

Mexico Real Estate Outlook

Second half 2020



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Closing date: September 25, 2020

1. Summary

We are currently in the midst of the worst economic crisis that Mexico has experienced in modern times. This has resulted in the sharpest declines in history and deeper impacts than those seen in 1995. Construction is not exempt, and the economic depression that the sector has been experiencing since 2018 has worsened. Although rates are not currently at their lowest—1995 saw a contraction of more than 40%—we are experiencing the longest recorded period of negative results. Recovery is still a long way off, given that there is no favorable outlook for its main components—building and civil engineering—in the short term. Financing to this sector has risen marginally, up 4% in real terms from 1Q19 to 2Q20. However, this higher demand for credit is associated more with the need to maintain liquidity than with an increase in economic activity.

In a similar sense, lending in the mortgage market is down almost 15% in real terms. This result is mostly due to commercial banking, as public institutions have been in decline since last year. By segment, demand for mid-range housing is now also slowing, as it has done for several years, to fall behind social housing demand. Only residential and residential plus housing have seen an improvement so far in 2020, suggesting that these segments are primarily driven by investment rather than the need to meet housing requirements. This was probably the final boost to demand. Moreover, supply was also curbed by the restrictions imposed in response to the health emergency, which helped to prevent a widespread over-supply and thus maintain appreciation. As we have seen on previous occasions, demand will pick up again to stimulate the creation of formal private employment with greater purchasing power. On this occasion, a combination of economic and health-related certainties will be essential for a return to growth in this market.

Within construction, one type of company particularly stands out during this period of economic contraction. From 2014 to 2019, SMEs have steadily increased their number of units, but their value added within the sector has increased even more so. This could be the result of the lower scales required in a smaller sector that focuses more on specific projects than on mass developments. It could also be explained by the segmentation of construction processes in major works. However, much remains to be done in order to consolidate these companies, which are the main source of employment for the sector and the economy as a whole. Reliability and access to formal financing will be paramount to these companies maintaining their good progress. SMEs are a pillar to the sector and are key in getting back on track toward growth.

We conclude this edition of ***Mexico Real Estate Outlook*** with a more formal review of housing price dynamics. In times of economic crisis, doubts always arise surrounding the valuation of these assets, as does the fear that they will depreciate. Demand factors have a greater impact on the outcome of appreciation rates both structurally and in the long term. However, supply has a negative or positive effect depending on whether or not it is synchronized with effective demand. Some aspects have changed over the years, such as the effect of housing subsidies that bolstered demand for the social housing segment. As such, the weight of formal employment, access to mortgage loans and confidence will be the factors that dictate housing price dynamics. In any case, we believe that, despite the slowdown in appreciation, housing will continue to be an attractive long-term investment.

2. Market Conditions

2a. Recovery of the sector could take years

Faced with the sector's longest-lasting depression

In the previous edition of *Mexico Real Estate Outlook*, we estimated that 2020 would be an even more difficult year for construction, however we never anticipated such an adverse scenario. The health emergency has driven the sector into an unprecedented economic crisis, which has deepened the construction depression and prolonged its duration. Although rates are not at their lowest—1995 saw the sector's GDP fall by up to 40%—it is likely that construction will remain stagnant for the longest period on record.

Figure 2a.1 **TOTAL GDP AND CONSTRUCTION GDP, CYCLICAL TREND (YoY % CHANGE)**



Source: BBVA Research based on SCNM and INEGI data

One reason why we are not seeing the lowest rates during the second quarter of 2020 (2Q20), as we have in other sectors, is because construction already began its decline at the end of 2018. The construction sector has now been in contraction for a total of seven quarters, close to the ten observed during the 2009 crisis if we consider the cyclical trend series. Taking into account the original series, there have now been eight quarters of negative results, making it the longest period of contraction since 2001. In 2008, construction GDP had reached an all-time peak of MXN 1.228 billion, a figure that was not reached again until 2012 when the year's GDP totaled MXN 1.234 billion. Despite only recording two and a half years of negative rates, recovery therefore took four years. In 2018, the sector's GDP reached a record high of MXN 1.299 billion, while the average GDP at 2Q20 stands at MXN 1.169 billion. All these figures are based on the cyclical trend series for construction GDP.

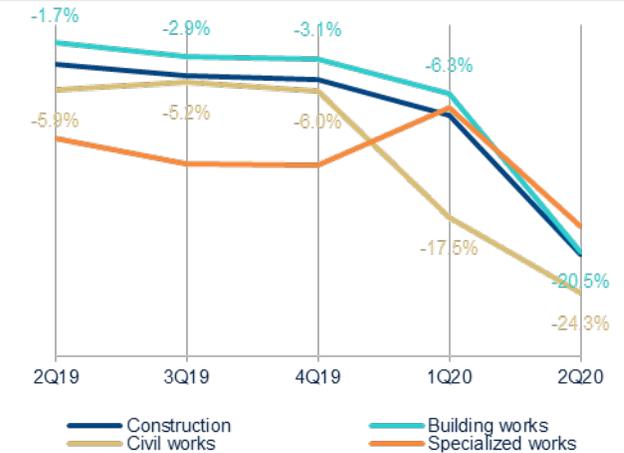
In the current cyclical context, construction GDP, in its original series, saw an acceleration in its rate of decline during the first two quarters of 2020. In 1Q20, the change was -8.2% and in 2Q20 it contracted by a total of 20.9% to reach MXN 993 billion. The last time that the sector recorded GDP of less than a trillion pesos was in 2003. This result is a combination of negative changes in each of the three sub-sectors. As in previous years, this result is led by civil engineering, followed by building and specialized works, although the share of the latter is very small.

Figure 2a.2 **CUMULATIVE CONSTRUCTION GDP (MXN BILLIONS AND YoY % CHANGE)**



Source: BBVA Research based on SCNM and INEGI data

Figure 2a.3 **CUMULATIVE CONSTRUCTION GDP (YoY % CHANGE)**



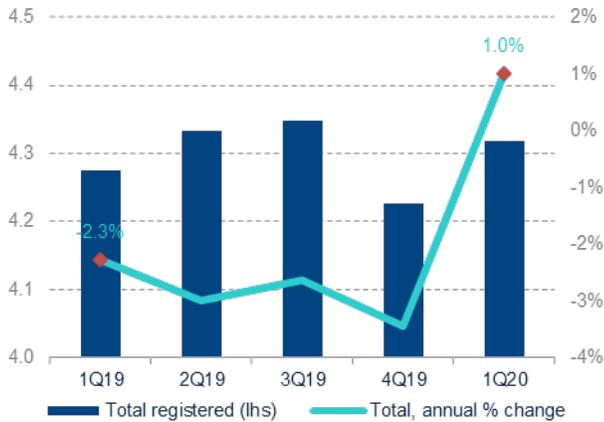
Source: BBVA Research based on SCNM and INEGI data

Civil engineering continues to contract as a result of lower investment. The public sector tends to have a larger share in this area as it involves infrastructure works, although the private sector share did experience growth. The decline in building also saw a sharper downturn in light of reduced demand across the board for this type of work.

Lower investment in infrastructure and lower demand for building works have led to adjusted supply and reduced projects. This would imply that, due to its output factors, demand would follow the same trajectory. However, given that the sector is labor intensive, there may also be a substitution effect between said factors. This is probably what we are seeing now that the number of workers in the sector reached 4.3 million in 1Q20, the latest figure reported by the INEGI (*Instituto Nacional de Estadística y Geografía* — National Statistics and Geographical Institute). This number represents growth of 1%. The maximum number of jobs in the sector was 4.5 million in mid-2018, when the decline had already begun.

As we mentioned earlier, predicting changes in labor demand in this sector during economic slumps may be vague given the substitution effect between factors. However, construction is one of the sectors that generates the most employment, as it requires fewer qualifications. As such, it can be a safe haven for employment, thereby highlighting its vital role in economic revival. In other words, increased investment in this sector would help the rest of the economy through the recovery of employment and, in turn, consumption. On the contrary, labor productivity, measured by the number of workers and the number of hours, continues to decline. This result is to be expected as the number of employees remains the same, but output falls.

