BBVA | RESEARCH

# Real Estate Outlook

## Mexico

Second Half 2014
Economic Analysis

- More housing starts and the National Infrastructure Plan point to a positive year-end for construction
- Medium and residential segments keep gaining ground in the mortgage market
- States with a dynamic economic activity attract housing construction
- Housing construction interest rates reflected the lower monetary policy rate, although the same cannot be said for mortgage interest rates
- Borrowers could pay less for their mortgage loans thanks to portability, also more efficient lenders will benefit too

BBVA Bancomer

# Index



**Closing date: September 21,2014**

# 1. Summary

Construction GDP continued to drop over the first half of 2014. As from last year, this was the outcome of both building and civil works stagnation in the first two quarters. Economic data hint that building might begin to see growth in the second half, but it will not regain the ground lost in this year. Contrary to our forecasts, civil works will take longer to improve, yet it is like that some indicators become positive at the end of the year. Stabilisation in the number of housing starts and considerable investments in infrastructure augur a better performance in the final two quarters for the construction sector, but this will not be enough to make the year positive on balance. Nonetheless, construction could grow in 2015.

The housing market has offered us two opposite stories in the first six months of the year. The public agencies still retain the lion's share of this market, but now they are placing fewer acquisition loans. On the other hand, mortgage loan origination by commercial banks has grown steadily throughout the six-month period. The figures confirm lower demand for low-priced houses as a result of the diversification of loan menu by the public institutions. In contrast, cheaper bank credit has led to greater demand in the mid-priced and high-priced homes. This has fed through to higher house prices for both categories, but for low-priced dwellings which are below average.

Mexico's diverse nature is also evident within the housing market. This is why we have given greater emphasis to the regional scope and set aside a specific section to examine this in more depth. In certain states there are signs of greater buoyancy, whereas in others they are still lagging behind. Price behavior varies among states, which is largely on account of inventory levels. House building is clustered in the regions where there is more economic activity and job creation; we ascribe this outcome to expectations being built up of a bigger sales turnover. Nevertheless, we could there be excess of supply in some state for specific segments. Even though differences exist, house affordability has increased in the country. This is due to lower mortgage rates and longer terms, every one of the states has experienced a rise in the number of households which can buy a home or upgrade to a better one.

On June 6th, the Bank of Mexico cut the monetary policy rate. This decision built up positive expectations over the credit market. Above all we focus on assessing the potential impact of this on the real estate market via the mechanisms of mortgage finance and housing construction credit, both within retail banking. The lower the monetary policy rate, the lower the funding cost for banks. This why one might expect the cost of mortgage loans and construction credit to come down, which would in turn provide a stimulus to the housing market, both on the supply and demand sides. Nevertheless we predict that the monetary policy decision taken by the authorities has effect on residential construction credit, but the mortgage loans. However this policy would boost the real estate sector through a lower financing cost for construction.

The fall in portability costs prompted by the Financial Reform via the legal concept of subrogation will set the scene for a more competitive environment. Making mortgage portability easier will benefit the market on both the demand and supply sides. On the one hand, consumers would be able to reduce their borrowing cost, on the other more efficient credit institutions would gain greater market share. This would result in more efficient allocation and growth in the mortgage market.

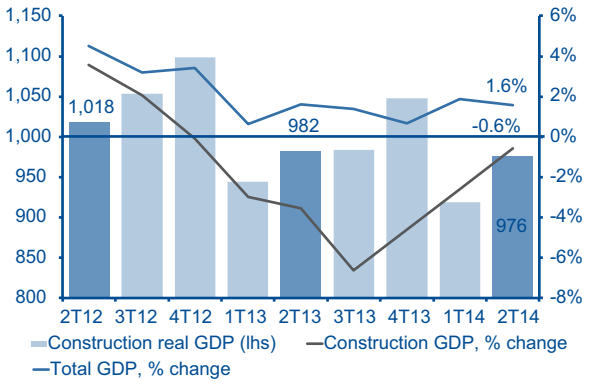
# 2. Situation

## 2.a. Construction activity will rise at the close of 2014

### Construction GDP is on the verge of making a comeback

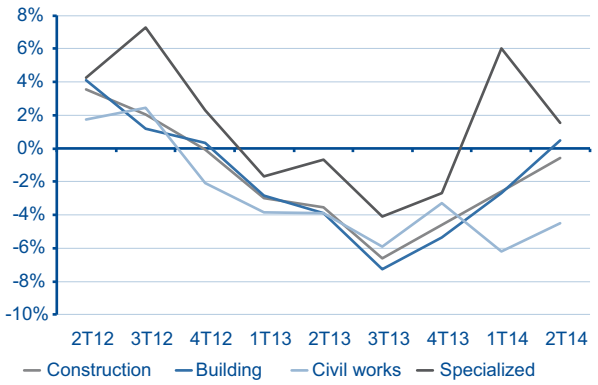
Despite the weaker performance, the construction sector remains one of the most significant for Mexico's economy. There are 49.5 million workers in the economy, of which 3.7 million people are employed in construction. Sometimes this share has reached 9% of the total employment. Besides, construction provides around 8% of GDP. So it is mandatory a recovery in this sector in order to improve the economy. After declining over the whole of 2013, construction GDP is close to coming out of the woods. In 2Q14, sector GDP only slipped 0.6% according to original series. This means that the rate is becoming increasingly less negative. This performance is due to the fact that building, which is the core component of construction, progressed by an annual 0.5% in real terms; civil works, however, have stuck at rates of less than -4%. If this trend persists, we expect to see growth rates of over zero for the second half of the year. A pick-up in civil works activity will be called for if the sector is to recover, which could materialize via the National Infrastructure Program (the "PNI").

Chart 2a.1
**Construction Gross Domestic Product**
**Real billion MXN and annual rate**




Source: BBVA Research with data from the SCNM, Inegi

Chart 2a.2
**Construction GDP breakdown**
**Annual rate**

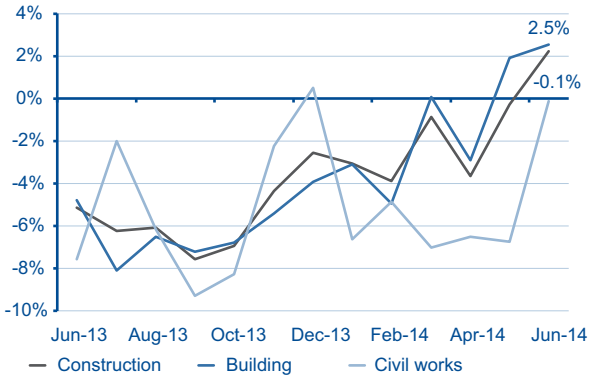



Source: BBVA Research with data from the SCNM, Inegi

The first signs of an upturn in building came in May and June. Industrial activity in this sub-sector reported annual growth rates of 1.9% and 2.5% for these months, progress not seen since 2012. Similarly, building output value had its biggest spurt of growth in May, when it topped MXN16.1bn, 3.2% more than for the same month in 2013, though this fell short of the May 2012 figure of MXN16.5bn. There is therefore definitely significant growth, but this is also attributable to a base effect, in the sense that the sharp drop in 2013 should be taken into account. That said, recovery in building is a good sign.

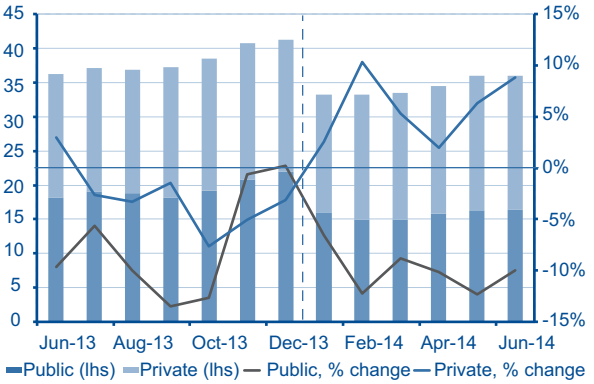
Civil works show the opposite trend. Even though it is falling off at a slower rate, GDP for this sub-sector still has a long way to go. The output value of projects associated with civil works has revealed a decline over the first six months of the year. The share in value of public construction work for the same period has also suffered. Public sector construction has not grown over 2014, meaning that its share of the whole has fallen off at the same time, giving up ground to its private sector counterpart. Civil works account for more than 30% of the construction sector, so a more robust showing will have a positive impact on construction recovery.

Chart 2a.3
Industrial activity in construction
Annual rate




Source: BBVA Research with Inegi data

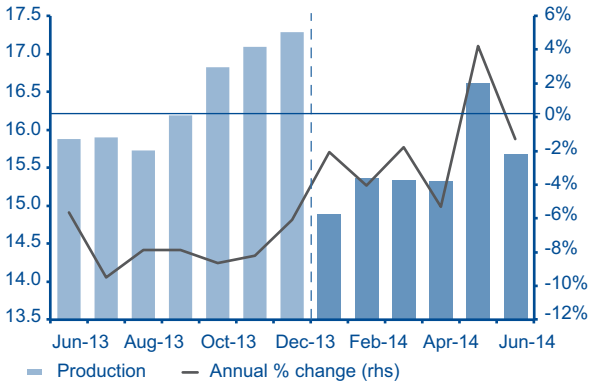
Chart 2a.4
Construction value by sector
Real MXN bn and annual rate




Source: BBVA Research with data from the ENEC, Inegi

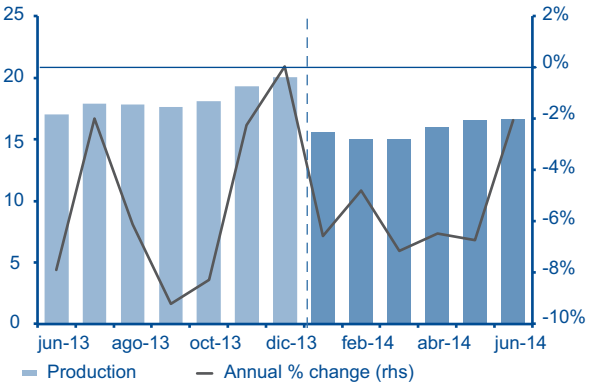
The prospect of recovery appears more likely when we look at the demand for work and inputs for construction. After hitting a high in terms of worker numbers in 2008, at a little over 3.8 million, a slide began in personnel hired within the sector. In 2Q14 the number of people working in construction is 3.7 million, of which 1.4 million are registered for Social Security (with the IMSS, the Mexican Social Security Institute), the annual growth rate for the first two quarters of the year being 1.1% and 3.8%. The proportion of workers registered with the IMSS came to an overall 37%, which marks a substantial improvement if we remember that up to 2010 this was a steady 30%. By the same token, the demand for manufactured products used as construction inputs has been growing since late 2013, with the pace increasing in 2014. This augurs well, as if the construction companies are hiring more personnel and ordering more inputs, it is because they have plans to step up output in the short term.

Chart 2a.5
Value of building construction
Real MXN bn and annual rate




Source: BBVA Research with data from the ENEC, Inegi

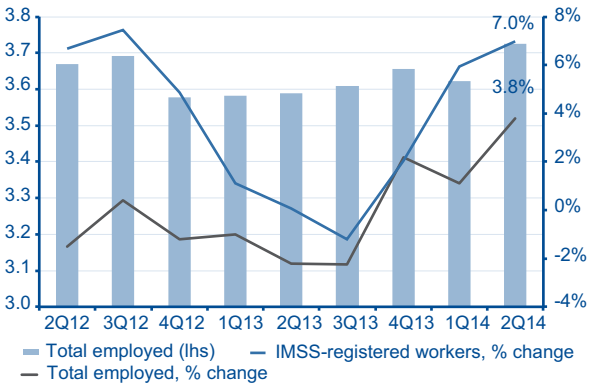
Chart 2a.6
Value of infrastructure construction
Real MXN bn and annual rate




Source: BBVA Research with data from the ENEC, Inegi

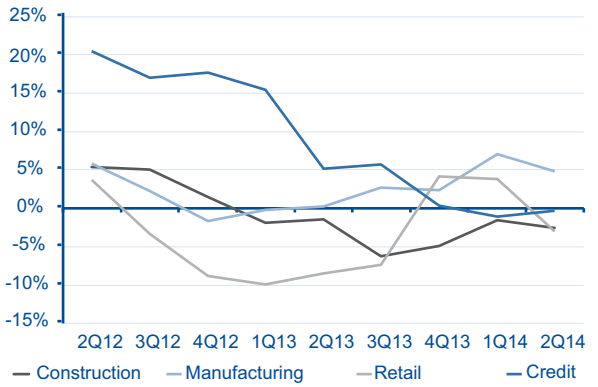
The flatness in the construction sector is reflected in the financing. At present, bank credit to the sector is still on the rise, though at lower rates than have been seen during the last two years. In 1Q14, bank credit for construction grew by an annual 8.2%, whereas in 2Q14 the rate was 6.5%. These rises mean that the construction loans portfolio has held above MXN400bn, which represents over 40% of sector GDP. These figures prove that credit is still flowing, even if this is at a slower rate given the lower level of real activity.

Chart 2a.7
**Construction sector employment**
**Million workers and annual rate**




Source: BBVA Research with date from the ENOE, Inegi

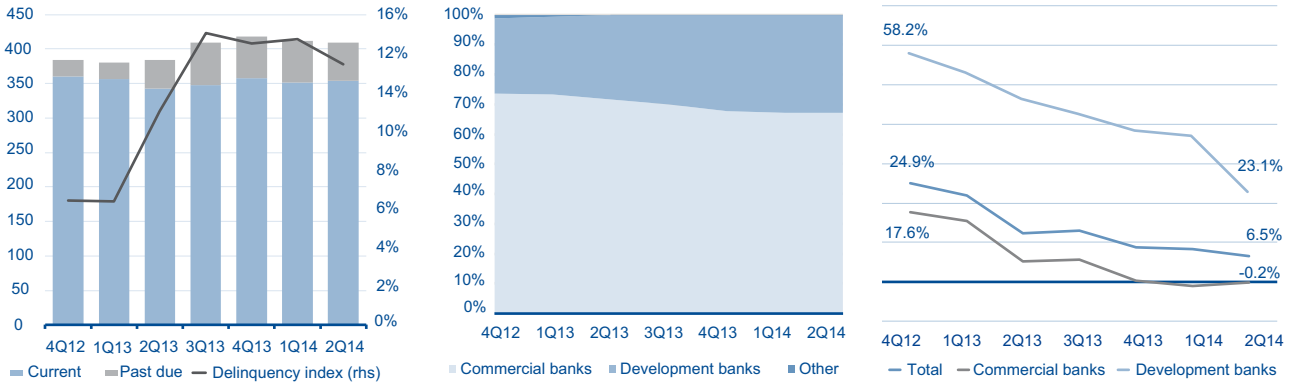
Chart 2a.8
**Key construction inputs**
**Annual rate**




Source: BBVA Research with data from the Inegi

Continued credit origination has helped to keep portfolio delinquency rate stable after the deterioration noted in the portfolio associated with residential building. The delinquency rate, the ratio of past-due loans to the overall portfolio, fell off slightly to 13%. We estimate that delinquency rate will be lower for the rest of the year and during 2015, mainly due to new credit for infrastructure and a recovery in the building portfolio. A more significant role in this task has been played by the development banks, where the credit they have arranged has risen to over 20%. Retail banks have lost out on share in this sector due to a building sector contraction, particularly in housing, which is a segment that the banks provide for almost entirely themselves, Meanwhile credit for infrastructure projects has provided the development banks with more scope to step in, which could be a signal for retail banks to become more deeply involved in products of this kind.

Chart 2a.9, 2a.10 y 2a.11
**Total real construction credit, share and annual rate**
**Constant MXN bn and %**



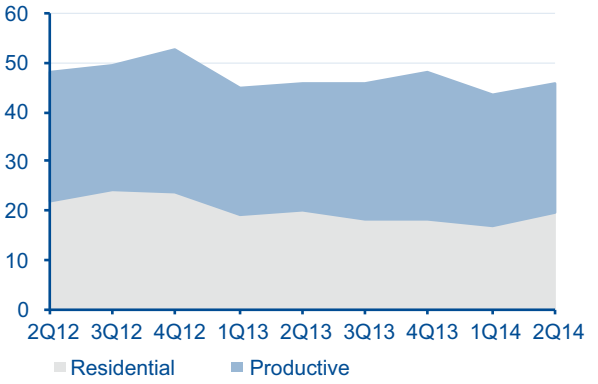

Source: BBVA Research with Bank of Mexico data

## Productive building remains the cornerstone of the subsector

Going into the year, we were expecting building to take longer to yield positive results. Fortunately, there are signs that the recovery could come earlier. At the close of the first half, sector building activity had already reported an uptick. We attribute this result to two effects. First, productive building is still performing positively, growing 3.8% and 2.0% in the first and second quarters of the year. Despite this, the value of construction work on shopping centers, industrial

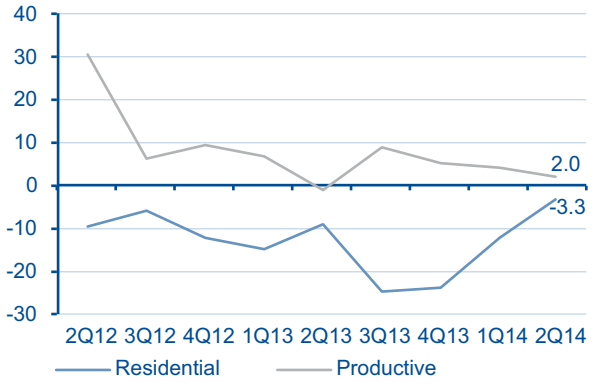
premises and offices, among others, is showing a slowdown. In the other hand, residential building is slowing its downward path and is nearer and nearer to stabilising. In the first quarter it fell more than 10%, but in the second housing output slipped back by only 3.3%.

Chart 2a.12
**Value of building construction**
**Real MXN bn**




Source: BBVA Research with data from the ENEC, Inegi

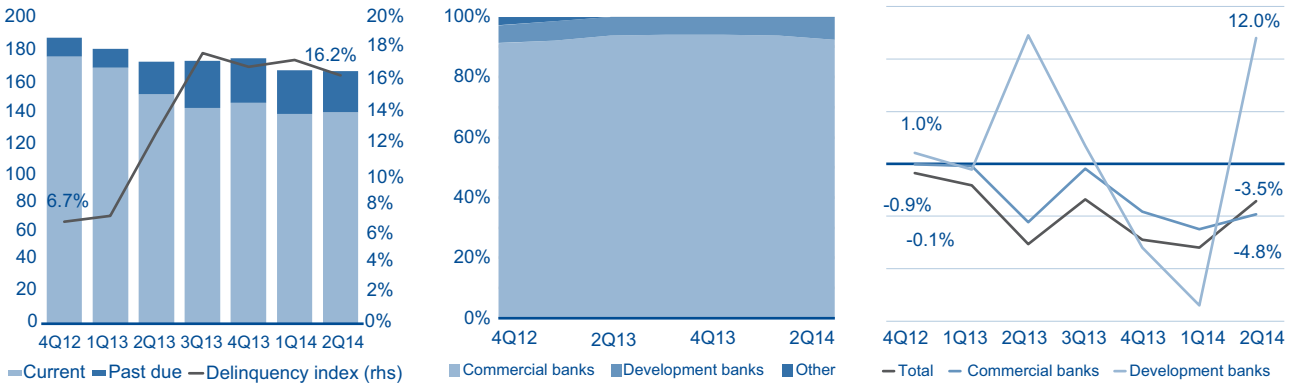
Chart 2a.13
**Value of building construction**
**Annual rate**




Source: BBVA Research with data from the ENEC, Inegi

Total bank credit in building reflects the activity in this sub-sector. With fewer projects to work on and the increase in risks observed, the flow of new loans has choked off. The credit portfolio for building came down by 4.6% from year-end 2013 to June 2014. In annual terms, in the first two quarters of the year the portfolio dropped by 8.0% and 3.5% respectively. The current balance stands at MXN165bn, of which more than 90% has been arranged by the banks. This lower figure to a large extent mirrors a correction given the smaller number of housing projects, as well as a slowdown in construction work on shopping centers and office buildings. On the other hand, the development banks have provided more credit in housing developer loans this year than they had been doing beforehand. The impact here has been smaller still, due to the fact that these loans have been to companies that are already being served by the retail banks.

Chart 2a.14, 2a.15 y 2a.16
**Overall balance in real terms of building credit, share and annual rate**
**Constant MXN bn and %**



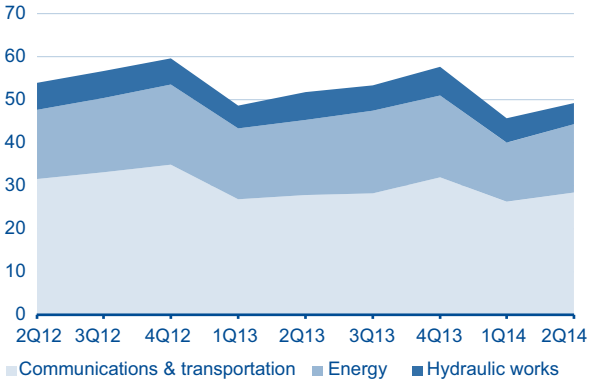

Source: BBVA Research with data from the Bank of Mexico

The building loan portfolio will start to grow until residential construction recovers and bridge-loans or other collateralized loans dominate the portfolio. This is a lesson learned from the period of adjustment in the housing sector. We expect residential construction to restore in 2015, which will mean more opportunity to place credit for companies in the sector.[1] We associate this upswing with a base effect, though also with a boost from the National Infrastructure Program (PNI), which indicates housing and urban development as being the second biggest in terms of the sum involved. Yet caution is called for, as the amount is associated with financing, where not all of this is for new construction work.

## More infrastructure creates potential for civil works

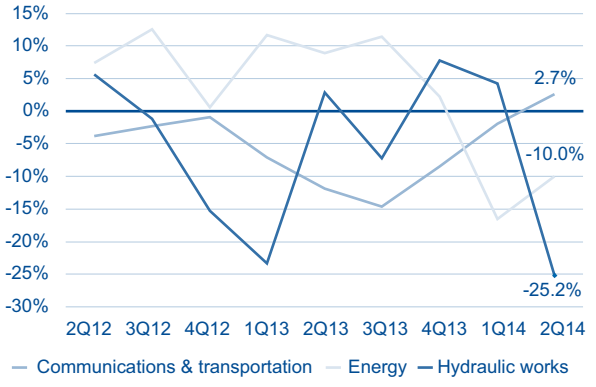
Contrary to what we were expecting, civil works is still lagging within the construction sector. The progress of the PNI, as well as the revival of public expenditure, gave rise to expectations of a swift recovery for civil works output. Going into greater detail, one can observe that only the value of construction in communications and transport projects is on the rise. Other infrastructure projects, such as those linked to the energy sector or hydraulic work, have not seen an increase in output to date in 2014. This performance contrasts with what was noted in 2013, when the construction companies reported greater business volume in energy projects and slowdowns in transport and communications infrastructure. Nonetheless, with publication of the rest of the PNI, where a hefty increase in the amount to invest can be seen, we forecast that civil works will recover as soon as the specifics of the projects mentioned are settled. Energy will stand to gain the most from having more than 80% of funds in addition to those planned in the previous administration. With the energy reform and its subsidiary legislation all passed now, we expect this to be reflected in momentum in this sub-sector. Hydraulic and transport projects will also receive a boost, although to a lesser extent. Private investment will step up its contribution to communications if the telecommunications companies view the regulatory changes in a favorable light.

