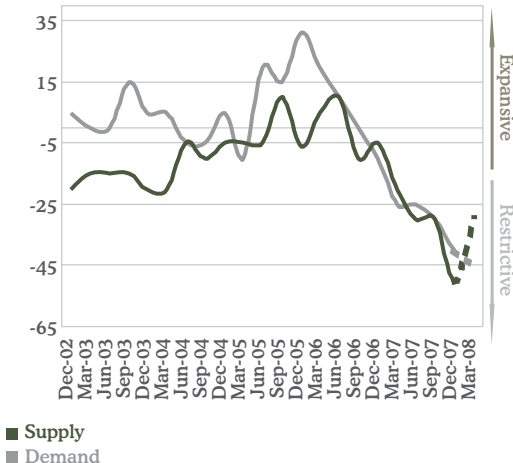
dynamics of moderate growth have continued until present, with latest data, from June 2008, showing a 2% growth, year-on-year. At the moment, prices of existing and new houses and recent growth rates of prices are very similar.

However, during the last years of the 90's and the first few years of the present decade, prices of new houses grew faster, increasing the distance with prices of existing ones. This trend changed during 2001 when prices of existing houses started a dynamic period that led up to an average rate close to 18% until the end of 2003.

Since that moment, the evolution of the price of existing and new houses has been more similar, which has implied that current prices and growth rates are more or less the same for both categories. The equilibrium could be in the same level of prices: the preference for better locations, in particular in the case of existing houses, would seem to counterbalance their lower quality. The forecasted price-growth rates are of 0.8% in 2008 and a decrease of 2.1% in 2009.

Chart 5.  
Bank lending Survey

Mortgages



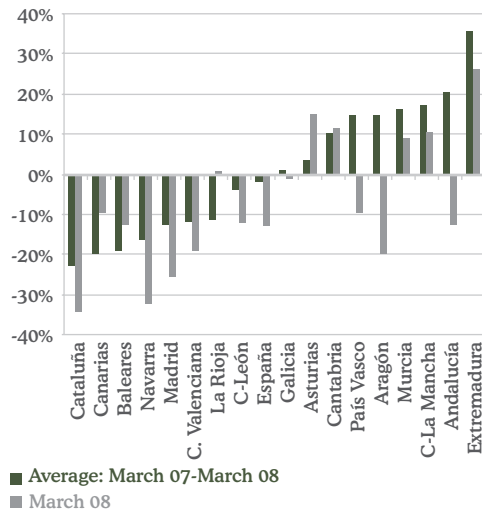
Source: BBVA ERD and BoS

The adjustment that is taking place in the real estate market is also having effects in the mortgage market, both in the number of mortgages and in the average amount of the operations. Since mid-2007 the number of mortgages granted has shown negative growth rates, registering an accumulated drop of 25% in the period January-May 2008. The average amount showed the first negative growth rates at the beginning of the current year, and it is still on that trend.

Moreover, the Bank Lending Survey shows that the demand for housing credit has been moderating since the end of 2005, when it recorded high levels. Since mid-2006 the tightening of credit conditions implied more sustainable credit growth rates.

From a national perspective it is clear that the current adjustment is more intense than originally expected. This process has been more intense in terms of quantity than in terms of prices. However, the unexpected increase in the intensity of the adjustment in transactions makes us forecast a more intense adjustment in housing supply.

Chart 6.  
New housing transactions growth



Source: BBVA ERD and Ministry of Housing

**Regional analysis: different intensity of the adjustment**

An additional characteristic of the real estate adjustment is that, although generalized in the entire national territory, its intensity is turning out to be different among the autonomous regions. This happens in particular for the adjustment in new houses transactions, since the average drop in the last twelve months in areas like Cataluña, the Canary Islands, the Balearic Islands, or Navarra reaches 20%, while in Extremadura, Castilla-La Mancha or Murcia the average for the last quarter was positive and above 10%.

The evolution of existing housing transactions, prices and housing permits also reflects the heterogeneity of the regional adjustments. However, except for prices, this trend is disappearing over time.

In view of the variety of the regional markets, the question is "what determines the different intensities of the adjustment?" There are two possible explanations that can be both true. On the one hand, the

different growth rates in the path have created a different scenario which, in face of a cycle change, will need a more or less pronounced adjustment. On the other hand, the different evolution of the fundamentals that determine the demand and supply of housing at a regional level will play a role. Therefore, if the evolution of housing affordability indicators, of the ratio of employees per household, of the rhythm of households' formation or the real growth of wages is showing a different intensity among autonomous regions, we should also expect a different adjustment of supply and demand in the real estate sector.

In the *Real Estate Watch* of June 2007 the determinants of geographic dispersion in the expansion of housing prices were analyzed. The asymmetry in the evolution of fundamentals (per capita income, average employment rate per household and interest rates) contributed to the generation of different price cycles among the different provinces. Now, we have to identify the determinants of the intensity of the already started adjustment.