Figure 2a.4 **CONSTRUCTION EMPLOYEES**
(MILLIONS OF WORKERS)



Source: BBVA Research based on INEGI ENOE data

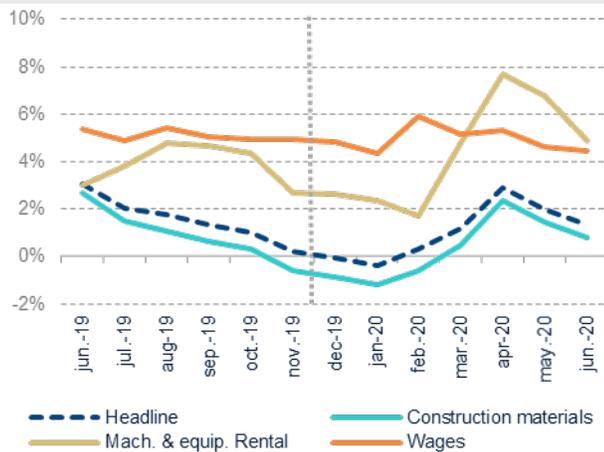
Figure 2a.5 **LABOR PRODUCTIVITY**
(YoY % CHANGE)



Source: BBVA Research based on INEGI data

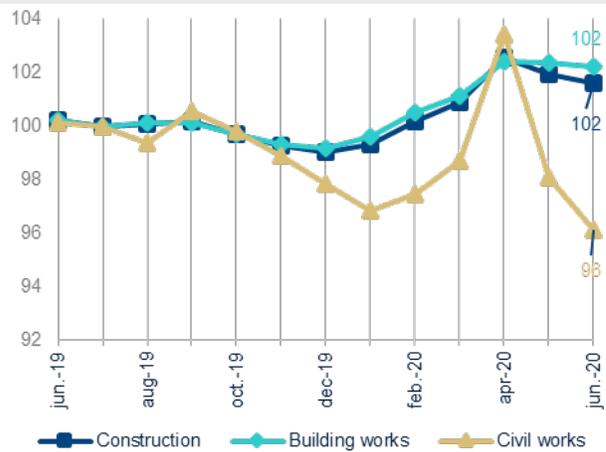
The inflation faced by builders remains under control. While there was a slight rebound in April, driven by higher costs in machinery rental and to a lesser extent by materials, the appreciation of inputs remains below the 3% bar. In the past year, prices for renting machinery and construction equipment have been rising higher than other components. In 2Q20, the cost of this particular input remained above 5%, although we expect it to ease during the second half of the year.

Figure 2a.6 **CONSTRUCTION INPUTS INPP**
(YoY % CHANGE)



Source: BBVA Research based on INEGI data

Figure 2a.7 **CONSTRUCTION INPP**
(2019 INDEX = 100)

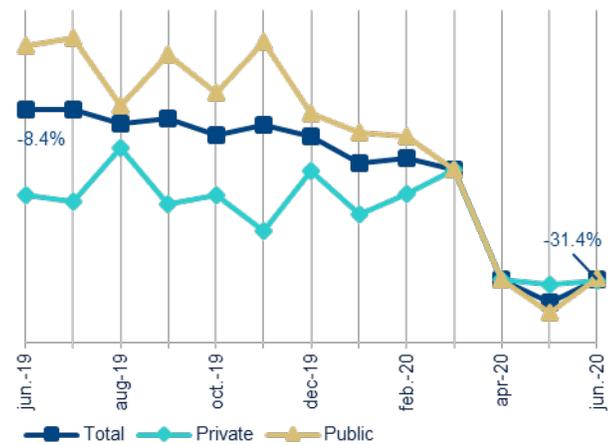


Source: BBVA Research based on INEGI data

The main reason behind this increase is the appreciation of the exchange rate with a slight lag, and not so much due to greater demand associated with the increase in construction works. The exchange rate is a determining factor in the rental of machinery and equipment as the exchange terms are usually defined in dollars. However, construction material prices are stabilizing as demand drops due to reduced activity. We believe that this dynamic will continue until the sector resumes its growth trend and suppliers in the sector can increase prices. All of the above is under the assumption that no supply shock will arise in the manufacture of these inputs. Finally, remuneration also remains stable, with minimum wage increases being the changes most reflected in this aspect.

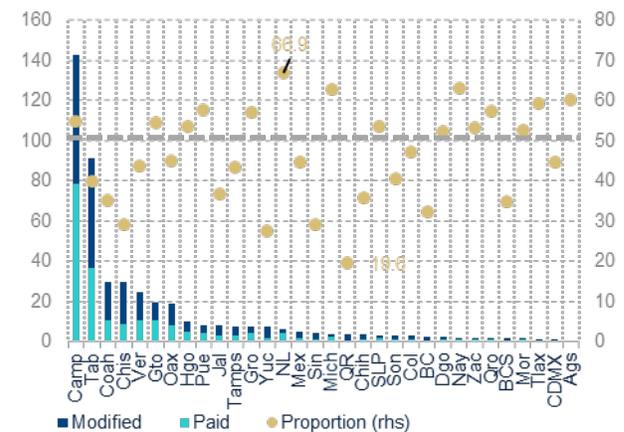
As was the case for many other economic activities, the gross value of construction, calculated in annual terms, plunged during 2Q20 as a result of the lockdown in response to the health emergency. The change recorded for each of the months in this quarter was -31.5%, -34.6% and -31.4% respectively. Unlike the previous year, so far in 2020, the declines in the public and private spheres have been very similar, given that operations ceased for both. Once restrictions were lifted in June, slight progress can be seen in monthly terms; however, the negative trend persists in the annual comparison.

Figure 2a.8 **GROSS VALUE OF CONSTRUCTION (YoY % CHANGE)**



Source: BBVA Research based on INEGI ENEC data

Figure 2a.9 **2020 PEF EXPENDITURE ON PUBLIC WORKS (MXN BILLIONS AND %)**



Source: BBVA Research based on SHCP data

According to the progress of the public works reported by the Ministry of Finance and Public Credit, 46.2% of the modified budget based on the 2020 Federal Budget had been paid out half way through the year. The entities with the highest budget for this type of work are those in the states of Campeche and Tabasco, thanks to the investment in infrastructure for hydrocarbon-based energy. However, Nuevo León, Nayarit and Michoacán have seen the greatest progress, above 60%; leaving Quintana Roo last at only 20%. These figures indicate that there has been no significant lag in the budget that can be attributed to reduced activity. However, the approved budget already represented less investment.

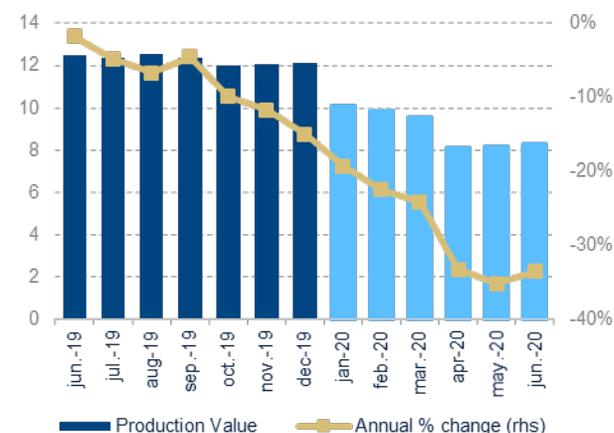
Severe contractions in the value of construction in both building and civil engineering confirm the result observed in the sector's GDP. As discussed, reduced demand for both building and infrastructure has resulted in lower output. Despite this, the value of building remained above MXN 12 billion during 1Q20, but by the next quarter it had already fallen below MXN 10 billion. Output around this figure has not been seen since this data was first recorded (2006); in 2018 alone the monthly average was just over MXN 15 billion.

Figure 2a.10 **BUILDING GROSS VALUE**
(MXN BILLIONS AND YoY % CHANGE)



Source: BBVA Research based on INEGI ENEC data

Figure 2a.11 **INFRASTRUCTURE GROSS VALUE**
(MXN BILLIONS AND YoY % CHANGE)



Source: BBVA Research based on INEGI ENEC data

Furthermore, the value of civil engineering output has been in decline for a longer period of time. At present, just over MXN 8 billion is yielded, a figure not previously recorded according to the ENEC (*Encuesta Nacional de Empresas Constructoras* — National Survey of Construction Companies) which is conducted and published by INEGI. As a reference point, the average monthly output in 2018 was over MXN 13 billion and just over MXN 12 billion in 2019. By the beginning of 2020, however, it had already fallen below MXN 10 billion. This result was to be expected in light of lower public and private investment.