Chart 2a.17
**Value of infrastructure construction**
**Real MXN bn**




Source: BBVA Research with data from the ENEC, Inegi

Chart 2a.18
**Value of infrastructure construction**
**Annual rate**

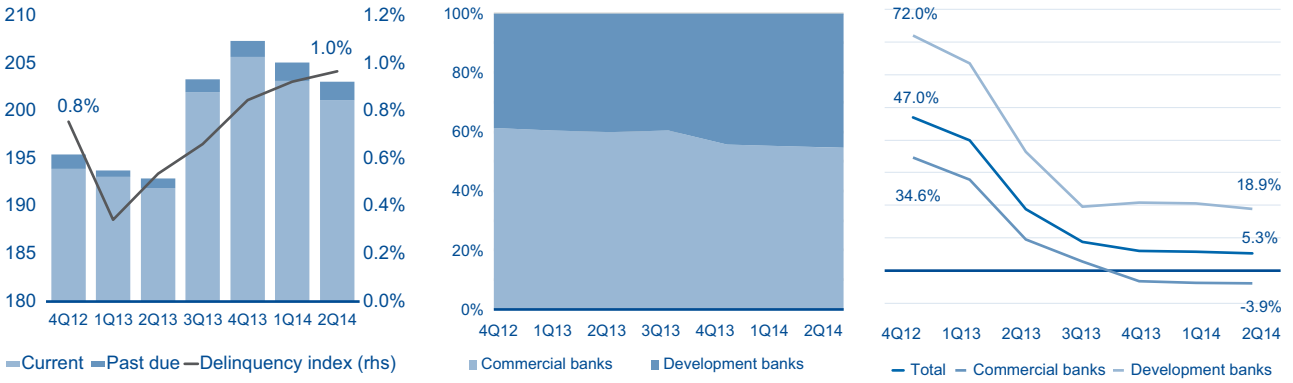



Source: BBVA Research with data from the ENEC, Inegi

Despite a lower level of activity, the balance of banking credit for infrastructure projects is still growing. In 1Q14 the annual growth rate was 5.8%, while in 2Q14 it was 5.3%. The portfolio held at over MXN200bn, meaning that banking credit finances over 50% of civil works GDP. The portfolio default rate has gone up slightly, but remains of the order of 1%, which evidences the excellent quality of the portfolio. Retail banking has lost share in this sector, too, as the overall balance and business activity in infrastructure have fallen, although this does remain the largest source of credit. Development banks have once again made their contribution, mainly in access route projects, a sector where activity has performed the best.

[1] See article "Mortgage credit turns towards higher value segments", in ***Mexico Real Estate Outlook*** Second Half of 2014.

Chart 2a.19, 2a.20 y 2a.21
Real total balance of infrastructure credit, share and annual rate
Constant MXN bn and %



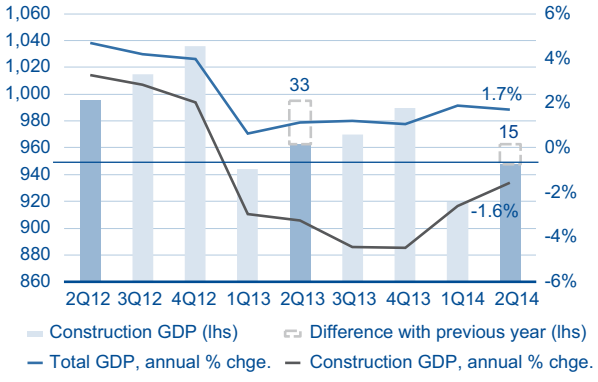

Source: BBVA Research with data from the Bank of Mexico

Civil works is well-placed to improve the construction sector. Two paths will lead the sector to recovery. First, from an economic outlook, plans for a heavy investment are afoot and the capacity exists to obtain these funds. The PNI features considerable increases in all sectors, mainly energy. Moreover, greater public spending which allows for a budget deficit can soon be reflected in a higher level of economic activity. Second, the legislative framework is tailored to make the most of this opportunity. The Public-Private Partnerships Act is primarily an instrument which can boost private investment, with the consequent lower financing burden that this would mean for the government. Furthermore, the energy reform will also permit private investment, both local and from abroad.

## Construction is set to grow in 2015, with building and civil works the drivers

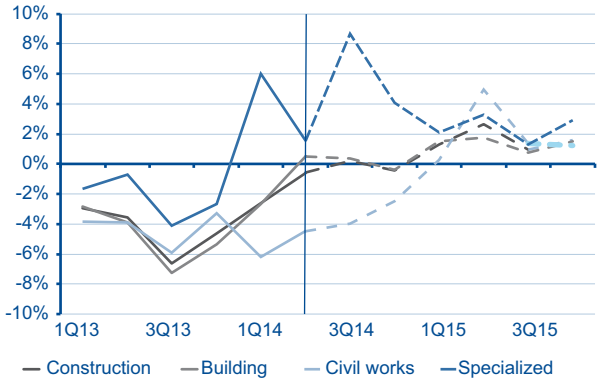
Construction output will close the year with a fall, despite already showing positive figures in one of its components. We expect the sector to reveal positive rates in 2H14, but they will not be enough for it to end the year ahead. Nonetheless, we forecast that in 2015 construction will move back onto an upward course again, and possibly go on to expand. Living up to these expectations would mean residential building putting a stop to its slide (which we see happening soon) and the major infrastructure projects being realized. Our assessment, to a great extent, turns on the PNI being fulfilled and house building stabilizing at a little over 300,000 new housing units.

Chart 2a.22
Cumulative construction GDP
Real MXN bn and annual rate




Source: BBVA Research with data from the Inegi

Chart 2a.23
Construction GDP breakdown
Annual rate




Source: BBVA Research with data from the Inegi

## Box 1: The 2014-18 National Infrastructure Programme

Last year the National Infrastructure Programme (the "PNI") for the current administration was announced, which initially featured an investment of MXN4trn. With the exception of the communications and transportation sector, however, no details had been given for the investment projects under all the other headings. In June this year the federal government presented a new version of the PNI for 2014-18, outlining the projects for all the participating sectors, and total investment was lifted to MXN7.7trn. This figure does not just make it the most impressive because of the sum involved, but also as a proportion of the size of the economy, as it amounts to over 40% of GDP for 2013. The total set to be invested will be possible largely thanks to the structural reforms.

The energy sector will draw the largest share of funds at MXN3.9trn over the remainder of the current administration, for which reason this ambitious programme will to a great extent depend on the effectiveness of the energy reform in raising private investment, which is expected to top MXN1trn. A key difference with respect to previous administrations is the inclusion of infrastructure investment for sectors such as tourism, health, and urban development and housing. These three sectors should absorb some MXN2.1trn, of which MXN1.8trn is likely to be earmarked for urban infrastructure and housing in step with the National Housing Policy.

The PNI 2014-18 is intended to narrow the existing gaps among the various regions in terms of development, meaning that a larger amount will be invested in the South and South-east region.[1] Energy infrastructure investment will also be proportionately the highest in this geographical zone.

### Opening up in energy will provide more infrastructure

Infrastructure investment for the energy sector will amount to MXN3.898trn, which is 87% up on the PNI in the previous administration. This rise is partly due to the fact that private initiative may take part to the tune of a little over MXN1trn, mainly in oil and gas exploration and extraction, as a result of the constitutional reform of energy matters passed last December. Second, the area of opportunity for private investment will be in oil products. In electricity there is less scope, as private involvement is only contemplated in electricity generation and not over the rest of the value chain.

Within energy infrastructure projects, the share taken up by alternative sources has risen. For example, wind power plants in the south of the country could draw investment of over MXN48bn, and solar energy almost MXN14bn. These funds will be used to build wind power plants in the states of Baja California, Oaxaca and Tamaulipas, while the solar energy infrastructure will mostly be implemented in the Baja California peninsula, Chihuahua, Durango and Sonora.

Table B1.1

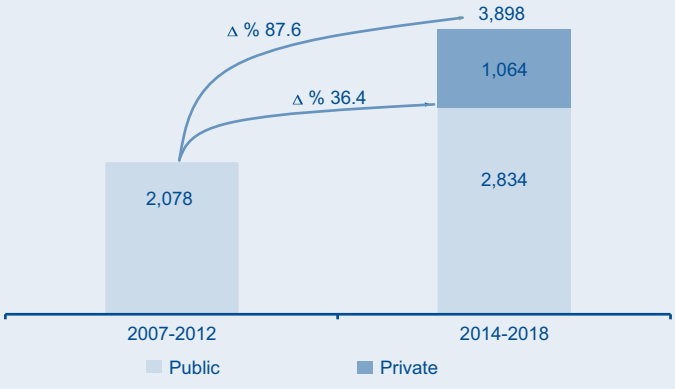
**Forecast infrastructure investment**
**MXNbn at 2014 prices**

| Sector | PNI 2014-2018 |
|---|---|
| **Total** | **7,751** |
| 1. Communications and transportation | 1,320 |
| 2. Energy | 3,898 |
| 3. Hydraulic | 418 |
| **Subtotal** | **5,636** |
| 4. Health | 73 |
| 5. Urban development and housing | 1,861 |
| 6. Tourism | 181 |
| **Subtotal** | **2,115** |

Source: BBVA Research with data from the PNI 2014-18

Chart B1.1

**Energy infrastructure investment**
**MXNbn at 2014 prices**




Source: BBVA Research with data from the PNI 2014-18

[1] This region comprises the states of Campeche, Chiapas, Guerrero, Oaxaca, Puebla, Quintana Roo, Tabasco, Veracruz and Yucatán.

## The PNI should kick-start the real estate sector

After energy, the largest sum to be invested will go towards urban development and housing, at more than MXN1.8trn. If these funds do actually materialise, the real estate sector could see recovery, where housing has been at a low ebb for some time. The task, however, does not appear straightforward, as the value of housing production from 2000 to 2013 barely reached MXN1.2trn.[2] This would mean an investment in only five years of 46% more than was invested over the previous 14 years, or tripling the equivalent of average annual housing production each year, in an environment in which there is increasingly more demand for existing housing and home improvements and less for new homes.

This investment would be far in excess of that made by the formal companies in the housing construction business, for which reason, if the PNI is agreed, building GDP would break off from its negative trend, which is even more likely if one takes into account hospital infrastructure investment of around MXN70bn. Bearing in mind that building is the principal component of construction, if it moves back onto an upward course, this would also boost construction GDP.

The figure of MXN1.8trn more closely resembles the balance of the public and private mortgage loan portfolio, which reached MXN1.6trn at the close of 2013. This amount does not, however, all represent new construction, as part of the financing is for existing homes, which means that the impact of this budget on the building subsector could be overstated.

## Communications overtakes transportation

The difference in the amount allocated to communications and transportation infrastructure is scarcely 3% more than was initially budgeted for in the previous administration, but it should be remembered that said administration failed to deliver on its own programme. In fact, some of the most important projects did not materialise, such as Punta Colonet, the Hidalgo refinery and the Riviera Maya airport, so if we compare the amount budgeted for in this administration with what was actually put into practice in the communications and transportation sector, the percentage variation comes to more than 30%.

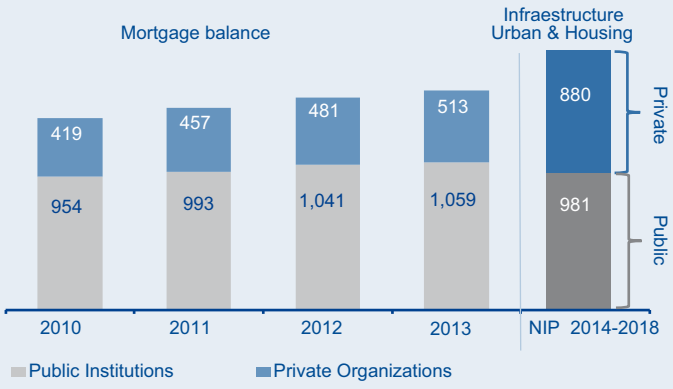
The largest increase will be in the communications component, where the reforms affecting the sector are expected to spur investment of over MXN0.5trn, with the share from the private sector leading the way. This matters because the supplementary legislation and proper application of it by the regulators will provide the incentive for such investments by private economic agents to become established.

## The new Mexico City airport

In the first week of September this year, the winning project for the New Mexico City International Airport (NAICM) was announced. This is intended to relieve saturation of the current airport and enhance the country's competitive edge in airborne passenger and freight transport. The estimated cost is MXN169bn for a new airport with the capacity to serve 50 million passengers in an initial phase, then to bring this

Chart B1.2

### Mortgage loan balance and urban investment MXNbn at 2014 prices




Source: BBVA Research with data from the Bank of Mexico and PNI 2014-18

Table B1.2

### Investment in communications and transportation MXNmn at 2014 prices

| Project | Amount |
|---|---|
| Private investment derived from the Constitutional Reform | 507,168 |
| Installation of fibre-optic network sharing infrastructure | 130,000 |
| "México Conectado" (Mexico Online) project | 18,600 |
| Expansion of the fibre optic backbone network | 9,750 |
| Mexsat satellite system | 8,217 |
| **Total** | **673,735** |

Source: BBVA Research with data from the PNI 2014-18

[2] 2Own calculations based on Inegi's national construction company survey (ENEC).

figure up to a maximum of 120 million. If all goes to plan, this airport would become the world's third largest, only behind London Britannia and Istanbul New Airport.

The lack of competitiveness caused by capacity saturation has taken its toll on the economy. As demand cannot be satisfied, users are choosing other airports to make connections. According to estimates from the Ministry of Communications and Transportation (SCT), airports in the southern United States and options in Central and South America are drawing potential passengers who would otherwise have gone to Mexico. This investment is therefore not only justified to offset saturation, but also to become more competitive internationally and thereby attract greater demand.

The figure of MXN169bn to be invested in the NAICM will mostly come from public funds and be self-financing. 42% of this will be sourced from private funding and the remainder from the Federal Budget for Expenditure. The banks will play an important part in the initial phase of financing. Even though there will be a substantial proportion of borrowing, the project will be funded by the income streams currently being generated by the existing airport and by funds raised by the NAICM from operations.

An all-inclusive approach is what differentiates this project from previous proposals: based on the experience of earlier efforts, what are sought now are social and environmental benefits beyond the purely financial. The costing budgets provide for these specific items as well.

The NAICM will work in favour of construction sector recovery. The economic resources pledged equate to 17% of 2013 construction GDP. This represents a golden opportunity for companies specialising in this kind of infrastructure, as well as their suppliers. Even house-builders will also feel the benefits, as the project gives all-in consideration to the building of housing in the surrounding area, along with schools and hospitals.

## Conclusions

If the PNI and the NAICM come to fruition they will make a sizeable impact on the economy. The sums to be invested would swiftly energise certain activities in the construction, energy and telecoms sectors, while the long-term effect could be greater still if this infrastructure boosts potential GDP. The task ahead seems daunting though, both in terms of the sum to be invested in the space of only five years and its reliance on the effectiveness of the supplementary laws implementing the constitutional reforms.

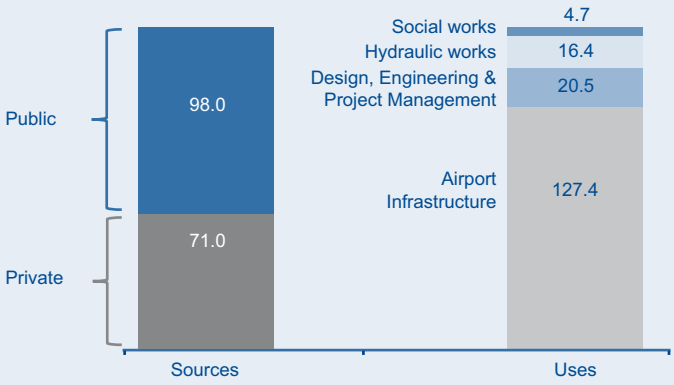
From the standpoint of public finances, the challenge posed by the PNI is bigger. This is because a major portion of the projects is to be financed by the public sector itself. This implies that for the investment actually to be realised, the public sector must have sufficient own funds from which to draw. This in turn will depend on the pace of economic growth in the five years under review. Come what may, we have two more reasons to believe in a cheerful scenario for construction in the coming years.

Table B1.3
### Operating capacity of the NAICM

| Indicator | Phase 1 | Maximum |
|---|---|---|
| Passengers annually (million) | 50 | 120 |
| Airport operations (thousand) | 550 | 1,000 |
| Runways | 3 | 6 |

Source: BBVA Research with data from the Ministry of Communications and Transportation

Chart B1.3
### Financing and Expenditure for the NAICM
MXNbn




Source: BBVA Research with data from the Ministry of Communications and Transportation

# 2b. Mortgage credit turns towards higher value segments

In the previous edition of ***Mexico Real Estate Outlook*** we laid emphasis on the reorganization of the housing market. On the one hand, greater demand for alternative solutions to acquisition, and on the other, less of a preference for low-priced housing, continue to predominate in the market. Now, as residential solutions other than buying become more established, the market is becoming more receptive to higher-priced niches. The private sector has been growing throughout 1H14 as banks meets demand for the higher-value segments. Whilst public institutions are making their products more flexible and substantially raising the amount financed. This is what will lead the course of the housing market ahead.

## Public institutions innovates their product menu once more

In the first six months of the year, mortgage market activity continued to reflect a decline produced by lower demand from the low-priced housing segment. Three factors can be noted which confirm this trend. First, the number of mortgage loans arranged for this type of home stands at 20% below the level in Infonavit's Annual Operating Program as of June. Second, home- improvement and self-construction loans have an increasing share within the Infonavit and Fovissste portfolios. Finally, both organizations are arranging more credit for medium-range and high-end segments. At the close of the first half, a 6.6% drop was posted in the number of loans, with a 2.7% increase in the sum financed in cumulative terms.

Table 2b.1

**Mortgage business: loans and sum financed by organization**
**'000 loans and 2014 MXN bn**

| | Number of loans (thousand) | | | Loan amount (MXN bn) | | | Average sum (MXN '000) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Jun-13 | Jun-14 | Annual % change | Jun-13 | Jun-14 | Real annual % change | Jun-13 | Jun-14 | Real annual % change |
| Public agencies | 213.2 | 195.1 | -8.5 | 64.4 | 62.4 | -3.0 | 302 | 320 | 6.0 |
| Infonavit | 182.6 | 164.6 | -9.8 | 48.5 | 44.9 | -7.3 | 265 | 273 | 2.8 |
| Fovissste | 30.7 | 30.5 | -0.6 | 15.9 | 17.5 | 10.0 | 519 | 574 | 10.6 |
| Private intermediaries | 40.4 | 43.1 | 6.7 | 43.0 | 47.9 | 11.3 | 1,065 | 1,111 | 4.3 |
| Banks | 40.4 | 43.1 | 6.7 | 43.0 | 47.9 | 11.3 | 1,065 | 1,111 | 4.3 |
| **Subtotal** | **253.6** | **238.2** | **-6.1** | **107.4** | **110.3** | **2.7** | **423** | **463** | **9.4** |
| Co-financings* (-) | 11.2 | 11.9 | 6.2 | | | | | | |
| **Total** | **242.4** | **226.3** | **-6.6** | **107.4** | **110.3** | **2.7** | **443** | **488** | **10.0** |
| *Published figures* | | | | | | | | | |
| Total Co-financings | 26.6 | 42.2 | 59.1 | 15.0 | 19.7 | 31.0 | 566 | 466 | -17.6 |
| Infonavit total | 15.3 | 30.3 | 97.9 | 5.9 | 10.0 | 68.1 | 388 | 330 | -15.0 |
| Other co-financings | 11.2 | 11.9 | 6.2 | 9.1 | 9.7 | 6.7 | 807 | 811 | 0.5 |

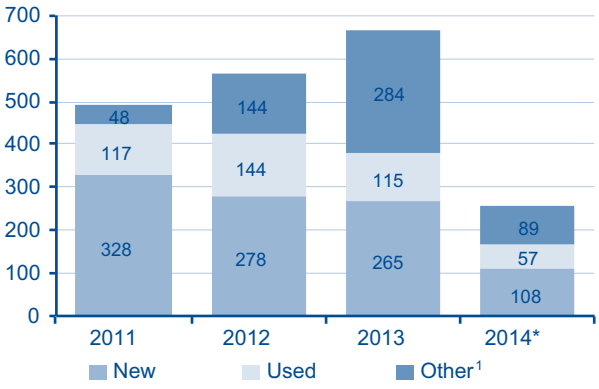
Note: The "Banks" heading includes the loans arranged for employees of financial institutions
*Does not include the "Infonavit Total" product
Source: BBVA Research with data from Infonavit, Fovissste ABM, AHM, the Bank of Mexico and CNBV

The combination of a lower number of mortgages and a higher financing volume accounts for the upturn in the average amount. For example, in the case of Fovissste, which provides the largest number of loans for medium segments, the average value reached MXN574,000, which represented a 10.6% rise against the like period in 2013. On the other hand, the banks stuck to their positive trend on both fronts and turned in rates of 6.7% and 11.3% in the number of loans and the amount financed respectively. This translated into an average sum per mortgage which was 4.3% up on last year.

For Infonavit, the transition has been a little more complex. The fact that over 80% of loans included in the annual programs went to the low-priced housing segment was ostensibly the factor which reflects a delay in applying its budget. Nevertheless, it should be said that as consumer demand has changed, the Institute has innovated and broadened its product menu so that low-income segments can use the most suitable loan, which can be used for improving the quality of existing homes and providing higher-value loans for those workers who want to upgrade to a home with better features.

According to figures as of June from the Annual Operating Program (POA) run by Infonavit, loans arranged for workers with incomes from two to four times the minimum wage (2-4 VSM) have progressed 95%, those loans for 4-11 VSM are up to 94%, and those for scheme participants with over 11 VSM have reached 107% of the scheduled amount. This is also reflected in a higher number of co-financings, which, via the different products available, have grown at double-digit rates in recent months.

Chart 2b.1
**Infonavit: loans provided per product**
**'000 loans**




1 Products for home improvements and self-build are included.
* Figures as of June
Source: BBVA Research with data from Infonavit

Table 2b.2
**Infonavit: loans provided by wage bracket**
**Loans as of June**

| POA segment | Cum. monthly POA | Formalised: House-holds* | Formalised: Mejoravit | Total | % Gain |
|---|---|---|---|---|---|
| Under 2 | 75,063 | 42,539 | 21,721 | 64,260 | 86% |
| 2 to 3.99 | 98,308 | 56,609 | 36,747 | 93,356 | 95% |
| 4 to 11 | 73,382 | 44,493 | 24,647 | 69,140 | 94% |
| Over 11 | 26,065 | 22,326 | 5,634 | 27,960 | 107% |
| **Total** | **272,818** | **165,967** | **88,749** | **254,716** | **93%** |

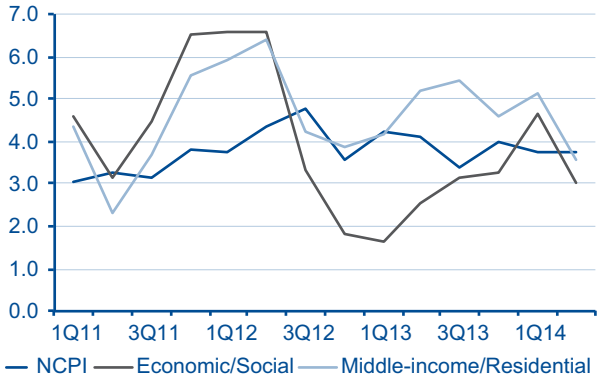
* Includes new and existing homes
Note: Includes "Apoyo Infonavit" (Infonavit Support), which is why the figures do not square with Table 2b.1
Source: BBVA Research with data from Infonavit

In the interests of workers, from August this year Infonavit has raised the amount financed from MXN483,000 to MXN850,000, with loans available in pesos and at a fixed rate for up to 30 years. This way, access to better quality homes is easier, which should allow a greater number of those on the scheme to aspire to the medium-range and residential segments.