Table 1. Average growth rate

	Price		Housing permits		Total transactions		New housing transactions		Existing housing trans.	
	March 04- March 06	June 06- March 08	March 04- March 06	June 06- March 08	March 04- March 06	June 06- March 08	March 04- March 06	June 06- March 08	March 04- March 06	June 06- March 08
<b>Spain</b>	<b>15.3%</b>	<b>7.1%</b>	<b>8.5%</b>	<b>-12.6%</b>	<b>8.7%</b>	<b>-9.2%</b>	<b>19.1%</b>	<b>5.3%</b>	<b>6.0%</b>	<b>-12.8%</b>
Andalucía	17.5%	7.8%	11.1%	-19.2%	6.0%	0.6%	15.2%	19.6%	1.4%	-12.2%
Aragón	15.3%	8.2%	17.0%	0.3%	14.1%	-9.8%	45.1%	7.0%	1.2%	-21.5%
Asturias	11.0%	8.3%	3.6%	-1.7%	8.7%	-2.6%	27.4%	9.4%	-1.1%	-10.4%
Baleares	12.8%	8.6%	-0.5%	-5.0%	18.0%	-3.4%	42.4%	8.8%	10.4%	-8.3%
Canarias	10.6%	6.6%	-10.2%	-2.8%	4.3%	-7.0%	17.3%	-5.8%	-3.9%	-6.9%
Cantabria	11.9%	8.7%	30.6%	3.3%	12.5%	-8.4%	17.4%	13.4%	9.6%	-26.3%
C-La Mancha	18.3%	6.4%	25.9%	-10.6%	19.4%	3.2%	41.0%	22.6%	4.8%	-19.1%
C-León	11.7%	7.0%	8.8%	-10.0%	12.7%	-0.9%	29.9%	13.7%	2.2%	-12.4%
Cataluña	11.9%	8.1%	13.0%	-19.2%	19.0%	-23.7%	22.1%	-10.1%	17.9%	-29.7%
C. Valenciana	17.0%	6.0%	3.4%	-10.2%	1.1%	-13.3%	15.1%	-4.1%	-7.1%	-20.4%
Extremadura	13.2%	7.7%	21.6%	7.1%	2.1%	4.6%	16.9%	28.1%	-2.8%	-6.8%
Galicia	14.2%	10.9%	17.5%	-3.1%	19.7%	-1.5%	33.4%	1.0%	4.9%	-4.4%
Madrid	11.9%	4.1%	-1.6%	-19.5%	0.6%	-18.9%	6.5%	-4.0%	-2.3%	-28.8%
Murcia	14.7%	8.4%	26.0%	-4.7%	12.7%	-6.9%	18.4%	20.2%	9.9%	-29.0%
Navarra	9.6%	4.1%	5.7%	-12.9%	26.6%	9.9%	36.6%	38.7%	22.0%	-10.3%
País Vasco	11.2%	7.4%	4.8%	-8.1%	24.0%	4.9%	28.6%	22.4%	22.5%	-4.9%
La Rioja	12.7%	5.4%	14.8%	-1.9%	-0.1%	-5.6%	9.2%	14.6%	-4.8%	-25.9%

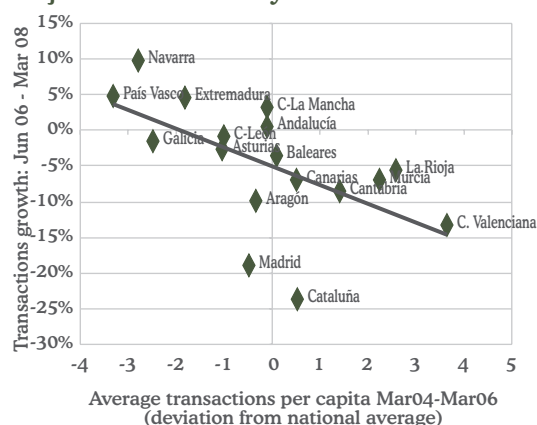
Source: BBVA-ERD, Ministry of Public Works and Ministry of Housing

## Regional analysis: different intensity of the adjustment. The accumulated imbalance

Identifying the accumulated oversupply in the real estate sector is not an easy task with the available statistical information. Because of this, it is only possible to construct partial indicators of imbalance. In this case, we have chosen to use the difference between the average growth in the number of transactions (or construction permits) per capita in each autonomous region and the national average as an indicator of the relative imbalance.