Activity in decline, bank credit on the rise

In light of reduced activity, and the associated investment, reduced need for financing was only to be expected. However, different behaviors often emerge in atypical times. This dynamic was confirmed during 2019 by lower demand for credit, despite the fact that the cost of funding was already falling as a result of the change in monetary policy. As if we had seen a certain "liquidity trap," the lower reference rate failed to boost demand for resources and thus boost activity, at least in the construction sector. The story changes at the beginning of 2020 when the balance of the sector's credit portfolio rose from MXN 603 billion to MXN 642 billion in 1Q20, to reach MXN 658 billion even during 2Q20. We attribute this increase in the sectoral portfolio to construction companies' need for liquidity, partly driven by the lower cost of such credit due to repeated reductions in the reference rate and the support programs designed by the financial authorities and the banking system.

Figure 2a.12 **CONSTRUCTION CREDIT BALANCE**
(MXN BILLIONS AND %)



Source: BBVA Research based on Bank of Mexico data

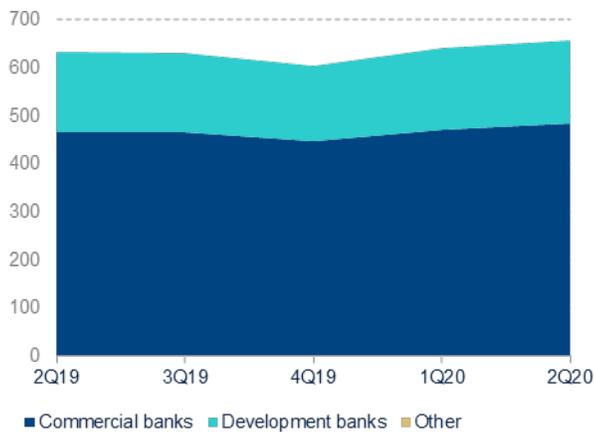
Figure 2a.13 **BANK CREDIT PENETRATION**
(% SHARE AND YoY % CHANGE)



Source: BBVA Research based on INEGI and Bank of Mexico data

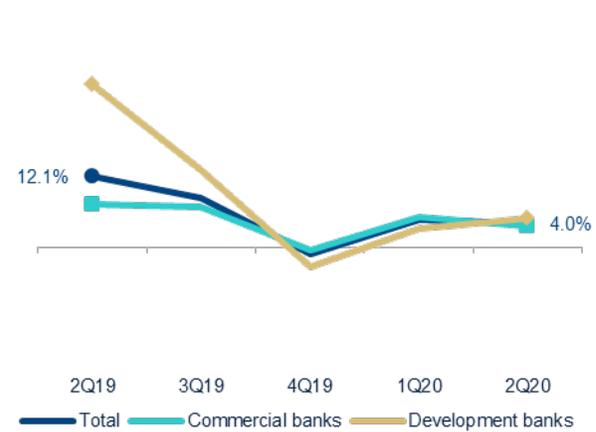
One effect of the situation described in the previous paragraph is increased bank credit penetration in construction relative to its GDP. This factor saw a decline throughout 2019, but after a turning point in 2020, it has begun to rise, reaching 66%. In any case, this level is due not only to the increase in credit directed to the sector, but also to lower GDP.

Figure 2a.14 **CONSTRUCTION CREDIT BALANCE**
(MXN BILLIONS)



Source: BBVA Research based on Bank of Mexico data

Figure 2a.15 **CONSTRUCTION CREDIT BALANCE**
(YoY % CHANGE)



Source: BBVA Research based on Bank of Mexico data

Year on year, the balance of this portfolio grew marginally, only 4.6% in 1Q20 and 4.0% in 2Q20. In any case, this marks significant progress given the fall in activity and when compared with the double-digit growth in the previous year. Commercial and development banking have maintained momentum in their lending, although commercial banking maintains a 74% share. Although the period of economic depression persists, this portfolio's delinquency has at least been contained at low levels so far, at only 1.4%. While a further decline is to be expected, we predict it will be curbed by the quality of origination, the increase in reserves by banks and the sector's tendency to provide collateral on its loans.

The building slump now based on all of areas of activity

Within building, all types of work are suffering a decline. The strongest effects come from housing construction and productive building, although works associated with services such as schools and hospitals have also declined. These types of work had already been suffering contraction since the beginning of 2019, and although housing seemed to revive, it changed direction from the beginning of 2020 before the start of the health emergency. In 2Q20, both residential and productivity building were already down and, by June, the value of output displayed rates below -30% in year-on-year terms. As in other sectors, 2Q20 recorded the lowest levels due to ceased activities.

Figure 2a.16 **BUILDING GROSS VALUE**
(MXN BILLIONS AND YoY % CHANGE)



Source: BBVA Research based on INEGI ENEC data

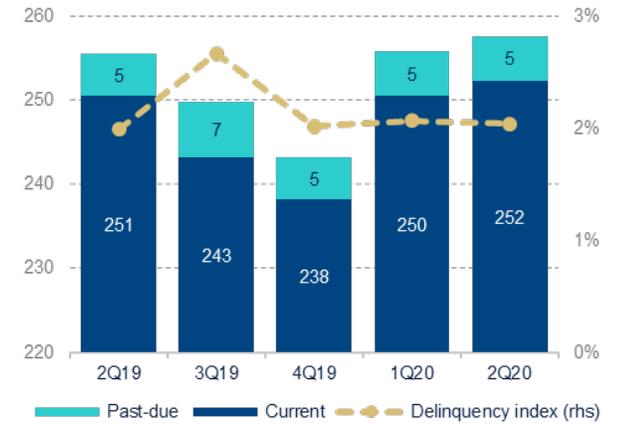
Figure 2a.17 **BUILDING GROSS VALUE**
(YoY % CHANGE)



Source: BBVA Research based on INEGI ENEC data

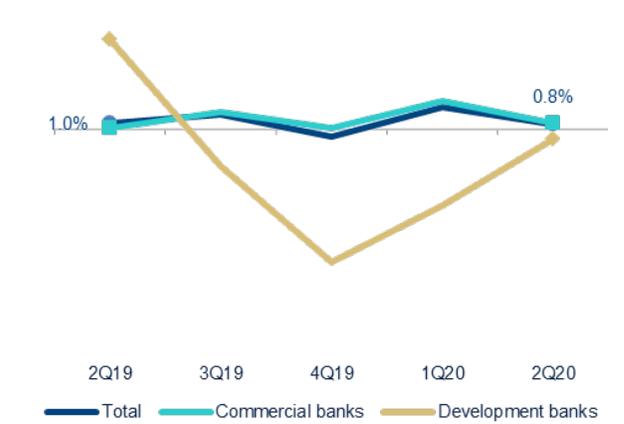
The credit balance for this type of work grew marginally in 2Q20, only 0.8% in real terms, due to the combination of a 1% progress in commercial banking and a 2% reduction in development banking. A significant part of the increased demand for funding would be provided by construction companies' search for liquidity to circumvent the period of economic contraction, in the hope that activity will normalize. Delinquency in this portfolio is 2%, but could see a slight increase by the end of the year as construction of these works continues to stagnate. One stimulus could be the resumption of manufacturing and foreign trade, which could lead to a recovery of productive building first, long before its residential counterpart.

Figure 2a.18 **BUILDING CREDIT BALANCE**
(MXN BILLIONS AND %)



Source: BBVA Research based on Bank of Mexico data

Figure 2a.19 **BUILDING CREDIT BALANCE**
(YoY % CHANGE)

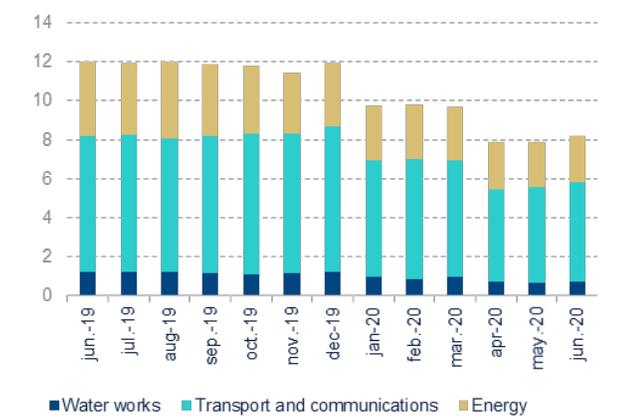


Source: BBVA Research based on Bank of Mexico data

Infrastructure sinks deeper despite major projects

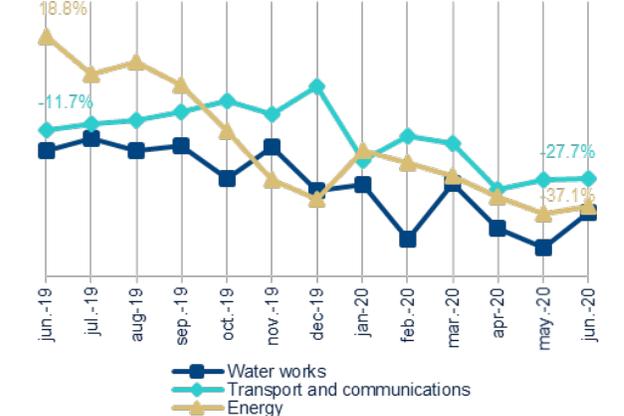
The value of civil engineering is at historically low levels. It was believed to have bottomed out in 2019, but this was not the case. Now, the value of infrastructure built each month in 2020 averages less than MXN 10 billion. Even the gross value of energy works is down more than 37% in 2Q20. All types of work associated with infrastructure have experienced a sharp decline. The value of constructions in communications and transport averaged a variation of -17.2% in 1Q20, which increased to -29.1% in 2Q20. This is despite the fact that the major works of this administration did not cease during the health emergency. In energy infrastructure, positive rates have not been seen since mid-2019, while for the other two types this is since 2018 (all rates based on their year-on-year comparison).

