

Real Estate Watch Spain

Economic Research Department
December 2009



Over-supply in residential construction continues to set the pace for activity ...

... but the pending price adjustment is significant

In the medium-term, the estimate of potential housing demand at around 400,000 is confirmed

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1. Summary

Global economic perspectives are improving, although uncertainty about the recovery is significant

The global economy has experienced a significant improvement since the last edition of this publication, leaving behind the freefall sensation that had been prevailing since the end of 2008, and has given way to a situation of relative stability and, in some cases, moderate growth. The origin of the change lies mainly in the exceptional public stimulus measures adopted by most economies, on both the monetary and fiscal fronts. In this way, the main risk for recovery is that one of a premature withdrawal of the stimulus packages, above all in the most advanced economies, and uncertainty over whether private-sector spending can replace public spending.

The adjustments facing the Spanish economy condition its recovery in the short term

In recent quarters the economic downturn has also slowed in Spain, leaving behind the major falls in GDP and employment seen in early 2009. This is due, in part, to a more intensive use of countercyclical fiscal policies than in Europe. However, the rate of gradual improvement in the indicators seen since spring appears to have slowed according to the most recent data. Both future foreign demand – conditioned by the slow recovery of commercial partners – and domestic demand will remain at reduced levels through 2010. Weak domestic demand in 2010 is explained by a series of pending adjustment factors, such as the deleveraging of the private sector and a reduction in the economy's funding requirements, the resizing of the real estate sector, the impaired job market with high structural unemployment, and the adjustment in public finances to begin in 2010.

Housing construction in the real estate sector is decreasing in line with over-supply, but the non-residential sector has not begun its adjustment

In this scenario, the Spanish construction sector has spent over 18 months contracting. A breakdown between residential and nonresidential sector points to a much higher adjustment in the former, while the non-residential sector has still shown no clear signs of contraction, due in part to support from economic policies. Nonetheless, in countries where the real estate adjustment is more advanced, such as the U.S., the non-residential sector has already deteriorated greatly. In this sense, non-residential activity is likely to contract over coming quarters, especially once the government support plans run out.

The housing sector, which grew the most during the latest expansionary phase, continues to show major imbalances in quantity and major over-supply despite the improvement in some indicators. The supply overhang will likely continue to pressure prices downwards. New housing supply has rapidly adapted to this scenario, reaching minimal levels. In addition, the development of investment, output and added value in construction

shows that this adjustment process has still not bottomed out. In the face of this contraction, demand slightly moderate its reduction over the summer months.

Several factors support the hypothesis that the sector adjustment has yet to bottom out. Firstly, the over-supply of new houses has still to be absorbed and this process will not begin until the first quarter of 2010. Secondly, price correction has been low until now when compared with earlier adjustments, both in terms of size (10% off the maximum in real terms) and duration (six quarters), given the major increase over the last expansionary phase. Thirdly, household affordability has improved less compared to other countries, such as the U.S. Lastly, consumer confidence continues to be at low levels, meaning that purchase decisions such as buying a home, could be postponed.

In this context of minimal new home supply, housing renovation permits are increasing, with 18% more renovation permits granted in the third quarter of 2009 than in the same period last year. In fact, this development is supported by economic policy elements that intend to make renovation one of the drivers for the recovery, being a labor intensive activity with negligible environmental impact. Both the State Housing and Renovation Plan and the Sustainable Economy Law draft include this type of initiatives.

This adjustment and later recovery in the construction sector will have clear repercussions on the Spanish job market. Until present, the fall in employment demand in the sector has led to a major contraction in employment but not wage moderation. The main causes behind this are the change in profile of those employed in the sector, due to the elimination of less productive and lower-pay jobs, and, to a lesser extent, the existence of comparatively high wage stickiness. This incipient salary adjustment looks set to continue in the future.

Once normality is restored, there will be potential housing demand of around 400,000 units per year

After the adjustment is over, the Spanish real estate sector should converge towards a more sustainable size, where potential housing demand will be in line with a mid- to long-term equilibrium. Birth rate, mortality rate, migration flows and vacation home demand projections have been used to estimate this potential level. Once the market returns to normality, the analysis points to a potential housing demand of around 400,000 units per year.

Chart 1.
Spain: GDP growth

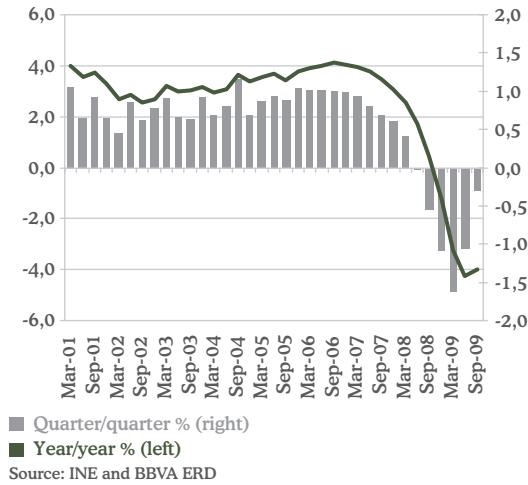


Chart 2.
Fiscal stimulus
(% of GDP)

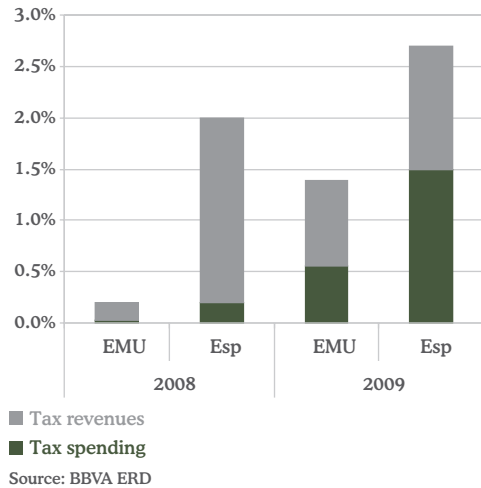
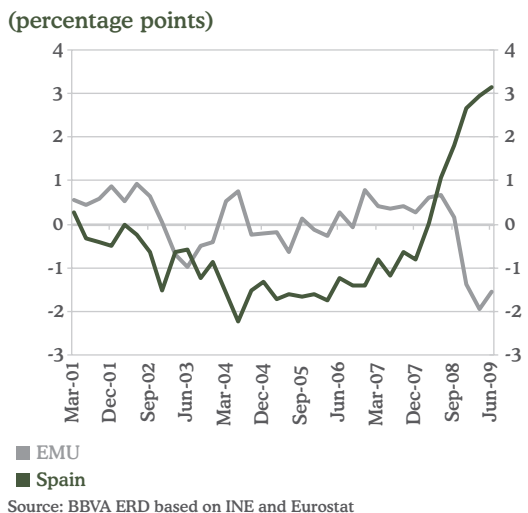


Chart 3.
Contribution of external sector to annual
GDP growth



2. The adjustments underway in the Spanish economy condition the start of the recovery

As in other economies, the rate of contraction is moderating in Spain...

Throughout the second and third quarter of the year, the Spanish economy has shown a pattern of slowing deterioration in its economic activity. The figures showing a major decline in GDP and employment at the start of 2009 have been overcome. In the second quarter of the year GDP declined by -1.1%, the third quarter saw a -0.3% fall, compared with -1.6% between January and March. Thus the Spanish economy moved towards less negative rates, in line with the other economies in the area. However, the reduction in the rate of decline in Spain has been less steep compared with the more vigorous rate in other European countries, some of which even posted positive GDP growth. This is despite the positive effect on the Spanish economy of the State Fund for Local Investment (FEIL) and the positive contribution of net exports, which in Spain made a notable contribution by compensating part of the fall in domestic demand.

The short-term indicators with available data up to the closing of this publication generally show that the trend to improvement remains. Despite the above, two points have to be made: first, that not all the segments of the economy present a similar pattern of behavior, as some are stronger in their recovery; second, the rate of gradual improvement in the indicators, which has been observed since the spring, appears in general to have slowed according to the most recent data.

This feature is particularly characteristic of consumption. The indicators of consumer confidence have clearly improved, but this has not been accompanied to the same extent by a recovery in the indicators of household spending, except for those affected by fiscal stimulus plans (as in the case for vehicles and the Plan 2000E). In turn, corporate investment will show a slightly less negative trend than in previous quarters, although it will still be conditioned by both uncertainty and the capacity of companies to finance new investment projects. In terms of investment in housing, over recent quarters demand slowed its fall significantly as a result of improved accessibility, while supply adjustment is gathering pace. Finally, the external sector is more dynamic than expected a few months ago. The labor market is worth a special mention. Its has been impacted by progress in the FEIL program, so that following sharp increases in job destruction and unemployment at the start of the year, the rates have eased off up to the summer. For example, the labor force survey for 3Q09 showed stabilization of what are still high rates of job destruction (over 200,000 jobs), and the progressive end to FEIL local investment program works creates some uncertainty with regard to its development over coming quarters.

In 2009 the rate of economic decline in Spain and the EMU will be similar...

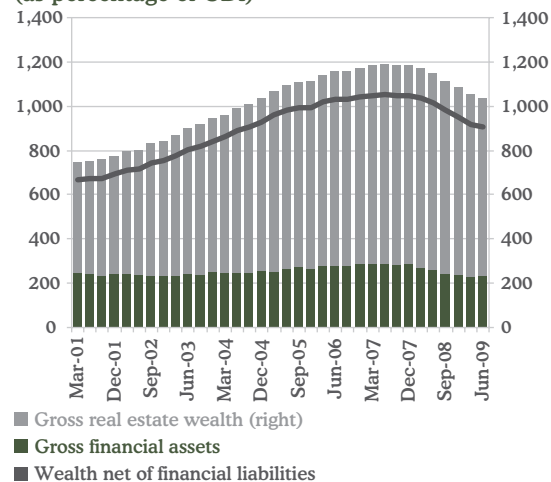
In any case, our forecasts point to a fall in GDP in the 4Q09 below than seen in the third quarter of the year. This would mean that for 2009 as a whole, the Spanish economy contracted slightly above 3.5%, a similar figure to that forecast for the Eurozone. Despite the elements that drag back Spanish growth compared with the rest of Europe (particularly the major process of deleveraging and adjustment in the real estate industry), the fact is that the Spanish economy has been able to contain the most acute phase of the recession and prevent decline from being greater than that in the rest of Europe. This is basically for two reasons. First, the Spanish economy has made a more incisive use of a countercyclical fiscal policy. In addition, the external sector has played an essential role in moderating the rate of GDP decline. In general the external sector contracts the GDP in Spain to a greater extent than in Europe in expansive phases, but has a positive contribution in recessions. This recession is no exception, and the external sector has gradually increased its contribution to GDP growth, first as a result of the major fall in imports, and more recently by the surprisingly high level of exports.

... but in Spain the contraction will continue into 2010.

There are few elements to suggest that the recession will not extend into 2010, and still fewer that it may turn into a period of sound recovery. Demand will continue weak throughout the year and only the beginnings of a sustained growth stage in GDP can be expected towards the end of 2010. In addition, progress towards recovery will depend on the capacity of the private sector to replace public stimuli. On average, GDP contraction in 2010 will be -1.2%.

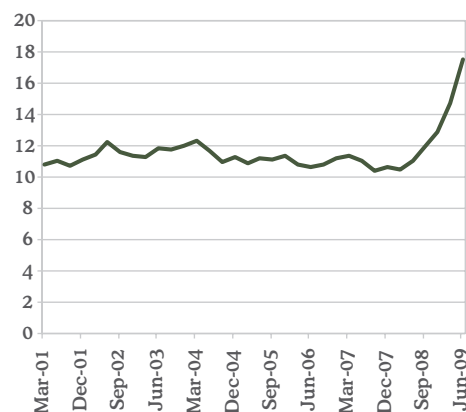
There are various reasons for this. First, the moderate growth prospects for our main trading partners will lead to very low levels of export growth. However, it will be domestic demand that will determine the rate of GDP, as all its components will be negative, except for public spending. Weak domestic demand in 2010 is justified by a series of factors pending adjustment. First, the process of deleveraging in the private sector and the reduction of the Spanish economy's funding needs. In 2009, this process intensified since its beginnings at the start of 2008 where financing requirements ran to 10 points of GDP, a figure that decreased to 5.9% as per 3Q09 data, both amounts being annual aggregates. The leading players in the process have been households, as reflected in the major increase in the savings rate and corresponding falls in consumption. The savings rate of households in 2Q09 was 17.5% of disposable income, 7 points above the figure for 1Q08. This process still has legs due to various reasons. On the one hand, household finances suffered major deterioration despite the level of financial liabilities on income gradually declining. This is added to the uncertainty in the labor market, expectations of lower growth in income (a perception that potential growth may have reduced) and expectations of fiscal consolidation starting in 2010 and continuing over the following years. All these factors will mean the 2010 savings rate remains at very high levels and consumer spending remains weak.

Chart 4.
Spain: gross and net household wealth
(as percentage of GDI)



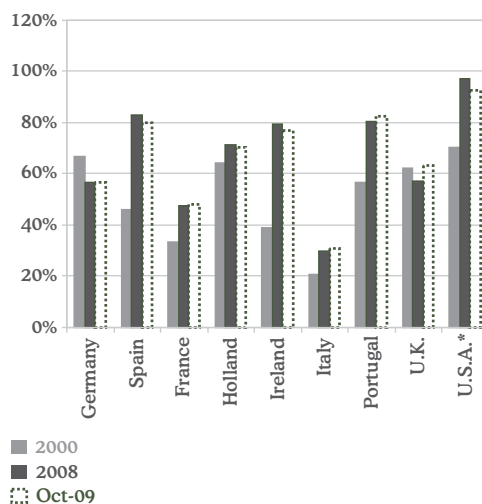
Source: BBVA ERD, based on Bank of Spain and INE

Chart 5.
Spain: household saving rate
(% annual aggregate household GDI)



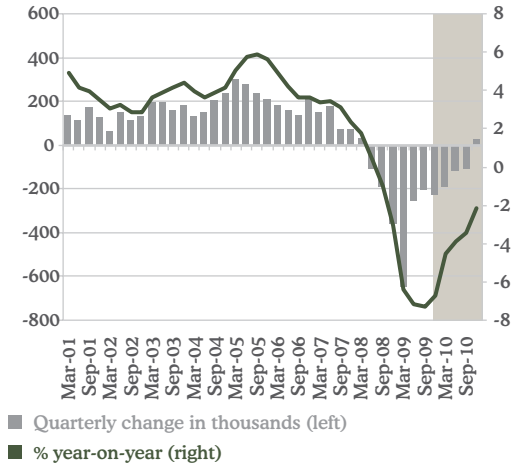
Source: BBVA ERD based on INE

Chart 6.
Household credit / GDP



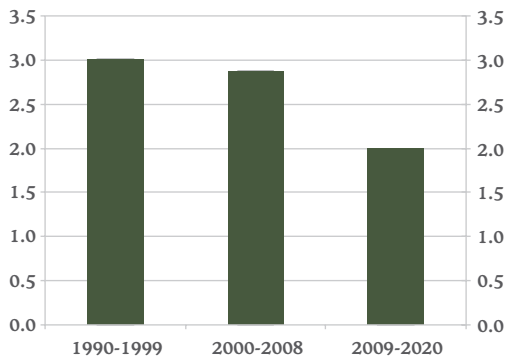
Source: BBVA ERD
(* Data as of September 2009)

Chart 7.
Spain: seasonally-adjusted employment (LFS)



Source: BBVA ERD based on INE

Chart 8.
Spain: potential GDP growth



Source: BBVA ERD based on INE

On the other is the resizing of the real estate sector, analyzed in the rest of this report. The third factor conditioning forecasts is the labor market, afflicted by bad performance and a high level of structural unemployment. In 2010 the employment rate will continue to decrease, although the fall in the active population will mean the additional upturn margin in the unemployment rate will be limited. Lastly, the adjustment to public finances the Spanish economy is set to see in 2010, after the intense countercyclical activity seen 2008 and 2009, also affects forecasts, although with differential effects in the short- and long-term.¹

Short-term to long-term policies: the need to speed up reforms that boost growth.

The most critical phase of the recession appears to be over. Although there are still risks, it can be said that the economic stabilization policies have been fairly successful in their aim of smoothing over the cycle and reducing the degree of contraction in the economy. However, the current situation and the most immediate perspectives are far from satisfactory. It is now time to implement structural policies. Until now, the agenda containing measures to recover the path of sustained job-creating growth is progressing slower than would be desirable. The biggest risk is thus that once the recession has ended (at some point in 2010), there will be a period of low growth and a slow reduction in unemployment. According to our estimates, if there are no key structural reforms to the factor, goods and services markets, there will be a significant fall in the potential growth of the Spanish economy, up to 2%, which will limit the strength of subsequent recovery, although it will still be above the estimate for the Eurozone.