Regarding transactions it is clear that in the regions where the highest transactions per capita were registered, the recent adjustment is more

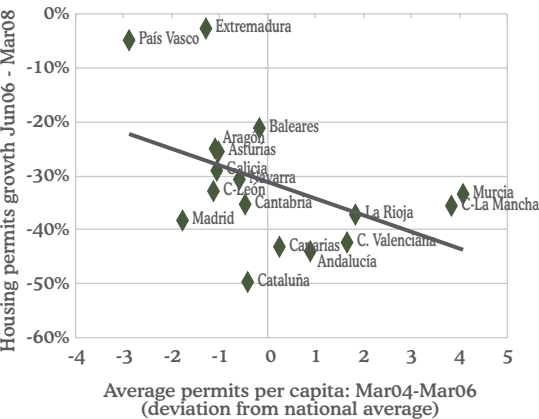
Chart 7.  
Transactions: growth disadjustment vs adjustment intensity



Source: BBVA ERD

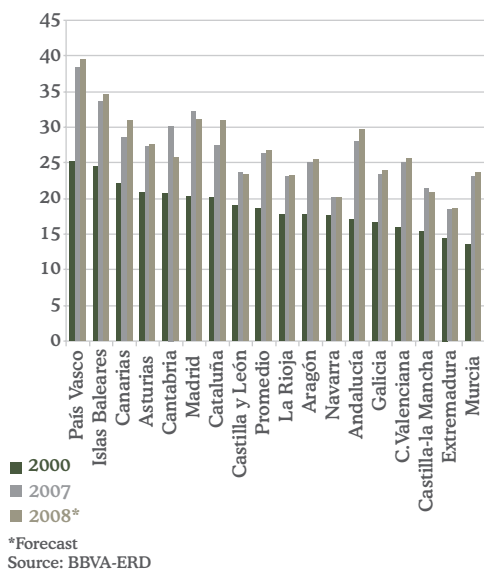


Chart 8. Housing permits: growth disadjustment vs adjustment intensity



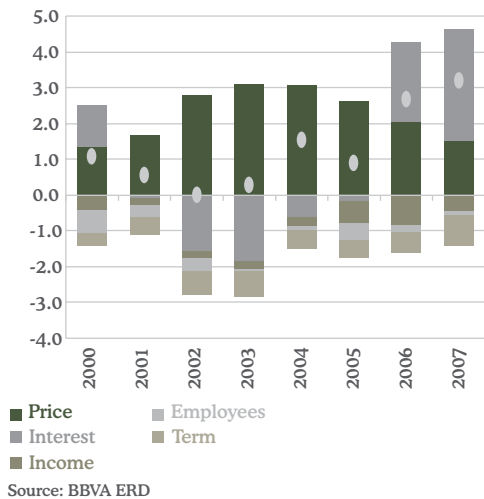
Source: BBVA ERD

Chart 9. Forecasted housing affordability per Autonomous Region



Source: BBVA-ERD

Chart 10. Contributions to changes in housing affordability



Source: BBVA ERD

intense. In fact, the Basque Country, Navarra, and Extremadura, which together with Galicia, were the autonomous regions which showed the lowest average growth of per capita transactions compared to the national average have showed a positive average year-on-year growth during the last two years of the deceleration.

The same happens regarding permits: the autonomous regions which registered a higher growth compared to the national average in permits per capita are the ones that have registered a more intense adjustment in the past twelve months.

However, the adjustment in prices is different. The difference between the price observed and the fundamental price estimated for the year 2006 by BBVA Economic Research Department<sup>1</sup> does not have any relationship with the intensity of the deceleration registered.

### Regional analysis: different intensity of the adjustment. The cyclical adjustment of the fundamentals

The traditional supports of the housing market are also adjusting in a different way within autonomous region. Therefore, one should expect a more intense housing adjustment in the regions where *fundamentals* are deteriorating more rapidly or in a more intense way.

The BBVA Affordability Indicator, which is a summary of the different support factors of the residential housing market, has shown increasing growth rates throughout the entire recent expansionary phase. Therefore, it cannot be used to explain the current cyclical adjustment.

However, if we break down the evolution of the indicator in its fundamental components, it is possible to observe how the ratio of employees per household, wages, and interest rates, are variables that help explaining housing affordability.

The ratio of employees per household shows that, despite its regional heterogeneity – growing 3% in Cantabria, and falling in the Canary Islands at a rate of more than 6% -, it does not seem to explain the intensity of the adjustment in transactions, permits or prices. This lack of correlation at a regional level is possibly due to related to the fact that, despite in most regions the recent evolution of the ratio of employees per household has acted as a support factor, in some – Asturias, Cantabria, Murcia, La Rioja and Castilla-Leon – there is no correlation.<sup>2</sup>

The case of the role of real wages is different. During the last five years real wages have been stable, growing from March 2002 to March 2008 at an average rate of 0.2% according to the *Quarterly Survey of Labor Cost*. However, they are showing positive rates since September 2006. In any case, its regional evolution has also been heterogeneous.