Figure 2a.20 **INFRASTRUCTURE GROSS VALUE**
(MXN BILLIONS)



Source: BBVA Research based on INEGI ENEC data

Figure 2a.21 **INFRASTRUCTURE GROSS VALUE**
(YoY % CHANGE)



Source: BBVA Research based on INEGI ENEC data

The positive outlook could be for the energy sector. This is based on the substantial investments included in the 2021 Draft Federal Budget; but with regard to communications and transport, there is no investment in this type of construction. The absence of the National Infrastructure Plan in the current administration reveals a lack of direction and, therefore, low expectations of recovery. This is despite how important it is to employment, potential GDP and the economy as a whole. Without direction in terms of planning and investment, the low cost of financing cannot be a stimulus for recovery. Moreover, investment certainty is essential so that the private sector can also help build infrastructure to drive growth.

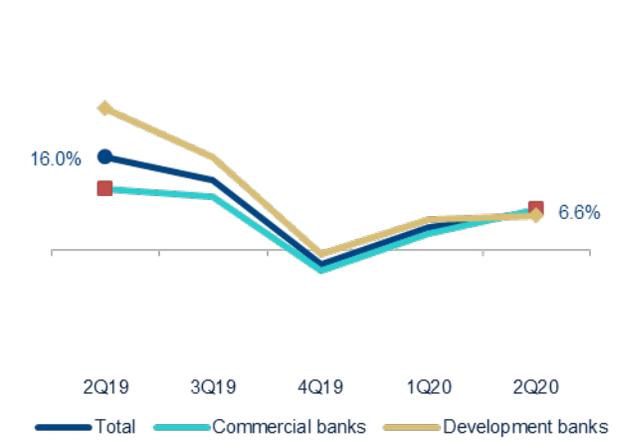
In a similar sense to building, bank credit to infrastructure slowed during 2019 and closed the year falling at an annual rate of 2.4%, mostly on the commercial banking side (-3.6%). The balance stood at MXN 332 billion in 4Q19, with delinquency of just 0.9%. However, demand for funding led to an amount of MXN 357 billion recorded for this portfolio in 1Q20, which rose again to MXN 369 billion in 2Q20. Credit growth is the result of both the commercial banking and development banking portfolios. The latter has increased its share slightly, increasing from 38.7% in 2Q18 to 41.4% in 2Q20, as part of the federal government's strategy to finance its flagship works.

Figure 2a.22 **INFRASTRUCTURE CREDIT BALANCE**
(MXN BILLIONS AND %)



Source: BBVA Research based on Bank of Mexico data

Figure 2a.23 **INFRASTRUCTURE CREDIT BALANCE**
(YoY % CHANGE)



Source: BBVA Research based on Bank of Mexico data

The construction slump is set to continue into this year and next

No sign of recovery is in sight for construction. On the building side, housing needs to see a boost in demand, mainly in the social housing segment, which is by far the largest in the Mexican market. Greater investment in productive building is also required in this sub-sector in order to get back on track toward growth. In any case, the industrial premises line may be the first to show positive signs, but not any time soon, thanks to manufacturing and foreign trade.

Civil engineering is only displaying momentum through specific communications and transport works. The most solid foundation will be energy infrastructure once public investment plans in this area come to fruition. However, it will not be enough to make up the ground lost by the sector. Private sector involvement and attributing certainty to such investments will be essential.

Figure 2a.24 **LEADING INDICATORS**
(YoY % CHANGE)

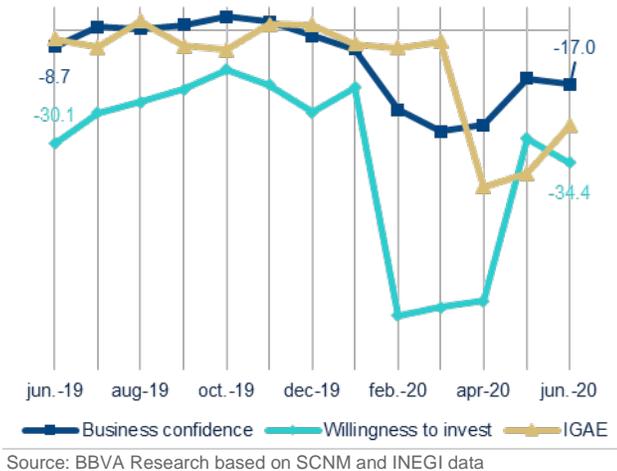
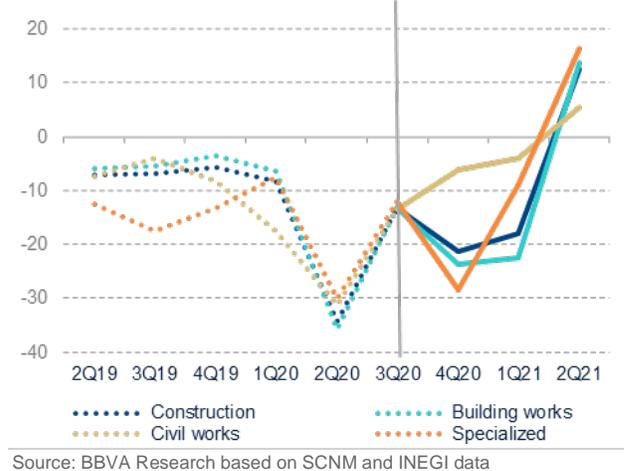


Figure 2a.25 **CONSTRUCTION GDP**
(YoY % CHANGE)



Business confidence indicators and willingness to invest are currently at their lowest. A change of direction is unlikely in the short term. The construction sector requires major investment for a return to growth. Based on this information, we estimate that the GDP of construction could plummet 19.2% during 2020, with a forecast variation of -7.3% the following year. In this instance, an incorrect prognosis would be the ideal scenario, with the impact proving much smaller.

2b. The mortgage cycle faces the worst crisis

Introduction

In our last issue of *Mexico Real Estate Outlook*, we mentioned the impact of the economic crisis caused by the COVID-19 pandemic on the real estate market. However the downturn is evident throughout the economy; formal employment, which we know is the main determinant of housing demand, is experiencing one of its greatest crises in recent history, even more severe than in the 2008–2009 episode.

As such, in this section, we will review the performance of the main housing market indicators within the framework of the current economic cycle. While the housing finance market is relatively young in Mexico, it has already seen key moments in the past 20 years. This will therefore allow us to identify the possible effects of the current crisis and estimate the time that the market could take to recover.

Mortgage banking contracted 19.4% in the first half of 2020

The mortgage market achieved moderate growth in 2019, despite the adversities of the economic slowdown. After this respite, in 2020, the widespread crisis caused by COVID-19 has had severe repercussions in the mortgage market. At the end of the first half of 2020, the amount of system-wide financing contracted 14.8%, while the commercial banking market fell 19.4%, respectively, both in real terms.

Table 2b.1 **MORTGAGE ACTIVITY BY AGENCY**
 (THOUSANDS OF LOANS AND MXN BILLIONS AT 2020 PRICES, CUMULATIVE FIGURES)

Mortgage Origination	Number of loans (thousands)			Loan amount (MXN billions)			Average amount (MXN thousands)		
	Jun-19	Jun-20	YoY % change	Jun-19	Jun-20	YoY real % change	Jun-19	Jun-20	YoY real % change
Public Institutions	174.8	162.8	-6.9	91.3	82.4	-9.8	522	506	-3.1
Infonavit	152.8	140.1	-8.3	74.8	65.7	-12.1	489	469	-4.1
FOVISSSTE	21.9	22.6	3.2	16.6	16.7	0.7	754	736	-2.4
Private Sector*	65.6	51.4	-21.7	98.2	79.2	-19.4	1497	1542	3.0
Banks ¹	65.6	51.4	-21.7	98.2	79.2	-19.4	1497	1542	3.0
Other									
Subtotal	240.4	214.1	-10.9	189.6	161.6	-14.8	788	755	-4.3
Co-financing ² (-)	19.5	10.8	-44.6						
Total	220.9	203.3	-8.0	189.6	161.6	-14.8	858	795	-7.4

*Although there are other private credit institutions (such as non-regulated agents), these are excluded due to a lack of reliable public information.