¹ For a more detailed analysis of these factors, see SpainWatch November 2009.

3. The overhaul of the construction sector has still not bottomed out

The construction sector as a whole has been contracting for over 18 months. A breakdown between residential and non-residential sector points to a much higher adjustment in the former, while the non-residential sector has still shown no clear signs of contraction. The housing sector, which grew the most during the latest expansionary phase, continues to show major imbalances in quantity despite the improvement in some indicators. This imbalance will continue to push for further adjustments in prices.

Construction in Spain continues to shrink

Construction in Spain has been contracting for over 18 months. After the long growth phase experienced from 2001 to mid-2007, the construction sector is in full adjustment phase. As seen in the development of investment, output and value added in construction shown in Chart 1, this process has still not bottomed out. Output data show that construction output conditions fell again in the third quarter of the year (-16.4% yoy), after having shown a certain moderation in decline in the first two quarters of 2009.

A breakdown by construction type, as it can be seen in Chart 2, shows the most volatile evolution in civil engineering, whose main client is the public sector. Although the loss of dynamism has affected the two construction subsectors (residential and civil engineering) equally strongly, it should be noted that civil engineering output mostly recovered, especially over recent quarters, with continual positive year-on-year growth from the first quarter of this year.

A more detailed analysis shows how residential construction is the most important part in the sector's output, followed by civil works and building renovation and maintenance (Chart 3). Residential output went from 26% of total construction in 1995 to 32% in 2008. This increase is due, above all, to a reduction in the weight of non-residential building, from 20% to 16% over the same period.

Given the greater weight of the residential sector, the adjustment is affecting this segment more than others. In terms of GDP, National Account data for the third quarter 2009 continue to show a deeper adjustment in residential construction (-25.5% yoy) (Chart 4). In turn, non-residential investment only slightly corrected, specifically due to the revitalizing effect public works are having on the deterioration of this investment segment. However, it should be highlighted that non-residential investment tends to follow residential investment changes with a certain delay. Chart 5 shows the correlations between residential and non-residential investment year-on-year growth rates, calculated with data from 1980 on. According to these data, non-residential investment shows its strongest correlation with the residential investment growth rate evolution with a three to four month delay. During the present cycle, non-residential investment began to record negative growth rates a month after residential investment (which did so in the first quarter

Chart 1. Spain: Construction sector indicators (% yoy, Seasonally-adjusted Data)

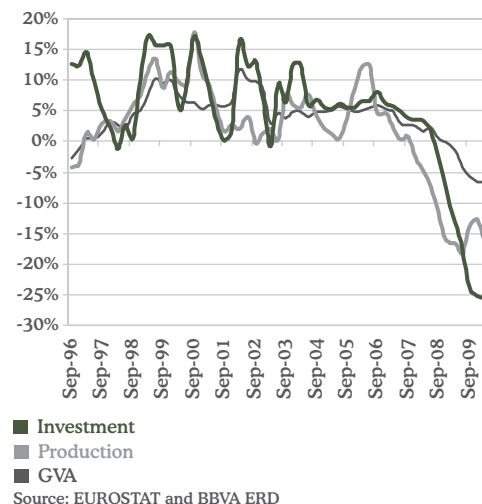


Chart 2. Spain: Construction sector production indices (% yoy CSV)

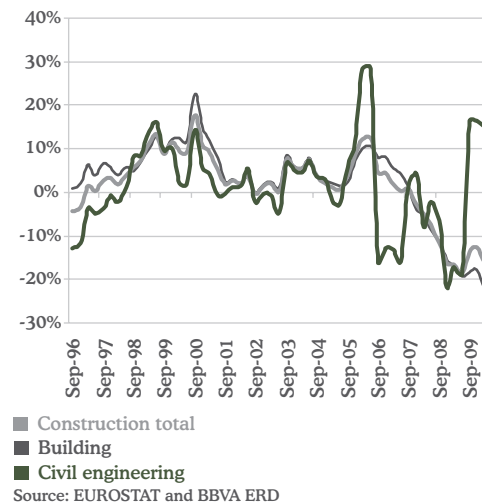


Chart 3. Spain: Construction sub-sector structure (%)

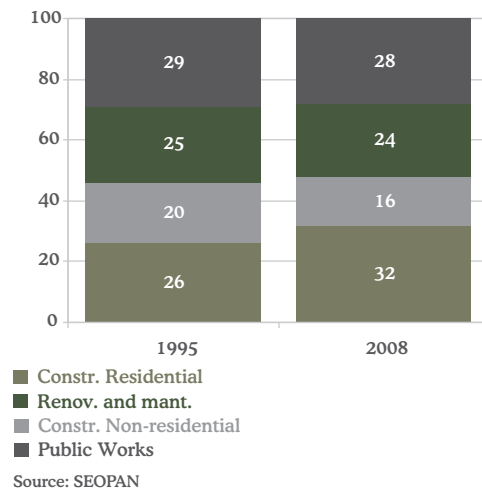


Chart 4.
Spain: Investment in construction

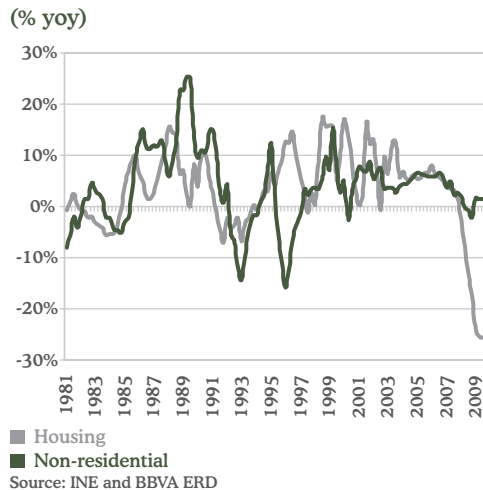


Chart 5.
Spain: Correlation between growth rates for residential and non-residential investment per quarter

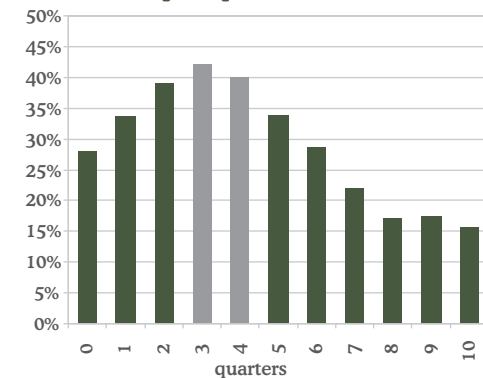
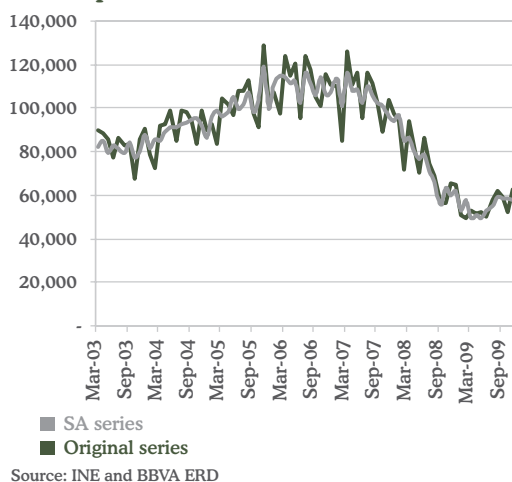


Chart 6.
Spain: Number of mortgages granted for house purchase



2008) and, according to data from the last two quarters, it would seem to be on the path to recovery. Given the delay of the non-residential sector in following the residential sector, the former activity is likely to contract again over the coming quarters, especially once the government support plans run out.

Despite some signs of recovery, the adjustment in the residential segment has not bottomed out yet

The housing sector has been contracting since the first quarter of 2008. Despite some signs of a softer sector adjustment during the summer months, the housing market continues to be affected by major imbalances, especially in terms of quantity.

As stated in previous editions of this review, housing construction in Spain generated considerable over-supply. In an adverse macroeconomic environment as the current one, it is likely that it will still take some time for the sector to adjust. In the face of this scenario, new housing supply showed important flexibility, reaching minimal levels. According building permit figures, published by the Ministry of Public Works, in the first nine months of the year just over 84,000 permits were issued, 61% fewer than in the same period in 2008. BBVA Research Department forecasts point to a stabilization in the number of permits in 2009 and 2010 at around 100,000 units, the lowest level since 1992.

In the face of this contraction, the free fall in demand showed a moderation during summer. According to the statistics published by the Association of Property Registrars, 110,709 homes were sold in the third quarter 2009, a 15% year-on-year decrease and the first positive quarter-on-quarter growth rate (+9.8%) after three consecutive quarters of falls. This trend is also confirmed by the evolution of mortgages for urban properties, which in September saw a slight upturn with around 60,000 monthly mortgages (Chart 6) – a 12.3% year-on-year fall compared to 18.8% the previous month.

As a whole, the housing sector over-supply remains at high levels, requiring greater price reductions

In accordance with demand, housing prices released by the Ministry of Housing also registered a slight decrease in the third quarter of the year. The latest data available show a cumulative decline from the peak of just over 10% (in real terms), a third of what the BBVA Research Department estimates the total correction should be (-30%)Chart. 7¹. Despite housing transactions moderating their fall in the same period, this contained price decrease cannot be interpreted as the floor for price corrections. It is worth looking at four aspects as to why the adjustment has still not bottomed out.

- Price corrections have been small. When compared to past real estate cycles, the adjustment in official price figures is smaller and of shorter duration, despite the fact that the expansionary phase

¹Price adjustments show a high level of diversity at regional level. See Table 1 at the end of this section for a breakdown by province of the corrections.

has been greater and longer this time around. For example, in the adjustment seen between 1992-1997, negative growth in real prices was recorded over 21 quarters (against the six of the current cycle) and the fall from the peak was around 20% (10% in the present cycle).

- The improvement in household affordability is lower than that estimated in other countries. The improvement in affordability registered so far has almost totally occurred thanks to historically low interest rates (Chart 8). Although being the most complete indicator, this affordability measure includes elements from the mortgage market which could depend on factors outside the housing market. In this sense, looking at a simpler ratio such as the house price index on gross household income could be useful, providing the number of years of income required to buy a home, independently of mortgage market developments. The index shows that buying a home today takes around one year less than those required at the price peak (6.6 compared to 7.7 years). In other countries that have experienced a real estate crunch, for example the U.S., buying a home today requires 3.5 times gross annual household income compared to the 5 years required at the market peak in 2006.
- Over-supply has still not been absorbed: finally, a key element in the real estate adjustment in Spain is the over-supply in the market. This stock continues to accumulate and, despite occurring at a slower pace, it is still considerable in size (Chart 9). BBVA Research Department forecasts show that absorption of over-supply will start at the beginning of 2010 and continue to push prices downwards throughout 2010 and 2011.
- Consumer confidence remains at low levels: in a highly uncertain economic environment with increasing unemployment, Spanish households show a marked preference for precautionary saving, delaying major investment decisions such as buying a home².

² See Consumer Watch, December 2009.

Chart 7.
Real house prices in Spain

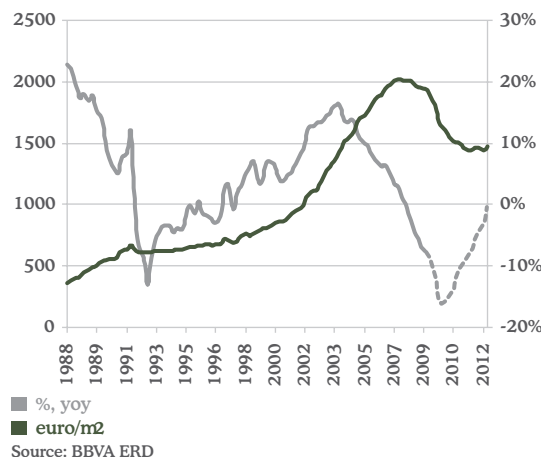


Chart 8.
Housing affordability in Spain
Tax adjusted purchase effort as a % of household income

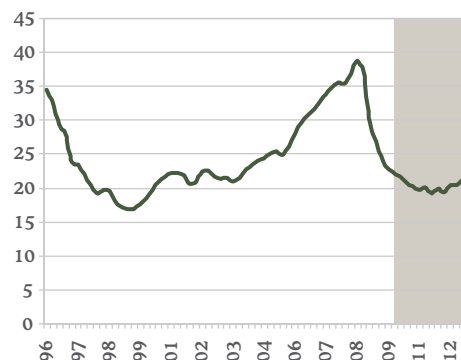
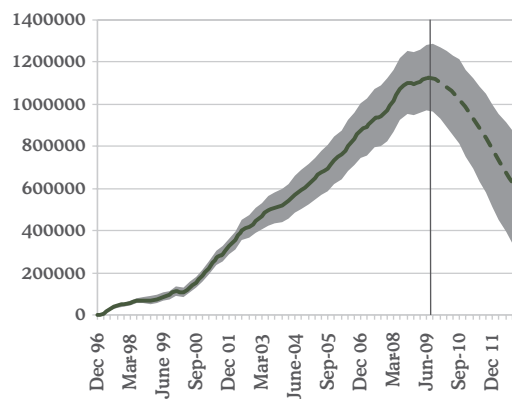


Chart 9.
Spain: Estimate of new housing over-supply



Box 1. The house price adjustment: a province breakdown

Based on national price projections, house prices in different Spanish regions have been estimated. The methodology used is based on forecasts made nationally from an estimated error correction model, with real estate investment and house prices as endogenous variables, that allows to efficiently capture the short-term house price dynamics¹.

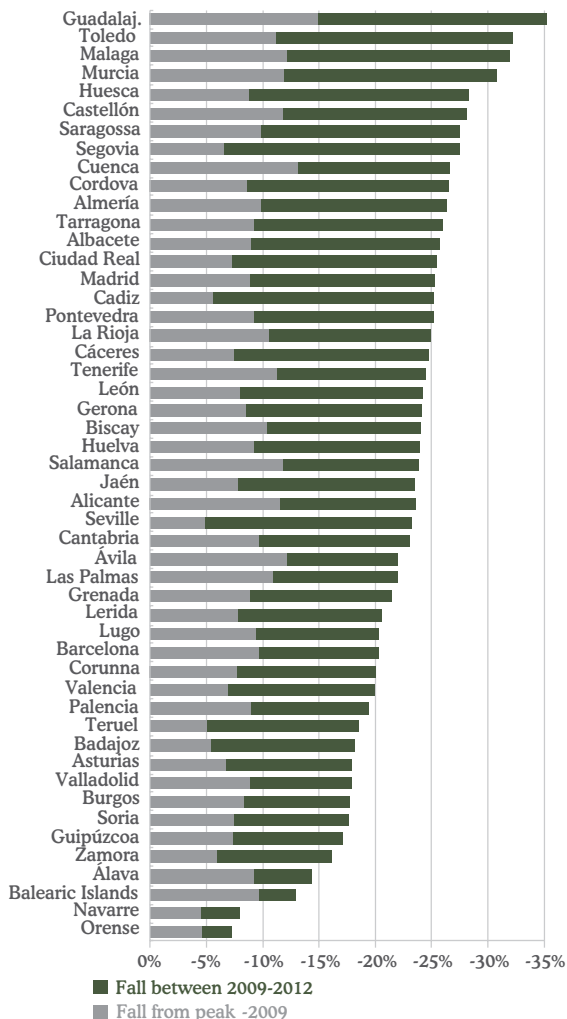
The regionalization of prices by province was performed with a simple linear regression models for each of the provinces in the following way:

$$\Delta \text{Precio}_{i,t} = \alpha + \beta_1 \Delta \text{Precio_Nac}_t + \beta_2 \Delta \text{PIB}_{i,t} + \varepsilon_t$$

Where the dependent variable is the real house price growth rate in t for the province i . The variable ΔP_x_Nac is the national real house price growth rate path and ΔGDP is the real economic growth in each province.

¹ See "Real Estate Watch", December 2008.

Chart 1.
Price/m² by province forecasts
(peak-trough)

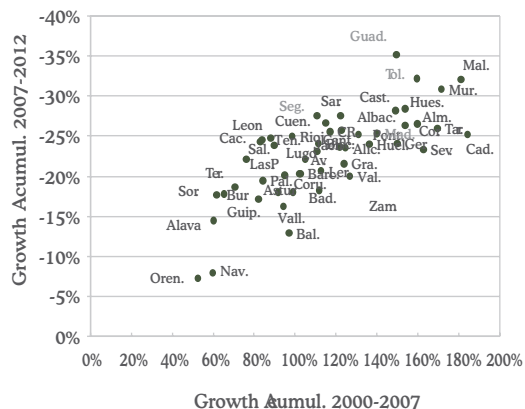


Source: BBVA ERD

Based on the projected provincial price paths, a price participation ratio was obtained for each province in the national total. This coefficient is defined as the projected price ratio by the model for each province (period by period) over the total projected evolution for all provinces.