## House prices reflected the greater demand for mid-priced and high-priced segments

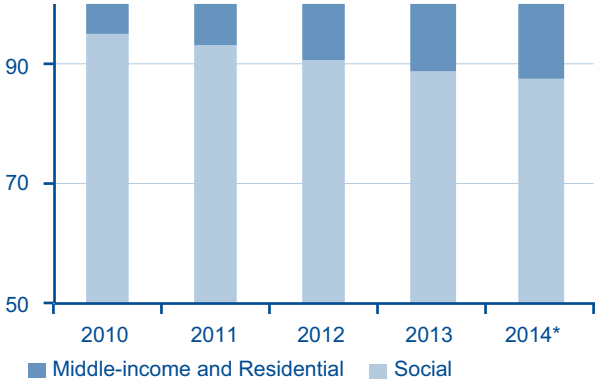
In the previous edition we highlighted appreciation performance is different among housing segments. From 2Q13 we have noted steady growth in mid-priced and high-priced dwellings. According to figures from the Sociedad Hipotecaria Federal (SHF), housing price index has risen 4.8% on average between 2Q13 and 2Q14, whereas consumer prices increased by 3.8% over the same time. This behavior confirms the higher demand for mid-priced and high-priced housing segments, where the banks have experienced a major increase in the number of mortgages arranged in recent years with an average amount for the year to date of over MXN1.1mn. Even the share of these segments appearing on the National Housing Register (RUV), while relatively insignificant given that not all projects in these segments are included on this record, shows a rising pattern.

Chart 2b.2
Housing and consumer prices
Annual rate




Source: BBVA Research with data from the Inegi and the SHF

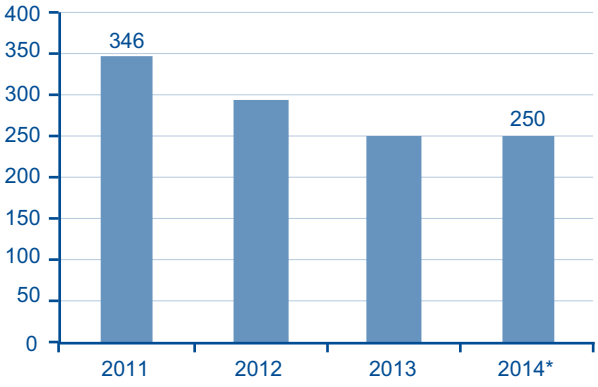
Chart 2b.3
Housing on the RUV (national register)
Share by segment




* Figures as of June
Source: BBVA Research with data from the RUV

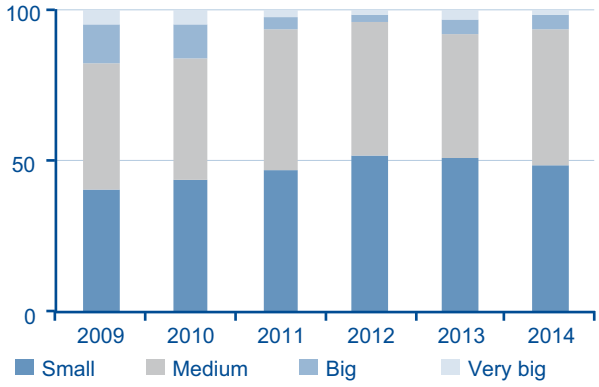
In the low-priced housing market, the supply overhang was key to price rises for these homes staying below inflation last year. According to the RUV, the number of on-inventory housing units in annualized figures has been falling off since 2011, when just over 350,000 homes were registered. The inventory level currently stands at around 250,000 units, which has led to shrinkage in the size of developments to smooth housing turnover and a lower borrowing requirement for construction. This new model does not require vast tracts of land to build on and is a feature of the inner city zones where vertical housing is more in demand, while there is more urban service infrastructure and a greater volume of economic activity. These characteristics have been ideal for smaller-scale developers who adapt themselves to regional needs and keep to a far more flexible construction model than do the larger developers.

Chart 2b.4
Inventory of completed housing units
Thousands of units, annualized figures




* Figures as of June
Source: BBVA Research with data from the RUV

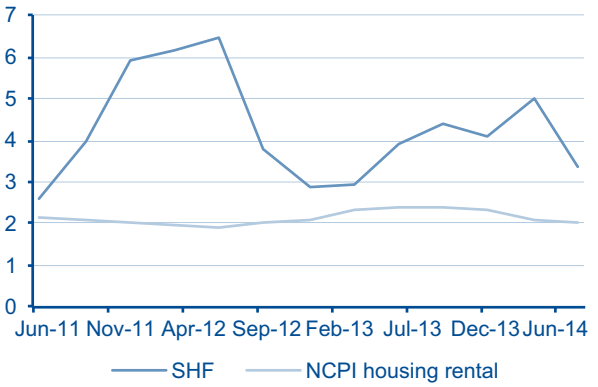
Chart 2b.5
Size of developments
Annual % share




* Small, up to 100 units; medium, from 101 to 500; large, from 501 to 1000; very large, over 1000.
Source: BBVA Research with data from the RUV

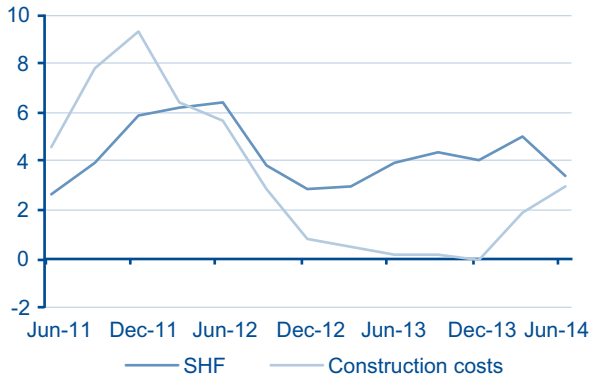
Nonetheless, with an overhang of units completed in 2011, why did price-rise rates only ease after a lag of several quarters? Housing prices can be explained by the interplay of supply and demand factors. On the demand side, a family's decision to buy depends on income, employment, lending terms (loan period and interest rate) and the comparative cost of occupying homes (rent), among the most important aspects. As regards income and employment, we have seen that there is a lag of almost a year before the housing market feels the effects of the real-world economy. On the rental side, a family decides to buy a home when the cost of renting a housing unit is greater than the cost of taking out a mortgage. According to figures from the Inegi, the growth of this component of the National CPI (the INPC) has increased steadily in recent years, by around 2%.

Chart 2b.6
**Housing prices and rental costs**
**Annual rate**




Source: BBVA Research and data from the INEGI and SHF

Chart 2b.7
**Housing prices and construction costs**
**Annual rate**




Source: BBVA Research with data from the INEGI and SHF

On the supply side, changing consumer preferences have accelerated the build-up of completed units. Despite a greater relative supply of low-priced housing, however, prices did not come down, owing to an increase in construction input costs. According to the producer price index, construction costs increased in the first six months of 2014, which held back a fall in prices, even though there was an inventory overhang. The materials purchase component was the most influential factor in pushing costs up. The effect of the excess supply relative to demand for low-priced housing showed through in a slower increase in prices than in the other segments.

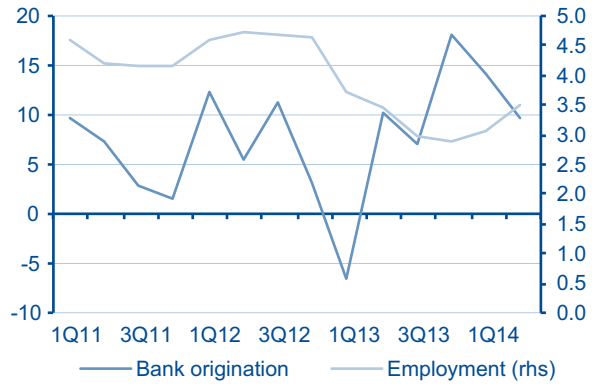
## The market is falling more closely into line with the economic cycle

Job creation is the key to maintaining housing demand. Growth in formal employment has been posting positive rates but over 2011 and 2012 it grew by an average of 4.5%, which was ahead of the economy. This has extended the growth cycle for mortgage loan demand from the banking sector, chiefly because there is empirical evidence that job creation has a delayed effect on housing demand of 10 to 12 months. This also correlates positively with consumer confidence, which reached a high of 83 basis points at the end of 2012. This suggests to us that consumer confidence in acquiring assets is down relative to what was seen in previous years, though in general there is still a willingness to buy.

Nevertheless, with an increasingly lower economic growth rate and fewer jobs being created, consumer confidence has begun to wane. At the close of Q2 it was at 76.7 points,[1] just 6 points below the high of two years ago. This has barely started to work through to the pace of mortgage placements by the retail banks, although, as we have already said, the effect will be more in evidence in 2015. We expect 2014 to close with a rise in the number of loans, but with a greater emphasis on the sum financed, conceivably with double-digit growth in real terms.

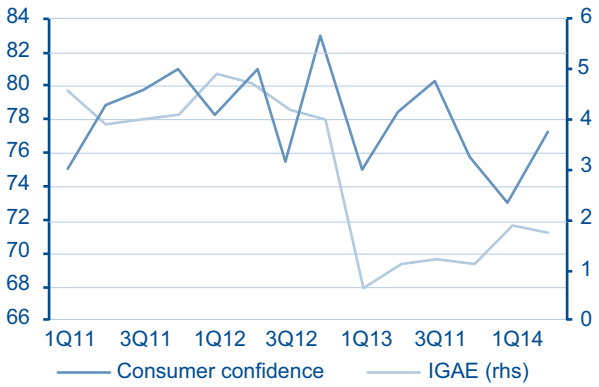
[1] Consumer confidence is held to be at a critical level when it is less than or equal to 50 basis points.

Chart 2b.8
**Mortgage loans and formal employment**
**Annual rate**




Source: BBVA Research with data from the ABM and STPS

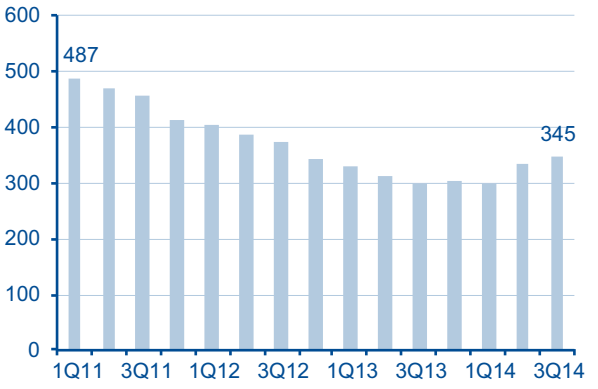
Chart 2b.9
**Consumer confidence and economic activity**
**Basis points and annual rate**




Source: BBVA Research with data from the INEGI

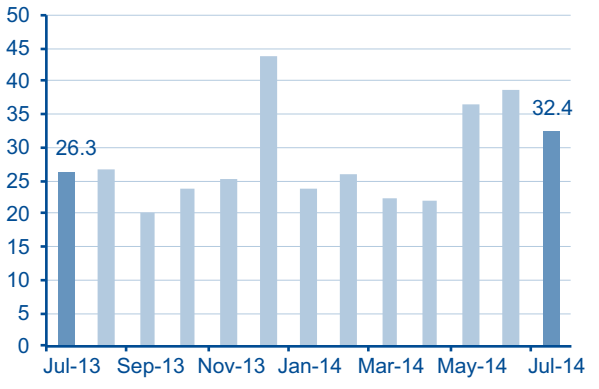
In terms of housing construction, inventory levels seem to be stabilizing, which means that new project registrations could rally this year. It should be remembered here that this might not become visible until 1H15, as the process entails a review and appraisal, meaning that housing starts are not immediate. Proof of this is that some of the May and June registrations still have no work completion, in other words they have only been planned and are not being executed.

Chart 2b.10
**RUV: housing construction registrations**
**Thousand units, annualized figures**




Source: BBVA Research with data from the RUV

Chart 2b.11
**RUV: housing construction registrations**
**Thousand units, monthly flows**

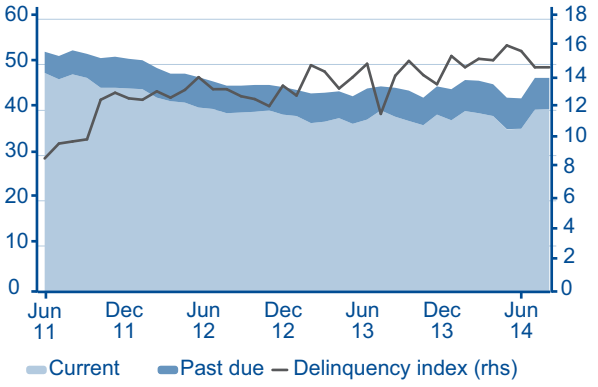



Source: BBVA Research with data from the RUV

Moreover, it should be stressed that the new housing units are intended to meet the requirements of the new housing policy in places closer to the urban zones. In fact, a sizeable number of these projects are located in municipalities near metropolitan zones, where the residential shortfall is not necessarily more acute but where pursuing business activities is feasible and public and private credit institutions see greater opportunities to place loans.

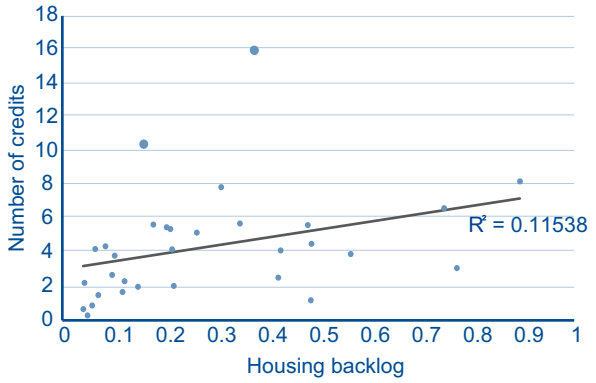
Developer housing loans are starting to take off again, in line with the upturn in RUV registrations, although on a far smaller scale than was seen some years ago. This is due to the change in model, which means a lower long-term borrowing requirement, a more flexible construction model and greater working capital turnover by companies. This has narrowed the growth gap between the performing and the past-due portfolio, with a stable default rate over the past year.

Chart 2b.12
**Retail banking: developer housing loan balance**
**Constant MXN bn and default rate**




Source: BBVA Research with data from the CNBV

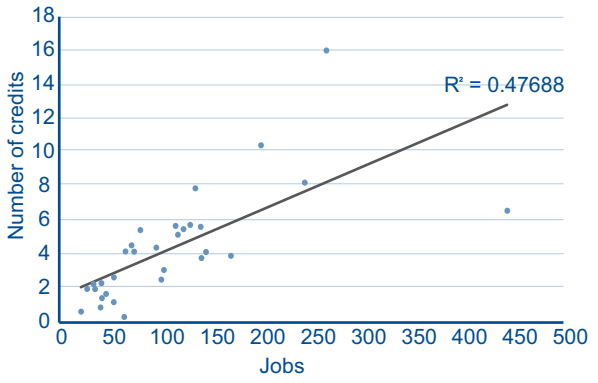
Chart 2b.13
**Infonavit: new mortgages and residential deficit**
**Thousand loans and million households**




Source: BBVA Research with data from the Infonavit and SHF

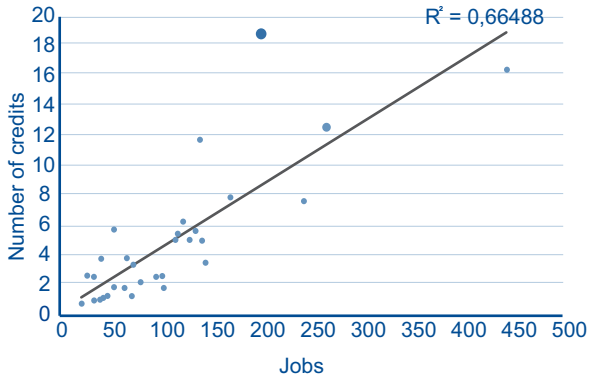
Thus, by broadening their range of credit options with a peso alternative and longer payment periods, the housing institutions are mirroring trends in each economic cycle more clearly, since, as we have mentioned previously, employment is the key driver of housing demand. For example, it is evident that the placement of mortgage loans originated by Infonavit is more in proportion to job creation and not the residential deficit measured from 2010 to 2012, which are the years for which the most up-to-date figures are available for residential deficit estimates. For loans arranged by Infonavit, the adjustment moves from 11.5% to 48% with the residential deficit being replaced by job creation as the variable which accounts for the number of loans. This result also appears in the placement of mortgages by the banks, where the link between placement and employment is even stronger, with employment causing an adjustment of as much as 48% of loan placement.

Chart 2b.14
**Infonavit: new mortgages and employment**
**Thousand loans and thousand persons**




Source: BBVA Research with data from Infonavit and ENOE, Inegi

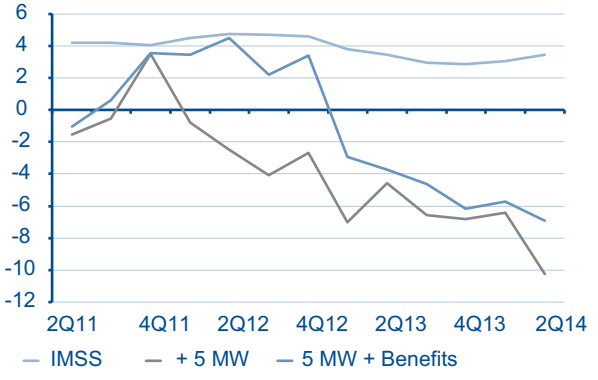
Chart 2b.15
**Retail banking: new mortgages and employment**
**Thousand loans and thousand persons**




Source: BBVA Research with data from the CNBV and ENOE, Inegi

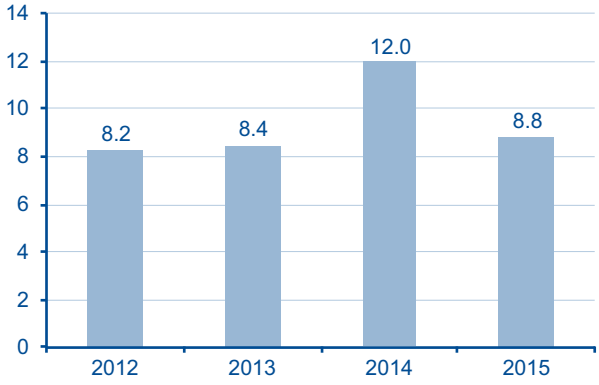
In 2H14, the economic cycle will continue to be shadowed in the housing market. The partial recovery in real wage growth seems to have faded away, for which reason we expect housing demand to start feeling the effects. All in all, we expect the banks to post positive growth, though on a smaller scale than the previous year. Low-priced housing will keep to its shrinking trend, even though, considering all the solutions offered by Infonavit, it could satisfy the bulk of the items included in the Annual Operating Program.

Chart 2b.16
**Employed persons by income bracket**
**Annual rate**




Source: BBVA Research with data from the central bank and the ENOE, Inegi

Chart 2b.17
**Conavi: annual subsidy program**
**2014 MXN bn**




Source: BBVA Research with data from Conavi and SHCP

As regards the annual program of housing subsidies, this also shows less activity at the close of the first half of the year, at less than 50%, the Federation Expenditure Budget of the Ministry of the Treasury and Public Credit earmarking MXN8.8bn for this in 2015, which is lower than for this year. This could have an impact on demand from people in the lower income brackets.

## The mortgage market is looking to achieve higher amounts of credit

The response by the housing institutions, in providing increasingly easy access to housing segments where there is greater demand, is a positive aspect. The fact that solutions such as improvements and extensions are the most common and have grown in scale in the last three years, as well as the response for mid-priced and high-priced dwellings, are factors translating into greater flexibility in Infonavit's loan products. The shrinking of the low-priced housing market should not be seen as something negative, but as an optimization of the range on offer from Infonavit to cater for the specific requirements of its scheme members. This effect is also due to a shift in demand towards higher value and more demanding markets.

The housing market is therefore falling more and more into line with the economic cycle, for which reason it will be important to pay more attention to the key short-term drivers of both supply and demand. Recently, low-priced housing prices have revealed two contrary effects. Lower demand relative to supply, partly because of an overhang of inventories, which inhibited price rises, yet at the same time a rise was observed in the cost of construction materials. The net result is a rise in prices, but below inflation and the total average for the three housing segments (i.e. low-priced, mid and high-priced dwellings).

# 2c. The mortgage market in the states

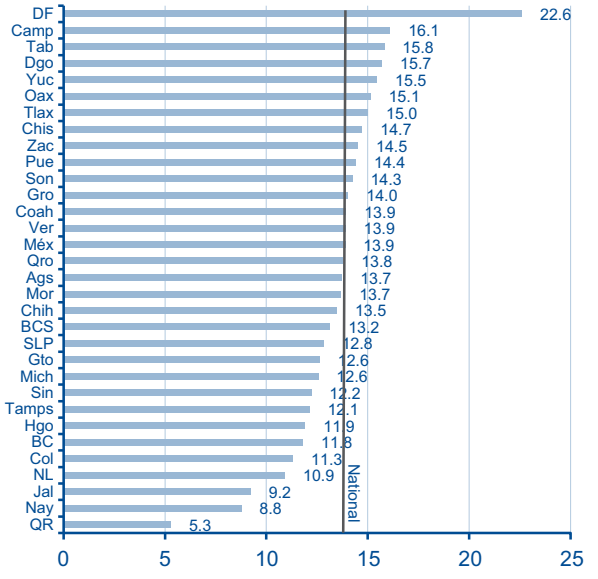
Over the last two years we have been observing a slowdown in demand for subsidised housing which has led to a build-up of inventories[1] and, as a result of this, a more sluggish rise in real estate prices at the low end. On the other hand, the medium-range and residential segments have become the niches where there is still credit expansion, which has driven prices within them at a faster pace in certain zones of the country.

In this section of ***Mexico Real Estate Outlook*** we focus on regional analysis of the mortgage market, which in most of the states has reacted as inventories have gone down and paved the way for housing production based on a different model. Even so, as we will see in the case of certain states and, in particular, certain cities, prices have rallied at an uneven pace, meaning that substantial divergences have emerged. We therefore compare trends in inventories and housing prices between 2Q11 and 2Q14, which allows us to gain a better idea of how the year with the biggest build-up of housing units meshed with the subsequent slowdown in price growth.

## The zones with the most housing construction show the smallest price rises

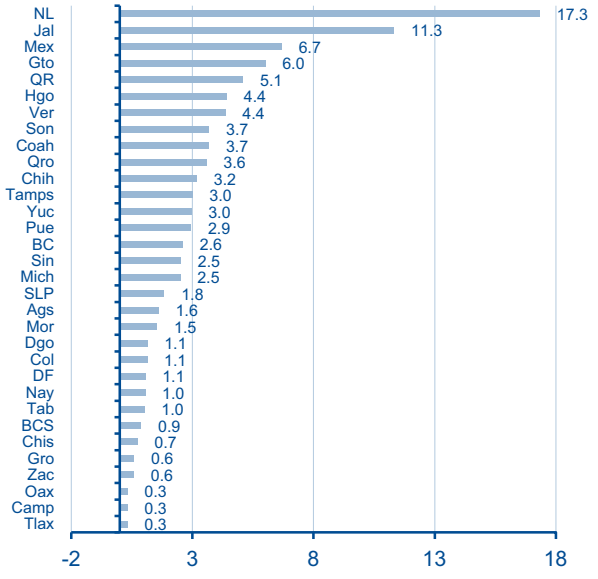
The regional discrepancies in the rate of housing price rises have become apparent since these began to ease up two years ago, as a result of inventories hitting a high in 2011. Nevertheless, concentration levels in regional terms seem to have altered very little in the past three years. Whereas in 2011 over 50% of all housing was concentrated in the states of México, Nuevo León, Jalisco, Baja California, Guanajuato and Quintana Roo, in 2014 the sample of six states accounting for this share remains virtually the same. The exception is Baja California, which moved down the ranking from 4th place in 2011 to 15th in 2014. On the other hand the state of Hidalgo rose from 11th to 6th over the same three years.