In March 2008, real wages growth at a regional level ranged from the highest growth of 1.5% in Castilla-La Mancha, Extremadura, the Basque Country and La Rioja and the drop of almost 1% in Galicia. Despite the fact that the evolution of real wages does not seem to influence

<sup>1</sup>For details on the indicator of divergence between observed and fundamental prices in 2006, see *Real Estate Watch of June 2007*

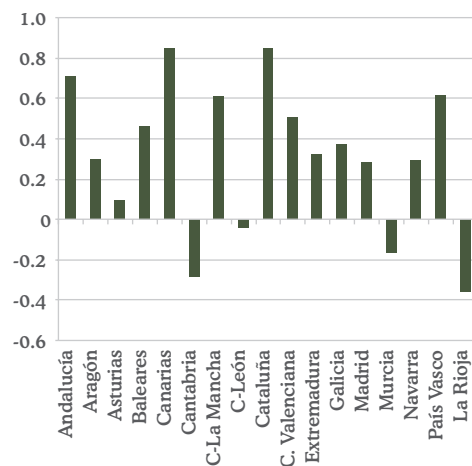
<sup>2</sup>The absence of a relationship between both variables can be attributed to, in the case of the first four regions, the potential sample errors of the *Labour Force Survey (EPA)* for regions with only one province, which show a higher volatility in the variable *employees per household*.

transactions, permits and prices, results indicate that the regions where real wages are growing at a higher rate are those where the drop in transactions is more intense. However, the relationship is not too strong.

In summary, divergences in the adjustment of the real estate market among autonomous regions seem to be due to the importance of the accumulated imbalances in quantities but not in prices. Moreover, the real estate cycle, both at regional and national level does not seem to be caused by the affordability indicator. However, the relationship is clearer with its components: the ratio of employees per household and the real wages, although not in a homogeneous way among regions.

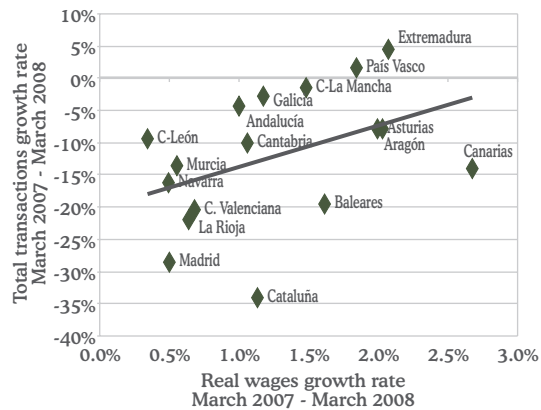
Chart 11.  
Correlation between total transactions and the ratio of employees per household

(March 2005 - March 2008)



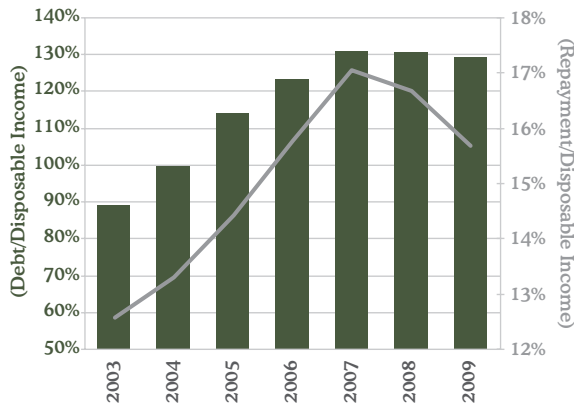
Source: BBVA ERD

Chart 12.  
Regional adjustment: different intensity. Total transactions vs fundamentals: real wages



Source: BBVA ERD

Chart 1.  
Households' Debt Burden and Indebtness



Source: BBVA ERD

### 3. The supports of the economy continue to play a stabilizing role

**The positive steps taken in the period of prosperity will not disappear in the next phase**

It should be kept in mind that during the last few years of bonanza, the Spanish economy made significant achievements, which will not necessarily disappear in the next phase. These factors will be a support for the construction sector, both residential and non-residential. In particular, investment in the non-residential sector accounts for approximately 8% of GDP, and this percentage has kept on growing continuously during the last decade.

In the first place, and from a supply perspective, there is an important decoupling between construction and the rest of the productive sectors, which show a better development in terms of employment and an important dynamism in their export quotas. On the one hand, the Spanish economy continues to generate jobs in a more flexible way, via the increase in the female and immigrant active population. Despite the deterioration of the economic situation, Spanish households continue showing a solid wealth position. In fact, households' indebtedness accounts for less than 14% of their net worth (this ratio being equivalent to more than 30% in countries like Sweden or the Netherlands). Moreover, Spanish households have experienced a noticeable increase in their level of per capita income in the last few years. Additionally, the existence of a solid financial system, which has improved the mortgage supply during the last few years, will continue to constitute a support for the future. Lastly, the public sector has a healthy fiscal position, which will allow to implement counter-cyclical policies.