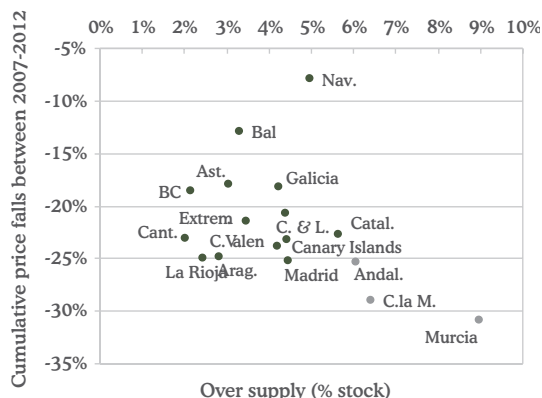
In this way, a house price by province paths were obtained, consistently with the national path and where the regional paths show a different evolution based on the regional distribution of economic growth.

Chart 2.
House price expansion and correction by province



Source: BBVA ERD

Chart 3.
Spain: Price corrections and housing over-supply by region



Source: BBVA ERD

The results are summarized in Charts 1 and 2. As can be seen, a cumulative fall in real house prices of between 15% and 30% is expected in most provinces. At present, this overprice has not yet been absorbed. BBVA ERD forecasts

show that the corrections expected up to 2012 will be higher in those provinces where prices saw greater increases during the expansionary market phase (2000-2007).

Finally, if we compare the available data on housing over-supply by region with the average price adjustment in each region, we see that the areas where the supply stock remains high are also those that will record higher price adjustments (Chart 3).

Box 2. The role of building renovation

Renovation and expansion permit growth

As stated in the first section of this review, new building permits will continue to see major contraction throughout 2009 and 2010, with permits for around 100,000 homes per year. According to the latest available information, in September 2009 housing permits numbered 7,758, making a 52% yoy fall. If cumulative data are taken into account from January to September 2009, the decline runs to 61% compared with the previous year (Chart 1).

On the other hand, renovation permits (works on houses already built) showed a more positive development. 18% more renovation permits (that do not change the size of the area built) were granted in the third quarter with respect to the same period the previous year. A quarterly fall of 32% was recorded over the same period for expansion permits (related to those projects involving an increase of the constructed surface area, incorporating new structural elements). Overall, taking into account new building, expansion and renovation permits, the decline in September came in at 42% (compared with -45% in August) (Chart 2).

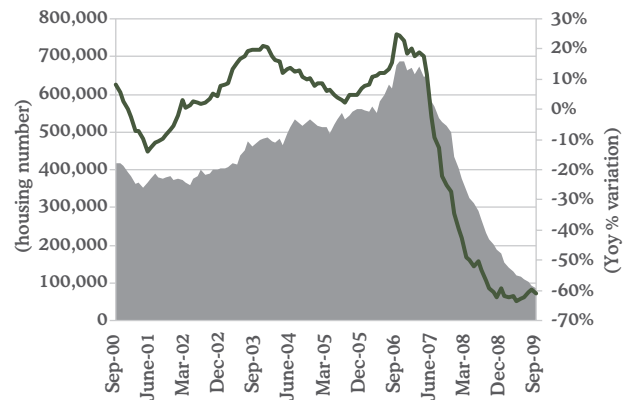
In addition, renovation permits clearly increased their share of total permits in 2009. In September they accounted for 28%, up from 13% in the same period the previous year. On the other hand, expansion works only accounted for 2% of the total in September 2009 (Chart 3).

These data lead us to ask whether building renovation activity can exhibit a counter-cyclical evolution with regard to the construction sector in general. Chart 4 shows that since 2000 the renovation permit growth rate performed very differently to the new building permit growth rate and to GDP. Different factors may explain the divergent performance of renovation works with regard to new housing construction over this cycle.

- During times of crisis, with high job uncertainty levels and decreasing house prices, households are more likely to prefer putting more resources toward home renovation than purchasing a new home.
- Given the over-supply stock on the market, available resources are likely to be put toward improving existing properties over new construction, so as to improve quality rather than increase numbers.
- Renovation works have different maintenance cycles with respect to new building activity. The need to renovate a property depends, among other things, on its age and use – elements more linked to natural obsolescence of properties than construction cycles.

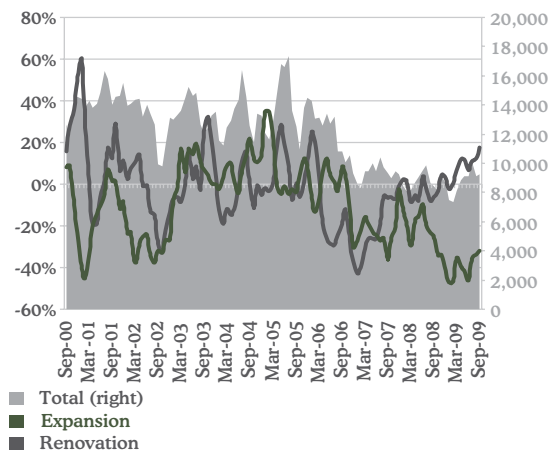
Chart 1.
New building permits

(Cumulative over 9 months and rate of change)



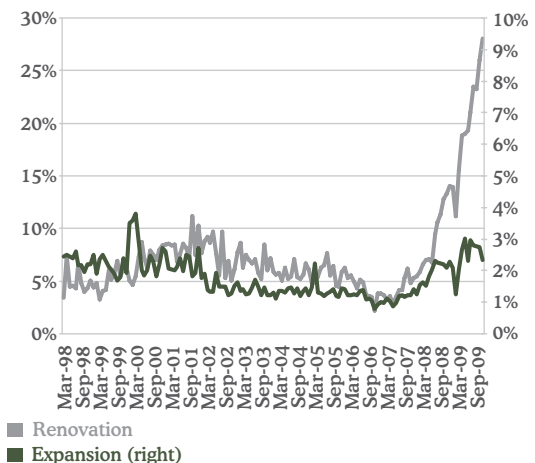
Source: Ministry of Public Works

Chart 2.
Renovation and addition permits
rolling figure per quarter, % yoy



Source: Ministry of Public Works and BBVA ERD

Chart 3.
Renovation permit weighting in total permits



Source: Ministry of Public Works

— Faced with the major contraction seen in the residential market, companies are actively offering their renovation services.

In addition, the more positive development in renovation permits is supported by government policies that intend to make renovation the driver for recovery in the real estate sector, being a labor intensive activity with negligible environmental and possibly high social impact.

“Sustainable” support for the real estate sector

Both the State Housing and Renovation Plan 2009-2012, passed in December last year, and the Sustainable Economy Law draft, passed at the end of November 2009, include this type of initiatives.

Strong support from the State Housing Plan towards total renovation of buildings and energy efficiency improvement works

The State Housing and Renovation Plan 2009-2012 includes two programs boosting the full renovation of buildings and urban areas on the one hand, and the RENOVE aid packages for housing renovation and energy efficiency in existing homes and buildings, on the other. Both programs and their five main axes intend to: contain the deterioration of the most degraded areas in city centres, renovate the most degraded historical centres and improve housing.

Homes in renovated areas or those receiving direct aid to increase energy efficiency or the renovation thereof must be the owner’s main residence or be meant for rental for at least five years after the renovation work is completed. In this way, as well as promoting renovation in affected areas, the supply of homes for rent is also improved – very limited in the Spanish market.

Sustainable economy preliminary development plan. Tax incentives for housing renovation, energy efficiency and accessibility

Further, one of the pillars in the recently passed draft bill is to drive the renovation and renewal of urban centres via tax incentives. The law redefines the deduction for purchase or renovation of the main home through an adjustment to VAT for some renovation projects (from 16% to 7%), in particular for those that favor energy efficiency, accessibility and saving water.

In this sense, the present deduction for taxpayers remains with a taxable base below 17,707 E and scaled for income

up to 24,107E. Deductions will be eliminated for higher income brackets from January 1, 2011. This measure intends to promote home purchase before 2011 to have the right to the corresponding deduction over the mortgage period and thus reduce over-supply.

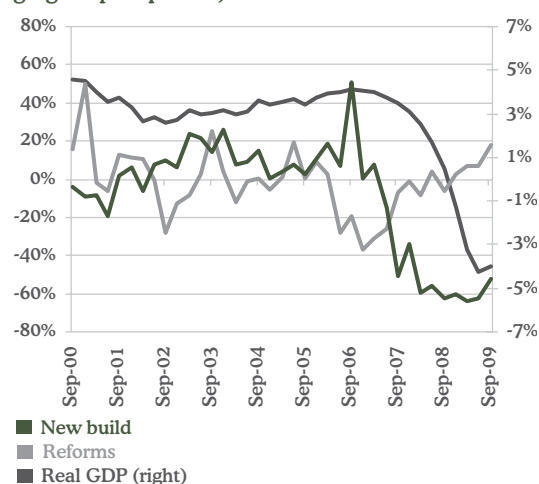
In turn, it also sets out a new deduction for renovations aimed at improving energy efficiency, water use and fitting properties for disabled access and use. 10% for the work carried out up to December 31, 2012 is deductible from the Income Tax, although the instruments for this are not set out.

In addition, the text sets out that users in properties under renovation “will have the right to be relocated in another properties in the same building”. If this is not possible, they will receive “financial compensation”.

Lastly, the law commits the State to supporting renovation and renewal of obsolete or degraded urban centres, albeit without setting out the use objectives for the space effectively.

These public initiative provide support at the best time for the real estate market by reactivating home renovation. According to 2001 census data, over 1.3 million main residences are classified as degraded, deficient or in bad condition, making up 9% of the Spanish housing stock.

Chart 4.
New building construction and renovation permits vs. real GDP. Year-on-year growth (rolling figure per quarter)



Source: Ministry of Public Works and BBVA ERD

Box 3. The non-residential real estate sector in the U.S.

Despite the incipient economic upturn, the non-residential segment will not recover until mid-2011

- Since the beginning of 2008 up to the end of 2009, non-residential real estate investment decreased by over 40%
- After a near-50% adjustment, non-residential property prices will not stabilize until 2011
- The deterioration in the non-residential market has led to major default increases and net losses for the financial system

Activity and Prices

Over 2009, non-residential real estate investment decreased gradually, running to a year-on-year rate of change of -22% in the third quarter of the year. In accordance with our forecasts, the perspective for sector growth in 2010 is negative and it will not be until the first half of 2011 when the first signs of recovery are seen in non-residential investment.

There are several reasons behind this fall in investment, some of the main ones being: 1) the fall in employment since early 2008 (leading to a total loss of 7 million jobs up to the end of 2009, of which just over 30% correspond to white collar positions); 2) the rationalization process in office space begun by many companies to adjust costs; 3) the slowdown in households consumption, leading to some commercial closures; 4) credit restrictions, and 5) the intense fall in non-residential property yields, making investment less attractive.

Despite the above, the non-residential space supply continued to increase in the first three quarters last year while demand declined. As a consequence to this double development, the rate of empty non-residential spaces (Chart 2) continued to see major increases over 2009, coming in at 16.5% in the third quarter of 2009 of all existing stock in the office segment, 10.3% of commercial space and 7.8% of leased apartments, in accordance with the latest data released by REIS.

For the occupancy rates to improve, both employment and household consumption need to recover. Although household consumption started to show the first signs of recovery in the last quarter of 2009, employment will not see positive growth rates until the first quarter of 2010, in line with our forecasts.

Chart 1.
Non-Residential Real Estate Investment and GDP

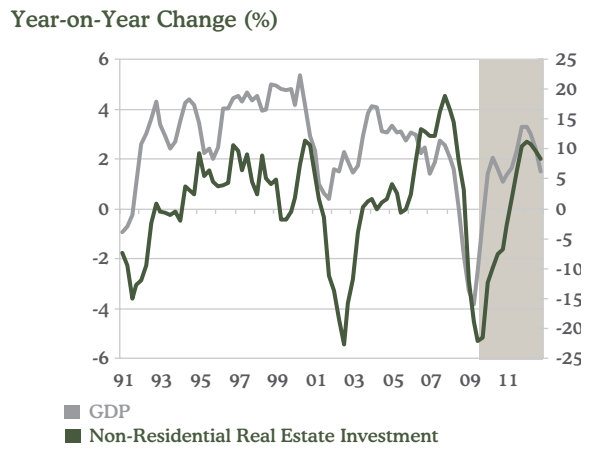


Chart 2.
Vacancy Rates

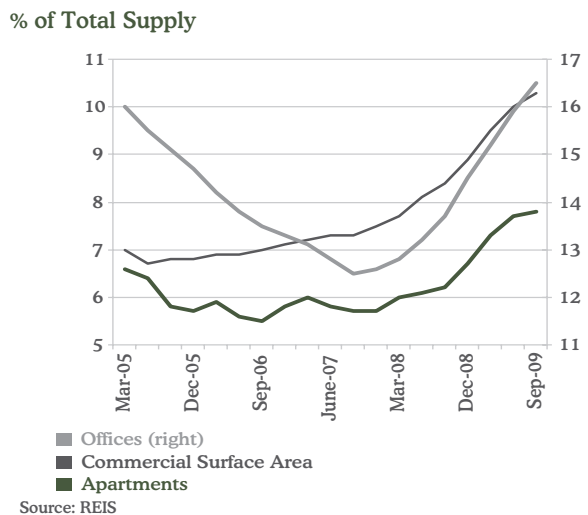
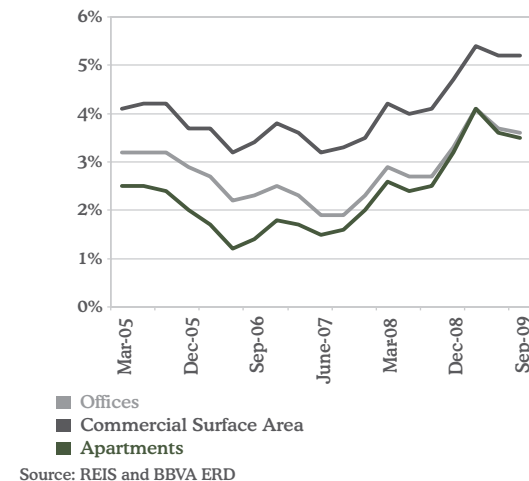


Chart 3.
Capitalization Rates



In any case, given the increasing over-supply in non-residential lease properties, effective rents continued to decrease across all segments in 2009, both in real and nominal terms. In this way, rental prices in the third quarter 2009 were 2.8% below the maximum seen in 2008 for homes, 8.8% for offices and 3.9% for commercial spaces. This downward trend in rents will continue in coming quarters due to weak demand and the growing available spaces.

In addition, as non-residential real estate investment risk increases, the capitalization or yield ratios demanded for investment in the segment also increase. In this way, at the end of the third quarter 2009 average capitalization ratios demanded in the last twelve months came in at 7.2% for rental apartments, 7.3% for offices and 8.9% for commercial spaces. The difference in these capital ratios with 10-year treasury bonds increased over 150 basis points over the last two years. This high risk premium will remain constant throughout 2010 due to the bad short-term segment situation, see Chart 3.

In line with the above, total real estate yields (profits made from leases plus that obtained through price changes) continued to decline in the third quarter 2009, coming in at year-on-year rates at -23.0% for lease apartments, -24.5% for offices and -15.8% for commercial spaces. This negative development in yields obtained can basically be explained by the fall in non-residential property prices.

In this way, from the maximum seen in the second half of 2007, non-residential real estate prices saw major adjustment in the most relevant segments: 40% for industrial spaces, 35% for offices and 28% for commercial spaces and lease apartments. In this sense, our forecasts show that prices will continue to decline until mid-2011 and the adjustment will increase between 10% and 15% as per the segment.

Finance

Both the development of finance in the segment and portfolio quality were negatively affected by the weak non-residential real estate market throughout 2008 and 2009. In fact, at the beginning of 2008, financial institutions began to tighten credit conditions for non-residential real estate investments in the face of the incipient deterioration in the segment portfolio. The tightening of credit conditions is linked to the major decline seen in credit lines for non-residential real estate since the last quarter in 2007.