Chart 2c.1
**Housing price rises, 2Q11-2Q14**
**Basis points**




Source: BBVA Research with data from the SHF

Chart 2c.2
**Inventory concentration 2014**
**% share**




Source: BBVA Research with data from the RUV

[1] 1Inventories on the National Housing Register (RUV) include total housing units certified as habitable, i.e. those with full construction completion certification and all basic services installed

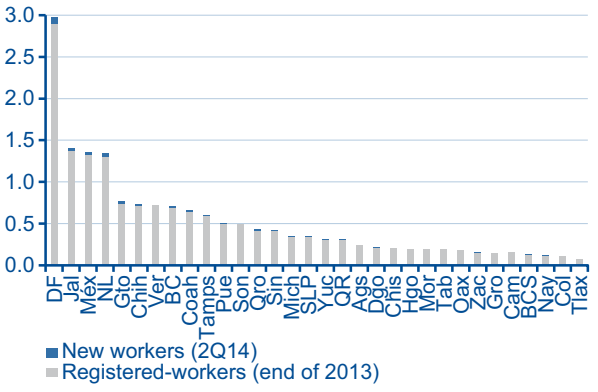
The states of Nuevo León, Jalisco and México account for 36% of all inventories in the country as of June 2014. This is possibly due to expectations of increases in sales in the short and medium term, given that these states have the most economic activity after the Federal District[2], which is mirrored in the sort of higher job numbers conducive to housing demand. There are nevertheless major differences which need to be clarified. According to certain local indicators, the commercialisation of more units could be on hold for economic revival, whereas other regions could require more housing construction in the next few months.

Although housing prices have climbed at above-average levels in over half of the states, it is important to give a special mention to the outstandingly fast pace of rises in the Federal District. This is because existing homes take up a share of over 73% of the market. Moreover, the limited amount of housing that has been built is aimed at the medium-range and residential housing markets. This marks an exceptional case, as housing applications in the metropolitan area with the greatest amount of economic activity far exceed the available supply, which has led to the most dramatic rise at state level.

The states of Nuevo León, Jalisco and the State of Mexico are those with the highest build-up of inventories in the country, which has meant that prices in the past two years in these states have risen at a rate far below the average. This is because a large slice of housing built is for the subsidised housing market, where the inventory overhang from lower demand for this segment has continued to rise in value, though at levels below the national total.

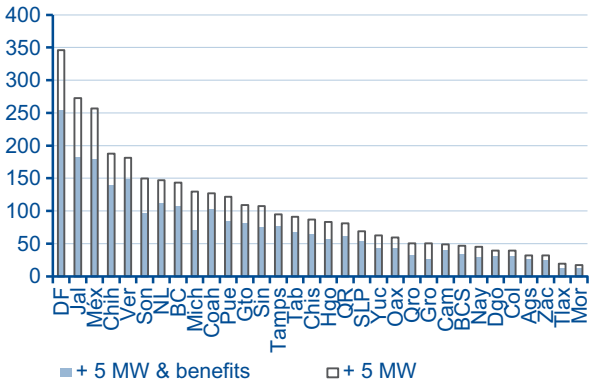
As we have said in previous Outlook reports, formal employment is still the key driver of demand for mortgage loans, and these in turn remain the best method for selling housing. Nevertheless, in the process of a downward adjustment in inventories there has also been unevenness, as, although in aggregate terms the number of people covered by the IMSS (Mexican Social Security) has grown at a faster rate than did the economy over the past two years, in some states the employment growth cycle has lagged behind. Here it should also be borne in mind that once workers start making Social Security contributions, a sufficient amount of time has to pass for them to build up enough points to apply for a loan through Infonavit and they need to have a track record of at least one year's service in their new job to qualify for a loan from the banks.

Chart 2c.3
**Workers registered with the IMSS by state**
**Million workers**




Source: BBVA Research with data from the IMSS

Chart 2c.4
**Workers by income and benefits 2Q14**
**Thousand workers**

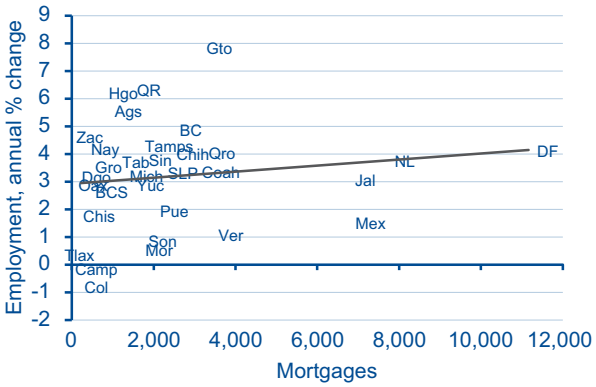



Source: BBVA Research with data from the IMSS

[2] The dynamics in the Federal District are different, as they mostly involve medium-range and residential housing, as well as a very high proportion of existing homes owing to a limited amount of available land and high prices associated with high population density.

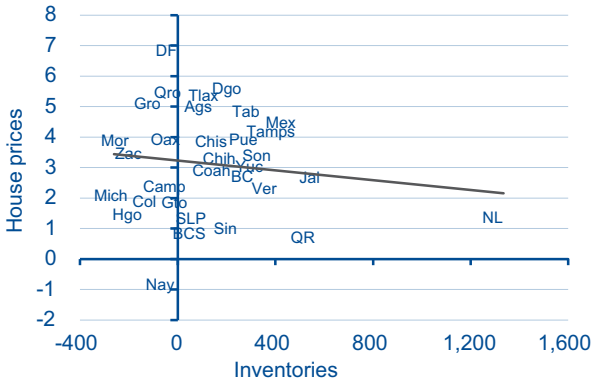
In the adjustment process, employment is still the driver for mortgage origination in states with greater economic activity. Nevertheless, other states, such as Aguascalientes, Baja California, Guanajuato, Querétaro, Chihuahua, Hidalgo and Quintana Roo have seen demand rise of late. With respect to the Infonavit loans budget for 2014, some of these states have shown an increase to June of over 50% over what had been expected going into the year.

Chart 2c.5
**Mortgages arranged by bank and IMSS employment**
**Annual rate**




Source: BBVA Research with data from the STPS and the ABM

Chart 2c.6
**Housing inventories and prices, 2013-14**
**Inventory difference and annual rate**




Source: BBVA Research with data from the RUV and SHF

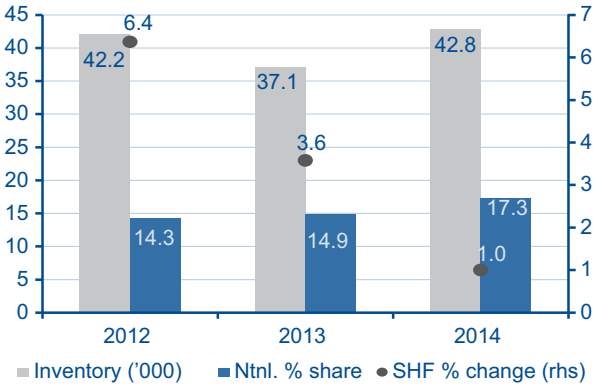
An additional factor to consider is the proportion of new homes in certain Mexican states. Whereas 35% of the loans provided by Infonavit nationwide are for existing homes as of June 2014, in the states of Quintana Roo and Nuevo León this kind of housing solution barely accounts for 10% and 15% respectively, the low-income and traditional segments being those which comprise 92% and 85% of loan placements in these states.

In the states of Jalisco, Hidalgo and Querétaro, existing homes have shares of 17%, 18% and 21% for the same period. This could represent an incentive to build housing in certain locations. Nonetheless, it is important for local markets to take the right amount of time to soak up housing, as evidence tells us that any saturation can rein in the pace of price rises, particularly in the larger cities, which in turn puts pressure on the portfolio quality of loans for residential building.

## Unevenness can also be seen among the metropolitan areas

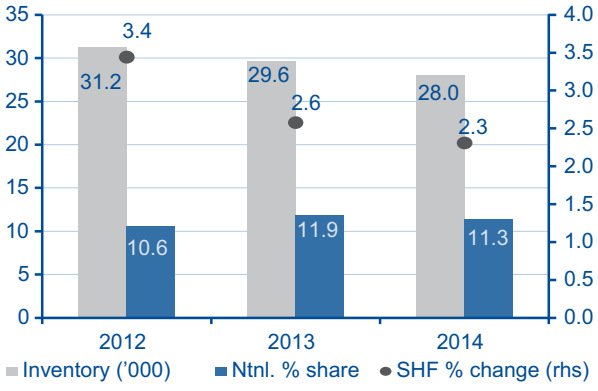
In terms of the major cities, in those states that are home to the biggest cities we find that adjustments in inventories and prices have been mixed. For example, in the state of Nuevo León, where there are several municipalities clustered within the Monterrey metropolitan area, we see that the level of inventories has held steady, despite the fact that mortgage origination and employment have reported increases for the year to date. This has led to the brakes being put on the pace at which real estate is rising in value, this being 1% in this metropolitan area so far in 2014. On top of this, the state's share of total inventories has risen. In the greater Guadalajara metropolitan area, in the state of Jalisco, the reduction in inventories, although proceeding more slowly, has lent itself to housing prices rising at over 2% thus far this year.

Chart 2c.7
Housing inventory and price rises, Nuevo León & Monterrey metropolitan area, thousand units & %




Source: BBVA Research with data from the RUV and the SHF

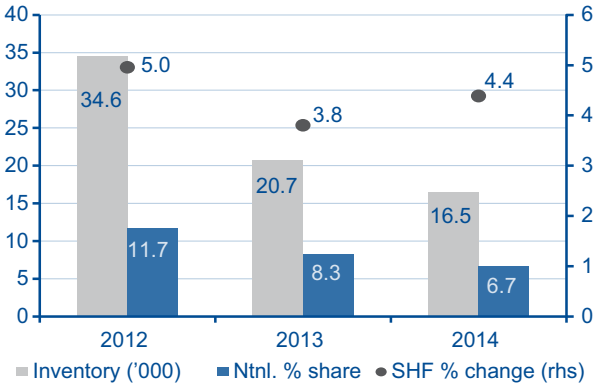
Chart 2c.8
Housing inventory and price rises, Jalisco and Guadalajara metropolitan area, thousand units & %




Source: BBVA Research with data from the RUV and the SHF

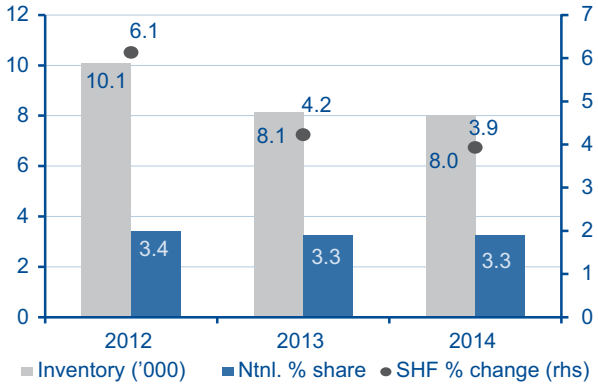
In other metropolitan areas, conflicting patterns also emerge. For example, in the State of Mexico inventories have not only been going down in the last few years, but the share of the nationwide total has also been reducing. This has kept the pace of rising values at between 4% and 5% from 2012 up to now, with origination levels remaining similar to other states, such as Jalisco. Finally, though on a far smaller scale in terms of inventory and origination, the Puebla-Tlaxcala metropolitan region has also stuck to a stable level of value gains.

Chart 2c.9
Housing inventory and price rises, State of Mexico and Toluca metropolitan area, thousand units & %




Source: BBVA Research with data from the RUV and SHF

Chart 2c.10
Housing inventory and price rises, Puebla-Tlaxcala region, thousand units and %




Source: BBVA Research and data from the RUV and SHF

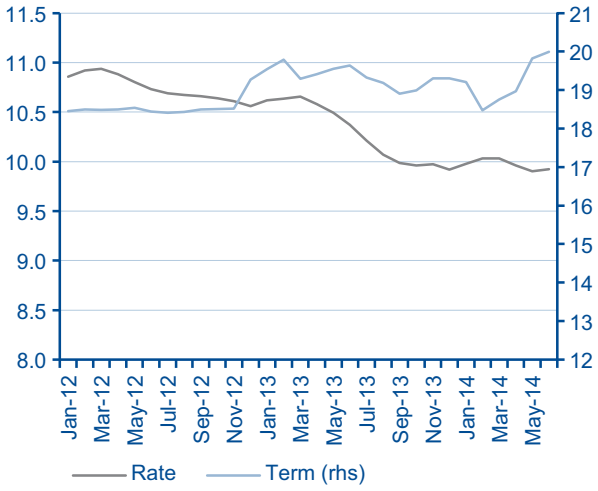
## Accessibility is also mixed among states

Rising housing prices are good news for those who already own a home, of course, but not necessarily good tidings for those who have just started looking for one. We have stressed the role of employment in housing demand, but has access to housing improved in the states despite the rise in home prices? Even if there are more people with well-paid jobs, if housing prices are growing ahead of purchasing power, effective demand will not materialise. This is why it is important to find out whether access to housing has improved. We have observed that moving prices and changing credit terms have had an impact on accessibility to housing in different ways in each state.

We propose to measure accessibility on the basis of the purchasing power of households via the mortgage loans offered by the retail banking sector. In other ***Mexico Real Estate Outlook*** reports we have offered accessibility indexes that show an improvement, but these have been more indicative of the relative cheapening of a specific type of housing or the financial burden represented by paying off the loan in relation to the average household income.

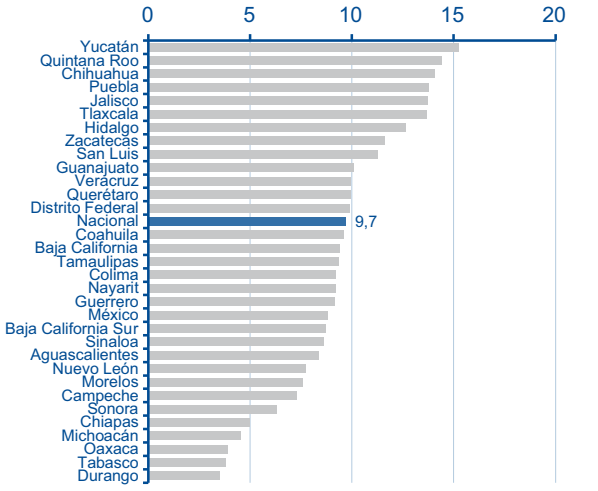
Nevertheless, lower readings of relative cost do not necessarily imply easier access: cheaper housing or credit has to make housing accessible. Even if a home has fallen in price, if a household's income or borrowing power is not enough to buy it, it remains unaffordable.

Chart 2c.11
**Banking sector mortgage loan rate and period**
**Annual interest rate and moving average years**




Source: BBVA Research and data from CNBV

Chart 2c.12
**Households with easier access to mortgage credit 2012-2014**
**% growth**




Source: BBVA Research

For this reason, we have conducted an exercise to find out how much the purchasing power rises of households which might be eligible for credit, thanks to the improvements in mortgage financing terms offered by banks from 2012 to the first half of 2014. Based on the 2012 Survey on Household Income and Spending (ENIGH 2012), the SHF's household prices index, and the characteristics of mortgage credit offered by the retail banking sector published by the CNBV (Mexico's National Banking and Securities Commission) we have estimated the highest affordable housing price for households which are eligible for a mortgage loan.

The results we obtained show that, thanks to the lowering of the interest rates and the lengthening of the average repayment periods observed over the course of this time, monthly instalments have come down and purchasing power has risen in real terms across-the-board. On the subject of households, the nationwide effect is that 9.7% of new home buyers would have seen increased purchasing power and bought higher value homes. In spite of the increase in prices, all the states have seen improved access. The states with the greatest increases in the number of households that could buy a home were: Yucatán, Quintana Roo, Chihuahua, Puebla and Jalisco. The states in the south of Mexico are below the national average, but still display positive results.

## The supply of housing will remain in those states with more dynamic economies

The mortgage market is moving towards a new equilibrium. Regional trends, however, suggest that those areas with greater economic activity and job creation will continue to be the centres of attraction for housing construction. While it is true that there are states where labour mobility and investment in sectors such as manufacturing make it feasible to step up supply, it is also important to see effective demand for what it really amounts to in states and districts.

The experience of recent years has taught us that having a better grasp of the market helps to bring decisions more into focus, regarding both construction and buying and selling real estate. There is no doubt that growth opportunities exist in regions such as the lowlands, where investment in key industries will spark housing commercialisation, as well as in the already highly developed city centres. Yet the options for expansion should be weighed up carefully, and in such a way that there is no disruption of the urban, residential or economic status quo.

# 3. Special Topics

## 3.a Transmission of monetary policy to the mortgage market

Commercial bank mortgage loans have been on the rise since 2010, both in the number of loans extended and the amounts of credit. Employment began to recover after the economic crisis of the end of the last decade, which had a favourable impact on demand for bank mortgage loans. Furthermore, the lower cost of credit explains the rise in banking activity. Banks have steadily improved the terms for this type of credit, with a consistent drop in interest rates and longer maturities. Consequently, in addition to the fact that more people have access to housing, they can now also afford higher-priced homes, as monthly payments have fallen.

On 6 June 2014, the central bank cut its benchmark rate by 50 basis points, which triggered expectations as to the potential effects this might have on the housing market. On the one hand, it could constitute a boost to demand, due to the potential transmission to mortgage interest rates. On the other, the impact on the real estate market could also come from the housing supply side through residential construction credit, which accounts for a significant portion of construction-associated costs. The effect on supply could be greater if builders anticipate changes in housing demand, as a result of a potential decline in consumer borrowing costs.

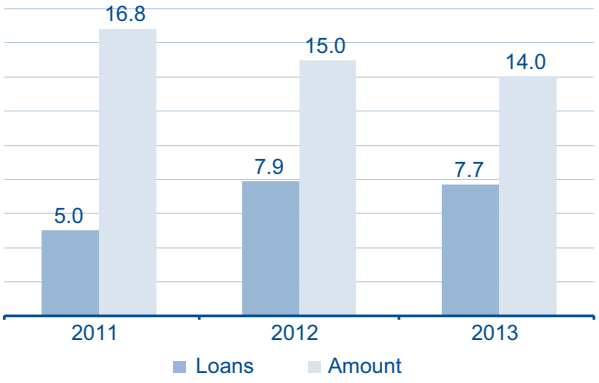
Thus, if the fall in the central bank's benchmark rate is transmitted to the mortgage market, it would reduce the borrowing costs of consumers seeking to purchase a home, which in turn would stimulate the mortgage market. Therefore, this document presents the statistical analysis we conducted to assess the transmission of the benchmark rate to the commercial banking mortgage rate.

### Lower interest rates have increased banking credit

The number of commercial banking mortgage loans has been rising steadily since 2010. The amount of credit grew at a rate of over 10% in each of these years. This result is largely due to a decline in interest rates and to longer average maturities, in addition to the recovery in employment. Currently, there are mortgage products with annual rates of less than 9% and maturities of up to 20 years.

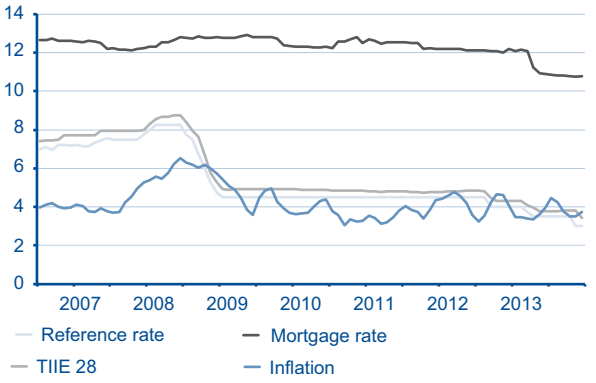
The rise in mortgage credit is also due to the fact that macroeconomic stability has provided certainty and prevented interest rates from experiencing major fluctuations. Inflation has remained contained, and the Bank of Mexico's benchmark rate has either remained stable or dropped, as it recently did. The Equilibrium Interbank Interest Rate (TIIE) reflects this behaviour. It moves practically in the same direction as the benchmark rate, that is, there is a very high correlation between the TIIE and the benchmark rate. From 2004 to 2008, the benchmark rate fell at a faster pace than the mortgage rate. In December 2004, the mortgage rate was at 14.1% on average. By April 2008, it had dropped to 12.1%. For its part, the benchmark rate declined from 8.6% to 7.5% over the same period. However, the benchmark rate had bottomed at 6.9% in April 2006, which means that these rates did not behave consistently over the mentioned period. This is because in those years housing demand was in the middle of a remarkable boom.. Even after the 2009 crisis, mortgage rates remained at 12% levels, whereas the benchmark rate had fallen from 8.3% in December 2008, to 4.5% in July 2009.

Chart 3a.1
**Commercial banking mortgage credit**
**Annual growth rate**




Source: BBVA Research with ABM data

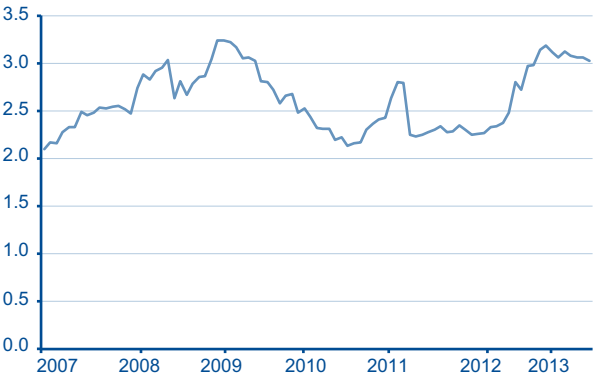
Chart 3a.2
**Macroeconomic variables and mortgage rate**
**Annual interest rate**




Source: BBVA Research with central bank data

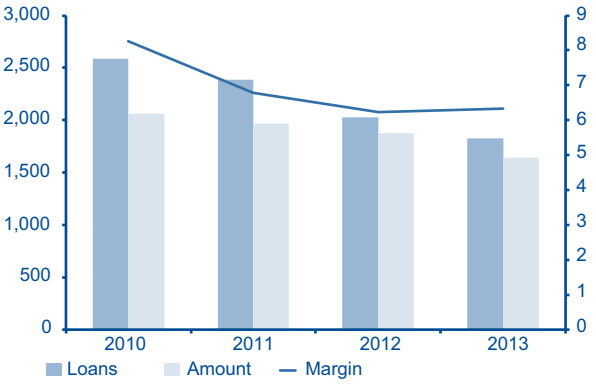
Therefore, it seems that changes in the benchmark rate do not influence changes in mortgage interest rates. The largest drop in the benchmark rate occurred in the first half of 2009, but the average mortgage rate remained unchanged over that period. The explanation in this case is found in a rise in credit risk due to the economic crisis. The mortgage rate has been declining since the start of the post-crisis period, even though the benchmark rate has remained stable. The reason for this improvement in mortgage credit terms is the greater competition among banks, as reflected by both lower concentration and a drop in margins. In the first case, the Herfindahl index has fallen since 2010, coming in below 2,000 points in 2013. In the second, risk-adjusted margins have fallen from 8% to 6% levels, and are now lying very close to government debt yields offered on the 10-year bond.