1: Includes: loans for self-construction, restructuring, acquisition, loans to former employees of financial institutions and loans for payment of liabilities and liquidity.

2: Loans granted in conjunction with Infonavit and FOVISSSTE.

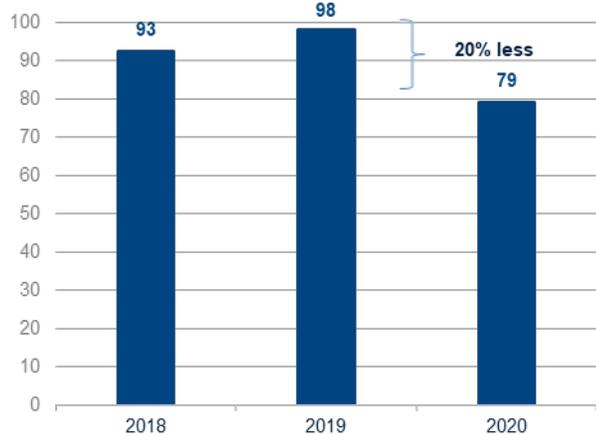
Note: the adjustment factor is based on the Federal Mortgage Company (SHF) housing price index; 2017 Base = 100

Source: BBVA Research based on Infonavit, FOVISSSTE, CNBV and SHF data

In terms of the activity of housing institutes, Infonavit granted 12.1% less mortgage financing, equivalent to an 8.3% contraction in the number of loans. For its part, FOVISSSTE achieved an increase of just 0.7% in the real amount and a rise of 3.2% in the number of loans. However, it should be emphasized that this slight growth was thanks to a good

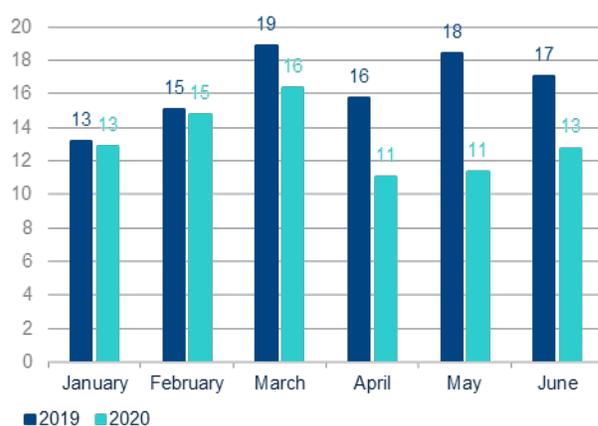
start to the year, as the Fund had carried over a volume of outstanding loans from the last quarter of 2019, an effect that was then exhausted by the end of June.

Figure 2b.1 **MORTGAGE FINANCING, JANUARY-JUNE (CONSTANT MXN BILLIONS, CUMULATIVE FIGURES)**



Source: BBVA Research based on CNBV data

Figure 2b.2 **JANUARY-JUNE MORTGAGE FINANCING (CONSTANT MXN BILLIONS, MONTHLY FLOWS)**



Source: BBVA Research based on CNBV data

By comparing the cumulative amount of financing generated in the first half of the last three years, we see that after having achieved growth in 2019, the accumulated amount of mortgage origination in 2020 was down 20% in real terms. This marked the lowest point of the analysis period.

Although the economic downturn intensified in the second half of 2019, demand for mortgage financing was marginally affected during the first quarter of the year in January and February. However, the crisis caused by the COVID-19 pandemic significantly lowered demand from March, meaning that the adverse effects were already reflected in the second quarter. As shown in Figure 2, monthly financing flows were on average 30% less for the three months of April, May and June alone.

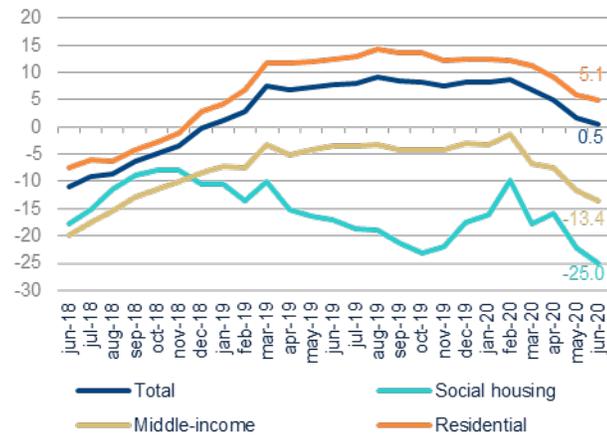
The residential segment managed to stay afloat in the first half

While we have seen a decline in banks' cumulative figures for the first six months of the year, a marginal increase of just 0.5% is still visible in terms of annualized figures.¹ This is due to the positive performance of residential segments last year, which have managed to maintain the employment inertia caused a few years ago, low mortgage interest rates and the strengthening of real wages. All of the above showed considerable strength, and therefore still provided a stimulus due to the lagged effect on this market. Conversely, the mid-range and social housing segments, which represent around 50% of commercial banking placement, have been on negative ground for more than two years. Although this support in the higher-priced segments (which seems to have been exhausted) helped banking to stay

1: In real growth rates updated in accordance with the Mexican Consumer Price Index (INPC).

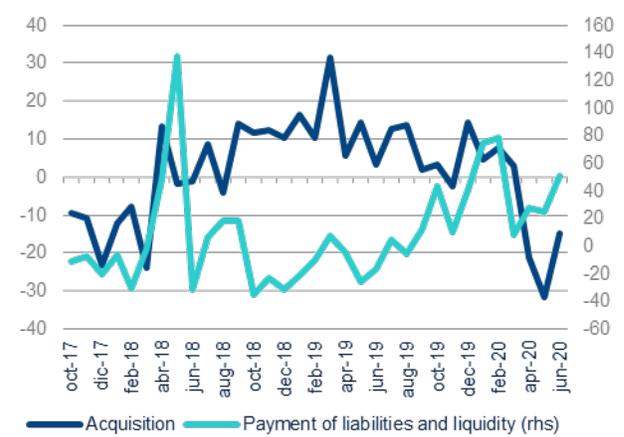
afloat between 2019 and 2020, the impact of the crisis caused by the COVID-19 pandemic will be more visible in the coming months.

Figure 2b.3 **BANK MORTGAGE LOANS (YoY % CHANGE, ANNUALIZED FIGURES)**



Source: BBVA Research based on CNBV data

Figure 2b.4 **BANK MORTGAGE LOANS (YoY % CHANGE, MONTHLY FLOWS)**



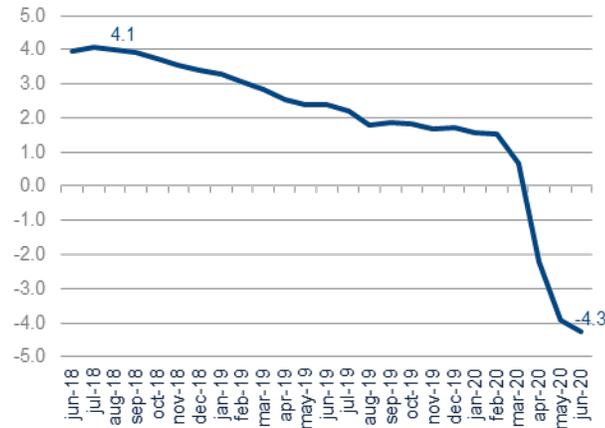
Source: BBVA Research based on CNBV data

While we see a clear downward trend in mortgage origination at the end of the first half of 2020, non-acquisition products, such as liability and liquidity financing, show a clear upward trend. As in other episodes in recent history, these come to play an important role in the cycles of interest-rate reductions, but, this time, they will also be strengthened by the economic crisis. Banks will seek to increase their mortgage portfolios by offering more competitive rates to customers with an existing mortgage, in a bid to gain market share. This option will be the fastest way to offset the lower origination of new mortgages in an environment where demand tends to decline.