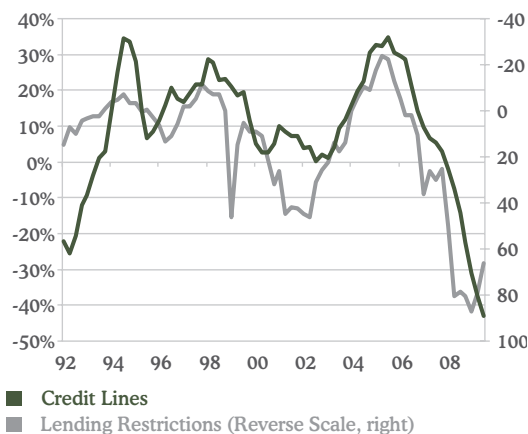
Chart 4.
Non-residential Real Estate Yield vs. Treasury Bond

Annual Yields (%) and 10-yr Bond



Source: NCREIF, Federal Reserve and BBVA ERD

Chart 5.
Non-residential Real Estate Lending Restrictions and Credit Lines



Source: FDIC, NCREI, Federal Reserve

The deterioration in non-residential real estate since 2008 led to major default increases and net losses for the financial system. In this way, in the third quarter 2009, default rates reached 8.7% of the total non-residential portfolio while net losses ran to 2.6%. These rates are at similar levels to maximum rates from the previous cycle in the early 1990s.

At the end of the third quarter 2009, total finance to the segment was almost 3.43 trillion dollars, 0.47% below the balance a year earlier. 52.2% of this total corresponds to

the portfolio at financial institutions, 10.6% to insurance companies and REITS, 10.5% to public administrations and just over 25% was securitized. Over the last year, the

lack of liquidity in the system led to only public administrations increasing the balance of the real estate segment over 2009.

Box 4. The effect of infrastructure on growth in Latin America

Infrastructure as an engine for growth and development

At a time where non-residential construction could be seen as a substitute with regard to labor requirement and an engine for economic activity in the residential sector, the use of new infrastructures for economies should be questioned. Economic literature has identified infrastructure as a key element to growth and development of nations. Two infrastructure types can be identified. Firstly, economic infrastructures (roads, ports, airports, pipelines, etc.) exercise their influence directly on output factor effectiveness and efficiency which play a role in business output. Secondly, social infrastructures (hospitals, schools, etc.) improve family living standards and, therefore, a country's development. This improvement in living standards influences work efficiency and, therefore, economic growth (Chart 1).

The main argument for the first type of infrastructures which contribute to economic growth is the accumulation of capital stock¹ and its contributions to the marginal output increases

¹ An attempt was made to explain why and how some countries grow and others do not in Solow's work and all later endogenous growth theory. Ashauer's work (1989) introduced infrastructures into an augmented neoclassical model, including them as an additional productive factor.

$$Y_t = A (K_t)^\alpha (L_t)^\beta (G_t)^\chi (1)$$

Where G_t is expenditure on infrastructures and χ is the elasticity of this factor which is below one.

Constant scale yields are seen once again ($\alpha + \beta + \chi = 1$).

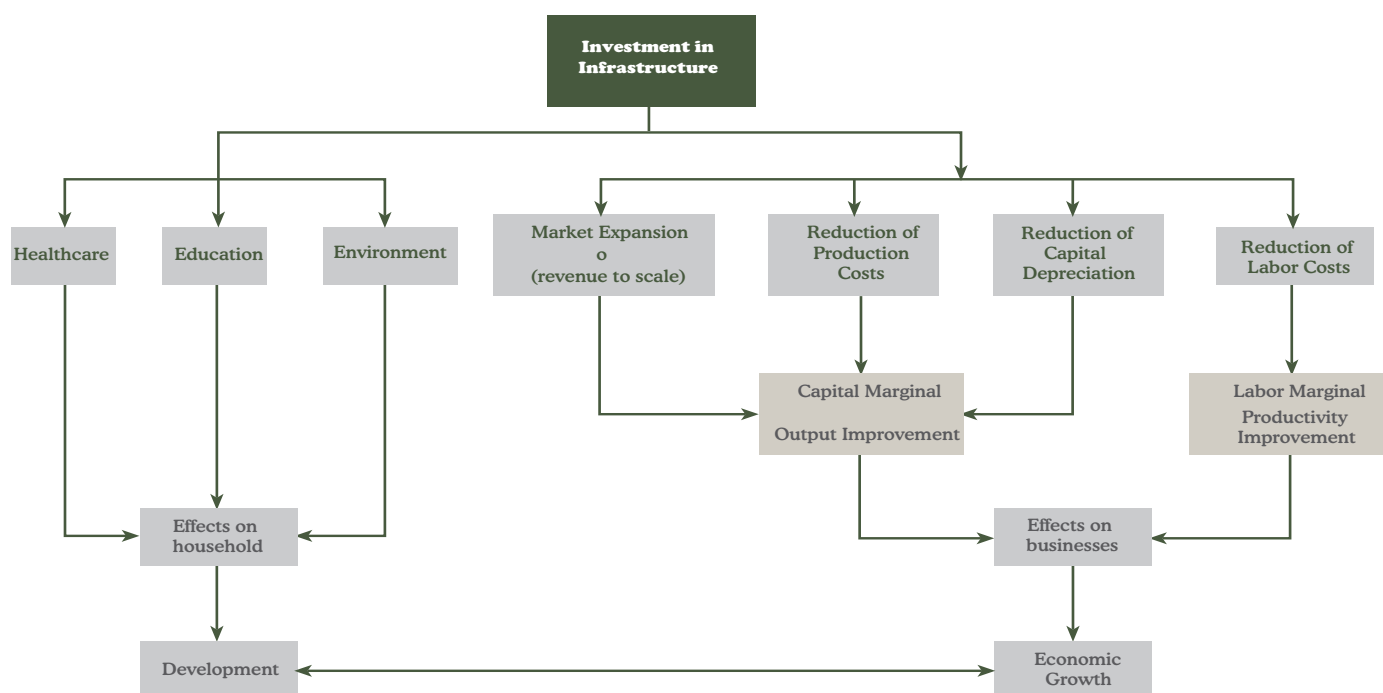
in work and capital. In this sense, the development of infrastructures favors attaining more profitable private investment projects, expanding markets and achieving higher scale yields. In turn, better infrastructures mean lower productive capital depreciation (for example, truck tires) and reduce business costs, limiting output and distribution times. Communication improvement help the more qualified work to reach difficult to access areas (Ferreira, 1999).

However, some authors find that there is an optimal infrastructure accumulation path². Any allocation of resources below this path provides GDP growth with higher investment in infrastructures, although not all growth potential is seized. If allocation is above this path, resources are removed from perhaps more productive factors and no effects are seen on economic growth; i.e., a *crowding-out* effect occurs. In a meta-analysis³ performed by Alonso et al (2009), investment elasticity in infrastructures/growth for GDP is found to reach an average value of 0.10, although the variation range is relatively high (-0.62, 0.53).

² See Canning and Pedroni (1999)

³ Meta-analysis comprises an exhaustive review of empirical evidence shown in economic literature on a specific topic, reaching a consensus conclusion through econometric techniques. 70 works were analyzed for this study relating infrastructures and growth, with 130 models being selected from them with sufficient empirical results.

Chart 1.
The Effect of Infrastructures on the Economy



Source: BBVA ERD

Table 1.
Statistical Descriptions of Investment Elasticity in Infrastructures in GDP

	Notes	Average	Median	Standard Deviation	Min	Max
Elasticity	130	0.100 (simple) 0.113 (weighted)	0.051	0.145	-0.62	0.53

Source: Alonso *et al* (2009)

Therefore, studies performed for different countries and periods show that the results appear to be mixed. However, in developing nations there seems to be unanimous results, concluding that investment in infrastructures has beneficial effects on output and growth.

The second type of infrastructures analyzed is that contributing to social welfare. The other less-known facet of the effect of infrastructures on the economy is the one towards families and the economic development of nations (see Chart 1).

Infrastructures that improve people’s access to drinking water and public drainage may lead to a substantial improvement in their health, reducing the mortality rate (Leipzig *et al*, 2003). In turn, access to regular energy sources (gas and electricity) reduce the cost of boiling water, improving health and allowing medicines and food to be cooled.

In addition, access to regular and more efficient energy sources, such as electricity and/or gas, means people can substitute other traditional energy sources. The chance to heat homes with other energy types reduces the pressure to exploit forest resources, avoiding desertification and preserving local biodiversity (see WHO, 2005).

At the same time, improved transportation allows access to new food from other regions or countries (Wang and Taniguchi, 2003). In turn, registration rates at schools considerably increase when access to them is easier with an appropriate road and transport infrastructure (Khandker *et al*, 2004). In addition, appropriate and healthy school facilities lead to lower school absence and better use. Finally, improved waste recycling improves the region’s environment.

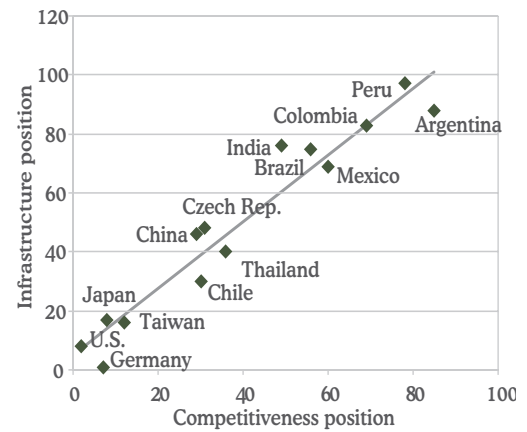
Infrastructures in Latin America and financing

The tax consolidations seen in the 1990s in most Latin American countries came about at the expense of reduced public investment in infrastructures. The privatization policy and foreign direct investment flows (FDI) into this type of assets will only manage to partly compensate this reduction.

As a result, the gap in funding infrastructures in Latin America in comparison to most of its direct competitors

increases, perhaps compromising its long-term growth capacity.

Chart 2.
Relative position of competitiveness/ infrastructures



Source: World Economic Forum.

Chart 2 shows that Latin American countries (except Chile) are in a worse competitive situation with poorer infrastructures than their most direct competitors in the Far East and Eastern Europe.

Certain official estimates on the investment requirements over coming years in Mexico, Peru, Chile and Colombia state that they could run to 4% of GDP. However, public finances are unable to cover this expenditure level. For this reason, these countries are considering the need to extend private sector participation through public-private partnership (PPP) schemes. A PPP comprises *Project Finance*, i.e., a concession where the licensee finances, constructs and operates an infrastructure in exchange for payment, where the State assumes certain risks.

Relatively recent PPP and *Project Finance* experience in Latin America has given mixed results. With just some exceptions, All the projects were successful in Chile. The first concessions overestimated the flow of demand in Colombia and Mexico, meaning the government had to nationalize them to avoid bankruptcy.

The lessons learned from these events are that PPP projects will only be beneficial for a country, and attractive for private capital, if there is a serious cost/benefit viability study and appropriate risk management techniques. In this sense, a correct concessions law and legislation ensuring the ownership system are among the first essential elements. Later, risk management tools⁴ such as those related to construction, demand, public debt, etc. and the deepening of financial markets are basic elements for good project development. However, in Colombia, Mexico and Peru there still are several challenges To be addressed in order to adapt their institutional structures and private partnerships into the funding activity of infrastructures (Fay and Morrison, 2007).

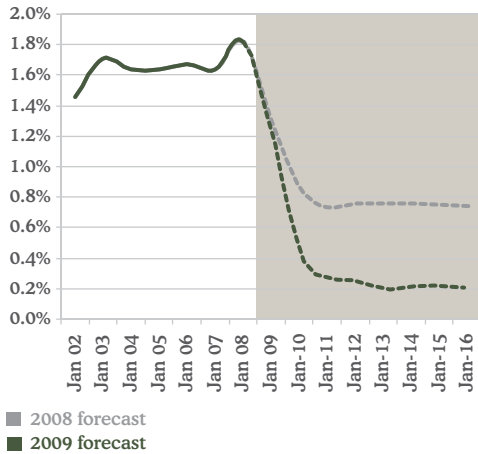
If all necessary sufficient conditions were fulfilled for PPPs to appeal to the private sector, pension funds would be firm candidates to participate in these projects since they would be expected to have major resources in the future. According to estimates collected by Alonso *et al* (2009), private pension funds in Chile, Colombia, Peru and Mexico could reach cumulative balances of 94%, 40%, 57% and 40% of GDP respectively in 2050, in addition to being local savings (not subject to a volatile exchange rate). Infrastructure assets may correctly fit with very long-term timeframes (for affiliate life-cycles) and have a good yield/ risk ratio for pension funds. Unfortunately, only pension funds in Chile and Peru directly invest 1.3% and 3% of their portfolios in this type of asset respectively.

⁴ Provided by multilateral financial institutions such as the World Bank, IDB, etc. in collaboration with the Country itself.

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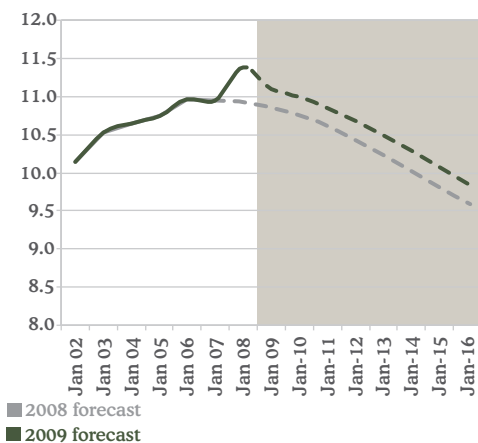
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Chart 10.
Spain: Population projections
(year-on-year growth)



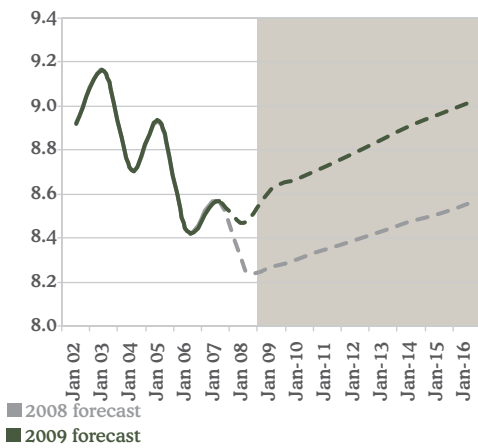
Source: INE

Chart 11.
Spain Birth projections
(gross rates per 1000 inhabitants)



Source: INE

Chart 12.
Spain: Mortality projections
(gross rates per 1000 inhabitants)



Source: INE

3.1 Potential housing demand in the new equilibrium of the residential market in Spain

A large part of housing demand is that created in response to demographic developments in a country and not to the real estate sector or economic situation. Still in an uncertain and difficult environment as the present, there is a potential housing demand sustainable in the medium and long-term equilibrium. This section will attempt to set out the most important factors for assessing this demand and housing demand created from mid-term dynamics in Spain will be quantified.

Demographic factors revised downwards...

Housing demand generated by demographic developments are mainly based on estimating the number of new households that could be formed and which, independently of their financial capacity, represent potential homebuyers in a given country. Population growth is one of the most important variables to forecast the number of new households and is also one of the most difficult to estimate. In Spain, there are mainly two official projections for population released by the National Statistics Institute (INE). On the one hand, the *Long-Term Population Projections*, that are calculated from data obtained from the latest census (2001) and estimated according to two scenarios, as per expected numbers in the mortality, fertility and migration movement rates. On the other, the *Short-Term Population Projections*, representing a forecast exercise more linked to the present environment and using all available information at the time of estimation. The short-term projections released during this past November will be used in this article. These projections are calculated from a starting point closer to the present (January 1, 2009) and also use new assumptions on the three basic demographic factors of birth, mortality and migration movement rates.

Chart 10 shows population growth in Spain reached its peak in 2008, with a year-on-year rate of 1.8%, and for the future expectations are set for significant lower growth, which will rapidly decrease reaching 0.2% yoy in 2012. In addition, if these forecasts are compared with previous forecasts, based on population information on January 1, 2008, the major downward adjustment is clear. The main factor behind this revision is easily identifiable in the lower expected growth of migration flows to Spain (Chart 13), which will more than compensate the upward revisions of mortality rates (Chart 12). The role migration flows played during the real estate market expansion phase is well-documented. Immigration increased population growth rates from 0.4% in the 1990s to 1.8% over the last decade, supporting real estate market expansion in the last cycle. Now, this contribution to demand is declining and the trend, always taking into account the uncertainty that characterizes any type of forecast made during an adjustment phase, would continue in the future.

...as does household formation

For population growth to translate into higher housing demand, it is necessary that new households are formed. Different methodologies can be used to estimate how many households will be established in Spain in the future, depending on data availability and assumptions made while making the estimate.

One of the most common and recommended methods used by international organizations is based on the household headship rates by age group which, multiplied by the expected population in each age group gives the new households that may be exclusively created through demographic dynamics. This rate is usually obtained from census data, in Spain dating back to 2001. In addition to the census figures, the headship rates can be obtained through data from the Labor Force Survey (LFS). Given the greater time proximity of the LFS data with respect to the Census, these rates are preferred and set out in Table 1.