Chart 3a.3
**Bank mortgage credit risk**
**%**




Source: BBVA Research with CNBV data

Chart 3a.4
**Herfindahl index and mortgage margins**
**Index and %**




Source: BBVA Research with CNBV data

Once the economic crisis had passed, credit risk dropped considerably, with some variations. However, it has displayed an upward trend since the end of 2013, which could be due to a greater penetration into previously uncovered niche markets. While the lower risk might explain the downward behaviour of mortgage rates, the latter have not risen, notwithstanding the recently-observed rise in risk. On another note and since 2010, the indicators of higher competition provide a better explanation for this result, the more so when observing credit risk-adjusted margins.

Overall, the data on risk and on competition among banks seem to offer a better explanation of the variations in banking mortgage interest rates versus the central bank's benchmark rate.

## The benchmark rate would impact the housing market through credit

There are different views on how monetary shocks propagate to real variables. The most popular involves the role played by real interest rates or cost of capital, corporate balance sheets, banking credit, the real exchange rate and financial asset prices. According to economic theory, monetary policy may have short-term effects via interest rates by means of the following mechanisms: i) borrowing costs; ii) expectations of a change in future home prices; iii) changes in household consumption patterns, and iv) housing demand and residential investment (Mishkin, 2007).

The role of expectations has become significant, not only due to potential variations in home prices, but also because one must consider their influence on the future behaviour of interest rates to assess the transmission of monetary policy. In this regard, Bernanke et al. (2010) find that transmission might be underestimated if future estimations of interest rates are not considered. In an application of this idea, Cecchin (2011) proposes that the interest rate swap includes these expectations in the Swiss economy.

One would expect monetary policy to mainly affect short-term interest rates, while having a relatively lower impact on long-term rates such as those for mortgages. However, Taylor (1995) notes that changes in short-term rates have asignificant effect on changes in long-term rates. To a degree, expectations on the future behaviour of short-term rates will have an influence on the movements of long-term rates. The same author states that consumption of durable goods, fixed capital investment, residential investment and even inventories are negatively related to the real interest rate in many countries.

On another note, assuming a relatively weak direct monetary impact on long-term interest rates, other conduits might be boosting it. Bernanke and Gertler (1995) argue that the credit conduit might be enhancing the impact of monetary shocks on the rates of longer-term financial instruments via a greater or lesser availability of credit. Furthermore, the importance of the relationship between short- and long-term rates (according to the share to variable-rate mortgages) must be considered to determine which one has a relatively higher impact on the investment component of aggregate demand.[1]

The degree of the effect of a monetary shock on mortgage credit relates to both the composition (with respect to risk) of loan portfolios as well as to a bank's main source of funding. Black et al. (2010) find that banks that have higher-risk mortgage portfolios and are mainly funded by deposits respond to a monetary contraction by reducing their credit offering.

In light of the foregoing, we propose a model to estimate the transmission of the benchmark rate to the banking mortgage rate. We included the secondary market 10-year swap and bond interest rates as the indicators of long-term rate expectations that could transmit their effect to mortgage rates, based on the fact that the average life of a mortgage loan in Mexico is seven to eight years, which is very close to the maturity of these securities.[2] The swap was not statistically significant, while the rate on the 10-year bond was. Another way of looking at the return on the latter instrument is as an opportunity cost, given that this bond might provide a higher risk-adjusted yield than a mortgage loan. If that were the case, the mortgage rate would rise to make this product more appealing than the government bond. On another note, and given the importance of competition among banks, we included the credit risk-adjusted margin in the definition of the mortgage interest rate. We believe that the margin is a better indicator of the level of competition as an approach to the Lerner index, as one must consider that, in and of itself, concentration is not a sufficient indicator of the level of competition.[3]

[1] In the case of Mexico, most mortgage loans are extended at fixed rates.
[2] Recently-originated mortgages have maturities of up to 20 years. However, the entire loan portfolio includes shorter-maturity loans originated years ago, together with increasing portfolio prepayment.
[3] In a Bertrand model with two players and no barriers to entry, there would be high concentration, but competitive results would be achieved. In a more extreme case, a disputable market also achieves competitive levels with as little as one player.

## A model of monetary transmission to mortgage rate

Given that monetary policy in Mexico works under a scheme in which the central bank uses the nominal interest rate as an instrument as a function of the inflation target, in this case the benchmark interest rate is taken as the exogenous variable. Therefore, for a given value of the benchmark interest rate, the monetary transmission conduits would operate under this scheme. The model's construction involves monthly series of the following indicators for the period from January 2007 to December 2013: the central bank benchmark interest rate ($r_f$); mortgage interest rate ($r_h$); secondary market 10-year bond rate (*BMX*); and the risk-adjusted financial margin as a share of the total portfolio (*MGA*).

As mentioned in the previous section, expectations on the level of future short-term rates would have an influence on long-term mortgage rates (Taylor, 1995), which might be reflected by the 10-year bond. Furthermore, and per Black et al. (2010), we include the risk-adjusted financial margin as a share of the portfolio to determine a potential effect on the supply of credit through changes in mortgage rates.

Building an explanatory model requires a statistical analysis of the series to use the most convenient transformation. Given that the variables to be used might be determined by a random walk, they are unlikely to have stationary properties time series (mean and variance). The 2008 crisis and a structural change in the housing market, expressed as a change in preferences that led consumers to demand higher amounts of financing, are some examples of the latter. Analysis of integrated variables is a useful tool to determine the most convenient transformation when choosing to work with stationary variables and/or to look for a long-term (cointegrated) relationship between said time series. This approach also prevents working with spurious relationships, (Granger, 1974).

There are several tests to detect trend problems in variance. In this case, we apply the Dickey-Fuller (1979) test. The results are shown in the following table.

Table 3a.1
**Unit root test**

| Variable | ADF | | | Result |
|---|---|---|---|---|
| | A | B | C | |
| $r_t^{ref}$ | -0.9113<br>(0.7802) | -2.3650<br>(0.3949) | -1.2010<br>(0.2087) | I(1) |
| $\Delta r_t^{ref}$ | -4.3885<br>(0.0006) | -4.3764<br>(0.0040) | -4.2529<br>(0.0000) | I(0) |
| $BMX_t$ | -1.4603<br>(0.5488) | -2.7241<br>(0.2299) | -0.4089<br>(0.5333) | I(1) |
| $\Delta BMX_t$ | -9.4883<br>(0.0000) | -9.4306<br>(0.0000) | -9.5367<br>(0.0000) | I(0) |
| $r_t^{hip}$ | 0.9150<br>(0.9953) | 0.0095<br>(0.9958) | -1.4121<br>(0.1460) | I(1) |
| $\Delta r_t^{hip}$ | -7.9539<br>(0.0000) | -8.1845<br>(0.0000) | -7.8362<br>(0.0000) | I(0) |
| $MGA_t$ | -3.7311<br>(0.0052) | -3.6112<br>(0.0348) | -0.6154<br>(0.4479) | I(1) |
| $\Delta MGA_t$ | -17.2723<br>(0.0001) | -17.2473<br>(0.0000) | -17.3681<br>(0.0000) | I(0) |

Source: BBVA Research.
Note: The Mackinnon critical values at 95% confidence for the test in a sample of T=100, are -2.89 with constant (Column A), -3.75 with constant and trend (Column B) and -1.96 without constant and without trend (Column C). Likelihood is noted in parenthesis. Schwarz information criterion. Period: 2007-2013. The first difference in the variables is noted by letter Δ.

According to the test results, the variables used have an *I(1)* order of integration by levels, which requires using the first difference in each case to propose an explanatory model. By doing this, we ensure the stationarity of the variables and the absence of unit roots.

Another way of confirming that there is an economic relationship between the variables is by applying the cointegration test. The Johansen (1992) test simultaneously compares the series' order of integration and the long-term relationships between them, considers them all to be equally endogenous and estimates all possible vectors.. This analysis is based on the Sims procedure (1980).

Table 3a.2
**Johansen cointegration test, $r_t^{hip}$, $r_t^{ref}$, $BMX_t$, $MGA_t$**

| Ho | Trace | Critical value at 95% | Likelihood |
|---|---|---|---|
| r = 0 | 91.38* | 63.87 | 0.0001 |
| r ≤ 1 | 54.89* | 42.91 | 0.0002 |
| **r ≤ 2** | 24.13* | 25.87 | 0.0811 |

Source: BBVA Research. Prepared in-house.
Note: * Denotes rejection at 5% significance level. Trace = trace test; r= number of cointegration vectors. Number of lags in VAR 1 to 11 (Akaike information criterion). Constant and without trend in VAR. Period: 2007-13.

The result of the cointegration test reveals that there are two vectors at 95% confidence for the mortgage rate, the benchmark rate, the secondary market 10-year bond rate and the risk-adjusted financial margin. This implies that, at a minimum, there is a relationship of long-term equilibrium between the involved variables. We note that the benchmark rate was not significant in this test, given that the equilibrium value is close to zero, as observed in the normalised vector. This can explain a limited transmission mechanism.

Table 3a.3
**Normalised cointegration vector**

| $r_t^{hip}$ | $r_t^{ref}$ | $BMX_t$ | $MGA_t$ |
|---|---|---|---|
| 1 | -0.0047<br>(0.0215) | -0.1994<br>(0.0413) | -0.0719<br>(0.0198) |

Source: BBVA Research.
Note: Standard error in parenthesis. Period: 2007-13.

## VAR and SVAR models are more appropriate to evaluate monetary transmissionn

The most commonly-used method to estimate monetary transmission is based on building Vector Autoregressive (VAR) and Structural Vector Autoregressive (SVAR) econometric models. As Sims (1980) explains, the main argument for using these types of models is due to two criticisms of single-equation models:

1. With single-equation models, determining the most appropriate number of lags is complicated. This may end up returning highly correlated, and thus biased, results.
2. Failing to consider the lagged endogenous variable as an explanatory variable poses the risk of omitting information, given that there could even be a case of double causation toward any of the variables. Furthermore, since transmission mechanisms can be slow, a considerable number of lags may be required to capture the transmission, which makes VAR or SVAR more convenient.

The problems described in the foregoing points may lead to the assumption that a variable is exogenous when it may not be. Therefore, a more extended model to analyse a transmission function consists in treating each variable under the same criterion of endogeneity. For example, in the case of two variables, we assume that variable $y_t$ may be affected in time by current and past realizations of variable $z_t$; while $z_t$ could also be affected by current and past realizations of variable $y_t$. For example, let us consider the following system of equations:

$$y_t = b_{10} - b_{12}z_t + \gamma_{11}y_{t-1} + \gamma_{12}z_{t-1} + \varepsilon_{yt} \quad (1)$$

$$z_t = b_{20} - b_{21}y_t + \gamma_{21}y_{t-1} + \gamma_{22}z_{t-1} + \varepsilon_{zt} \quad (2)$$

Where there are three assumptions: i) that $y_t$ and $z_t$ are stationary; ii) $\varepsilon_{yt}$ and $\varepsilon_{zt}$ are white noise errors with standard deviations $\sigma_y$ and $\sigma_z$ respectively, and iii) $\varepsilon_{yt}$ and $\varepsilon_{zt}$ are not correlated.

These equations constitute a first-order vector autoregression, given that the maximum length of the lags is the unit. This example for two variables is useful to illustrate higher-order multivariate models. In this first approach, coefficient $-b_{12}$ is the contemporaneous effect of a change of unit of $z_t$ on $y_t$ and $\gamma_{12}$ is the effect of a change of a unit in $z_{t1}$ on $y_t$. Note that $\varepsilon_{yt}$ and $\varepsilon_{zt}$ are innovations (or shocks) in $y_t$ and $z_t$ respectively. Of course, if $b_{21}$ is other than zero, $\varepsilon_{yt}$ has an indirect contemporaneous effect on $z_t$, and if $b_{12}$ is other than zero, then $\varepsilon_{zt}$ has a contemporaneous effect on $y_t$.

Equations (1) and (2) are not expressed in reduced form, given that the effects between both endogenous variables are transitory. Therefore, matrix algebra must be used to write the system of equations in compact form.

$$\begin{bmatrix} 1 & b_{12} \\ b_{21} & 1 \end{bmatrix}\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix}\begin{bmatrix} y_{t-1} \\ z_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \quad (3)$$

Or rather,

$$Bx_t = F_0 + F_1x_{t-1} + \varepsilon_t \quad (4)$$

Where,

$$B = \begin{bmatrix} 1 & b_{12} \\ b_{21} & 1 \end{bmatrix},\ x_t = \begin{bmatrix} y_t \\ z_t \end{bmatrix},\ F_0 = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix},\ F_1 = \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{bmatrix},\ \varepsilon_t = \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix}$$

Premultiplying by $B^{-1}$ allows us to obtain the standard expression of a VAR model:

$$x_t = A_0 + A_1x_{t-1} + e_t \quad (5)$$

Where, $A_0 = B^{-1}F_0$, $A_1 = B^{-1}F_1$ and $e_t = B^{-1}\varepsilon_t$. We thus now consider the general multivariate model of the autoregressive process:

$$x_t = A_0 + A_1x_{t-1} + A_2x_{t-2} + \cdots + A_px_{t-p} + e_t \quad (6)$$

Where:

1. $x_t$ is a vector (n X 1) with each of the variables included in the VAR
2. $A_0$ is a vector (n X 1) with the intercept terms
3. $A_i$ is a matrix (n X n) of coefficients
4. $e_t$ is a vector (n X 1) with the error terms

One of the intrinsic characteristics of a VAR is that it is over-parameterised, given that many of its coefficients will not be significant. However, the goal is to find economic relationships between the variables used. Note that the error term is assumed as non-correlated and with constant variance. This is why each equation can be estimated by OLS, as the estimators are consistent and asymptotically efficient. Even if one thought that the errors between equations might be correlated, a SUR (Seemingly Unrelated Regressions) model would not add more efficiency, since the regressions have the same number of variables.

Another aspect to consider is whether the variables must be stationary. Sims (1980) and Sims, Stock and Watson (1990) recommended the use of series in levels, even in the case where they contain a unit root. They argue that the main advantage of VAR is in determining relationships between the variables, and not the parameters themselves. Differentiating the variables might omit important information from the model, and would even exclude the possibility of finding a cointegration relationship. Therefore, we chose to include the cointegration test in our model, as well as the short-term equation through the error correction term.

The search for a consistent economic relationship also requires establishing the difference between the use of a common VAR and a structural VAR (SVAR). If the main interest lies in estimating a forecast, then the composition of the errors in the dynamic is not important, but the quality of the simulation is. However, when we intend to determine the economic relationship through structural shocks, we then use the impulse-response function. In the case of this research, we chose to combine cointegration theory in the determination of the long-term relationship and the analysis of impulse-response though Vector Error Correction (VEC).

## Estimation of Vector Error Correction (VEC)

Vector Error Correction (VEC) is a restricted vector autoregression, designed to use non-stationary variables that have proved to be cointegrated. VEC includes cointegration relationships within the VAR specification, such that it restricts the long-term behaviour of the endogenous variables toward the convergence of the long-term relationship found, while correcting the short-term skews. The cointegration term, also known as *error correction term*, gradually adjusts any deviation toward the long-term equilibrium value. In the case of a system with two variables and a cointegration equation with no lagged terms, that is, $y_{2,t} = \beta y_{1,t}$, the VEC model would be given by:

$$\Delta y_{1,t} = \alpha_1 (y_{2,t} - \beta y_{1,t-1}) + \varepsilon_{1,t} \quad (7)$$

$$\Delta y_{2,t} = \alpha_2 (y_{2,t} - \beta y_{1,t-1}) + \varepsilon_{2,t} \quad (8)$$

In this simple model, the term on the right side of the equation is the error correction term. In the long-term equilibrium it is zero. However, if $y_1$ or $y_2$ deviate from said equilibrium, the error correction term will be other than zero, and each variable will be partially adjusted until long-term equilibrium is restored. Coefficient $\alpha_i$ measures said endogenous variable's speed of adjustment toward the equilibrium relationship at the *i-th period*. Therefore, said term must be less than one.

In our assessment, given that we check the long-term relationship with the Johansen test, we estimate a VEC for the period from January 2007 to December 2013. The short-term results are as follows:

$$\begin{pmatrix} \Delta r_t^{hip} \\ \Delta r_t^{ref} \\ \Delta BMX_t \\ \Delta MGA_t \end{pmatrix} = \begin{pmatrix} -0.41 \\ 0.25 \\ -0.90 \\ 6.31 \end{pmatrix} \varepsilon_{t-1} + \begin{pmatrix} 0.59 & 0.02 & 1.76 & -4.38 \\ 0.24 & 0.96 & -0.13 & -0.28 \\ -0.02 & 0.04 & 0.07 & 1.21 \\ -0.01 & -0.00 & -0.08 & -0.66 \end{pmatrix} \begin{pmatrix} \Delta r_{t-1}^{hip} \\ \Delta r_{t-1}^{ref} \\ \Delta BMX_{t-1} \\ \Delta MGA_{t-1} \end{pmatrix} + u_t \quad (9)$$

The short-term equation meets the convergence condition, given that the mortgage interest rate coefficient is significant, negative and less than one, which means that any deviation from the long-term equilibrium ensures a return to equilibrium. For example, a rise in the secondary market 10-year bond rate in the short term would place the mortgage interest rate below the long-term equilibrium value. However, the return to the latter would be effected by the error correction term at an adjustment speed of 0.41 times the long-term error.

In this regard, the economic relationship is given by:

$$\varepsilon_{t-1} = -2.23 + r_{t-1}^{hip} - 0.005 r_{t-1}^{ref} - 0.100 BMX_{t-1} - 0.054 MGA_{t-1} \quad (10)$$

Therefore, in the long term, the effect of any change in the benchmark rate is null toward the average mortgage rate, while the 10-year bond rate and risk-adjusted margin have a permanent effect. The Granger and Wald causality tests confirm that the benchmark rate is strictly exogenous.

Table 3a.4

**Granger causality test / Wald exogeneity test**
**$r_t^{hip}$, $r_t^{ref}$, $BMX_t$, $MGA_t$**

| Dependent Variable $r_t^{hip}$ | Value of $Xi^2$ | Likelihood | Result |
|---|---|---|---|
| $\Delta r_t^{ref}$ | 26.18 | 0.0010 | Causa |
| $\Delta BMX_t$ | 16.14 | 0.0404 | Causa |
| $\Delta MGA_t$ | 10.41 | 0.2374 | No causa |
| **Dependent Variable $r_t^{ref}$** | **Value of $Xi^2$** | **Likelihood** | **Result** |
| $\Delta r_t^{hip}$ | 7.97 | 0.4360 | No causa |
| $\Delta BMX_t$ | 13.81 | 0.0868 | No causa |
| $\Delta MGA_t$ | 15.04 | 0.0582 | No causa |
| **Dependent Variable $BMX_t$** | **Value of $\chi i^2$** | **Likelihood** | **Result** |
| $\Delta r_t^{hip}$ | 20.73 | 0.0079 | Causa |
| $\Delta r_t^{ref}$ | 13.26 | 0.1030 | No causa |
| $\Delta MGA_t$ | 17.29 | 0.0272 | Causa |
| **Dependent Variable $MGA_t$** | **Value of $\chi i^2$** | **Likelihood** | **Result** |
| $\Delta r_t^{hip}$ | 17.86 | 0.0223 | Causa |
| $\Delta r_t^{ref}$ | 01.29 | 0.9956 | No causa |
| $\Delta BMX_t$ | 13.45 | 0.0973 | No causa |

Source: BBVA Research.

In terms of the direction of causality, there is evidence of a simultaneous transmission mechanism between the mortgage rate and the secondary market 10-year bond, which in turn would be generating a long-term effect on risk-adjusted financial margin, according to the results of the long term relationship.

The model's statistical error tests are shown on the following table:

Table 3a.5

**Granger causality test / Wald exogeneity test**
**VEC $r_t^{hip}$, $r_t^{ref}$, $BMX_t$, $MGA_t$**

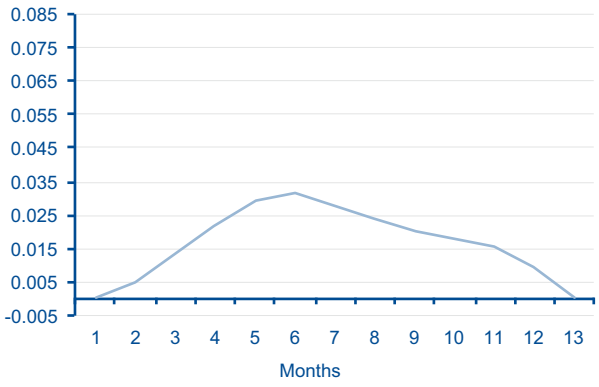
| Test | Statistical | Likelihood | Result |
|---|---|---|---|
| LM(6) | 16.04 | 0.4499 | Ho: No serial correlation |
| LM(7) | 12.36 | 0.7184 | Ho: No serial correlation |
| LM(8) | 17.71 | 0.3407 | Ho: No serial correlation |
| LM(9) | 16.68 | 0.4064 | Ho: No serial correlation |
| JB(1) | 10.02 | 0.2630 | Ho: Normality |
| JB(2) | 64.12 | 0.1871 | Ho: Normality |
| White | 685.64 | 0.6437 | Ho: Homoscedastic |
| VIF* ($r_t^{ref}$) | 2.2029 | | No Multicollinearity |
| VIF* ($BMX_t$) | 2.0565 | | No Multicollinearity |
| VIF* ($MGA_t$) | 1.1060 | | No Multicollinearity |

Note: LM (q-order) of Lagrange multipliers for serial correlation; JB(1), Jarque-Bera statistic for Cholesky (Lutkepohl) normality; JB(2), Jarque-Bera statistic for normality with residuals covariance (Urzúa); White, for heteroscedasticity with no cross terms. *Variance Inflation Factor for the cointegration vector. Multicollinearity is considered when VIF is greater than five.

The impulse-response exercise applied to the economic relationship allows determining the degree of persistence of monetary policy instruments. For example, a policy shock equivalent to 1% of the benchmark interest rate transfers an effect to the mortgage rate of barely 0.015% during the first six months. However, the effect disappears after the elapsing of roughly 13 months. Once this period elapses, the transmission to mortgage rates is determined by the 10-year bond purchased on the secondary market. Thus, we could say that once the market internalises a downward change in the benchmark rate, the predominant decision is to invest in longer-term assets to sustain margins. The cumulative effect after 24 months is 0.04%.

Chart 3a.5

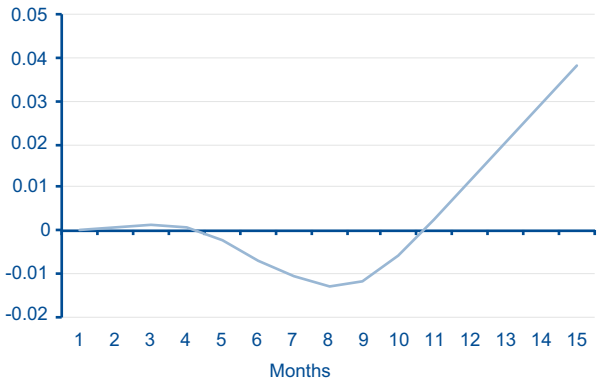
**Response of mortgage interest rate to a 1% Change in the benchmark rate**




Source: BBVA Research. Prepared in-house with central bank and CNBV data

Chart 3a.6

**Response of mortgage interest rate to a 1% Change in the 10-year bond**




Source: BBVA Research. Prepared in-house with central bank and CNBV data

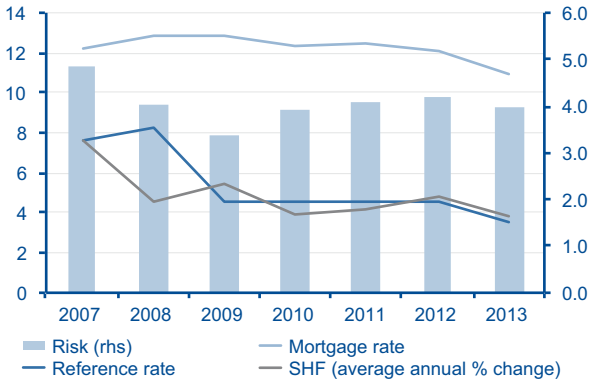
In general, the historical behaviour shows that mortgage rates have scant sensitivity to monetary policy instruments. The periods that most clearly showed a positive relationship between both rates, ran from April 2005 to April 2006, when the real estate boom began, and recently, from April 2013 to date. However, the recent decline in mortgage interest rates are better explained by competition among banks. Moreover, some were advertising lower rates before

the benchmark rate was cut. On another note, given that mortgage rates should consider a long-term expectation, the 10-year bond includes the aforementioned component, given that it might be the financial asset that is closest to the life of a loan of this type, and may have caused a substitution effect to seek higher yields, especially because the benchmark rate remained unchanged for nearly four years.