The drop in formal employment translates into less demand

As mentioned in the previous section, conditions for the main determinants of mortgage loan demand were favorable until before the COVID-19 pandemic broke out, even despite the economic uncertainty already surrounding the contraction of GDP in 2019. However, this optimum combination of factors such as employment and real wages has faded further into the background with the onset of the health crisis. In the first half of 2020 alone, the number of workers insured at the IMSS (*Instituto Mexicano del Seguro Social* — Mexican Social Security Institute) fell by 4.3%.

Figure 2b.5 **IMSS-INSURED WORKERS (YoY % CHANGE)**



Source: BBVA Research based on IMSS data

Figure 2b.6 **IMSS-INSURED WORKERS, SALARY GRADE (YoY % CHANGE)**



Source: BBVA Research based on IMSS data

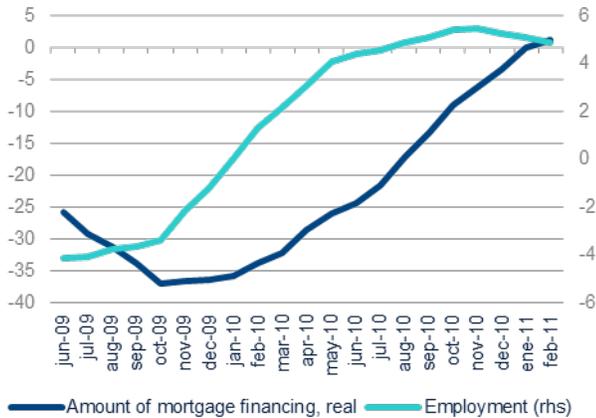
From March to June 2020 alone, 1.1 million jobs were lost, with a forecast 1.5 million job losses by year end. Even if we break employment down into those who earn more than five times the minimum wage and those who earn less than this level, we see that there was an increase up until April in the insured workers who receive a lower wage level. However, workers who earn more than five times the minimum wage and who are the main focus of demand for bank credit were already in outright decline since 2019.

While the mortgage market had not faced a similar crisis since 1995, it is not comparable to the current one, given the credit conditions at that time and the construction model whereby the public sector was virtually the main player. The most similar critical event would therefore be the 2009–2010 global economic crisis.

As such, in a long-term context, we can make a brief comparison of how long it took for mortgage financing demand to recover based on the how long it took for employment to return to growth.

We have consistently made reference to the lag between employment growth cycles and mortgage financing. During the 2009 crisis, the lowest point in employment contraction occurred in June 2009, equivalent to a loss of nearly 700,000 jobs, whereas the turning point at the bottom of the mortgage financing amount cycle was recorded in October of the same year.

Figure 2b.7 **2009 CRISIS. RECOVERY, FINANCING AND EMPLOYMENT (YoY % CHANGE)**



Source: BBVA Research based on IMSS and CNBV data

Figure 2b.8 **2009 CRISIS. EMPLOYMENT RECOVERY (YoY % CHANGE)**

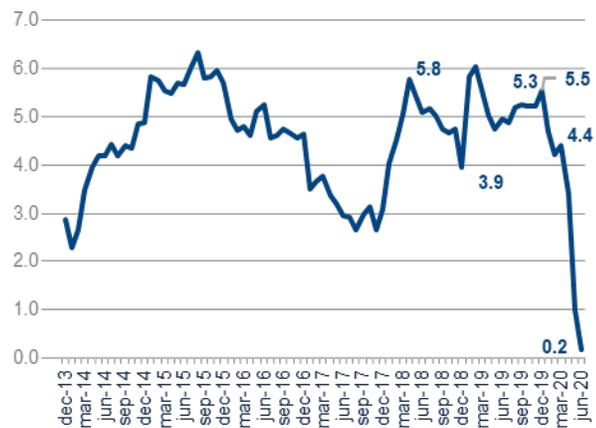


Source: BBVA Research based on IMSS data

It took around nine months for employment to enter positive ground and one year to return to the pre-crisis employment level. Even the employment of workers who earn more than five times the minimum wage followed a similar trajectory. For the latter, the mortgage financing amount took 17 months to record a positive growth rate again, i.e. almost a year and a half.

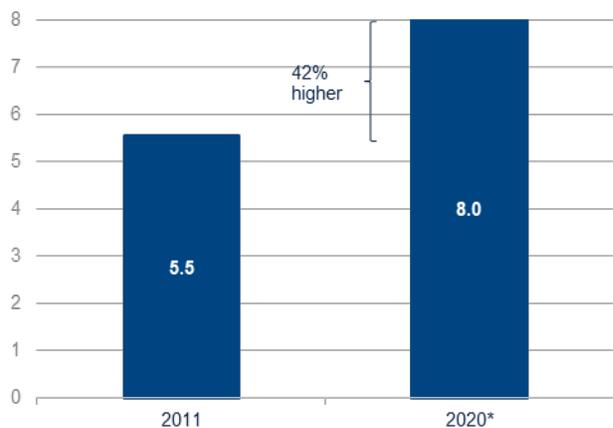
Conversely, real wages, which had performed well over the past two years, partly due to stable inflation and wage increases as a result of regulatory measures, barely increased 0.2% in real terms in June and could see a downturn over the coming months.

Figure 2b.9 **ACTUAL TOTAL WAGE BILL (YoY % CHANGE)**



Source: BBVA Research based on IMSS and INEGI data

Figure 2b.10 **AVERAGE ACTUAL TOTAL WAGE BILL (CONSTANT MXN BILLIONS)**

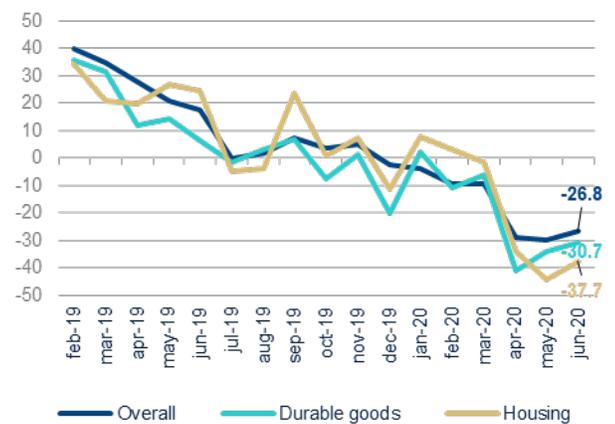


*Annualized figures as of June.

Source: BBVA Research based on IMSS and INEGI data

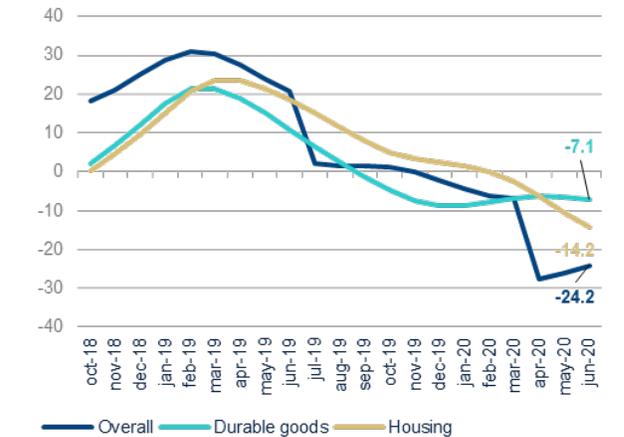
An important factor to mention is that, despite the fall in formal employment, the volume of workers who currently pay contributions to the IMSS receive a larger actual wage bill, compared to those in 2011 when employment and mortgage financing recovered. In 2020, the average wage bill over the last twelve months has been 40% higher than the last crisis, which, as we have already seen, has considerably improved access to bank credit in the period leading up to the crisis caused by the pandemic.

Figure 2b.11 **CONSUMER CONFIDENCE, ORIGINAL (YoY % CHANGE)**



Source: BBVA Research based on INEGI data

Figure 2b.12 **CONSUMER CONFIDENCE, TREND-CYCLE (YoY % CHANGE)**



Source: BBVA Research based on INEGI data

However, before considering widespread recovery, consumer expectations must improve considerably, as they are highly correlated with the formal employment trend. We have commented in previous issues that the demand for mortgage financing manifests around 12 to 18 months after a worker enters the formal sector, so consumer confidence is not expected to grow until employment shows strong signs of recovery.