Household headship rates are taken to remain constant in the future in order to forecast the number of households, with the rate per age group being multiplied by the total corresponding population in each group:

$$H_t = \sum_i (HR_{i,t} * POB_{i,t})$$

Where the headship rate (HR) for each group corresponds to those in Table 1 and applied to the different population groups in each year *t*: native (men and women) and immigrant (men and women).

The results are set out in Chart 14. As can be seen, based on these Estimates, the year 2009 will close with a total of 16.8 million households with an average of just over 100,000 new households per year appearing over the coming seven years. This figure is a quarter of those that were formed over the last decade (with an average of almost 400,000 households per year between 1998-2008). The fact that the number of households obtained is so low can be explained by several factors. First, estimates exclusively take into account demographic dynamics, leaving out other factors, such as job creation. Second, head of household rates for both natives and foreigners are taken as remaining constant over the forecast period.

For this, the number of new households expected over the coming seven years is derived from a different independent methodology of the evolution of the headship rates. Specifically, starting from the future evolution of employment, given by our long-term employment forecast, we proceed to the estimation of the variable "number of employed persons per household". Thereafter, the number of new household is computed using INE population growth forecasts.

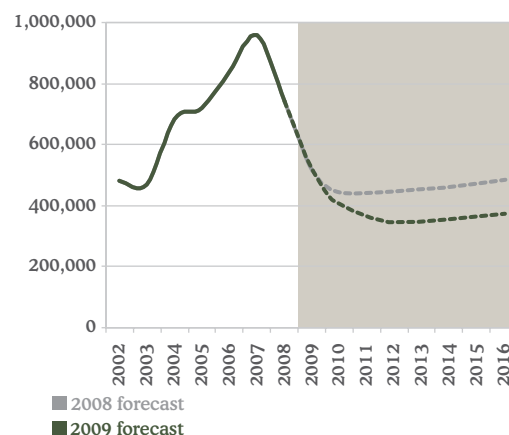
The estimated equation is as follows:

$$\Delta \frac{e_t}{h_t} = \alpha + \beta_1 \Delta emp_t + \beta_2 \Delta emp_{t-4} + \varepsilon_t$$

Where $\frac{e_t}{h_t}$ represents the number of employed persons per household and *emp*/the employment, and has been estimated with quarterly data from the first quarter 1992 to the latest available employment data in the LFS from the third quarter 2009.

Two scenarios were added to this estimate. Firstly (scenario 1) where the number of employee per household follows its historical growth trend and continues on the reduction path begun in 2008. A second

Chart 13. Spain: Migration flow projections



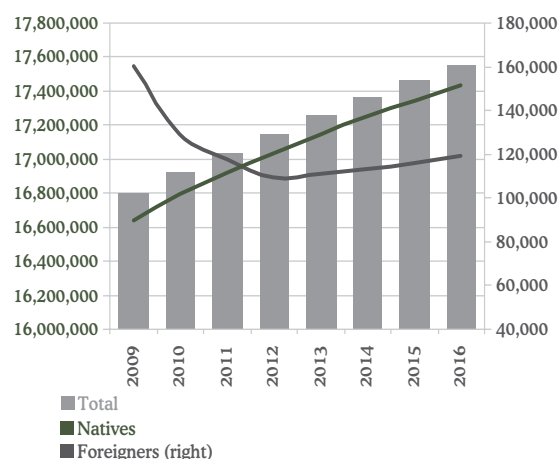
Source: INE

Table 1: Headship rates, 2008

	Natives			Foreigners		
	Male	Female	Total	Male	Female	Total
<6	0.0	0.0	0.0	0.0	0.0	0.0
16-20	0.8	1.2	1.0	2.8	5.1	3.9
21-25	7.1	8.2	7.6	27.2	22.6	24.7
26-30	28.7	20.4	24.8	45.2	29.1	36.8
31-35	50.8	32.8	42.1	52.9	33.4	43.5
36-40	57.0	39.0	48.2	60.4	38.4	50.2
41-45	57.9	35.8	46.8	64.1	39.6	52.2
46-50	68.6	49.2	58.9	67.3	41.5	54.3
51-55	63.3	49.3	56.3	64.3	36.9	50.1
56-60	63.5	49.8	56.4	62.4	41.3	51.6
61-65	62.5	52.4	57.2	70.1	42.6	53.6
66-70	65.3	55.5	60.0	66.7	39.6	52.1
71-75	65.7	65.3	65.5	59.7	54.4	56.8
76-80*	46.3	52.7	50.0	51.3	47.1	48.9
81-85	50.0	51.8	51.1			
86 and +	50.5	41.3	44.3			

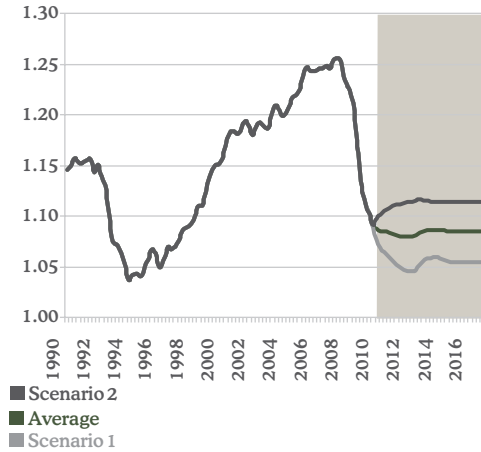
* 76 and above for foreigners
Source: INE

Chart 14. Spain: household forecasts (estimates based on headship rates)



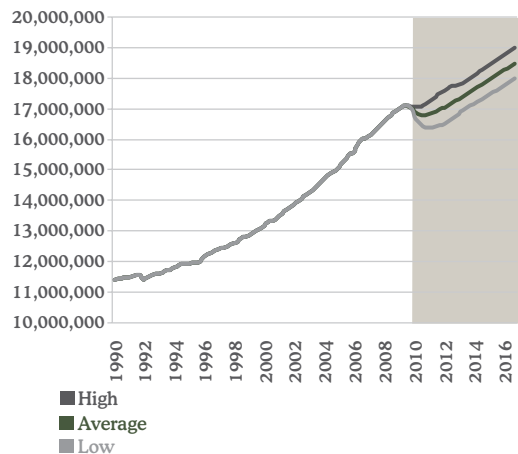
Source: INE and BBVA ERD

Chart 15.
Spain: Number of employee per household projections



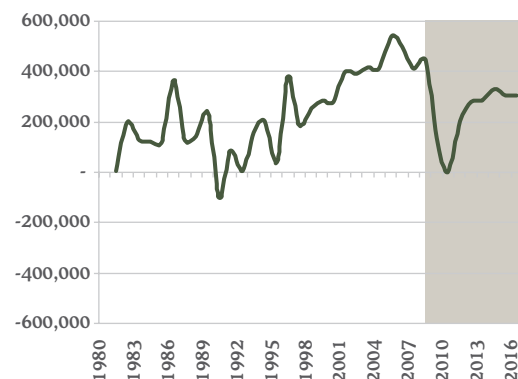
Source: BBVA ERD based on INE

Chart 16.
Spain: Household number projections



Source: BBVA ERD based on INE

Chart 17.
Spain: household formation



Source: BBVA ERD based on INE

scenario is characterized by an increase in the number of employee per household, meaning a lower rate of emancipation or a lower number of divorces, among other factors. Lastly, the intermediate scenario is an average of the two above. The three scenarios are summarized in Chart 15. In accordance with these scenarios and short-term INE population forecasts, the number of households and new household that will be created in the next years are projected as per these dynamics (Charts 16 and 17). As can be seen, the average scenario points to a major slowdown in household formation in 2009 and more so in 2010. The return of some migrants to their home countries, fewer divorces and other changes that could affect household structure, are among some of the most important factors that can explain the possible decline in households. Given these dynamics, the reduction in Spanish household size, which has grown uninterruptedly since 1996, could slow down (Chart 18). From an average size of about 3.3 individuals per household at the start of the 1990s, the number of family members has almost converged to the European average of 2.5. However, in a difficult economic context as today's, with a slow economic recovery towards levels below those seen in the last cycle, the continuation of such a decline in household size is more difficult, slowing down the convergence process towards the European average.

Other factors to be considered in order to estimate the potential housing demand in the Spanish market

Estimates relating to household formation undoubtedly represent the most important element to determine housing demand. However, internal and external vacation home demand in Spain, represented a major percentage of sales during the latest real estate cycle, and holiday home demand is likely to increase as economies recover.

According to the last housing census, 31.5% of housing stock in Spain comprises holiday homes of Spanish nationals and overseas citizens (Chart 10). This percentage was reached partly due to the growth in disposable income, recorded in the last expansionary economic phase and also owing to a greater preference for housing investment shown by Spanish families, both for their own use and as a tourism investment. One in five Spanish families had a holiday home during the last decade.

Housing demand for holiday homes was also boosted by real estate investment from overseas, which in the last cycle represented around 40% of holiday home purchases.

In order to estimate potential housing demand, the assumption remains that holiday homes could represent 31.5% of stock in normal conditions. A low scenario is added to the above where only 25% of housing would be for holidays, and a high scenario, where this percentage runs to 35%.

Adding to the three household formation scenarios, the demand for holiday homes generated by Spanish and overseas nationals will reach potential demand of about 400,000 homes per year (Chart 20). This potential represents housing demand that could be generated in the mid- to long-term exclusively thanks to the country's demographic

dynamics and the structural features linked to tourism. However, it is important to state the high uncertainty that affect these forecasts which, dealing with potential demand, could only become effective depending on many factors.

First, new household formation is not an exogenous process to a country's economy. The fall in employment seen in the last three quarters in Spain has slowed this process and, given the slow economic recovery perspective, the rhythm of household formation could slow further.

Second, expectations about future house price dynamics also play a major role. Given the over-supply in housing for sale on the market, with purchasers waiting for greater price adjustments, together with reduced consumer confidence, existing potential demand is being postponed.

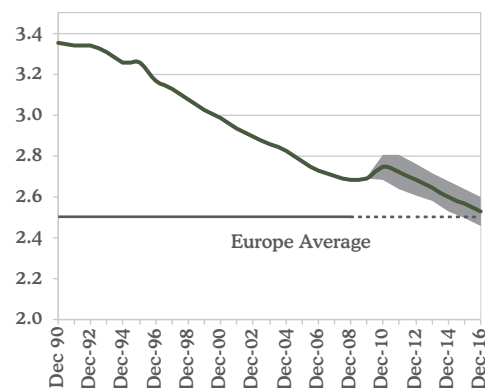
Lastly, financial conditions also affect decisions to set up a new household. If mortgage conditions continue to be tight, this is likely to further delay a recovery in housing demand.

Table 2: Development of the most important variables in determining potential housing demand

	2001-2008 (average)	2011-2016 (average)
Population, in thousands	42,738	46,409
% yoy Population	1.6%	0.2%
Immigration, in thousands	700	361
% yoy Immigration	8.0%	-1.2%
No. individuals per household	2.80	
high		2.54
average		2.58
low		2.61
No. households (thousands)	15,304	
high		18,214
average		17,975
low		17,736
Households formation (thousands)	440	
high		306
average		284
low		262
% of non-main housing (% total)	31.5%	
high		35.0%
average		31.5%
low		25.0%
No. homes demanded based on demographic requirements (thousands):		
high		414
average		374
low		328

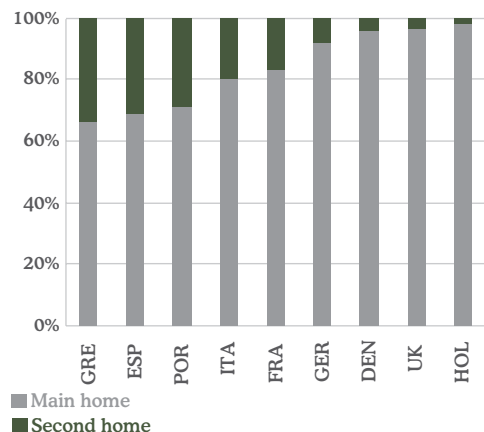
Source: INE and BBVA ERD

Chart 18. Spain: average household size



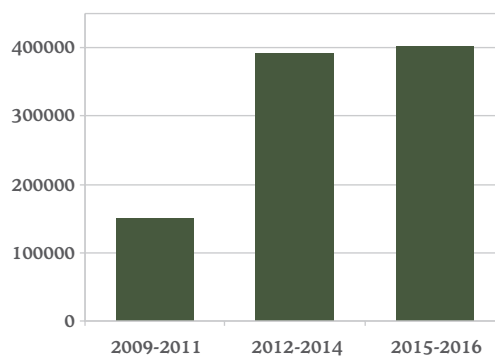
Source: INE; Eurostat; BBVA ERD

Chart 19. Housing type per use



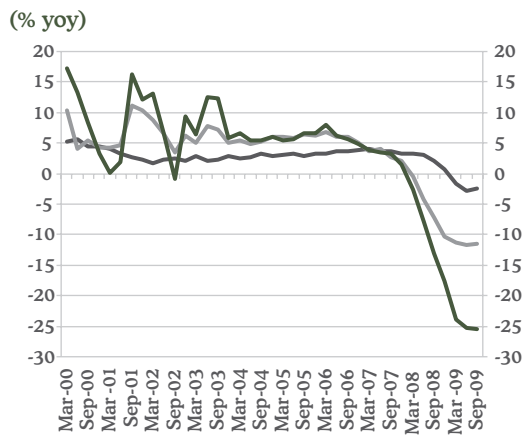
Source: European Statistics, INE, INSEE, DESTATIS, UK Census, INE (Portugal), BBVA ERD

Chart 20. Spain: Potential housing demand (average values)



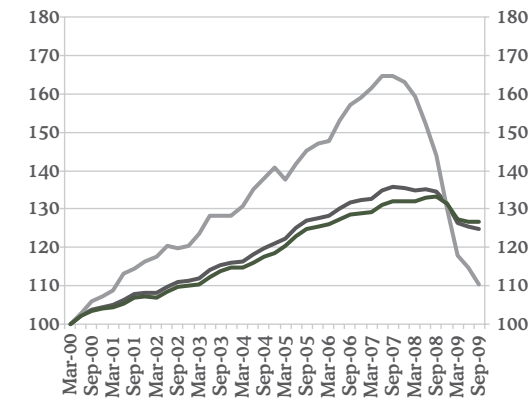
Source: BBVA ERD

Chart 1. Spain. GDP, construction and housing (% yoy)



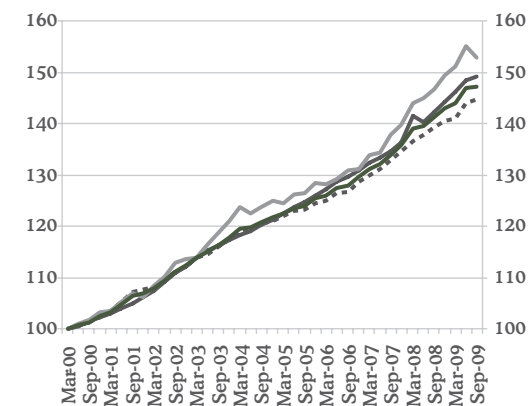
■ Investment in construction
 ■ Investment in residential property
 ■ GDP excluding construction
 Source: BBVA ERD based on INE

Chart 2. Spain. Cumulative employment growth (1Q00 = 100)



■ Total
 ■ Construction
 ■ Total excl. construction
 Source: BBVA ERD based on INE (LFS)

Chart 3. Spain. Total wage cost growth (Series: calendar and seasonally-adjusted; 1Q00 = 100)



■ Construction
 ■ Industrial
 ■ Market services
 ■ Market economy
 Source: BBVA ERD based on Eurostat (HLCI)

4. Wage growth and job losses in the construction sector

The fall in employment demand due to the adjustment being seen in the construction sector has led to a major contraction in employment but not in wage restraint

The comparatively high decline being seen in construction in Spain with regard to other economic sectors (see Chart 1) is leading to a significant decrease in employment demand at sector businesses.

If the job market were perfectly competitive, demand contraction would lead to a downward wage adjustment and reduction in employment levels, higher when job supply is more flexible in the face of wage changes. However, data show that the labor market in Spain operates non-competitively. The construction sector began to cut jobs in the fourth quarter of 2007, a year before the rest of the economy as a whole. Despite the fall in employment intensifying in the second half of 2008 across all economic areas and not only in construction, net cumulative job losses in the sector ran to 909.5 thousand individuals in the third quarter this year, 54.7% of total jobs lost in the economy (see Chart 2).