## Risk and competition among banks do have an effect on the mortgage rate

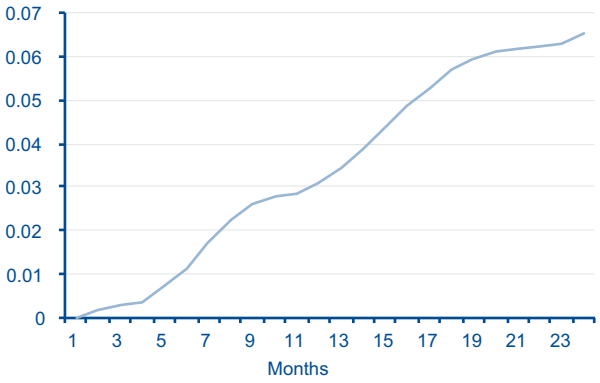
The results of the econometric model confirm two things. First, there is a positive long-term relationship between risk-adjusted margin (MGA) and the mortgage rate. Second, we also find a causality relationship of mortgage rates to risk levels. This was expected, given that from 2010 forward financing amounts rose due to higher origination in the mid-range and residential segments. The effect is moderate over the first five months of the shock, but it transmits by over two-thirds in the following three years, which would explain the stiffness in mortgage rates. In our model, the cumulative effect after 24 months is 0.06%.

Chart 3a.7
**Interest rates, home prices and portfolio risk*, %**




*Margin as percent of portfolio.
Source: BBVA Research with central bank, SHF and CNBV data.

Chart 3a.8
**Response of risk-adjusted margin to a 1% Change in the mortgage interest rate**




Source: BBVA Research. Prepared in-house with central bank and CNBV data

According to Mishkin (2007), the difficulty that lenders encounter to extend a loan, in the process of identifying clients with greater risk of default, may be compensated by the higher appreciation of the collateral asset. This would reduce the cost of asymmetric information, by minimising the losses in the event of a creditors default. Higher home prices tend to narrow the gap between the risk-free interest rate and the effective rate that creditor faces. That is, the net financial margin.

Another way of looking at this is by analysing the effect of higher home appreciation, especially from 2006 to 2007, when house prices rose 7.1% on average over that two-year period as a result of the real estate boom, according to the SHF price index. For its part, risk displayed a downward trend until 2009, creating an expectation of a market recovery. However, the decline in risk was not reflected in a lower mortgage rate, with home prices growing at near-inflation levels, given that the risk premium rose once again as a result of the economic crisis. This means that faced with the expectation of an ongoing rise in prices and a higher risk of default, which remains high, the only way to cover that premium was by keeping the interest rate firmly to secure higher net profits, comparable solely to those offered by financial assets with similar maturities.

## Conclusion: no evidence of transmission to mortgage market

This article presented an econometric exercise to determine the mechanism of monetary policy transmission to the mortgage interest rate, in two stages. We first computed the potential long-term interaction between the benchmark rate and the mortgage rate via integration and cointegration analysis. Second, we estimated a VEC to determine the pass-through effects and the transmission mechanism of a long-term rate, to reflect market expectations, as well as the mortgage portfolio's risk-adjusted financial margin..

The results reveal that, over the long term, there is no pass-through of the benchmark rate to mortgage interest rates. The null transmission to mortgage rates can be explained by two factors. First, the significance of long-term monetary policy expectations, included in our model via the 10-year bond, as this maturity is the closest to the life of a home loan. Second, the rise in the risk premium that began in 2009 and was accompanied by lower home price appreciation. Therefore, high mortgage interest rates were the most effective way to close the gap between risk (which has remained high) and profit margins, given that according to our model they would have a positive short-term effect on earnings. For its part, the long-term expectation would be covered by a foray into investments in the 10-year bond on the secondary market. In contrast, the decline in bank mortgage rates is better explained by increasing competition among banks.

These results are consistent with the international evidence, where fixed rates tend to reflect a lower transmission than credit products with variable rates. The supply of fixed-rate mortgage credit provides the consumer with certainty as to their future payments, and encourages housing demand as a result of the long-term confidence that it generates. Therefore, the market may be opting for this long-term certainty instead of expecting any changes in the mortgage rate by modifying the benchmark rate, with the benefit that if the opposite trend is observed, the rise would not be reflected in the payments of previously-extended loans. Nevertheless, the mortgage market continues to grow, due to the banks' quest for capturing increased market shares.

## References

Andrés, J., R. Mestre and J. Vallés (1996). "A Structural Model to Analyse the Monetary Transmission Mechanism: The Case of Spain." Studies Services. Bank of Spain. Working Paper No. 9629.

Bernanke, B., and M. Gertler (1995). "Inside the Black Box: The Credit Channel of Monetary Policy Transmission," Journal of Economic Perspectives, Vol. 9 (No. 4), pp. 27-48.

Bernanke, B., M. Gertler, and S. Gilchrist (1999). "The Financial Accelerator in a Quantitative Business Cycle Framework" in J. B. Taylor and M. Woodford, eds., Handbook of Macroeconomics (New York: Elsevier Science--North Holland), Vol. 1C, pp. 1341-93.

Black, Lamont, Hancock, Diana and Wayne Passmore (2010). The Bank Lending Channel of Monetary Policy and Its Effect on Mortgage Lending. Finance and Economics Discussion Series. Divisions of Research & Statistics and Monetary Affairs. Federal Reserve Board, Washington, D.C.

Cecchin, Iva (2011). Mortgage Rate Pass-Through in Switzerland. Working Paper 2011-8. Swiss National Bank.

Martínez, L. (2001). Considerations on the Transmission of Monetary Policy and the Mechanism of Transmission in Mexico. Research Document 2001-02. Bank of Mexico.

Mishkin, F. (2007). The Economics of Money, Banking and Financial Markets, 8th ed. (Boston: Addison Wesley)

Mishkin, F. (2007). Housing and The Monetary Transmission Mechanism. Working Paper 13518. National Bureau of Economic Research. October

Mirdala, R. (2009). Interest rate transmission mechanism of the monetary policy in the selected EMU

Dickey, D. A. and W. Fuller (1979), "A Distribution of the Estimators for Autoregressive Time Series with a Unit Root," Time series, Vol. 1, Harvey, Andrew (ed.), Elgar Reference Collection. International Library of Critical Writings in Econometrics, Vol. 5. Aldershot, U.K.: Elgar; distributed in the U.S. by Ashgate, Brookfield, Vt., 199-203, 1994

Granger, C. and P. Newbold (1974). "Spurious Regressions in Econometrics" Journal of Econometrics 2. 111-120.

Johansen, S. A. (1992), "Representation of Vector Autoregressive Processes Integrated of Order 2," Econometric Theory, Vol. 8 (2), 188-202, June.

Sims, C. (1980), "Macroeconomics and Reality," Econometrica, 48 (1), 1-48.

Sims, C., J. Stock and M. Watson (1990). "Inference in Linear Time Series Models with Some Unit Roots." Econometrica 58. 113-44.

Taylor, John (1995). The Monetary Transmission Mechanism: An Empirical Framework. Journal of Economic Perspectives, Vol. 9, pp. 11–26.

## Box 2: The lower benchmark interest rate could drive residential building

In the previous section, we stated that the central bank's lower benchmark rate could have effects not only on mortgage lending, but also on the financing of residential building. Hence, we shall now apply a similar methodology to estimate the impact of a lower benchmark rate on the rates used by banks to lend to home construction companies. The first main difference is that credit products for residential building are not permanent rates, but are indexed to the Interbank Equilibrium Interest Rate (*Tasa de Interés Interbancaria, TIIE*), so that, *a priori*, a high transmission level is to be expected. A second important characteristic is that some of the companies that commonly apply to credits for residential construction can get access to other markets of credit. This might heighten the transmission effect, as it poses additional competition for bank credit offering. A lower benchmark interest rate would prompt a lower cost of lending for residential building, giving the latter an extra stimulus in addition to those it has received during the year.

### Benchmark interest rate and international liquidity have an impact on lending for housing

According to the economic literature, a short-term fall in the interest rate would tend to lower the long-term interest rate outlook. Consequently, the cost of finance would also tend to fall, promoting higher demand for credit. The outlook for higher future sales arising from a lower cost of mortgage lending would be an incentive for residential building. On the other hand, a lower cost of finance for building would also drive the offer. Although we saw in the previous section that the transfer of the benchmark interest rate to the mortgage market is negligible, the central bank's measure might be reflected in the housing market if it is transferred through building credit. Since the second half of 2009, at least, a very high correlation has been apparent between the benchmark interest rate of the central bank and the average interest rate used by banks to lend to residential construction. We associate this behaviour because of these loans were contracted at variable interest rates, where the interest rate is usually defined as the Interbank Equilibrium Interest Rate (TIIE) plus a risk premium, depending on the borrower and the project in question.

Our analysis includes foreign bond ownership as a measure of international liquidity, which is actually reflected in the domestic market. This measure is relevant because it might have played a role in lower financing costs, and in facilitating admission of credit risks.[1] This might in turn have caused an excessive use of debt and credit by construction companies. Once the market has more financing resources, bank financing to housing developers faced greater pressure to be granted in less restrictive conditions, and to grow to a greater degree than was expected against a background with less international liquidity. This was combined with expectations of the real estate boom being sustained for a longer period of time. Hence, we consider that the evaluation of the likely transfer of the benchmark interest rate to credit for residential building should take these effects into account.

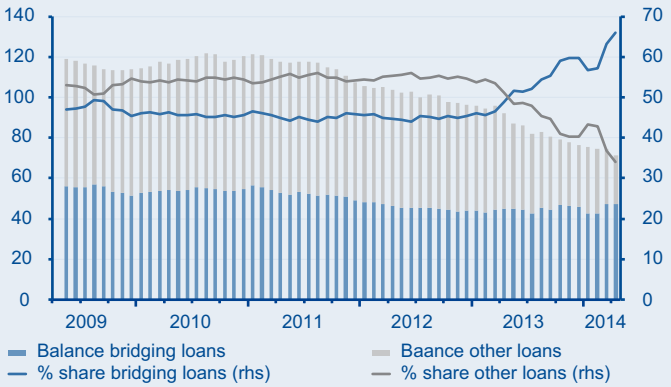
Chart B2.1

**Benchmark interest rates, 28-day Interbank equilibrium interest rate (TIIE 28) and building credit**
**Annual interest rate %**


Source: BBVA Research with central bank and National Banking and Securities Commission (CNBV) data

Chart B2.2

**Balance of bank financing to residential building**
**MXN bn at 2014 prices**




Source: BBVA Research with National Banking and Securities Commission (CNBV) data

[1] See Sánchez, M.G. (2013) "Emerging Economies facing the Financial Boom" ("Las Economías Emergentes frente a la Bonanza Financiera") IX Monetary Policy Leaders Meeting ("Reunión de Responsables de Política Monetaria"). CEMLA. Argentina

Bank lending to residential building peaked in 2009 as a result of the real estate boom in the previous decade, and also due to excess liquidity at international level. The latter is corroborated by the growing balance of foreign bond ownership, and a growing share of products other than bridge loans in banks' portfolios. However, in spite of slight reductions in the interest rate, the portfolio balance began to fall as a result of the economic crisis, which by prompting a fall in new housing sales deteriorated the portfolio quality. As a result of this deterioration and project risks, the banks adjusted their criteria for granting credit, preferring bridge loans, which they saw as a safer product. As a result, the balance of this credit type did not fall in such a pronounced way, nor did the NPL ratio increase to such a degree, as in other products.

Against this background, we can see how there were slight drops in the residential building lending interest rate, matching the pattern of the 28-day Interbank Equilibrium Interest Rate (TIIE 28) between July 2009 and the first quarter of 2013, a period in which there were no changes in the benchmark rate. From then onwards, a higher correlation is apparent, mainly from March 2013 onwards, when the benchmark rate began to fall. The result of these latest months has been combined with higher foreign bond ownership, prompting a fall in interest rates for residential building. Thus, market liquidity through bond placements has Imposed pressure on the aforesaid cost of financing for residential building, mainly from July 2013 to date.

## Confirmation of monetary transmission towards lending rate for residential building

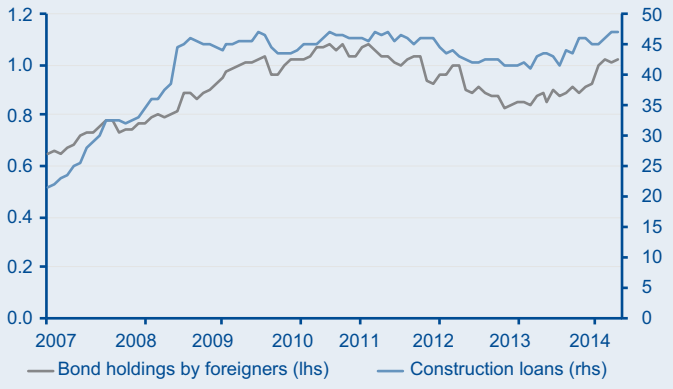
Based on the statistical methodology which we used in the previous section to estimate the monetary transmission to the mortgage lending interest rate, we now statistically check the mechanism for the transmission of the benchmark rate and international liquidity towards the credit interest rate for residential building, using a Vector Error Correction (VEC) model for August 2009 to April 2014. The construction of this model involves monthly series, and includes: the central bank's benchmark interest rate ($r_f$); interest rate for residential building ($r^{cv}$) of the National Banking and Securities Commission (CNBV); and foreign bond ownership (*TB*), also by the central bank.

Once the economic relationship between the variables involved in the model was proven, the long term equation is provided by the following expression:

$$\varepsilon_{t-1} = -6.24 + r^{cv}_{t-1} + 0.664 r^{ref}_{t-1} - 0.376 TB_{t-1}$$

Therefore, in the long term, the effect of any change in the residential building lending interest rate is statistically significant and 0.66% is transferred for each percentage point of increase in the benchmark interest rate. On the other hand, for each percentage point of increase in liquidity, which is measured in the model by foreign bond ownership,

Chart B2.3
**Balance of bridge loans and bond ownership**
**MXN mn at 2014 prices**




Source: BBVA Research with central bank and National Banking and Securities Commission (CNBV) data

Chart B2.4
**Response of residential building interest rate to a change of 1% in bond ownership, %**


Source: BBVA Research

the lending to residential building interest rate would fall by 0.37%. It has a negative effect, given that higher international liquidity represents competitive pressure for the placement of bank lending in the local market, leading the price of credit to fall. It is important to note that, according to the results of the model, the short term effects of liquidity on the market are more important than the change in the benchmark interest rate, which is transferred more slowly - albeit with greater effect in the long-term. This is why during the last year the residential building lending interest rate has fallen more slowly than the benchmark interest rate. This might be an incentive to reactivate residential building in the coming months, once inventories have fallen against 2012-13.

Chart B2.5

**Response of interest rate for residential building to a change of 1% in the benchmark interest rate, %**


Source: BBVA Research with central bank and National Banking and Securities Commission (CNBV) data

## In housing, the benchmark interest rate is transmitted via construction lending

In this section, we use an econometric exercise to determine the mechanism whereby monetary policy is transferred towards the residential building lending interest rate. A model was estimated to determine the effect of a percentage change in the benchmark interest rate of the Bank of Mexico and international liquidity through foreign bond ownership.

Results show that for the period undertaken for this analysis there is transmission towards residential building lending interest rates through two channels. However, in the short term the effect of international liquidity appears to be more important, due to the expectations generated in terms of land and technology investments, which may be considered as issues which are less flexible to possible modification. Subsequently, the effect of the benchmark interest rate is more significant and two-thirds of a point is transferred for each percentage point towards long-term construction lending interest rates.

The impact of the offer could be greater if construction companies anticipate changes in housing demand as a result of the possible variation in the end-consumers' cost of finance. However, as we have concluded in this analysis, we do not expect there to be a transfer towards mortgage rates in the short term, given that market conditions in terms of the rate and term have been ideal in recent years, prolonging the cycle of growth in banking activity. Hence, it is necessary to reactive construction in locations in which it is required by economic activity and labour mobility, but on an appropriate scale.

# 3.b Mortgage portability

The Law of Transparency and for the Promotion of Competition in Secured Credit (LTyFCCG) came into force at the end of 2002. Among other aspects, the Law seeks to promote competition among secured loan providers by means of subrogation, so that borrowers who already have a loan of this type can lower their cost by switching to a lending institution that offers them a lower interest rate. However, no surge in subrogated loans has been observed. From January 2010 to June 2014, 21,000 loans were conveyed from one bank to another, not by subrogation but by the method of liabilities payment, which involves greater expenses.

Consequently, the Financial Reform sought to reduce the costs of secured loans transfer to achieve the goal of higher competition among lending institutions. Instead of a loan for liabilities payment, subrogation would merely entail the conveyance of the outstanding balance without having to start a new issuance process, thus avoiding notarial expenses. Reducing mobility costs would lead loan providers to compete, now not only for new borrowers but also for current customers, which would stimulate the real estate market. In this ***Mexico Real Estate Outlook*** article, we conduct a review of the changes that will lead to greater mobility and the opportunity for borrowers to improve their loan terms. Specifically, we will focus on the subrogation of the mortgage loan creditor.

## The reduction of mobility costs will encourage subrogation

There can be both debtor and creditor subrogation. The first case involves the substitution of the debtor of a secured loan, such as a mortgage. Creditor subrogation is the change of the lending institution or creditor, mainly due to a lower interest rate, which reduces the cost of the loan. In both cases, it applies to credit for both the end consumer and the real estate developer.

Various legal aspects seek to make subrogation easier. To be noted are the changes that reduce or eliminate mobility costs. For example, since 2003, the legal framework requires the secured loan-issuing institution to extend a binding offer with all of the terms and conditions of the loan.[1] In particular, this binding offer must include the express acceptance to receive the prepayment of the loan from any other lending institution, and to allow debtor substitution. Another aspect that will reduce mobility costs is that creditor subrogation does not have to be formalized with a notarial instrument,[2] which means higher notarial costs are not incurred. Instead, the subrogation agreement is recorded free of charge at the Public Commerce Registry. Also in this regard, the Law authorizes the Ministry of Economy to enter into coordination agreements with local governments to eliminate registry and notarial costs.[3] Both the notarial instrument formalization exemption and the agreements with local governments are favorably geared to facilitate mobility, as transaction costs are reduced.

Competition in the secured credit sector is not only encouraged by facilitating credit mobility through subrogation. The Law also specifies that the purchase of insurance associated with this type of credit from the same institution is optional. Packaging and tied sales are thus avoided. However, if the insurance is purchased from an institution other than the one that issues the secured loan, this may generate risks and thus reduce the incentives to offer subrogation. For example, there may be difficulties in collecting insurance payments between the loan-issuing institution and the insurance policy issuer. Furthermore, the subrogating institution will have to conduct ongoing follow-up on the validity of the insurance. In other words, that the borrower remains current on their payments so that the collection covered by the loan or the surety may be exercised.

## Subrogation benefits both borrowers and lenders

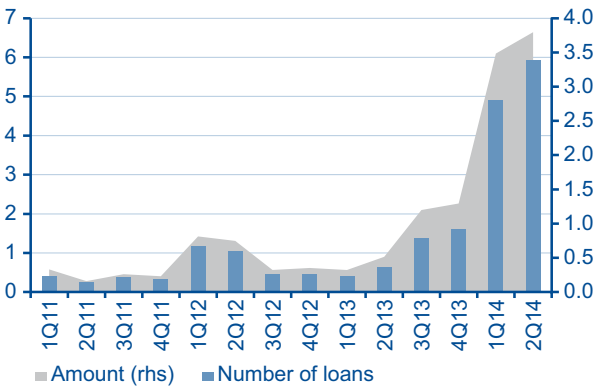
The economic literature notes that lower mobility costs lead to higher market efficiency, as they enable reallocation to other, more economic options. People who already have a mortgage are favored by the opportunity to switch to lower cost or better quality services. The supply-side is also helped, given that the most efficient players improve their market share. The result is higher efficiency and growth, in this case, of the mortgage market.

[1] Article 6 of the LTyFCCG
[2] Article 15 of the LTyFCCG
[3] Article 19 of the LTyFCCG

Nevertheless, we must note that a lack of mobility is not necessarily an indicator of scarce competition. In a perfectly competitive market with no information asymmetries, mobility would tend toward zero. Prices observed in perfectly competitive markets tend toward their marginal cost, which is the same for all competitors as there are no asymmetries. Thus, margins are reduced significantly and supra-competitive profits are eliminated, such that there is no market player that can offer a lower price or interest rate without incurring losses. A more appealing offering would only be possible in response to an innovation in associated costs. Examples in the secured credit market would be lower funding costs or risk reductions. However, as these factors would be common to all players, there would be no single player capable of offering a lower rate. In this case, we would only see restructuring within the same lending institutions.

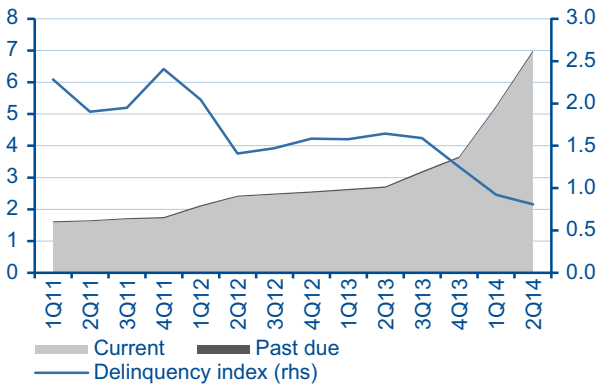
Secured loans mobility can be initiated by both customers and lending institutions. On the one hand, borrowers have two ways to improve their credit conditions. The first is by creditor subrogation which, as we mentioned, allows switching the loan from one institution to another one that offers a cheaper credit product. A second alternative is when a borrower becomes aware of the option to switch their mortgage to another institution. This opens the door to the current creditor extending improved credit conditions to retain the borrower in its portfolio. Whether by subrogation or by restructuring, borrowers can benefit by swapping their current loan for one on which they will pay less interest. On the other hand, the most efficient lending institutions will be able to capture a higher market share, given that they will be capable of offering more attractive loans to the users of their less efficient competitors, as well as being better positioned to retain their own customers.