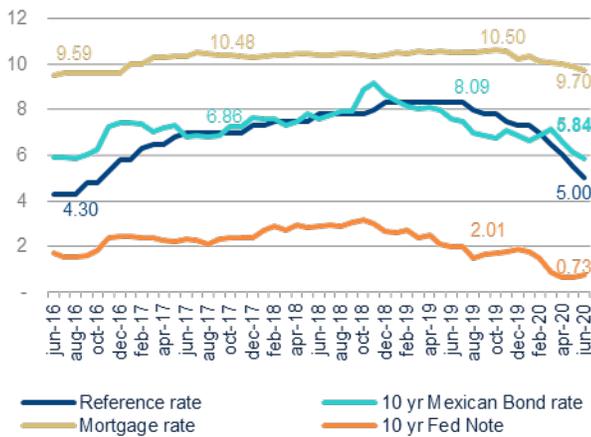
As of June, according to INEGI data, the overall consumer confidence index in the original series recorded an annual contraction of 26.8%, while the housing and durable goods subindex contracted by 30.1% and the housing subindex fell by 38%. Conversely, in the trend-cycle series, the confidence in housing subindex surpassed the durable goods subindex for the first time since April 2019 and fell 14.2% at the end of June. Consumer confidence is likely to remain unchanged during 2020, although it is possible that a turning point has already been reached in June, which could mark the start of a difficult path to return to positive ground. This optimum combination, which lasted for many years, now faces the worst economic crisis since 1929. As a result, the effects of this crisis will be more visible in the second half of 2020 and throughout 2021.

Supply conditions are a key strength

As far as the mortgage loan market is concerned, financing conditions have remained at entirely favorable levels. The beginning of the crisis caused by the COVID-19 pandemic triggered a cycle of falling interest rates, both in the short term and in the long term.

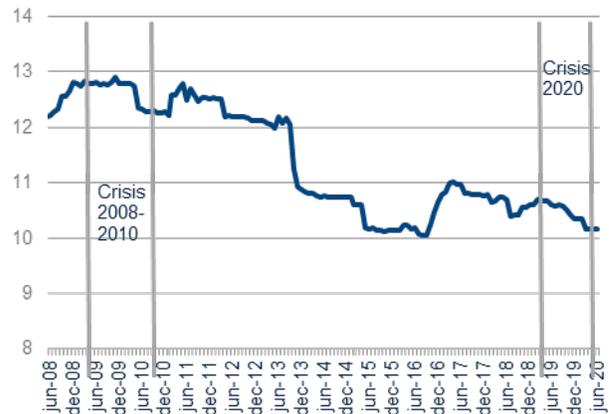
This has certainly had a positive impact on the financing market and confirms that supply is not restricted by credit. In fact, since the end of 2019, the cycle of declines in both short-term rates and in the FED's M0 and Treasury note became evident. The mortgage interest rate reached levels of 9.7% in June, while the M10 bond rate reached 5.84%.

Figure 2b.13 **INTEREST RATES**
(% NOMINAL ANNUAL RATE)



Source: BBVA Research based on Banxico, Bloomberg and CNBV data

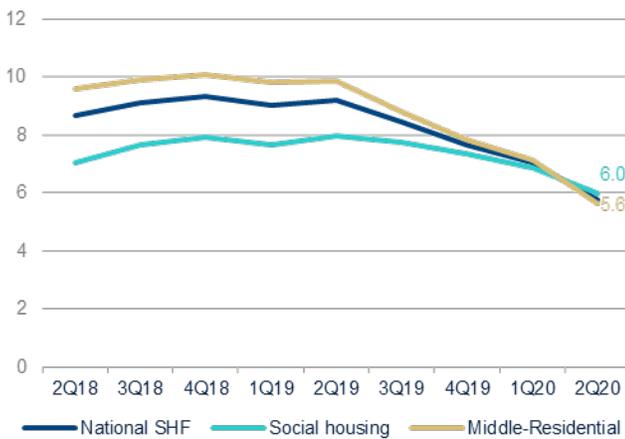
Figure 2b.14 **MORTGAGE INTEREST RATE**
(YoY % CHANGE)



Source: BBVA Research based on Banxico data

These rate levels are not comparable to those recorded in the 2009–2010 crisis, when mortgage rate levels were between 12% and 13%, which had no adverse effect on the market because, as we have already seen, recovery in higher-paid employment was vigorous during those years and in line with low and high income levels.

Figure 2b.15 **HOUSING PRICE INDEX (YoY % CHANGE)**



Source: BBVA Research based on SHF data

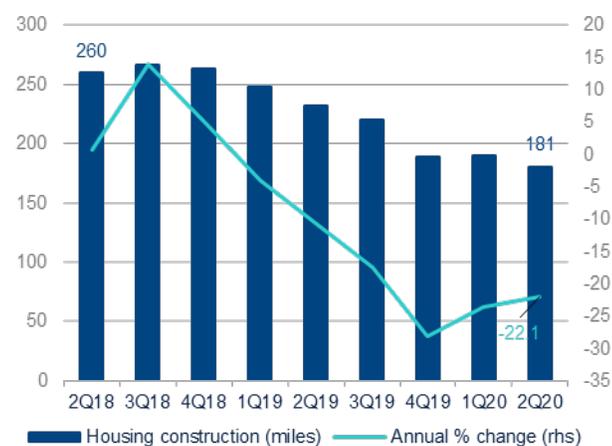
Figure 2b.16 **VALUE OF HOUSING OUTPUT (REAL YoY % CHANGE)**



Source: BBVA Research based on INEGI ENEC data

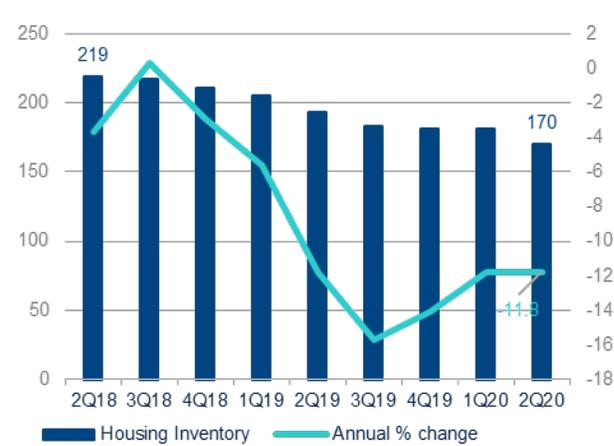
Housing prices have continued to rise, albeit at more moderate rates due to the general decline in demand. In June, the overall index increased by 5.8%. However, we observed annual rates of 6% in the social housing segment and 5.6% in the mid-range residential segment. This has also been a positive impact of the decline in housing output by construction companies, which have aligned themselves with the reduced market size and have not engaged in excessive output that could be difficult to place.

Figure 2b.17 **HOUSING PROJECTS IN THE RUV**
(THOUSANDS OF RECORDS AND YoY % CHANGE)



Source: BBVA Research based on RUV data

Figure 2b.18 **HABITABLE HOUSING IN THE RUV**
(THOUSANDS OF RECORDS AND YoY % CHANGE)



Source: BBVA Research based on RUV data

The housing construction projects in the RUV (*Registro Único de Vivienda* — Mexican housing registry) also confirm the output performance observed in the INEGI's ENEC. In the second quarter of 2020, housing construction projects are down 22.1%, while habitable housing, i.e. the inventory of new housing with basic services installed and ready for sale, has decreased by 12%. As on previous occasions, we see this as a healthy development, as it guarantees the continuous appreciation of housing stock and maintains the value of real estate guarantees. Once again, developers have demonstrated their ability to adapt efficiently to the real estate cycle. In this case, the number of projects is already very similar to the number of habitable units, i.e. near an equilibrium value.

The mortgage portfolio remains healthy

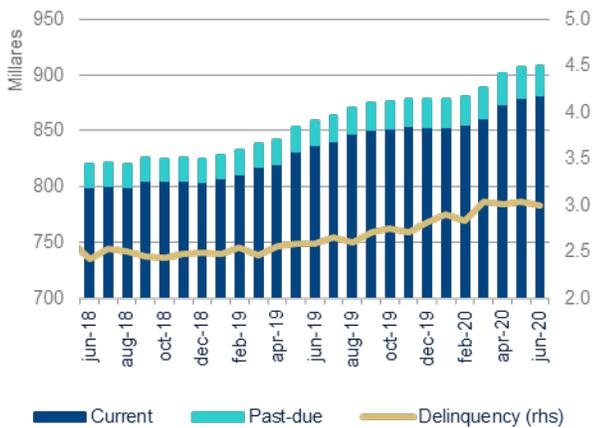
The mortgage portfolio balance has continued to grow in 2020, albeit at a lower rate. While in 2019 it grew by an average of 5.1% in real terms, in the first six months of 2020 it was up 6.1% in real terms. This is explained by an increase in the current portfolio, which grew 4.9% and 5.6% over the same periods. As we have already seen, the increased origination in residential segments in real terms provided a boost in the months leading up to the pandemic, but is already beginning to slow down.²

%. Between January and June 2020, the average delinquency rate remained at 3%. In other words, the measures put in place by the banks to defer the payment of mortgages as a result of the crisis caused by the COVID-19 pandemic

2: Mortgage portfolio items are updated in accordance with the INPC.