On the contrary, the fall in employment demand has not led to wage restraint. The Harmonized Labor Cost Index (HLCI) based on data from the Quarterly Labor Cost Survey shows that the average nominal wage received by those employed in construction increased 10.9% between 4Q07 and 2Q09¹, and only decreased 1.4% in 3Q09 (last available data). In other business sectors, average cumulative wage growth ran to 8.9% in industry and 7.1% in services (see Chart 3).

The scant wage growth sensitivity to job losses is not an exclusive phenomenon to the Spanish labor market, but its size is a differential element in the Spanish economy

If the construction sector adjustment in Spain is compared in terms of amounts (jobs) and prices (wage) with that seen in surrounding countries, there are major quantitative and qualitative differences (see Table 1).

Firstly, those economies which did not see a real estate expansion phase over the last decade (Germany, France and Italy) show reduced job losses in construction and moderate wage growth below the rest of the economy.

Secondly, countries which saw significant growth like Spain in the construction sector over the last decade (U.K. and, especially, Ireland) show major job losses and a slight wage adjustment in line with employment.

Therefore, although the low wage growth sensitivity to job losses in the construction sector is not a phenomenon exclusive to the Spanish labor market, the fact that wages reacted to the sector decline with a

¹ Note that the CPI only increased by 2,0% over the same period.

seven-month delay does comprise a differential factor in the Spanish economy.

The main cause behind recent wage developments is the change in composition of those employed in the construction sector, caused by the loss of less productive and lower paid positions...

What other factors could also explain the positive wage development seen by those employed in construction in Spain? Mainly two:

- i. An increase in the relative importance of those in work with better remuneration (composition effect), and/or
- ii. The existence of downward wage stickiness .

The microdata in the Labor Force Survey are used to analyze the possible existence of a composition effect. Specifically, how the job composition change by level of education, contract type and seniority at the company is analyzed, these three being determining individual factors in wage development² .

Charts 4 and 5 show the weight of those in work with second stage high school and university studies in construction grew 4.8% percentage points (pp) since 2007, reaching 40.8% in 3Q09, compared to the 1.2 pp increase seen in the rest of the economy.

Similarly, the decline in the temporary work rate in the construction sector (-9.3 pp) was significantly greater than that seen across other economic sectors (-3.0 pp), as shown in Chart 6.

With this, the most revealing change came in the seniority variable. Chart 7 shows that average seniority of those employed in the sector increased 25.3% between 4Q07 and 3Q08, coming in at an average 7.2 years. The increase in the rest of the economy was significantly more modest (5.3%).

Therefore, employment destruction in the construction sector affected the most vulnerable and worst paid groups (mainly young people with low qualifications, temporary contracts and a short length of service at the business). This sent wage growth upwards in average terms. Undoubtedly, behind this composition effect lays one of the aspects characterizing the behavior of the Spanish labor market: the imbalance in job protection based on contract type. This duality means the adjustment cost in job terms falls on those comparatively less protected groups³ .

... but the existence of downward wage stickiness, characteristic of setting wages in Spain, also plays an important role

Two Phillips' curves have been estimated to analyze the existence of wage stickiness in the construction sector compatible with the existence of a composition effect, one for the construction sector and one for the rest of the economy.

² See Rodríguez (2004) for a summary of the determining factors to the wage setting process in Spain.

³ A detailed analysis of the consequences to the duality in the Spanish labor market can be found at BBVA ERD (2009).

Chart 4.
Spain. Employment profile in construction

By qualification levels

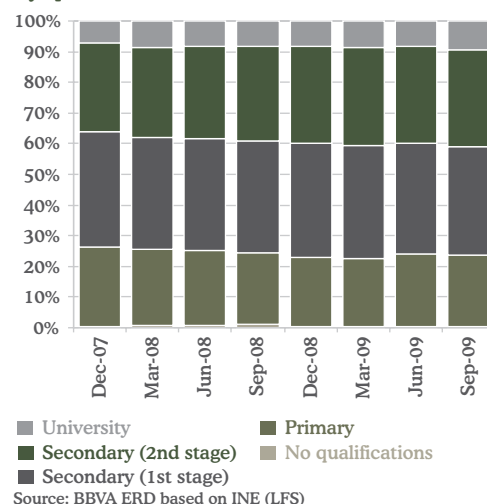


Chart 5.
Spain. Employment profile in the rest of the economy

By qualification levels

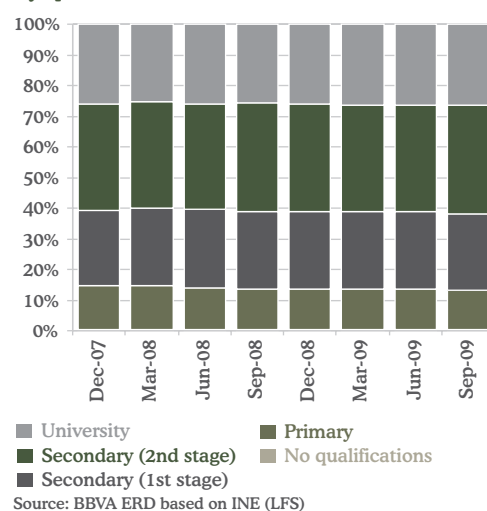


Chart 6.
Spain. Temporary employment rate
(% of workers with temporary contracts)

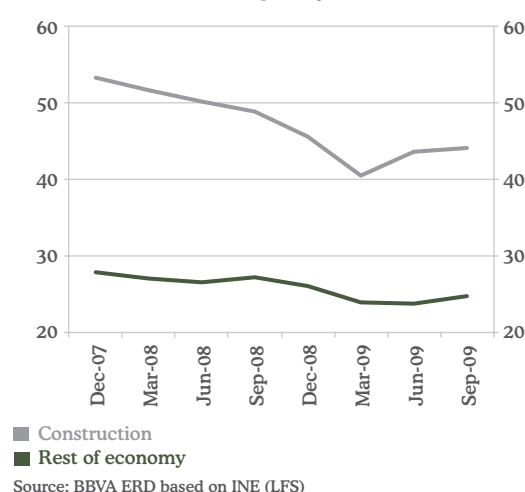
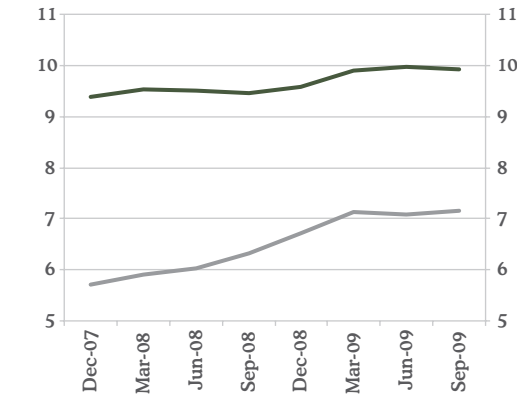


Chart 7.
Spain. Average seniority (years)

Construction vs. rest of economy

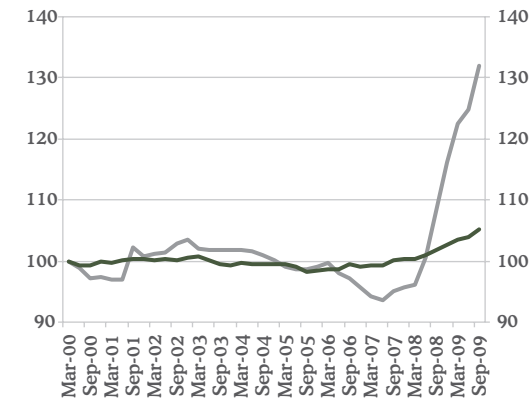


■ Construction
■ Rest of economy

Source: BBVA ERD based on INE (LFS)

Chart 8.
Spain. Cumulative productivity growth per employee

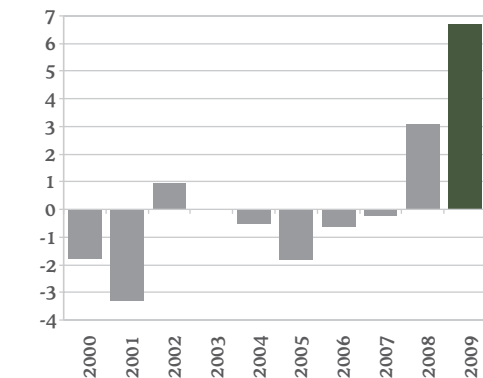
(1Q00 = 100)



■ Construction
■ Total

(+) Real gross added value/number of employees
Source: BBVA ERD based on Eurostat

Chart 9.
Spain. Change in unemployment rate (percentage points)



Source: BBVA ERD based on INE (LFS)

The original Phillips curve sets a negative relationship between nominal wage growth and the unemployment rate in an economy. When it is high, the excess job supply (and/or lack of demand) places downward pressure on wage growth; when reduced, it suggests there is a lack of labor supply whereby the probability of employees gaining a higher wage raise increases⁴.

In the case here, an augmented Phillips curve is estimated where short-term wage growth depends on the level and growth in the unemployment rate, inflation rate and apparent work factor productivity change. In the long-term, the unemployment rate would equal the NAIRU (non-accelerating inflation rate of unemployment) i. e., it would come in at its balance value. For this to occur, the change in wage depends on the inflation rate and work productivity growth (see Appendix for more details).

The augmented Phillips curve estimate uncovers the level of stickiness (nominal and real) due to the wage determination mechanism. In this way, nominal stickiness is defined as the nominal wage growth response to the inflation rate. Therefore, it is a measure of the indexation level of an economy or sector. When setting salaries involves a slow adjustment to nominal wage growth in the face of a change in price levels, the real wage response to disturbances causing inflationary pressures will be higher.

Real stickiness refers to real wage increase sensitivity to changes in demand, approximate for the unemployment rate. In this sense, the lower the nominal wage increase elasticity to the unemployment rate, the higher the level of real wage stickiness. This leads to a more costly adjustment in employment terms.

The effect of job composition changes is set out by the coefficient accompanying work productivity growth. If job losses affect the least productive jobs comparatively highly, *ceteris paribus*, there will be an increase in average productivity in the short-term.

Chart 8 shows that work productivity increased since the end of 2007, both in the economy as a whole and, especially, in the construction sector: work productivity cumulative growth in construction over the last two years was 38.0% compared to 4.7% in the total.

The Phillips curve estimated results show that, in the short-term, nominal wage growth response in the construction sector to work factor productivity changes is significant. Contrarily, work productivity growth does not explain nominal wage development in the rest of the economy in the short-term⁵.

Similarly, important differences in the effect of unemployment on nominal wage development are seen. Results show that the unemployment rate level negatively affects wage development of those working in the construction sector, whereas in the rest of the economy, its change

⁴ Chapter 8 in Cahuc and Zylberberg (2004) has a detailed analysis of the relationship between wage development and unemployment in developed economies.

⁵ But true in the long-term. See Appendix.

also negatively impacts wage growth. This means that construction – in opposition to other sectors as a whole – is not affected by hysteresis or persistence problems, whereby increased growth in the unemployment rate, such as that seen in 2008 and 2009 (see Chart 9), would not cause a downward wage reaction.

With this, wage growth response to changes in unemployment is reduced when compared to the wage indexation level.

In summary, the main cause behind significant wage growth seen in recent quarters is the change in profile of those employed in the construction sector, caused by the loss of less productive and lower paid positions. Although the stickiness representative of the wage setting mechanism in Spain play an important role, only real ones – higher in construction – help to explain the difference between wage development in the sector and that seen in others. Given the wage convergence speed to long-term balance in construction is significant, as shown by the estimates, the wage adjustment started in 3Q09 looks set to continue over coming quarters.

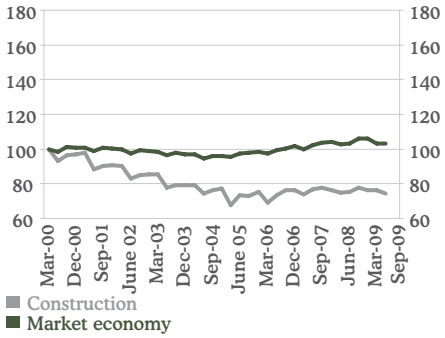
References

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Table 1: Comparative development of employment and salaries in the construction sector in some surrounding countries (1Q = 100)

Germany.

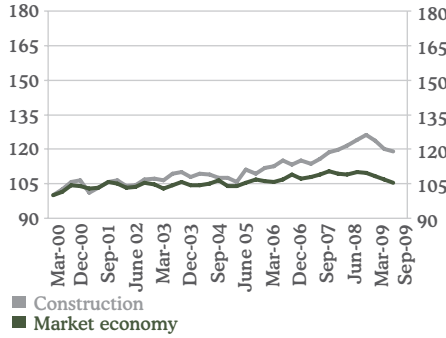
Cumulative employment growth



Source: ERD, BBVA based on Eurostat

France.

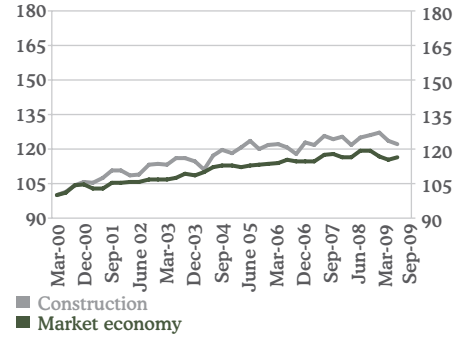
Cumulative employment growth



Source: ERD, BBVA based on Eurostat

Italy.

Cumulative employment growth



Source: ERD, BBVA based on Eurostat

Germany.

Total labor cost growth

(Series: calendar and seasonally-adjusted; 1Q00 = 100)



Source: ERD, BBVA based on Eurostat

France.

Total labor cost growth

(Series: calendar and seasonally-adjusted; 1Q00 = 100)

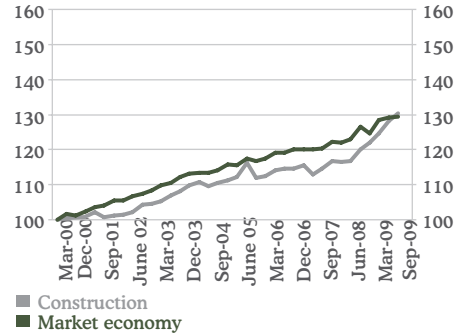


Source: ERD, BBVA based on Eurostat

Italy.

Total labor cost growth

(Series: calendar and seasonally-adjusted; 1Q00 = 100)



Source: ERD, BBVA based on Eurostat

U.K.

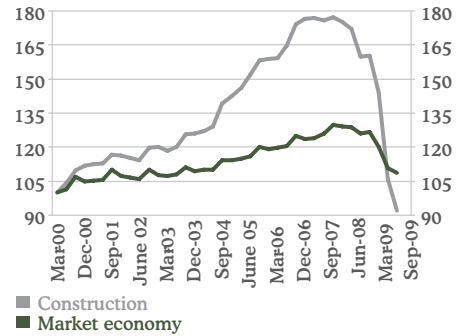
Cumulative employment growth



Source: ERD, BBVA based on Eurostat

Ireland.

Cumulative employment growth



Source: ERD, BBVA based on Eurostat

U.K.

Total labor cost growth

(Series: calendar and seasonally-adjusted; 1Q00 = 100)

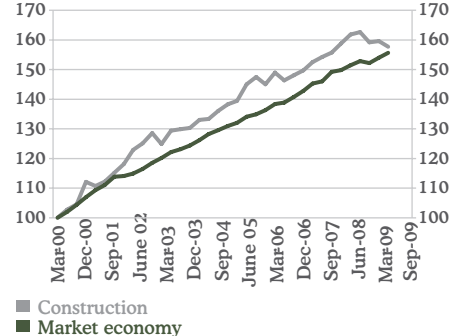


Source: ERD, BBVA based on Eurostat

Ireland.

Total labor cost growth

(Series: calendar and seasonally-adjusted; 1Q00 = 100)



Source: ERD, BBVA based on Eurostat

Appendix

Two augmented Phillips' curves have been estimated to analyze the existence of downward wage stickiness with the existence of a composition effect, one for the construction sector and one for the rest of the economy as a whole.

The data running from 1970 to 2008 are from AMECO⁶. Those available variables only from 1980 were reconstructed by using the series corresponding to EU KLEMS⁷.

Under the hypothesis that the unemployment rate equals the natural long-term rate, nominal wage growth depends on the inflation rate and apparent work factor productivity growth. Wage, price and productivity variables are required to develop following a common trend for this, *i. e.*, they should be cointegrated.