More specifically, among the measures announced by the government to support the Spanish real estate sector stands out is the boost in State Subsidized Housing (SSH) and the non-residential public investment. These two alternatives will be analyzed in greater detail.

#### Who does the State Subsidized Houses protect?

In the framework of the current adjustment in residential investment, the government is resorting to the promotion of SSH as a reactivating measure for the sector. However, it is convenient to analyze whether this measure is in fact stabilizing, and if it is the most convenient at the moment.

As it was highlighted in the Presidential Economic Report of 2007, the government has proposed diverse measures to boost the SSH. During the current legislature, around 150,000 SSH a year will be promoted (versus the 90,000 that were constructed during the last few years), of which for the first time 40% would go to the rental market. Besides, a minimum reserve of 30% of the new residential building land will be allocated to the construction of this type of houses. The Institute of Official Credit (ICO) will award 5,000 million euros in guarantees for securitizations that incorporate SSH loans. Lastly, the possibility of reclassifying already constructed available houses as SSH to facilitate their sale in the market was also mentioned. In any case, it is important to emphasize that despite the new boost

Chart 2.  
Number of Subsidized Houses:  
National and Regional



Source: BBVA ERD based on Ministry of Housing

that is being given to this policy, the SSH is not a tool as important as it was in the past since the subsidized houses that are currently being finished only account for 10% of the total, compared to the 24% that they were in the crisis of 1993.

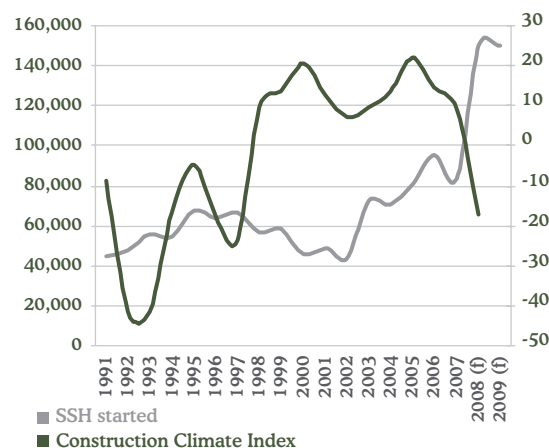
However, can the SSH policies become an important support for the residential demand? In the past they used to be, as traditionally the SSHs were finished at moments when access to housing was more difficult. Between 1995 and 2007 the indicator of the effort needed to buy a house and the number of SSHs finished showed a positive correlation. However, the new SSHs initiated now will be completed in two years, when the predicted reduction of official interest rates will make access easier.

Where the state subsidized housing can have a certain positive effect in the short-term is on the residential supply. In fact, the Construction Climate Index that the Ministry of Industry, Tourism and Commerce provides indicates that the confidence of the builders is deteriorating rapidly. In fact, the index has entered negative territory during the first months of the year. At the same time, not-subsidized housing starts have gone from almost 700,000 in 2006 to barely half-a-million last year. Thus, increasing the usual number of subsidised housing starts by 60,000 units could help avoid the collapse of the sector.

In any case, the estimates do not seem to indicate that this measure can have a key influence in the housing supply. In fact, supposing that the 150,000 new SSHs starts are added to the total of houses under construction, such that there will be around 177,000 SSHs under construction in 2007 (12% of the total), 206,000 in 2008 (16%) and 270,000 in 2009 (26%), the effect on employment figures will be soft. The estimates point out that the jobs generated by a policy change would be around 60,000 workers this year and 100,000 in 2009.

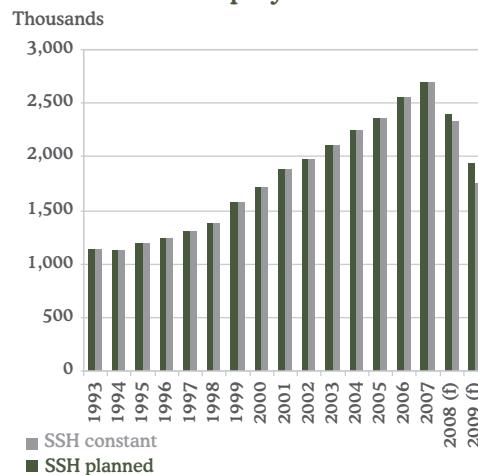
In a nutshell, the boost given to SSH will have a certain positive effect on the sector, although it will benefit more the builders participating in the new SSHs than the demand of housing. Nevertheless, its impact in terms of construction jobs will be relatively moderate. Besides, for those builders who do not participate in this type of houses, its effect could be negative, since the arrival of more SSH houses at low cost could force them to reduce their prices and the new houses would constitute serious competition for the available housing stock they have for sale.