Chart 3b.1
**Origination of loans for liabilities payment**
**'000s of loans and MXN mn**




Source: BBVA Research with CNBV data

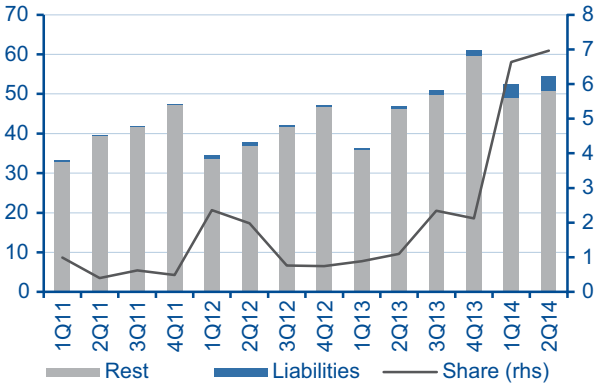
Chart 3b.2
**Balance of loans for liabilities payments**
**MXN bn and %**




Source: BBVA Research with CNBV data

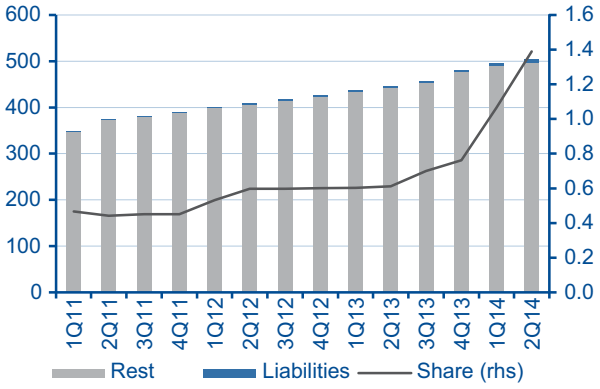
The mobility of secured loans did not have the expected impact, notwithstanding the LTyFCCG being in force since 2003. While it is true that the first half of 2014 revealed a considerable rise in the number of conveyances, the method used up to now has been through liabilities payment instead of creditor subrogation. Over the said six-month period, over 10,000 loans of this type were originated, versus slightly over 8,000 in the three previous years. This incipient portfolio displays very low delinquency, at less than 1%, in part due to its increasing origination. Such a significant progress is yet another indication of greater competition among banks in the mortgage market.

Chart 3b.3
Origination of mortgage loans by type
Current MXN bn and %




Source: BBVA Research with CNBV data

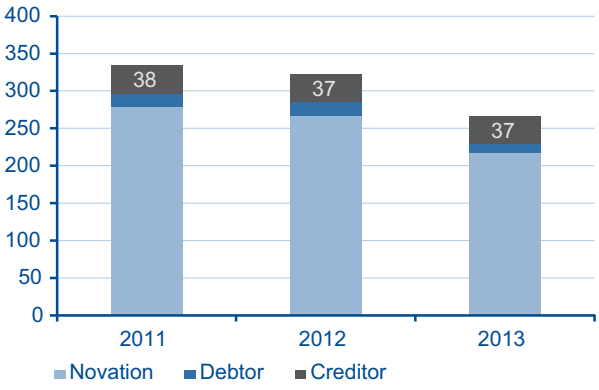
Chart 3b.4
Balance of mortgage portfolio by type
Current MXN bn and %




Source: BBVA Research with CNBV data

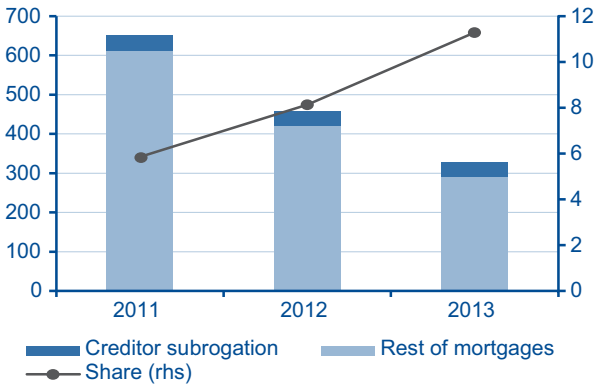
Were the reduction of mobility costs sought through subrogation to materialize, its share within the total portfolio might rise substantially. Currently, loans for liabilities payment account for 7% of total commercial banking origination, but barely exceed 1% in terms of balance. Internationally, loan subrogation is more significant. In the case of Spain, over 30,000 loans of this type are generated each year, accounting for nearly 12% of the total portfolio.[4]

Chart 3b.5
Mortgage subrogation in Spain
'000s of loans




Source: BBVA Research with INE data, Spain

Chart 3b.6
Mortgage portfolio in Spain
'000s of loans and share %t




Source: BBVA Research ENEC, Inegi data

Since the last decade, the Mexican mortgage market has displayed a constant fall in the interest rates charged by commercial banks. The subrogation of a creditor and/or the mobility of mortgages are more likely to occur in response to lower interest rate scenarios. These types of contexts may be due to lower funding costs or declines in risk levels, the two main factors in the cost of a loan. In the case of creditor subrogation, once lower interest rates are observed, debtors would seek to improve their credit conditions by switching creditor institutions or renegotiating the interest rate with their current creditor. The first step is not limited to borrowers; lenders can also be proactive in seeking debtors to whom they can offer cheaper loans.

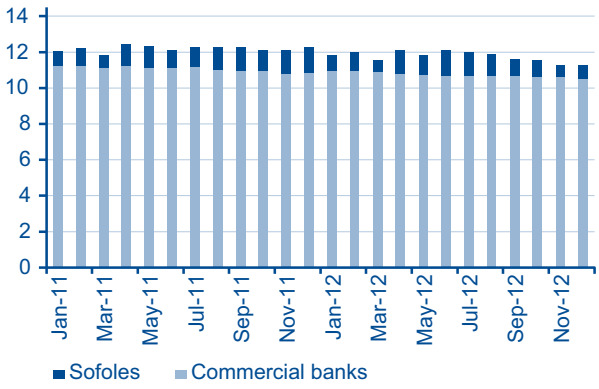
[4] See National Statistics Institute, Spain: www.ine.es

However, the observation of lower interest rates is not enough for creditor subrogation or mobility between lending institutions to take place. When a person sees that interest rates on mortgage loans have dropped, they may seek to change their loan. But for an offer to be extended, the user will have to have a risk profile that allows him access to cheaper credit. For example, a borrower who pays an annual interest rate of 10% sees that a different bank offers mortgage loans with an annual interest rate of 9%. The latter, however, are subject to a specific risk profile. In some cases, conditions are placed on the value of the real estate, income levels, down-payment amount and even whether a minimum investment amount is held in an account at the issuing bank. These conditions seek to extend preferential interest rates to customers with lower risk profiles. As they are lower-risk loans, the rate can be dropped.

## Borrowers will further improve by switching to commercial banking

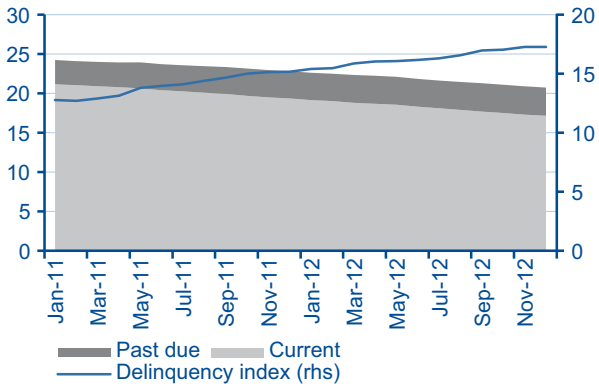
Whether with a considerable reduction or even the elimination of mobility costs that are sought by the regulatory changes, there is significant scope for people to cut the cost of their mortgages. Although it is true that there is an opportunity for mobility among banks, we see the biggest declines in interest rates when moving from other sectors to commercial banking. The Sofoles (Limited Purpose Financial Companies) currently have no share of mortgage loan origination, but there is a considerable number of their loans in the financial system. The interest rates at which the Sofoles originated were higher than those originated by banks over the same period, and even higher than those they currently originate. Therefore, Sofoles customers can reduce the cost of their mortgages through creditor subrogation or mortgage mobility, by switching to commercial banking sources.

Chart 3b.7
**Average mortgage interest rates**
%




Source: BBVA Research with CNBV data

Chart 3b.8
**Sofoles mortgage portfolio**
Real MXN bn and %

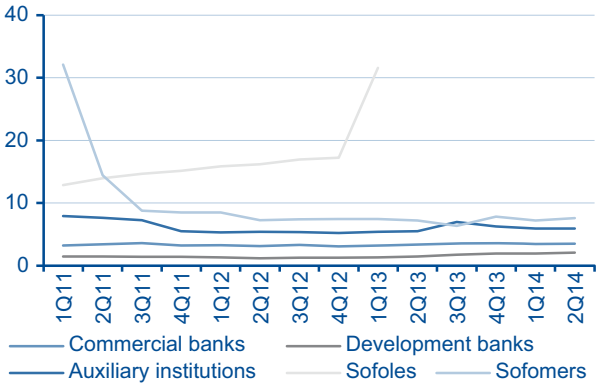



Source: BBVA Research with Bank of Mexico data

Borrowers who obtained their mortgages from the Sofoles and who have low risk profiles can improve their loan conditions by transferring their mortgages to a bank, which on average offer lower interest rates. Therefore, these users have incentives to approach banks with the intention of improving their loan conditions. However, for matching incentives to arise on the credit-supply side, user risk must meet the bank's required profile. Therefore, the entire current portfolio of that niche would not necessarily qualify for subrogation. The level of portfolio impairment of the Sofoles is higher than that of banks which, *ex post*, suggests that the average credit risk of the former portfolio may be higher.[5]

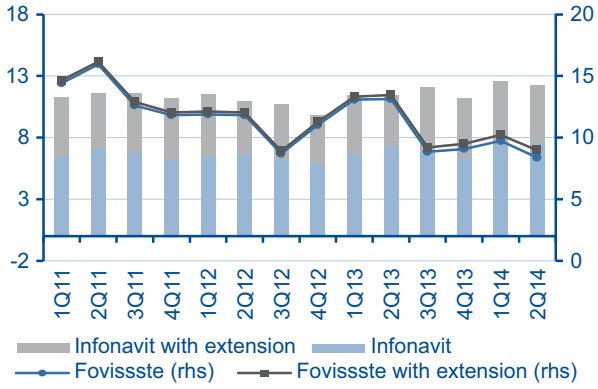
[5] While a portion of the impairment may be due to an inadequate recovery strategy, a portion is also due to lower-quality origination.

Chart 3b.9
Mortgage portfolio delinquency
Percentage




Source: BBVA Research with Bank of Mexico data

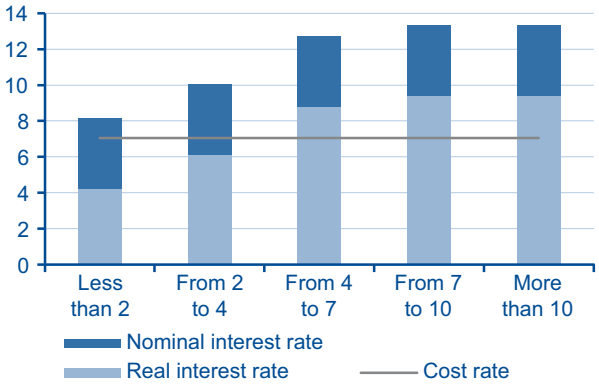
Chart 3b.10
Delinquency at public institutions
Percentage




Source: BBVA Research with public institution data

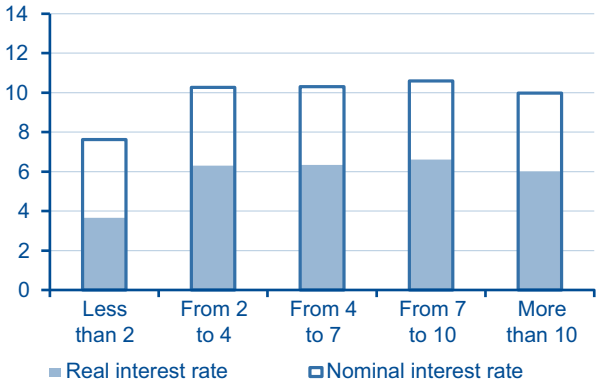
Another segment of the mortgage market with an opportunity for improvement is the high-income segment served by Infonavit. Based on borrower income levels, the average annual interest rate that the Institute charges its members is higher for each of the segments compared to what the banks charge; members with incomes in excess of seven minimum wages pay a higher rate than the rest of the borrowers. This is due to the cross-subsidy that Infonavit provides to fulfil its social mission to extend credit to the lower-income segments. Therefore, workers who meet the required risk profile could considerably improve their loan conditions and thus pay less interest by switching their loans to commercial banks. Although the public institution's portfolio displays higher impairment than that of banks, the difference is much less compared to the Sofoles. Given that the public institution's portfolio has a lower level of delinquency, one might expect its credit risk to be lower, which means that its borrowers would have a higher probability of obtaining a bank loan.

Chart 3b.11
Infonavit average interest rates
Annual interest rate %




Source: BBVA Research with Infonavit data

Chart 3b.12
Commercial banking average interest rates
Annual interest rate %




Source: BBVA Research with CNBV data

At the market niche level, the segments served by the Sofoles and the public institutions might be the most susceptible to improvement by way of creditor subrogation, or another instrument that enables the mobility of their mortgage loans.

## Subrogation increases the risk of prepayment

The development of this instrument will not only respond to notarial, registry or loan origination costs. Rather, there are two important risk issues that must be considered for there to be an effective offering of loans with better conditions. The first is that providing mortgage subrogation increases the risk of prepayment. In the United States, rises in the risk of prepayment have an effect on the secondary market via the price of mortgage-backed securities, as well as a rise in the derivative instruments used to hedge these risks.

In Mexico, however, neither the securitization nor the derivatives market are sufficiently developed to cover the risk of prepayment. On the one hand, only the public institutions securitize, as they have competitive advantages. On the other, the derivatives market does not offer hedging options for this type of risk. Second, asymmetries in risk measurements and in collecting payments on mortgage loans might have adverse effects. The public institutions have the advantage of payroll direct debit, but with banks this is optional. Direct debit from payrolls reduces the risk of default, which means that not having that option is a competitive disadvantage. However, the willingness of the borrower to agree to direct debit also works as a risk level revelation mechanism. On another note, risk measurement models are not standardized among those offering mortgage loans. While it is true that banking regulation seeks to provide a minimum level of certainty in risk measurement levels, at the time of extending a loan for creditor subrogation it is inevitable that the borrower will be reassessed and not automatically assigned the same risk level. As a result, the lender may not necessarily be able to offer a lower rate. For example, the risk measurement methods at origination are clearly different, as revealed by the case of the Sofoles, where we see that their measurements differed from those used by banks, as partially proven by the greater impairment of their portfolio.

## Reducing mobility costs is a shift toward efficiency

The reduction of mortgage loan notarial and registry costs through creditor subrogation will facilitate mortgage loan mobility. Competition among providers of these products would consequently rise. Until now, however, the specific details show that the liabilities payment loan has risen as a viable option. If the reduction of regulatory and notarial costs is extended to include this product, faster results might be achieved, with benefits for consumers.

On another note, developing the financial derivatives market will be important, given that higher mobility will increase the risk of prepayment, and lending institutions will have to seek ways to hedge that risk. The availability of said derivatives would lead to lower hedging costs, which means that the cost of credit could drop and encourage the offering of mortgages.

We believe that the greatest scope for current borrowers to improve their loan conditions lies in switching from other segments to banking. There are also opportunities within banking, although to a lesser extent. At any rate, the reduction of mobility costs sought via the Financial Reform is a decision that will favor mortgage market efficiency. The effects are already being seen in 2014. The Increased competition has led to a considerable rise in loans that have been switched between banks.

# 4. Statistical Appendix

Table 1

## Annual macroeconomic indicators

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014e | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Real GDP[1] (annual % change)** | 3.3 | 5.0 | 3.1 | 1.2 | -4.5 | 5.1 | 4.0 | 3.7 | 1.3 | 2.5 | 3.5 |
| Private consumption, real (annual % change) | 4.7 | 5.5 | 3.0 | 1.7 | -6.3 | 5.7 | 4.8 | 4.6 | 2.9 | 2.0 | 3.5 |
| Government consumption, real (annual % change) | 2.9 | 3.3 | 2.4 | 3.2 | 2.3 | 1.6 | 2.5 | 3.2 | 1.4 | 5.4 | 9.8 |
| Investment in construction, real (annual % change) | 3.4 | 7.4 | 5.1 | 6.2 | -5.7 | -0.2 | 3.0 | 1.6 | -5.0 | 0.1 | 3.6 |
| Residential | 4.1 | 10.7 | 4.0 | 2.4 | -11.6 | -0.6 | 4.1 | 1.3 | -5.0 | 0.4 | 3.9 |
| Non-residential | 2.8 | 4.5 | 6.1 | 9.6 | -0.7 | 0.1 | 2.3 | 1.7 | -5.0 | 0.0 | 3.4 |
| Formal private empl. (IMSS)[2], total | 12,966 | 13,574 | 14,145 | 14,436 | 13,994 | 14,524 | 15,154 | 15,856 | 16,409 | 16,913 | 17,478 |
| Annual % changel | 3.2 | 4.7 | 4.2 | 2.1 | -3.1 | 3.8 | 4.3 | 4.6 | 3.5 | 3.1 | 3.3 |
| Avge. salary of cont. (IMSS, nominal pesos per day, avge.) | 189.9 | 200.0 | 211.0 | 222.3 | 231.6 | 239.2 | 249.3 | 260.1 | 270.2 | 282.9 | |
| Annual % changel | 9.5 | 9.6 | 89.6 | 0.2 | -1.0 | -0.9 | 0.8 | 0.2 | 0.1 | 1.3 | |
| Real total wages (IMSS, annual % change) | 13.1 | 14.7 | 97.5 | 2.3 | -4.0 | 1.9 | 5.7 | 5.2 | 3.6 | 4.0 | |
| Minimum general salary (daily, nominal pesos) | 45.2 | 47.1 | 48.9 | 50.8 | 53.2 | 55.8 | 58.1 | 60.5 | 63.1 | 65.6 | |
| % real annual change | 8.0 | 8.2 | 7.8 | -1.3 | -0.4 | 0.6 | 1.0 | -0.1 | -0.2 | -0.1 | |
| Consumer prices (end of period, annual % change) | 3.3 | 4.1 | 3.8 | 6.5 | 3.6 | 4.4 | 3.8 | 3.6 | 4.0 | 3.8 | |
| TIIE 28 average (%) | | 7.4 | 7.7 | 8.3 | 5.8 | 4.9 | 4.8 | 4.8 | 4.3 | | |
| 10-year interest rate, 10 year Govt bond (M10) | | 8.4 | 7.8 | 8.3 | 8.0 | 7.0 | 6.8 | 5.7 | 5.7 | 6.0 | |

[1] Seasonally adjusted series.
[2] Thousands of people
Source: BBVA Bancomer with Banco de Mexico, Conasami, INEGI and IMSS

Table 2

## Annual construction and housing indicators

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014e | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Real GDP (annual % change)** | 3.6 | 8.7 | 4.7 | 3.8 | -6.1 | -0.5 | 4.1 | 2.0 | -4.5 | -0.9 | 2.2 |
| Building | 2.4 | 10.9 | 3.5 | 2.0 | -11.1 | -0.4 | 4.3 | 2.1 | -4.9 | -0.9 | 1.7 |
| Civil engineering and major works | 10.4 | 2.9 | 11.2 | 20.0 | 6.7 | 3.6 | 2.9 | 1.0 | -4.2 | -3.2 | 3.0 |
| Specialist construction work | 1.2 | 3.5 | 2.8 | -12.4 | 4.8 | 1.9 | 5.6 | 4.3 | -2.3 | 4.0 | 4.1 |
| **Construc. empl. (IMSS, thousands people, avg.)** | 1,019.9 | 1,132.8 | 1,203.8 | 1,209.5 | 1,103.6 | 1,145.5 | 1,199.5 | 1,275.2 | 1,289.8 | 1,358.2 | |
| Annual % change | 5.2 | 11.1 | 6.3 | 0.5 | -8.8 | 3.8 | 4.7 | 6.3 | 1.1 | 5.3 | |
| **Hydraulic cement prod. (tons, ann. % change)** | 11.1 | 7.7 | 0.9 | -2.8 | -3.1 | -2.9 | 1.5 | 2.1 | -5.7 | 2.4 | |
| **Nat'l. cement consumption (tons, ann. % chge.)** | 10.1 | 6.7 | 0.0 | -3.7 | -6.1 | -5.3 | 1.4 | 2.5 | -5.8 | 2.3 | |
| **Construc. comp.[1] (real prod. value, ann. % chge.)** | 4.2 | 220.3 | 2.2 | -2.2 | -8.6 | 3.3 | 3.2 | 3.4 | -3.7 | -5.6 | |
| Building | 9.0 | 230.3 | 6.5 | -2.3 | -18.6 | -5.3 | 6.3 | 2.0 | -5.6 | -2.7 | |
| Public works | 0.2 | 229.0 | -2.1 | -1.5 | 8.0 | 9.8 | 0.3 | 0.5 | -4.4 | -9.1 | |
| Water, irrigation and sanitation | -1.3 | 135.2 | -23.4 | 4.3 | 4.9 | 3.7 | 10.5 | 1.9 | -6.0 | -12.5 | |
| Electricity and communications | -28.4 | 216.3 | -12.6 | 15.4 | 8.2 | 27.0 | 21.4 | -6.8 | -2.2 | -15.2 | |
| Transportation | 6.9 | 283.4 | 6.6 | 6.3 | 9.5 | 8.0 | -2.8 | -2.7 | -7.8 | -4.9 | |
| Oil and petrochemicals | 5.7 | 211.2 | -4.2 | -24.3 | 5.3 | 9.5 | -7.7 | 14.7 | 3.6 | -13.7 | |
| Other | -0.8 | 136.9 | -3.2 | -6.0 | -31.5 | 21.5 | 6.2 | 36.4 | 10.6 | -0.2 | |
| **Resid. construc. prices, general (ann. % change)** | 0.6 | 11.8 | 2.9 | 13.1 | -1.0 | 4.8 | 9.3 | 0.4 | -0.7 | 4.3 | |
| Construction materials (annual % change) | -0.2 | 14.1 | 2.6 | 15.5 | -1.8 | 5.2 | 10.6 | -0.2 | -1.4 | 4.5 | |
| Labor (annual % change) | 3.8 | 3.8 | 4.4 | 3.5 | 3.1 | 3.3 | 3.8 | 3.2 | 2.9 | 3.5 | |
| Rental equipment (annual % change) | 2.8 | 2.8 | 2.9 | 6.9 | 1.8 | 3.2 | 5.3 | -0.2 | 1.4 | 4.1 | |

[1] Considers companies affiliated and not affiliated to the Mexican Chamber of the Construction Industry.
Source: BBVA Bancomer with Banco de Mexico, INEGI, IMSS.