When the order of series integration is analyzed, both nominal wage and the inflation rate and work productivity can be seen as order 2 integrated variables. For this reason, the Phillips curve is specified as an error correction model (ECM) in second differences (Δ^2):

$$\Delta^2 \text{LN}(w_{it}) = \beta_0^i + \beta_1^i \Delta^2 \text{LN}(p_{it}) + \beta_2^i \Delta^2 \text{LN}(pr_{it}) + \beta_3^i (1 - \gamma^i) u_{it} + \beta_3^i \gamma^i \Delta u_{it} - \lambda^i [\Delta \text{LN}(w_{it-1}) - \beta_4^i \Delta \text{LN}(p_{it-1}) - \beta_5^i \Delta \text{LN}(pr_{it-1})] + \varepsilon_{it}; \quad (1)$$

$$i = \{\text{construction}; \text{rest of economy}\}; t = 1970, \dots, 2008,$$

where $\text{LN}(w_{it})$ denotes the Neperian logarithm for the average nominal wage in the sector i in year t ; p , the consumer price level; pr , the work factor productivity; and u the unemployment rate. The long-term equation shows the nominal wage change with the inflation rate and productivity growth per employee, λ being the wage growth adjustment speed to balance level.

The parameter β_1 measures the wage change elasticity to the inflation rate and provides an approximation of the nominal inflexibility level induced by the wage determination mechanism⁸; on the contrary, the lower β_3 is, the greater the real inflexibility level. Finally, γ is a measure of the persistence of the disturbance effect on the unemployment rate.

Since the cointegration contrasts of the variables specified in the error correction (λ) lead to a rejection of the non-cointegration hypothesis, the ECM estimate results – commented on in the text – are set out in Table A.1.⁹

⁶ Further details at: http://ec.europa.eu/economy_finance/db_indicators/db_indicators8646_en.htm

⁷ Further details at: <http://www.euklems.net/>

⁸ Given the possible endogeneity in the inflation rate, the parameter estimator β should be treated with caution.

⁹ A similar model to the estimate in this article for several European economies can be found in Horn, Scheremet and Zwiener (1999).

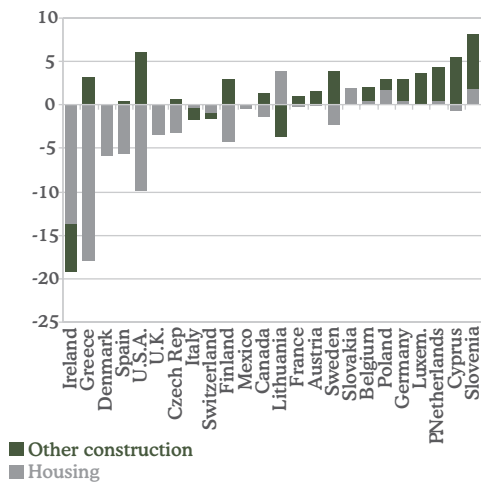
Table A.1. Augmented Phillips curve estimate. 1970-2008

Dependent variable: $D_2 \text{LN}(w_{it})$	Total economy	Construction	Rest of economy
Constant	0,0156 (0,006)	0,0316 (0,017)	0,0147 (0,007)
$\Delta^2 \text{LN}(p)$	0,552 (0,139)	0,787 (0,353)	0,533 (0,154)
$\Delta^2 \text{LN}(pr_{\text{total}})$	0,308 (0,160)		
$\Delta^2 \text{LN}(pr_{\text{construction}})$		0,314 (0,094)	
$\Delta^2 \text{LN}(pr_{\text{rest}})$			0,235 (0,199)
u	-0,133 (0,051)	-0,253 (0,132)	-0,129 (0,055)
Δu	-0,367 (0,137)	-0,181 (0,384)	-0,342 (0,150)
λ (total)	-0,237 (0,134)		
	$\Delta \text{LN}(p_{\text{total}})$ 1,027 (0,084)		
	$\Delta \text{LN}(pr_{\text{total}})$ 0,650 (0,245)		
	constant 0,006 (0,006)		
λ (construction)		-0,601 (0,157)	
	$\Delta \text{LN}(p_{\text{c}})$ 1,088 (0,123)		
	$\Delta \text{LN}(pr_{\text{c}})$ 0,242 (0,126)		
	constant 0,009 (0,011)		
λ (rest)			-0,306 (0,147)
	$\Delta \text{LN}(p_{\text{rest}})$ 0,960 (0,089)		
	$\Delta \text{LN}(pr_{\text{rest}})$ 0,943 (0,273)		
	constant 0,007 (0,006)		
R^2	0,623	0,563	0,535
R^2 adjusted	0,562	0,492	0,459
H_0 : no first order auto-correlation	0,997	0,581	0,992

Source: BBVA ERD

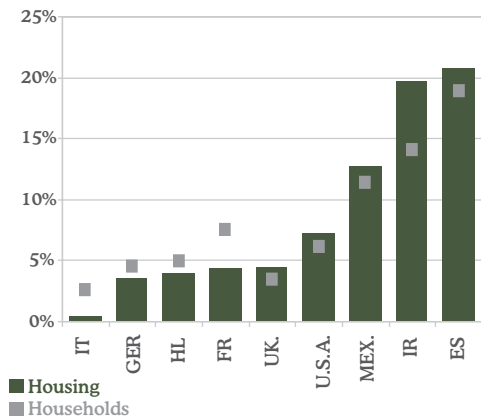
Chart 1.
Investment in construction

Contributions to the year-on-year growth rate in 2008 (%)



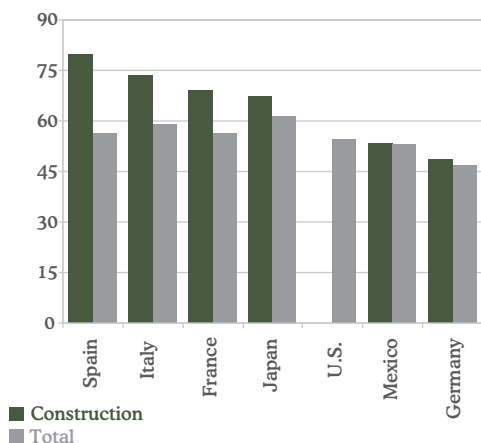
Source: BBVA ERD based on AMECO

Chart 2.
Household formation and growth in housing stock during the last real estate cycle



NB: Growth between 2000 and 2003 for Italy, between 2000 and 2004 for France, between 2000 and 2005 for Mexico, between 2000 and 2007 for Spain, between 2002 and 2007 for U.S. and between 2002 and 2006 for Ireland. Growth between 2000 and 2006 for remaining countries.
Source: BBVA ERD based on EMF and national sources.

Chart 3.
Leveraging (*) of the construction sector
Average 2005-2007 (%)



Notes: (*) Debt/Assets.
2004-2005 average for Japan, 2001-2005 for the U.S. and 2005-2008 for Mexico
Source: BBVA ERD based on BACH

5. Effects of resizing in the productive capacity of the construction sector in developed countries¹

The drop in demand during the current recession and higher growth than the economy during the previous expansionary cycle have exacerbated the problem of overcapacity in the construction sector

From mid-2007, the construction sector in developed economies saw a restructuring process in productive capacity as a result of the significant squeeze in both domestic and foreign demand, the unbalanced growth pattern registered in previous expansionary cycles and the squeeze on finance after the worsening of the global credit crunch in the second half of 2008.

With regard to the first factor, despite the countercyclical role played by civil works, investment in construction in Western Europe and the U.S. suffered major falls due to the slump in home buying (see Chart 1).

Secondly, the slump in demand exacerbated the problems of overcapacity in the sector. During the previous expansionary cycle, countries such as the U.S., U.K., Mexico, Ireland and Spain (among others) recorded higher construction in housing than could be explained by people setting up new households (see Chart 2). The increase in housing above the level explained by its fundamentals contributed to the expansion of present excess supply, mainly in the U.S. and Spain².

Thirdly, the deterioration in construction activity coincides with its fragile financial situation. Since it is an economic sector where past expansion was credit-based, it has reached a high rate of leverage compared with other sectors in developed economies, as can be seen in Chart 3. This has led to it being particularly affected by tougher financial conditions.

Macroeconomic effects of the construction adjustment

The complex situation affecting construction has important macroeconomic consequences due to its significant contribution to output and employment in the economy and its close links to other branches of economic activity³.

In general, the average Gross Value Added (GVA) growth in construction in developed nations was below the economy as a whole, mainly during the 1970s, 80s and 90s (see Table 1). Contrarily, job creation was generally more intense than the observed one in the

¹ Thanks go to Fernando Balbuena, Alma Martínez and Eduardo Torres for their collaboration.
² Between 2005 and the start of 2008, the housing stock available in the U.S. doubled to an all-time high of 5 million units, the equivalent to a year's sales at the 2008 rate. In Spain, BBVA ERD forecasts indicate that the oversupply of new housing is currently 1.2 million units. This is equivalent to the cumulative sales of new homes between 2006 and 2008. See BBVA ERD (2008, 2009) for more details about the estimates of excess housing supply.
³ The following country subset has been chosen to analyze the strategic importance of the construction sector in developed economies: Germany, U.S., Spain, France, Italy, Japan, Mexico and the United Kingdom.

rest of the economy as a whole⁴. This indicates a clearly improvable evolution in apparent labour productivity, especially over the last twenty years. With this, the contribution of the construction industry to GVA growth and, above all, employment growth is significant due to its large relative size. The case of Spain particularly stands out, where construction made up 9.1% of average GVA growth in the economy and 11.9% in average employment growth between 2000 and 2008. On the opposite end are Germany and the U.S. where construction hardly contributed 4% to average GVA growth and 6% to employment over the last decade.

The importance of the backward linkages on other sectors implies that the impact of the slump in construction is comparatively high

However, although the **direct** contributions of the construction industry to the deterioration of aggregate economic activity are limited, its effects on the economic performance of the economy as a whole in the countries under analysis is relevant, given the **indirect** repercussions it has on activity and employment of the remaining productive branches of the economy.

The strategic importance of an economic activity, i.e., its capacity to boost production in other activities, can be quantified by *Input-Output* Tables (IOT) that reflect the economic structure of a country, identify the interrelation between sectors and measure the effect of changes in the final demand of a determined sector on production in the remaining activities and agents⁵. The recent updating by the OECD on domestic symmetric IOTs for each of its members makes it easier to compare the direct and indirect effects of construction in each country on the economy as a whole⁶.

Table 2 includes the backward linkages of demand⁷ in the main branches of economic activity on economic output as a whole in each of the countries under consideration. The results indicate that the construction backward linkages are comparatively high in all the economies under analysis. Construction plays a particularly important role in Italy, the United Kingdom, Mexico and, above all, Spain, where it is the economic activity with the greatest spillovers.

To calculate the direct and induced effects of changes in final demand in a sector on the rest of the economy, we have to work in terms of GVA⁸ and employment, not output. Certain regional homogeneity is seen in the results obtained in terms of added value (See Table 3). In

⁴With the exception of Germany and Japan, two countries where construction has drained economic growth and employment, mainly during the last two decades, either for demographic reasons and sectoral specialization in other activities, or because (in the case of Japan) there was a severe real estate crisis at the start of the 1990s.

⁵ See BBVA ERD (2007) for a detailed analysis of the *Input-Output* method used.

⁶ The symmetrical IOTs for OECD countries, except Mexico, are available at: http://www.oecd.org/document/3/0,3343,en_2649_34445_38071427_1_1_1_1,00.html.

They are based on Revision 3 of the International Standard Industrial Classification of all Economic Activities (ISIC) and, with some exceptions, correspond to the year 2000. The Mexico IOT for 2003 was compiled by the National Institute of Statistics and Geography (INEGI). The Mexico IOT is different to other countries' as it uses the U.S. industrial classification system (NAICS).

⁷ The backward linkages of the demand of a sector is the sum of its direct effect on production and the induced effect on the activity of the remaining sectors.

⁸ GVA at base prices = Production at base prices – Intermediate consumption at base prices – Net taxes on production.

this way, a reduction of 1 million monetary units in final demand in the construction would cause a drop in GVA in the economy slightly above 0.8 million, half of which would come from the induced fall in the other productive sectors.

Table 3. Effects on GVA and employment in each economy of a decrease in 1 million monetary units in final demand for construction

Construction	Domestic IOT					
	GVA (1)			Employment (2)		
	Total	Direct	Induced	Total	Direct	Induced
Germany	-0.83	-0.43	-0.41	-19.52	-12.29	-7.23
U.S.	-0.92	-0.51	-0.41	-15.67	-10.13	-5.53
Spain	-0.84	-0.33	-0.50	-20.45	-8.79	-11.66
France	-0.82	-0.37	-0.44	-17.58	-9.26	-8.33
Italy	-0.84	-0.38	-0.46	-20.69	-11.19	-9.50
Japan	-0.80	-0.52	-0.28	-7.06	-3.33	-3.73
Mexico	-0.83	-0.49	-0.35	-12.50	-9.41	-3.10
United Kingdom	-0.81	-0.37	-0.44	-22.05	-10.01	-12.03

(1) GVA in millions of monetary units
 (2) Full-time equivalent employment, except in United Kingdom (total employment)
 Source: BBVA ERD

In terms of employment, the effects of changes in the final demand of construction show a greater variation between countries. This can be explained by differences in the weight of the industries in each economy, in the intensity in the use of the labor factor⁹ and in productivity differentials.

Regional homogeneity is detected in terms of the size of construction backward linkages, as well as the type of sectors affected by construction

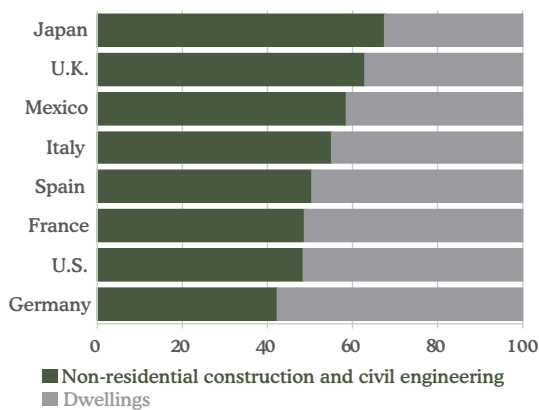
Just as we can see a high level of regional homogeneity in terms of the capacity of construction to boost production in the rest of the economy, we can also see certain similarities between countries in terms of the type of activities affected by it. Thus, Table 4 shows that the sectors of other non-metal mineral products, commerce, other business activities, the manufacture of metal products and financial intermediation comprise the activities on which construction has the greatest backward linkages in the countries under analysis.

Table 4. Main sectors affected by changes in construction demand

	Ranking in each country (*)							
	Germany	U.S.	Spain	France	Italy	Japan	Mexico	U.K.
Other non-metal mineral products	1st	6th	1st	3rd	1st	4th	2nd	4th
Sales and repairs of motor vehicles	3rd	1st	3rd	4th	2nd	1st	1st	2nd
Other business activities	2nd	11th	4th	1st	3rd	2nd	6th	1st
Manufacture of metal products (except machinery and equipment)	5th	3rd	2nd	5th	4th	3rd	8th	6th
Financial intermediation	7th	5th	9th	2nd	6th	6th	18th	3rd

(*) 42 branches of activity (ISIC) in Germany, U.S., Spain, France, Italy, Japan and U.K.; 77 (NAICS) in Mexico
 Source: BBVA ERD

Chart 4. Composition of construction investment
 Average 2000-2008 (*) (%)



(*) 2000-2007 average for Japan and the U.S. 2003-2008 average for Mexico
 Source: BBVA ERD based on AMECO, OECD and INEGI

⁹ The greater share of non-residential construction in Japan, which is less labor intensive than residential, is behind the lower effect on employment (see Chart 4).

Note that the real estate activities is not among those most affected by construction, except in Germany, the U.K. and Mexico, while construction is itself one of those most affected by changes in demand in real estate activities in all the countries under consideration, as shown in Table 5. This result suggests that in the real estate sector, it is demand (understood as real estate activity) that stimulates supply (understood as construction), and not the other way round. Therefore, housing over-supply in some countries could be explained, because supply overestimating demand in the last expansionary real estate cycle.

Table 5. Construction and real-estate activities. Position held by each activities in the backward linkages ranking (*)

	Construction: backward linkages ranking	Real estate actv.: backward linkages ranking
	Position held by real estate actv.	Position held by construction
Germany	5th	2nd
U.S.	16th	7th
Spain	8th	1st
France	21th	3rd
Italy	9th	3rd
Japan	22nd	2nd
Mexico	6th	9th
U.K.	5th	2nd

(*) 42 branches of activity (ISIC) in Germany, U.S., Spain, France, Italy, Japan and U.K.; 77 (NAICS) in Mexico
Source: BBVA ERD

Forward linkages estimates suggest that the construction industry would above-average benefit from a future expansion in final demand, mainly in Spain

If an economic sector is to be considered relevant to the economic structure of a country it must not only have a significant backward linkages on the rest of the economy, but it must also experience a comparatively high positive effect when the final demand of the economy grows. Nonetheless, in a recession such as this one, which is characterized by weak demand, it is the industries that are most sensitive to changes in the demand in the economy that are those most affected.