Chart 3.  
Subsidized Housing starts and Construction Climate Index



Source: BBVA ERD based on Housing Ministry and Ministry of Industry, Tourism and Commerce

Chart 4.  
Construction Employment



Source: BBVA ERD based on Housing Ministry and INE

## Investment in infrastructures in Spain as a counter-cyclical<sup>1</sup> policy

### Public investment in infrastructures is one of the stabilization policy options

Public investment is one of the most relevant public expense items, not so much for its magnitude but, above all, for its effects on economic activity. In fact, the potential growth of the economy and the redistribution of income between regions depends, among other factors, on public capital (stocks of highways, airports, trains, ports, hydraulic infrastructures, urban structures and educational and health infrastructures). Infrastructures reduce the transaction costs for the private sector.

Using the BD MORES<sup>2</sup> database, the rate of public investment in infrastructures (including direct investment made by the government, by public enterprises and also in assets of public use like toll roads) was 4.8% in 2007, a rate similar to that reached at the beginning of the 90s. In fact, as can be observed in chart 5, the real investment rate on infrastructures has increased almost continuously since 2000.

Within the investment in non-residential construction (which includes the investment in offices and commercial centres, among others), the investment in infrastructures (both building new ones and maintenance of the existing ones) accounts for around 60%. By type of capital, the bulk of the stock of infrastructures corresponds to transport infrastructures (highways, roads, railways...). By investor, the Central Government, the Autonomous Regions, and the local corporations invest more or less the same amount.

### The empirical evidence in Spain shows that in two out of the last three decelerations, the rate of investment in infrastructures increases, contributing to soften the adjustment.

Usually, when the economic literature analyzes the economic impact of public infrastructures, since the papers by Aschauer (1989a and 1989b)<sup>3</sup>, it uses a production function. In this framework, the *output* is a function of the traditional factors (private capital and employment) and also of public capital infrastructures. A rise of 10% in the stock of public capital will allow for a long-term increase in GDP of about 0.5% to 1.0%<sup>4</sup>.

Besides, the economic literature has also pointed out the possible stabilizing role of public investment: in times of economic deceleration,

Chart 5.  
Real investment rate: non-residential construction  
(% GDP)



Source: INE, BDMORES and BBVA ERD

<sup>1</sup> We would like to thank Javier Escribá for providing us with an up-to-date data base and to Rafael Domenech for his comments.

<sup>2</sup> The public investment series were extracted from the latest B.D. Mores data base, developed by the Ministry of Economy. (see to Dabán, T.A. Díaz, F.J Escribá and M.J. Murgui (2002). "The B.D. Mores data base", Revista de Economía Aplicada (30), p. (165-184). This data base contains investment and stock series by agents (public administration and non-public administration), by Autonomous Regions and by type of infrastructure. The series can be compared to Regional and National Accounts published by the National Institute of Statistics for 1964-2004. Since 2005 figures are estimated using the gross fixed capital formation of public administrations published by the European Commission.

<sup>3</sup> Aschauer, D.A. (1989a): "Is public expenditure productive?" Journal of Monetary Economics, 23 (2), p.177-200 and Aschauer, D.A. (1989b): "Public investment and productivity growth in the group of seven", Economic Perspectives, 13(5), pp.17-25 Federal Reserve Bank of Chicago.

<sup>4</sup> Refer to Boscá, J.E., J. Escribá y M.J Murgui (2004) Macroeconomic Effects of Investment in Public Infrastructures, mimeo and Bonn, P and J.E. Ligyhart (2008) "How productive is public capital? A meta-analysis", CESifo Working Paper n.2206 for a quantitative analysis of empiric literature.

the construction of infrastructures can be useful to support aggregate demand. The empirical evidence for the Spanish case confirms partially that public investment is counter-cyclical. In two out of the three decelerations experienced by the Spanish economy since 1980 (between 1980 and 1985, and between 2000 and 2004), public investment rate (over trend GDP) increased, constituting a partial support to aggregate demand (Chart 6). However, in the mid-90's deceleration, public investment as a percentage of GDP<sup>5</sup> decreased.

### The Plan of Economic Stimulus announced by the government includes the acceleration of public works

The Plan of Economic Stimulus approved by the government in May 2008 contemplates reinforcing construction activity, via measures to improve the execution of public works and to boost the construction of subsidized houses.

With respect to the acceleration of public works, the main infrastructure projects in Spain are included in the Strategic Plan of Infrastructures and Transport (in Spanish: PEIT<sup>6</sup>) which puts together the main public investment projects for the period 2005-2020. The PEIT has a total budget of around 250,000 million euros in 2005 constant terms, equivalent to more than one-third of the 2005 GDP. Around half of the funds are related to railway transport (being the accumulated investment about 81% of 2004 stock), 25% to road transport (accounting for 42% of the stock) and the rest mainly to sea transport, ports and air transport (Table 1). The public budget will continue to be the main source of funding, although the use of public-private association formulas will increase up to accounting for around 20% of total investment.