Table 3

## Annual housing finance indicators

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Number of loans granted (thousands)** | | | | | | | | | | | |
| Total | 476.0 | 567.5 | 670.8 | 725.7 | 746.5 | 632.8 | 639.7 | 600.8 | 572.3 | 540.8 | 238.3 |
| Infonavit | 306.0 | 376.4 | 421.7 | 458.7 | 494.1 | 447.5 | 475.0 | 445.5 | 421.9 | 380.6 | 164.6 |
| Fovissste | 59.4 | 48.7 | 76.6 | 68.4 | 90.1 | 100.1 | 87.8 | 75.2 | 64.3 | 65.9 | 30.5 |
| Commercial banks and Sofoles | 110.6 | 142.4 | 172.5 | 198.6 | 162.3 | 85.2 | 76.9 | 80.2 | 86.0 | 94.3 | 43.2 |
| Reduction[1] | | 38.1 | 73.7 | 79.2 | 80.8 | 39.4 | 30.7 | 24.4 | 26.7 | 25.3 | 11.9 |
| Equivalent purchases | 472.8 | 529.4 | 597.1 | 646.5 | 665.6 | 593.4 | 609.0 | 576.4 | 545.5 | 515.5 | 226.3 |
| **Financing flow (billions of pesos, June 2014 prices)** | | | | | | | | | | | |
| Total | 67.5 | 95.3 | 145.6 | 175.6 | 207.7 | 182.2 | 187.9 | 204.4 | 213.6 | 229.0 | 110.4 |
| Infonavit | 40.7 | 55.4 | 67.8 | 78.4 | 94.1 | 88.0 | 98.6 | 108.9 | 103.8 | 97.6 | 44.9 |
| Fovissste | 11.8 | 10.9 | 18.6 | 17.1 | 24.4 | 40.3 | 37.5 | 31.6 | 30.9 | 33.4 | 17.5 |
| Commercial Banks and Sofoles | 15.0 | 29.0 | 59.1 | 80.0 | 89.2 | 54.0 | 51.8 | 63.9 | 79.0 | 98.0 | 47.9 |
| **Commercial banks current loan portfolio** | | | | | | | | | | | |
| Balance end of period (billion pesos, June 2014 prices) | 341.1 | 394.8 | 452.7 | 478.9 | 452.0 | 421.5 | 448.2 | 463.0 | 484.7 | 480.4 | 493.8 |
| Past-due loans index (%) | 7.0 | 2.4 | 2.0 | 2.5 | 3.2 | 4.4 | 3.4 | 3.2 | 3.1 | 3.5 | 3.5 |

[1] It refers to financing (loans and grants) that are considered in two or more institutions.
* Figures for June 2014
Source: BBVA Bancomer with Banco de Mexico, CNBV, Conavi, Mexican Mortgage Association (AHM) and ABM.

Table 4

## SHF Quarterly Housing Price Index by state (annual % change)

| | 11'III | IV | 12'I | II | III | IV | 13'I | II | III | IV | 14'I | II |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **National** | **3.9** | **5.9** | **6.2** | **6.4** | **3.8** | **2.9** | **2.9** | **3.9** | **4.4** | **4.1** | **5.0** | **3.4** |
| Aguascalientes | 2.9 | 4.4 | 5.0 | 5.2 | 2.7 | 1.9 | 2.2 | 3.3 | 4.9 | 5.0 | 6.4 | 5.2 |
| Baja California | 4.7 | 6.4 | 6.4 | 6.1 | 2.5 | 2.0 | 2.1 | 3.2 | 4.0 | 3.3 | 4.2 | 2.7 |
| Baja California Sur | 5.6 | 7.5 | 7.3 | 7.8 | 5.1 | 4.5 | 4.8 | 5.1 | 4.6 | 3.1 | 2.7 | 0.8 |
| Campeche | 5.5 | 7.3 | 7.1 | 8.0 | 5.5 | 4.8 | 5.7 | 6.2 | 6.0 | 4.9 | 4.4 | 2.4 |
| Chiapas | 6.0 | 7.2 | 6.7 | 7.0 | 4.5 | 3.7 | 3.6 | 4.4 | 4.4 | 3.9 | 4.8 | 2.9 |
| Chihuahua | 1.9 | 3.3 | 3.9 | 5.1 | 3.0 | 2.3 | 3.1 | 4.5 | 5.1 | 4.5 | 4.2 | 1.9 |
| Coahuila | 5.6 | 7.3 | 7.0 | 7.2 | 4.1 | 3.3 | 3.7 | 4.5 | 4.9 | 4.3 | 4.8 | 3.3 |
| Colima | 5.5 | 6.9 | 6.5 | 6.6 | 3.8 | 2.9 | 2.7 | 3.7 | 4.1 | 3.9 | 5.1 | 3.5 |
| Distrito Federal | 4.4 | 7.3 | 8.7 | 9.7 | 7.0 | 5.8 | 5.3 | 6.6 | 7.2 | 7.0 | 8.2 | 6.8 |
| Durango | 5.9 | 7.3 | 6.9 | 6.7 | 3.4 | 1.9 | 2.0 | 3.6 | 4.7 | 5.4 | 7.1 | 5.6 |
| Guanajuato | 3.7 | 6.6 | 7.2 | 7.3 | 4.4 | 2.8 | 3.0 | 3.9 | 3.9 | 3.4 | 3.6 | 1.9 |
| Guerrero | 2.8 | 4.2 | 4.6 | 5.0 | 3.2 | 2.9 | 2.9 | 4.0 | 4.7 | 4.9 | 6.3 | 5.1 |
| Hidalgo | 6.8 | 9.8 | 9.1 | 8.3 | 4.1 | 1.7 | 1.4 | 2.8 | 3.3 | 3.3 | 3.9 | 1.5 |
| Jalisco | 1.3 | 3.0 | 3.2 | 3.5 | 1.9 | 2.0 | 2.3 | 3.0 | 3.1 | 2.8 | 4.5 | 2.7 |
| Mexico | 3.5 | 4.6 | 5.0 | 5.5 | 3.3 | 2.8 | 2.7 | 3.8 | 4.6 | 4.7 | 6.1 | 4.8 |
| Michoacán | 3.4 | 6.5 | 7.0 | 6.8 | 3.7 | 2.0 | 2.5 | 4.0 | 4.5 | 4.3 | 4.4 | 2.1 |
| Morelos | 3.2 | 6.0 | 6.4 | 6.3 | 3.3 | 2.2 | 2.1 | 3.8 | 5.1 | 5.0 | 5.8 | 3.9 |
| Nayarit | 3.1 | 6.2 | 6.7 | 7.1 | 4.2 | 2.8 | 2.6 | 3.1 | 2.6 | 1.1 | 1.1 | -0.8 |
| Nuevo León | 2.5 | 5.0 | 5.8 | 6.3 | 3.6 | 2.5 | 2.8 | 3.7 | 3.6 | 2.7 | 3.0 | 1.2 |
| Oaxaca | 6.0 | 8.3 | 7.8 | 7.1 | 3.2 | 1.5 | 2.3 | 4.4 | 5.8 | 5.6 | 6.0 | 3.9 |
| Puebla | 5.9 | 8.0 | 7.4 | 6.4 | 2.8 | 1.9 | 2.3 | 4.3 | 5.7 | 5.0 | 5.9 | 3.9 |
| Querétaro | 2.2 | 3.9 | 4.5 | 4.8 | 2.7 | 2.4 | 2.4 | 3.9 | 4.9 | 5.3 | 6.7 | 5.2 |
| Quintana Roo | 3.0 | 4.1 | 3.7 | 3.5 | 0.8 | 0.1 | 0.4 | 1.2 | 2.3 | 1.8 | 2.6 | 0.7 |
| San Luis Potosí | 4.7 | 7.4 | 8.0 | 8.0 | 5.0 | 3.4 | 3.3 | 4.1 | 3.9 | 3.2 | 3.3 | 1.3 |
| Sinaloa | 4.3 | 6.9 | 7.6 | 7.8 | 5.2 | 4.0 | 3.6 | 4.0 | 3.6 | 2.7 | 2.9 | 0.9 |
| Sonora | 5.1 | 7.2 | 7.0 | 7.4 | 4.5 | 3.4 | 3.1 | 3.8 | 4.1 | 3.8 | 4.9 | 3.4 |
| Tabasco | 6.3 | 8.0 | 7.6 | 7.1 | 3.6 | 2.4 | 2.9 | 4.1 | 4.9 | 4.8 | 5.9 | 4.8 |
| Tamaulipas | 6.1 | 7.0 | 5.9 | 5.8 | 2.8 | 1.2 | 1.3 | 2.4 | 2.7 | 3.1 | 5.0 | 4.2 |
| Tlaxcala | 6.4 | 8.6 | 7.6 | 6.7 | 2.8 | 0.6 | 0.9 | 3.3 | 5.0 | 5.6 | 7.2 | 5.2 |
| Veracruz | 5.5 | 7.0 | 6.5 | 7.2 | 4.9 | 4.0 | 4.0 | 4.6 | 4.3 | 3.8 | 4.5 | 2.5 |
| Yucatán | 4.4 | 6.4 | 7.1 | 8.0 | 5.3 | 4.2 | 4.3 | 4.9 | 5.3 | 4.4 | 4.6 | 3.0 |
| Zacatecas | 2.5 | 4.4 | 5.5 | 7.1 | 4.6 | 3.7 | 3.8 | 4.2 | 4.8 | 4.2 | 4.9 | 3.5 |

Source: BBVA with SHF data

Table 5
## Quarterly macroeconomic indicators

| | 11'II | III | IV | 12'I | II | III | IV | 13'I | II | III | IV | 14'I | II |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Real GDP (annual % change)[1]** | 3.7 | 4.2 | 4.2 | 3.8 | 4.5 | 3.2 | 3.3 | 2.9 | 0.5 | 1.4 | 0.6 | 0.7 | 2.7 |
| Real private consumption, (annual % change) | 4.9 | 6.1 | 4.2 | 6.2 | 4.8 | 3.1 | 4.2 | 4.2 | 2.9 | 2.9 | 1.5 | 0.4 | 2.3 |
| Real government consumption, (ann. % change) | 0.8 | 2.3 | 4.1 | 4.4 | 4.7 | 2.3 | 1.4 | 0.8 | 0.3 | 1.9 | 2.8 | 2.0 | 2.1 |
| Real const. investment, (annual % change) | 1.2 | 3.8 | 6.4 | 2.2 | 3.2 | 1.8 | -0.6 | -3.7 | -4.1 | -6.9 | -5.2 | -3.0 | -1.6 |
| Residential | 6.0 | 5.0 | 4.1 | 2.1 | 3.3 | 0.4 | -0.2 | -3.1 | -4.0 | -7.3 | -5.5 | -2.7 | 0.4 |
| Non-residential | -2.1 | 2.8 | 8.3 | 2.4 | 3.1 | 2.8 | -0.9 | -4.1 | -4.2 | -6.5 | -5.0 | -3.3 | -3.1 |

Source: BBVA Research with INEGI and Banco de México data

Table 6
## Quarterly construction and housing indicators

| | 11'II | III | IV | 12'I | II | III | IV | 13'I | II | III | IV | 14'I | II |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Construction GDP, real. (annual % change)** | 4.8 | 4.7 | 4.6 | 2.9 | 3.6 | 2.1 | -0.1 | -3.0 | -3.6 | -6.6 | -4.6 | -2.6 | -0.6 |
| Building | 6.1 | 5.4 | 4.6 | 3.0 | 4.1 | 1.2 | 0.4 | -2.9 | -3.9 | -7.3 | -5.4 | -2.7 | 0.5 |
| Construction engineering and major works | 1.0 | 3.0 | 3.7 | 2.5 | 1.7 | 2.5 | -2.1 | -3.8 | -3.9 | -5.9 | -3.3 | -6.2 | -4.5 |
| Specialized construction work | 6.1 | 4.4 | 7.0 | 3.2 | 4.3 | 7.3 | 2.3 | -1.7 | -0.7 | -4.1 | -2.7 | 6.0 | 1.5 |
| Construction companies[2] (annual % change) | 2.6 | 1.7 | 3.8 | 1.8 | 5.3 | 7.2 | 1.5 | -1.8 | -1.5 | -6.3 | -4.9 | -1.6 | -2.6 |
| Building | 8.4 | 6.3 | 7.3 | 1.4 | 5.8 | 2.5 | 0.5 | -3.4 | -4.8 | -7.1 | -6.9 | -0.8 | -0.6 |
| Public works | -1.4 | -2.5 | -0.2 | -1.6 | 0.3 | 6.0 | -1.2 | -4.1 | -3.9 | -7.3 | -2.4 | -4.1 | -4.5 |
| Water, irrigation and sanitation | 5.0 | 13.7 | 14.5 | 9.3 | 9.3 | 5.7 | -11.3 | -28.1 | 3.9 | -7.1 | 9.7 | 11.5 | -23.6 |
| Electricity & communications | 13.1 | 38.3 | 24.4 | -2.6 | -6.1 | -1.8 | -16.5 | -10.8 | -11.4 | 7.6 | 6.6 | -11.0 | -6.6 |
| Transportation | -4.1 | -7.0 | -4.4 | -7.0 | -4.8 | 1.2 | -0.2 | -4.0 | -9.3 | -13.6 | -4.1 | 0.2 | 0.8 |
| Oil and petrochemicals | -6.3 | -14.3 | -7.5 | 9.6 | 17.3 | 26.5 | 11.1 | 16.6 | 11.8 | -0.2 | -7.8 | -16.3 | -5.5 |
| Other | -3.2 | 5.8 | 11.7 | 34.3 | 55.6 | 51.3 | 24.4 | 21.6 | 37.0 | 3.9 | -7.7 | 7.7 | -1.6 |

Source: BBVA Research with INEGI and Banco de México data

Table 7
## Quarterly housing market indicators

| | 11'II | III | IV | 12'I | II | III | IV | 13'I | II | III | IV | 14'I | II |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Home sales by segment (quarterly flows, thousands of units)[2]** | | | | | | | | | | | | | |
| Segment A | 91.5 | 81.4 | 93.6 | 79.0 | 89.4 | 79.9 | 64.1 | 65.6 | 74.1 | 67.4 | 77.6 | 54.8 | 65.3 |
| Segment B | 44.6 | 35.6 | 51.2 | 32.9 | 39.1 | 38.4 | 39.9 | 26.8 | 36.8 | 34.9 | 38.6 | 25.5 | 32.4 |
| Segment C | 23.1 | 21.0 | 26.8 | 18.3 | 20.5 | 21.2 | 21.1 | 16.8 | 21.7 | 22.0 | 24.5 | 14.8 | 21.2 |
| Segment D | 6.0 | 5.7 | 6.5 | 5.3 | 5.5 | 6.0 | 6.2 | 4.9 | 6.0 | 6.5 | 7.0 | 4.3 | 5.4 |
| Segment E | 1.6 | 1.5 | 1.7 | 1.4 | 1.5 | 1.7 | 1.7 | 1.3 | 1.7 | 1.8 | 1.9 | 1.1 | 1.4 |
| Total | 166.9 | 145.1 | 179.8 | 136.9 | 155.9 | 147.3 | 133.0 | 115.5 | 140.4 | 132.6 | 149.6 | 100.6 | 125.8 |
| **Home sales by agency (quarterly flows, thousands of units)** | | | | | | | | | | | | | |
| Infonavit | 120.7 | 106.6 | 123.7 | 102.1 | 115.4 | 108.7 | 95.8 | 83.5 | 99.0 | 92.1 | 106.0 | 71.8 | 92.8 |
| Fovissste | 23.4 | 15.8 | 31.9 | 14.5 | 19.9 | 15.7 | 14.2 | 12.6 | 18.0 | 16.0 | 19.2 | 13.7 | 16.8 |
| Banks | 22.8 | 22.8 | 24.2 | 20.3 | 20.5 | 22.9 | 23.1 | 19.3 | 23.3 | 24.5 | 24.4 | 15.1 | 16.2 |
| Total | 166.9 | 145.1 | 179.8 | 136.9 | 155.9 | 147.3 | 133.0 | 115.5 | 140.4 | 132.6 | 149.6 | 100.6 | 125.8 |
| | | | | | | | | | | | | | |
| SHF Housing Price Index (annual % change) | 2.6 | 3.9 | 5.9 | 6.2 | 6.4 | 3.8 | 2.9 | 2.9 | 3.9 | 4.4 | 4.1 | 5.0 | 3.4 |

Source: BBVA Research with Banco de México, Conavi, Asociación Hipotecaria Mexicana (AHM) and Asociación de Bancos de México (ABM). data

Table 8
## Quarterly housing finance indicators

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Commercial banks current loan portfolio** | | | | | | | | | | | | | |
| Past-due loans index (%) | 3.4 | 3.6 | 3.2 | 3.3 | 3.1 | 3.3 | 3.1 | 3.2 | 3.4 | 3.5 | 3.5 | 3.5 | 3.5 |

[1] Consider the value of production of firms affiliated and not affiliated to the Mexican Chamber of the Construction Industry.
Note: Price ranges expressed in times the minimum monthly wage (VSMM); Economic and Popular Segment (118-200), Classic (201-350), Medium (351-750), Residential (751-1500) and Plus (1500 and more) SMM=2,046 pesos in 2014 in the "A" zone.
[2] Includes new and used homes: INFONAVIT, FOVISSSTE, Banks and others (considers reduction for co-financig).
Source: BBVA Research with INEGI, and Banco de México data.

Table 9
## Monthly macroeconomic indicators

| | A.13 | M | J | J | A | S | O | N | D | J.14 | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IGAE (annual % change) | 4.2 | 1.2 | -0.4 | 2.2 | 1.1 | 1.1 | 1.4 | 0.0 | 1.1 | 0.9 | 1.6 | 3.2 | 0.4 | 1.7 | 2.7 | 2.5 |
| Construction vol. real (ann. % change)[1] | -0.7 | -4.8 | -5.1 | -6.2 | -6.1 | -7.6 | -6.9 | -4.4 | -2.5 | -3.0 | -3.9 | -0.9 | -3.6 | -0.3 | 2.2 | 2.9 |
| Building | -1.3 | -5.5 | -4.8 | -8.1 | -6.5 | -7.2 | -6.8 | -5.4 | -3.9 | -3.1 | -4.9 | 0.1 | -2.9 | 1.9 | 3.0 | 4.7 |
| Civil engineering and major works | -0.6 | -3.3 | -7.6 | -2.0 | -6.2 | -9.3 | -8.3 | -2.2 | 0.5 | -6.6 | -4.9 | -7.0 | -6.5 | -6.7 | -2.2 | -3.8 |
| Specialized construction work | 2.8 | -3.1 | -1.6 | -3.7 | -3.1 | -5.6 | -4.6 | -2.5 | -0.6 | 5.6 | 5.6 | 6.8 | -2.0 | 0.8 | 6.9 | 6.9 |
| Formal private empl. (IMSS, mills)[2] | 16,348 | 16,355 | 16,357 | 16,363 | 16,415 | 16,509 | 16,652 | 16,773 | 16,525 | 16,547 | 16,673 | 16,781 | 16,837 | 16,885 | 16,929 | 16,966 |
| Annual % change | 4.1 | 4.0 | 3.5 | 3.2 | 3.1 | 3.0 | 2.9 | 2.9 | 2.9 | 2.7 | 2.7 | 3.1 | 3.0 | 3.2 | 3.5 | 3.7 |
| Average salary quote[3] | 269.1 | 271.6 | 270.9 | 272.9 | 272.2 | 269.1 | 267.8 | 268.4 | 268.1 | 282.3 | 282.0 | 280.1 | 280.3 | 283.3 | 282.6 | 285.8 |
| Real annual % change | -0.5 | -0.6 | -0.1 | 0.0 | 0.1 | 0.3 | 0.3 | 0.1 | -0.3 | -0.6 | -0.2 | 0.3 | 0.6 | 0.8 | 0.6 | 0.6 |
| Real wage income (IMSS, ann. % chge.) | 3.6 | 3.3 | 3.4 | 3.3 | 3.2 | 3.2 | 3.2 | 3.0 | 2.6 | 2.1 | 2.5 | 3.4 | 3.6 | 4.0 | 4.1 | 4.3 |
| Minimum general salary (daily, pesos) | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 63.1 | 65.6 | 65.6 | 65.6 | 65.6 | 65.6 | 65.6 | 65.6 |
| CPI (end of period, annual % change) | 4.6 | 4.6 | 4.1 | 3.5 | 3.5 | 3.4 | 3.4 | 3.6 | 4.0 | 4.5 | 4.2 | 3.8 | 3.5 | 3.5 | 3.8 | 4.1 |
| TIIE 28 average (%) | 4.3 | 4.3 | 4.3 | 4.3 | 4.3 | 4.1 | 4.0 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 3.8 | 3.4 | 3.3 |
| 10-year Gov. bond interest rate (M10) | 4.6 | 5.4 | 5.8 | 6.1 | 6.4 | 6.1 | 6.0 | 6.2 | 6.4 | 6.6 | 6.3 | 6.2 | 6.2 | 5.8 | 5.7 | 5.8 |

[1] industrial production index
[2] Thousands of people
[3] Nominal pesos per day for the number of members of the IMSS
Source: BBVA Research with Banco de México, INEGI and IMSS data

Table 10
## Monthly construction and housing indicators

| | A.13 | M | J | J | A | S | O | N | D | J.14 | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Construction emp. (IMSS, thousands) | 1,271 | 1,272 | 1,283 | 1,297 | 1,312 | 1,321 | 1,350 | 1,351 | 1,267 | 1,278 | 1,302 | 1,317 | 1,331 | 1,355 | 1,373 | 1,403 |
| Annual % change | 2.6 | 1.1 | 0.1 | -0.5 | -0.9 | -1.2 | -0.2 | 1.6 | 2.0 | 2.2 | 3.4 | 5.9 | 4.7 | 6.5 | 7.0 | 8.2 |
| Cement sales (tons, annual % change) | 1.3 | -1.3 | -11.7 | -8.7 | -10.3 | -15.4 | -9.1 | -3.5 | 2.8 | -0.1 | -1.5 | 6.2 | -3.7 | 2.6 | -2.3 | 1.0 |
| Cement consum. per inhab. (ann. % chg.)[3] | 1.6 | -1.1 | -11.9 | -9.0 | -10.6 | -15.7 | -9.4 | -3.9 | 2.4 | -0.4 | -1.8 | 5.8 | -4.0 | 2.3 | -2.5 | 1.0 |
| Contruction prices (annual % change) | -0.3 | -0.5 | -1.0 | -1.3 | -1.2 | -0.5 | -0.5 | -0.8 | -0.7 | 0.5 | 0.8 | 1.6 | 1.9 | 2.3 | 2.9 | 3.9 |
| Materials (annual % change) | -1.0 | -1.1 | -1.8 | -2.1 | -2.0 | -1.2 | -1.2 | -1.5 | -1.4 | 0.0 | 0.3 | 1.3 | 1.6 | 2.0 | 2.9 | 4.0 |
| Labor (annual % change) | 3.1 | 3.1 | 3.1 | 3.0 | 3.0 | 3.0 | 2.9 | 2.9 | 2.9 | 3.4 | 2.9 | 2.8 | 3.0 | 3.2 | 3.3 | 3.4 |
| Machinery Rental (annual % change) | -0.5 | -1.0 | -0.5 | 0.2 | 0.9 | 1.5 | 1.4 | 1.1 | 1.4 | 3.0 | 3.6 | 4.0 | 4.2 | 4.0 | 3.2 | 3.6 |

[3] The volume of cement production is used as a proxy for consumption
Source: BBVA Research with Banco de México, INEGI, and IMSS data

Table 11
## Monthly housing financing indicators

| | A.13 | M | J | J | A | S | O | N | D | J.14 | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Comm. banks loan portf. (bal., bn pesos*) | 466.6 | 473.2 | 470.6 | 474.8 | 477.9 | 479.5 | 478.2 | 479.8 | 480.4 | 480.1 | 480.4 | 486.2 | 487.8 | 495.0 | 493.8 | 490.6 |
| Annual % change | 3.2 | 3.4 | 2.6 | 3.4 | 3.7 | 3.4 | 3.2 | 3.8 | 3.1 | 2.4 | 3.7 | 4.6 | 4.5 | 4.6 | 4.9 | 3.3 |
| Total annual cost (CAT) | 13.7 | 13.6 | 14.0 | 13.7 | 13.7 | 13.7 | 13.5 | 13.3 | 13.4 | 13.5 | 13.4 | 13.4 | 13.4 | 13.3 | 13.4 | 13.3 |

* June 2014 pesos
Source: BBVA Research with Banco de México, INEGI data

# 5. Special topics included in previous issues

## First Half 2014
Demand for mortgage credit: employment is the key
New housing after the real estate boom
Financing retirement with real estate assets
The Infonavit Financial Plan 2014-2018. A focus on quality

## August 2013
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The new housing policy: between short and long term
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# Mexico Real Estate Outlook
## Second Half 2014

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