We have decided to use the Rasmussen indices¹⁰ to analyze jointly the backward linkages of each industry together with the results that changes in the final demand of the economy have on production in the industry. These indices measure the (standardized) capacity of each industry to spread or absorb productive activity. They allow us to characterize each branch of activity as key, driving, strategic or independent. Thus, a higher (lower) value indicates that the capacity for spreading/absorbing the production activity is higher (lower) than average for the economy.

The results in Table 6 show that sectorial characterization of construction is mixed. Three groups of countries stand out:

¹⁰ See Pulido and Fontenla (1993) for more details.

The first group comprises France, Japan and Mexico, where construction is classified as boosting economic growth, given its greater relative potential to stimulate production in other activities and its lower relative capacity to absorb changes in final demand in the economy.

The second only comprises the U.S. where construction is classified as independent since its capacity to boost production in other activities and possible changes seen to variations in the final demand in the economy are both lower than average.

The third comprises Germany, the U.K., Italy and Spain. In all these, construction is considered a key factor: the backward and forward linkages, are greater than the national average.

In summary, these results suggest that the construction sector in Germany, the United Kingdom, Italy and especially Spain could, *ceteris paribus*, benefit more than the average from future growth of final demand in the economy when the next expansive cycle begins¹¹.

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¹¹ It should be noted that to extract conclusions referring to periods other than the reference year of each IOT it has to be assumed that there have been no relevant changes in the productive structure of the economy.

Table 1. Added value, employment and labour productivity in the construction sector (*)

	Total economy				Construction													
	Average annual growth rate				Average annual growth rate				Real GVA share					Nominal GVA share				
	70-80	80-90	90-00	00-08	70-80	80-90	90-00	00-08	1970	1980	1990	2000	2008	1970	1980	1990	2000	2008
Germany																		
GVA	2.9	2.4	2.2	1.4	0.7	-0.2	-0.9	-2.5	11.2	9.1	7.0	5.2	3.8	8.8	7.6	6.1	5.2	4.3
Employment	n.a.	1.0	0.1	0.4	n.a.	-0.7	-0.1	-2.9	n.a.	8.0	7.3	7.1	5.4					
Productivity	n.a.	1.3	2.0	1.1	n.a.	0.5	-0.7	0.4										
Spain																		
GVA	4.0	3.0	2.5	3.1	0.0	3.5	1.8	4.4	12.5	8.4	8.9	8.3	9.2	8.9	8.0	8.6	8.3	11.4
Employment	n.a.	1.1	1.7	2.8	n.a.	1.5	3.0	3.5	n.a.	9.4	9.8	11.1	11.7					
Productivity	n.a.	1.9	0.7	0.2	n.a.	2.0	-1.2	0.8										
France																		
GVA	3.8	2.5	2.0	1.7	0.3	1.3	-0.8	1.6	10.8	7.6	6.8	5.2	5.1	8.7	7.9	6.6	5.2	6.7
Employment	0.5	0.3	0.6	0.8	n.a.	-1.5	-1.5	2.9	n.a.	8.9	8.1	6.0	7.1					
Productivity	3.3	2.2	1.4	0.9	n.a.	2.8	0.7	-1.3										
Italy																		
GVA	3.9	2.4	1.5	0.9	0.2	0.7	-0.4	1.8	10.4	7.2	6.0	5.0	5.4	9.3	7.2	6.2	5.0	6.2
Employment	0.7	0.6	0.1	1.2	-1.4	-1.2	0.3	2.8	9.9	8.0	6.7	6.8	7.7					
Productivity	3.2	1.9	1.4	-0.3	1.6	1.9	-0.6	-1.0										
Japan																		
GVA	4.7	4.0	1.4	1.3	2.9	3.1	-2.7	-2.4	13.9	11.7	10.7	7.1	5.5	7.4	9.0	9.7	7.1	5.9
Employment	0.8	0.9	0.2	-0.2	n.a.	0.5	0.4	-2.3	n.a.	10.0	9.6	9.8	8.4					
Productivity	3.9	3.0	1.2	1.5	n.a.	2.6	-3.1	0.0										
Mexico																		
GVA	6.6	1.8	3.5	2.6	6.7	-0.5	2.7	2.5	8.6	8.7	6.9	6.4	6.4	6.6	7.9	4.8	6.4	6.9
Employment	n.a.	n.a.	n.a.	1.9	n.a.	n.a.	n.a.	2.1	n.a.	n.a.	n.a.	8.0	8.2					
Productivity	n.a.	n.a.	n.a.	0.7	n.a.	n.a.	n.a.	0.4										
United Kingdom																		
GVA	1.6	2.6	2.4	2.3	-1.1	4.3	-0.3	2.4	7.7	5.9	6.9	5.3	5.3	6.2	6.1	6.7	5.3	6.2
Employment	n.a.	0.7	0.2	0.8	n.a.	2.0	-2.3	2.6	n.a.	7.1	8.1	6.3	7.3					
Productivity	n.a.	1.9	2.2	1.5	n.a.	2.3	2.1	-0.1										
United States																		
GVA	2.6	2.9	3.3	2.3	-0.5	1.7	2.1	-2.9	8.1	6.0	5.3	4.7	3.3	5.2	4.9	4.6	4.7	4.7
Employment	2.0	1.8	1.7	0.5	2.6	1.7	3.0	0.3	5.3	5.6	5.6	6.4	6.3					
Productivity	0.5	1.2	1.6	1.8	-3.0	0.0	-0.9	-3.2										

(*) Data expressed in purchasing power parity Constant prices. 2000-2007 GVA in Japan and U.S. Full-time equivalent employment in U.S.
Source: BBVA ERD based on OECD (including STAN)

Table 2. Demand multipliers for each industry (*)

Germany		
Ranking	Sector	DM
1	Manufacture of motor vehicles, trailers and half trailers	2.05
2	Activities related to transport; travel agency activities	2.02
3	Manufacture of food products, beverages and tobacco	1.99
4	Energy extraction	1.96
5	Manufacture of wood and cork products	1.90
6	Other non-metal mineral products	1.81
7	Metallurgy	1.80
8	Construction	1.80
9	Financial intermediation	1.80
10	Manufacture of electrical equipment and machinery	1.77
11	Manufacture of pulp, paper and paper products; publishing, graphic arts and printing	1.76
12	Land transport; pipeline transportation	1.76
13	Manufacture of machinery and equipment	1.75
14	Furniture, other manufacturing industries and recycling	1.75
15	Manufacture of metal products (except machinery)	1.75
...		

Spain		
Ranking	Sector	DM
1	Construction	2.35
2	Manufacture of food products, beverages and tobacco	2.35
3	Furniture, other manufacturing industries and recycling	2.07
4	Metallurgy	2.05
5	Other non-metal mineral products	2.03
6	Textile industry	1.96
7	Activities related to transport; travel agency activities	1.94
8	Water collection, cleaning and distribution	1.90
9	Manufacture of wood and cork products (excl. furniture)	1.88
10	Manufacture of electrical equipment and machinery	1.88
11	Extraction of other minerals except energy products	1.87
12	Energy extraction	1.87
13	Manufacture of metal products (except machinery)	1.86
14	Production and distribution of electrical energy	1.84
15	Manufacture of machinery and equipment	1.83
...		

Italy		
Ranking	Sector	DM
1	Air Transportation	2.24
2	Manufacture of food products, beverages and tobacco	2.22
3	Water collection, cleaning and distribution	2.22
4	Maritime transport	2.14
5	Activities related to transport; travel agency activities	2.11
6	Construction	2.10
7	Manufacture of motor vehicles, trailers and half trailers	2.09
8	Manufacture of machinery and equipment	2.04
9	Textile industry	2.04
10	Furniture, other manufacturing industries and recycling	2.04
11	Manufacture of wood and cork products	1.99
12	Navel construction and repair	1.99
13	Other non-metal mineral products	1.98
14	Metallurgy	1.97
15	Manufacture of pulp, paper and paper products; publishing, graphic arts and printing	1.97
...		

Mexico		
Ranking	Sector	DM
1	Electricity, water and gas supply via pipelines to end consumers	1.79
2	Construction	1.66
3	Post and storage	1.65
4	Manufacturing industries	1.60
5	Corporate and business management	1.54
6	Financial and insurance services	1.50
7	Agriculture, livestock, forestry, hunting and fishing	1.48
8	Information in mass media	1.46
9	Transport	1.40
10	Culture and sports services and other leisure services	1.38
11	Temporary accommodation and food and drink preparation services	1.37
12	Government and international and offshore organization activities	1.34
13	Professional, scientific and technical services	1.33
14	Commerce	1.30
15	Health and social welfare services	1.29
...		

U.S.		
Ranking	Sector	DM
1	Manufacture of food products, beverages and tobacco	2.31
2	Manufacture of wood and cork products	2.13
3	Manufacture of motor vehicles, trailers and half trailers	2.12
4	Agriculture and fishing	2.07
5	Textile industry	2.04
6	Metallurgy	2.00
7	Rubber and plastic products	2.00
8	Chemical industry (excl. pharmaceutical)	2.00
9	Maritime transport	1.99
10	Oil refining and processing nuclear fuel	1.97
11	Manufacture of machinery and equipment	1.94
12	Manufacture of pulp, paper and paper products; publishing, graphic arts and printing	1.93
13	Manufacture of electrical and electronic equipment	1.89
14	Manufacture of office machinery and IT equipment	1.88
15	Mail and telecommunications	1.86
...		
21	Construction	1.80

France		
Ranking	Sector	DM
1	Navel construction and repair	2.25
2	Manufacture of motor vehicles, trailers and half trailers	2.21
3	Manufacture of food products, beverages and tobacco	2.18
4	Activities related to transport; travel agency activities	2.16
5	Manufacture of electronic equipment; manufacture of radio equipment and machines, television and communications	2.11
6	Maritime transport	2.05
7	Metallurgy	1.98
8	Manufacture of pulp, paper and paper products; publishing, graphic arts and printing	1.97
9	Furniture, other manufacturing industries and recycling	1.97
10	Air Transportation	1.97
11	Manufacture of machinery and equipment	1.96
12	Construction	1.96
13	Chemical industry (excl. pharmaceutical)	1.96
14	Manufacture of electrical equipment and machinery	1.93
15	Manufacture of wood and cork products	1.92
...		

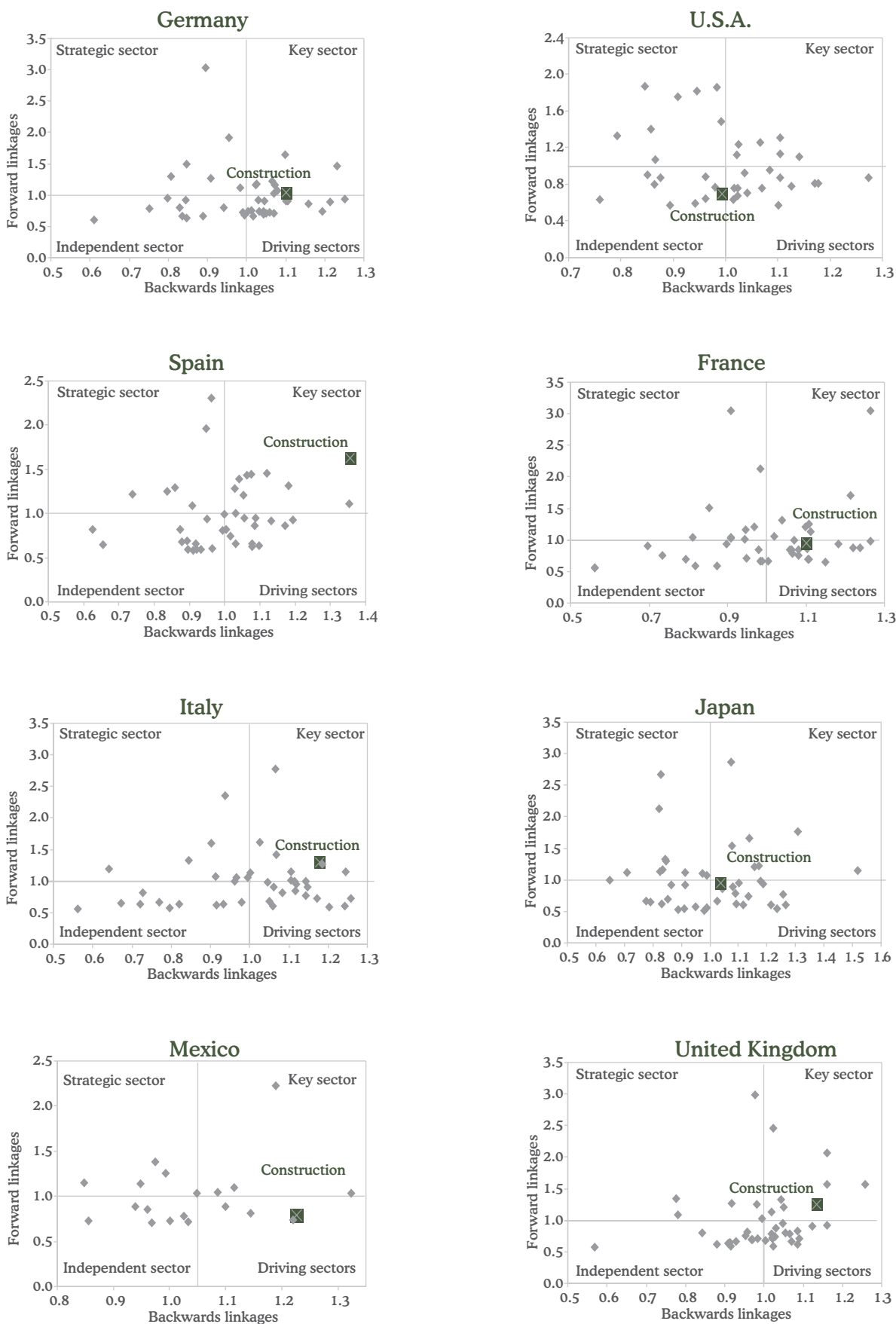
Japan		
Ranking	Sector	DM
1	Manufacture of motor vehicles, trailers and half trailers	2.96
2	Metallurgy	2.55
3	Manufacture of other transport equipment	2.47
4	Non-ferrous metals	2.45
5	Navel construction and repair	2.41
6	Manufacture of office machinery and IT equipment	2.37
7	Furniture, other manufacturing industries and recycling	2.32
8	Manufacture of machinery and equipment	2.30
9	Manufacture of rubber and plastics	2.28
10	Manufacture of electronic equipment; manufacture of radio equipment and machines, television and communications	2.25
11	Households employing domestic staff and offshore organizations	2.23
12	Chemical industry (excl. pharmaceutical)	2.22
13	Manufacture of electrical equipment and machinery	2.21
14	Manufacture of medical-surgical and precision equipment and instruments, optics and watches	2.18
15	Manufacture of metal products (excl. machinery and equipment)	2.15
...		
22	Construction	2.02

United Kingdom		
Ranking	Sector	DM
1	Production and distribution of electrical energy	2.21
2	Manufacture of food products, beverages and tobacco	2.04
3	Financial intermediation	2.04
4	Activities related to transport; travel agency activities	2.04
5	Construction	2.00
6	Metallurgy	1.98
7	Manufacture of motor vehicles, trailers and half trailers	1.92
8	Maritime transport	1.91
9	Oil refining and processing nuclear fuel	1.91
10	Air Transportation	1.88
11	Manufacture of wood and cork products	1.87
12	Agriculture and fishing	1.85
13	Manufacture of pulp, paper and paper products; publishing, graphic arts and printing	1.85
14	Chemical industry (excl. pharmaceutical)	1.84
15	Land transport; pipeline transportation	1.83
...		

(*) Effect of the increase of 1 million monetary units in the final demand for each industry on total production (*) 43 branches of activity (ISIC) in Germany, U.S., Spain, France, Italy, Japan and U.K.; 20 (NAICS) in Mexico

Source: BBVA ERD based on OECD, INE and INEGI

Table 6. Characterization of each industry for their backward and forward linkages Rasmussen indices (*)



(*) A higher (lower) value indicates that the capacity for spreading/absorbing productive activity is higher (lower) than the average for the economy. (*) 43 branches of activity (ISIC) in Germany, U.S., Spain, France, Italy, Japan and U.K.; 20 (NAICS) in Mexico
 Source: BBVA ERD based on OECD, INE and INEGI

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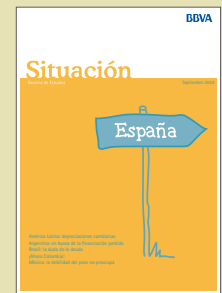
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