According to available studies (OEP, 2007<sup>7</sup>), in 2020 PEIT and A.G.U.A. programs (focused on hydraulic infrastructure) will allow Spain to converge with the EU in terms of infrastructure per capita, and surpass it in terms of GDP. In terms of stock of public capital, the best scenario of accelerated investment rate (estimated in 0.4% of GDP each year) would elevate the level of infrastructures to around 5.5% in 2020. (versus a scenario of trend investment).

### The simulations of a scenario of accelerated public works show that there would be a positive although moderated impact, due to restrictions in implementation.

A scenario of accelerated public works, denominated "accelerated PEIT", seems feasible from a financial point of view. The situation of the public accounts in Spain is positive given that the level of debt over GDP is the lowest of the past 20 years. In the next few years Spain will still receive funds from Europe (although less than in the past). Lastly, the General Law of Budget Stability incorporates a lighter version of the golden rule that allows government to register a deficit of 0.5% of GDP to finance productive investment. In fact, the information available on the execution of PEIT between 2005 and 2008 indicates that it is above

<sup>5</sup> As a result of this behaviour of investment in infrastructures, its correlation to the output gap has been -0.29 in deceleration phases and 0.78 during the expansions. In all the expansionary phases (from the trough to the peak) public investment was pro-cyclical. The non-residential investment has increased in all the expansions (from the trough to the peak) since 1980 and has decreased in all the deceleration phases except in the one that started in 2000.

<sup>6</sup> For more details, see <http://peit.cedex.es>.

<sup>7</sup> Economic Office of the President (2007) "Infrastructure, human capital and technological capital", Economic Report of the President 2007, p.77-102, Madrid.

Chart 6.  
Public Investment and output gap \*  
(% trend GDP)



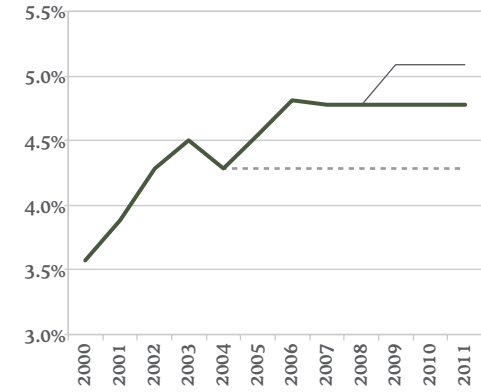
\* The output gap is the difference between GDP and trend GDP calculated using the Kalman filter, quarterly data  
Source: INE, BDMORES and BBVA ERD

Table 1. Economic Evaluation of PEIT, 2005-2020

	EUR Millions (constant 2005)	% Capital Stock *	% GDP 2005
Transport...			
by train (non urban)	108,760	81%	14.7%
by road	62,785	42%	8.5%
by plane	15,700	93%	2.1%
by sea and ports	23,460	120%	3.2%
intermodal transport (merchandise and people)	3,620	n.a.	0.5%
urban and metropolitan	32,527	65%	4.4%
R&D	2,040	n.a.	0.3%
<b>Total</b>	<b>248,892</b>	<b>66%</b>	<b>33.6%</b>

\* Total budget divided by the estimated stock of that type of capital in 2004  
Source: Ministry of Public Works, BD.MORES and BBVA ERD

Chart 7.  
Scenarios of Public Investment  
(%GDP)



— Base  
- - - Without PEIT  
— Accelerated PEIT

Source: INE, BD.MORES, Ministry of Public Works and BBVA ERD

the initial projections (around 15% above, equivalent to a 0.1% of GDP, according to SEOPAN 2008<sup>8</sup>)

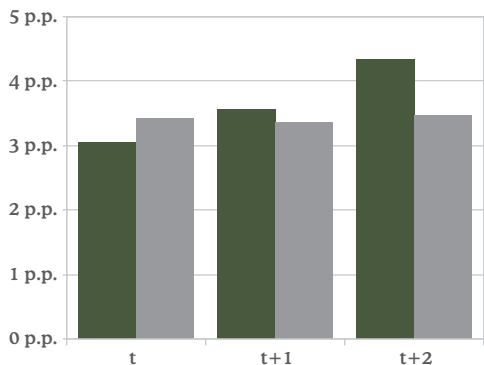
However, the limits to further accelerate this policy seem to be due to practical reasons. Before starting the execution of an infrastructure project there is a complex administrative process, even in the case of public works already projected. It includes starting a public auction, an environmental evaluation, the expropriation of land or preparing the project itself. Although the time needed depends on the type of infrastructure, in general it is at least two years. All these factors make it less probable for the stimulus to arrive when the economy is in the lowest phase of the cycle.

As we lack of further quantitative information to design a scenario of accelerated PEIT<sup>9</sup> we have simulated the impact of a significant but moderated acceleration of the public investment in infrastructures, from 4.8% to 5.1% of GDP. This stimulus will be maintained for three years and lowered gradually afterwards, not affecting the total budget of PEIT (Chart 7). The amount of the stimulus is due to the existence of a fiscal margin to finance infrastructures (0.20% of GDP for Autonomous Regions and 0.05% of GDP for local corporations) and due to certain evidence that these entities have a higher operative margin than the Central Administration.

To evaluate the aggregate impact of this acceleration of the infrastructure investment, the REMS simulation model (Boscá et al., 2007<sup>10</sup>) has been used. This model allows for the estimation of not only the demand effects in the short-term but also of the long-term supply effects. This happens because in the production function an increase of 10% of the public capital stock triggers a 0.6% increase of GDP. Therefore, the public investment profitability is approximately 12%, in line with the elasticity estimated by the literature.

The results of a transitory increase in the public investment rate equivalent to 0.3% of GDP for three years are that GDP growth would be higher than in the base scenario (current PEIT) since the beginning of the implementation period. As can be seen in Chart 8, from the first year of execution (year t, after the initial administrative process), the measure would add between 0.3% and 0.4% of GDP per year, compared to an alternative scenario of current PEIT. Moreover, the boost in public works would trigger an increase in employment of more than 0.3% (equal to about 70,000 jobs in these three years). If the acceleration is permanent, its long term effect on GDP would be even higher, slightly above 0.6% of GDP, but this would entail a higher cost.

Chart 8.  
Economic Impact of Accelerated PEIT  
(Difference with respect to the base scenario, percentage points)



■ GDP  
■ Employment

Source: BBVA ERD, based on REMS

<sup>8</sup> Núñez, J. (2008): "Construction and public-private collaboration". XI National Construction Symposium. The figures of public work tenders (SEOPAN 2008) show a slight decrease until May 2008 (-0.3% between January and May 2008, in contrast to January and May 2007), mainly in the local administration sector (-25%).

<sup>9</sup> After the presentation of the Plan, the government has only confirmed that PEIT will be further accelerated. The government has promised that infrastructures will grow above public expenditure average in 2009.

<sup>10</sup> Boscá J. E., A. Díaz, R. Doménech, J. Ferrí, E. Pérez and L. Puch (2007): "A rational expectations model for simulation and policy evaluation of the Spanish economy". Working Paper WP-2007-03, Ministry of Economy. It is a dynamic general equilibrium model, designed for the simulation of short term effects of alternative economic policies. The Spanish economy is considered a small and open economy, with three representative agents, households, companies and the public sector, as well as a monetary authority (ECB) and the rest of the world.

**Infrastructures would have a positive and significant effect, mainly in the long term. However, as a stabilizing tool for the economy, it has a limited impact.**

At the beginning of 2008, the U.S. Congressional Budget Office<sup>11</sup> analyzed the main options for the fiscal policy to respond in the short-term to the economic deceleration. They were classified according to three criteria: effectiveness, lag and uncertainty of its effects.

Public investment in infrastructures obtained a very good mark according to the third criterion (little uncertainty exists about its positive impact), but not very favourable in the remaining two: the impact on the aggregate demand in the short-term is not very high and the time between the investment is made and its economic impact is significant (Table 2).

The analysis presented in this chapter is similar to the CBO one, but the short-term effects are significantly higher. Therefore, the increase in infrastructure investment should be implemented due to its positive stabilizing effects in the short-term, when GDP is growing significantly below its potential, and in particular for its positive impact on long-term growth.

<sup>11</sup> Congressional Budget Office (2008): "Options for responding to short-term economic weakness". *CBO Paper*, January. Washington.

**Table 2. Options for short-term economic boost**

<b>Policy</b>	<b>Effectiveness (a)</b>	<b>Lag (b)</b>	<b>Uncertainty</b>
<b>Fiscal discount</b>			
Rate discount	Low	Low	Low
Fiscal pay back	High	Medium	High
Reduction of contribution	High	Medium	High
Increase of unemployment benefits	High	Low	Low
Incentives new investment	Medium	Medium	High
<b>Public Works</b>	<b>Low</b>	<b>High</b>	<b>Low</b>

(a) Impact on aggregated demand  
(b) High lag: impact above one year / Medium: 2 quarters-1year / Low: below 2 quarters  
Source: CBO (2008)





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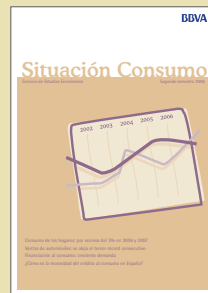
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