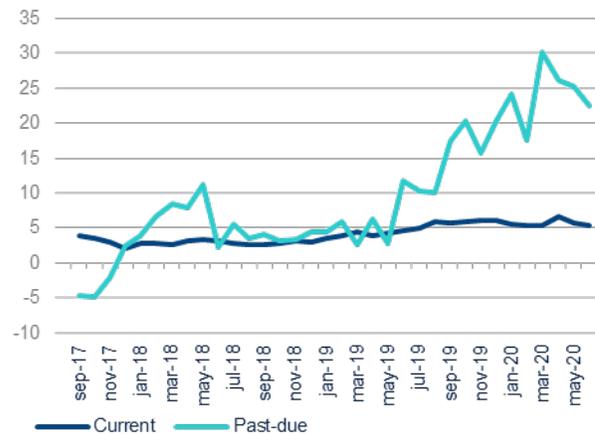
were undoubtedly an assertive measure. However, going forward, delinquency could result in a decline if the situation does not improve in terms of a recovery in employment.

Figure 2b.19 **MORTGAGE LOAN PORTFOLIO BALANCE (CONSTANT MXN BILLIONS AND DELINQUENCY, %)**



Source: BBVA Research based on Banxico data

Figure 2b.20 **MORTGAGE LOAN PORTFOLIO BALANCE (YoY % CHANGE)**



Source: BBVA Research based on Banxico data

Conclusions

2020 is proving to be a year filled with many challenges for mortgage banking. While it has already faced lower economic activity since 2019, mortgage banking is confronted this year with the most severe economic crisis, which many say is the worst since the great crisis of 1929. However, we only need to make a few comparisons with the 2009 crisis to put some key differences into context.

Employment will once again be the key to determining recovery times. According to BBVA Research's forecasts, the IMSS job losses that could exceed 1.5 million by year-end could take around 15 months to see a positive growth rate and more than 40 months to return to the pre-crisis employment level.

As a result, the mortgage financing amount could contract by between 25% and 28% in real terms this year. Recovery will depend largely on formal employment, given that conditions have been favorable in terms of financing. Even the slowdown in housing prices could be an incentive to take out a new loan or to seek restructuring with a bank offering a competitive rate, which will increase the supply of the liability payment figure.

As has been the case in other similar episodes, crises are also opportunities for acquisition at a better price and preferential rates, meaning that consolidated recovery will be waiting in the wings for the revival of employment with unbeatable financing conditions, which have so far reflected the long-term certainty momentarily lost by the real economy.

3. Special Topics

3a. SMEs play an increasingly important role in construction

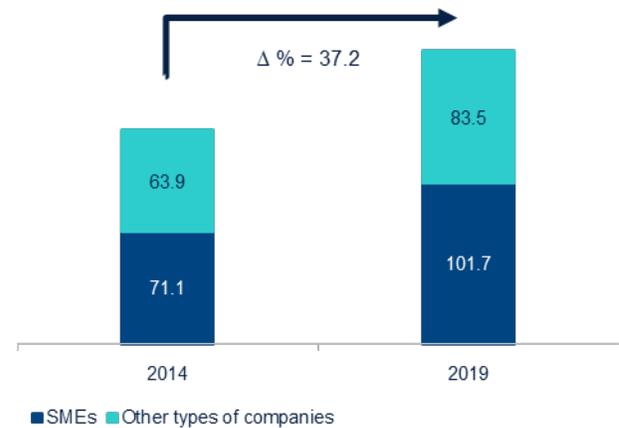
SMEs are increasing in number, but more so in their contribution

The construction sector has been in a slump since 2018. This result is largely due to long-term changes in its structure. On the one hand, residential construction (the main component of building) has been in decline for several years as the social housing segment becomes less relevant. On the other hand, lower investment in infrastructure has resulted in civil engineering also stagnating for years. This suggests a structural change in construction. The size of the required scale could be shrinking as sectoral GDP contracts. As such, we therefore review the contribution of small- and medium-sized enterprises (SMEs) specifically in construction based on the economic censuses of 2014 and 2019, the two most recent censuses, conducted by the INEGI.

Figure 3a.1 **NUMBER OF ESTABLISHMENTS**
(THOUSANDS OF UNITS)



Figure 3a.2 **VALUE ADDED**
(CONSTANT MXN BILLIONS)



From 2014 to 2019, the number of establishments in construction was up 14.3%; while SMEs increased 11.3% in the five-year period, or 2.2% on average each year. In proportional terms, there was no significant change. The share of SMEs in construction fell from 51.9% to 50.5% in the same period. By contrast, SMEs increased their contribution to the value added of the sector over this five-year period, by 43% or an average annual growth rate (AAGR) of 7.4%.

SMEs, without the number of establishments increasing more than other types of companies, have significantly increased their contribution to the value added of the sector. This means that, compared to other companies, their productivity has increased. As the size of the sector has reduced, so has its scale, creating a more favorable space for

SMEs. One example of this may precisely be the building sub-sector, whose main type of work, housing, has decreased in scale.

Figure 3a.3 **NUMBER OF ESTABLISHMENTS 2019**
(STATE DISTRIBUTION)



Source: BBVA Research based on data from INEGI Economic Censuses

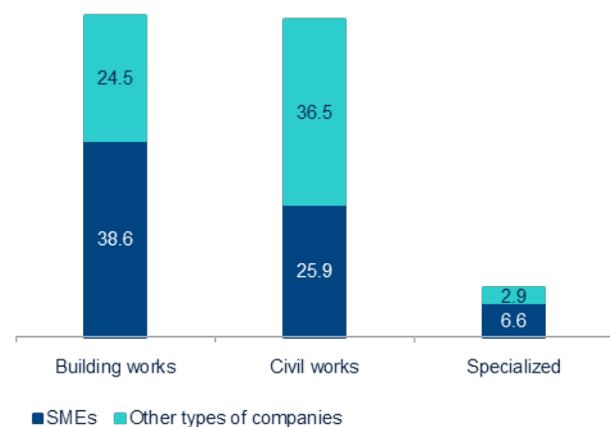
Chart 3a.4 **VALUE ADDED 2019**
(STATE DISTRIBUTION)



Source: BBVA Research based on data from INEGI Economic Censuses

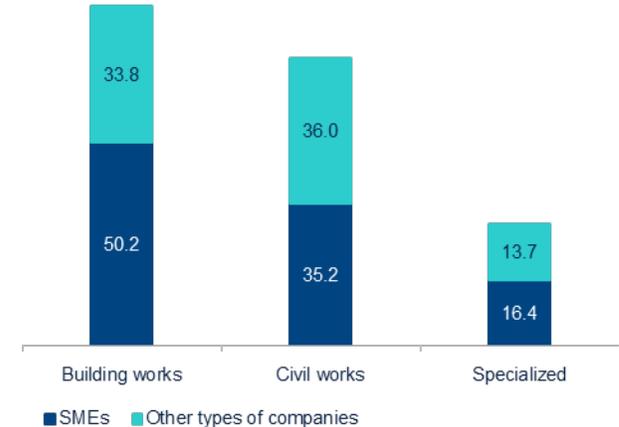
A regional perspective also shows how the value added provided by SMEs is better distributed throughout the country than the number of establishments of this size of company. The concentration of units is highest in states with large cities and major state economies such as Mexico City, Nuevo León and Jalisco, for example. By changing the number of establishments to value added, the map becomes more blurred and, while concentration still exists, it is less pronounced and smaller state economies gain part of that value added.

Figure 3a.5 **SME VALUE ADDED 2014**
(CONSTANT MXN BILLIONS)



Source: BBVA Research based on data from INEGI Economic Censuses

Figure 3a.6 **SME VALUE ADDED 2019**
(CONSTANT MXN BILLIONS)



Source: BBVA Research based on data from INEGI Economic Censuses

During the review period, building GDP grew while civil engineering GDP fell. However, the value added by SMEs in both sub-sectors did increase in terms of amount and share. The value added by SMEs in building shows an AAGR of 5.4%, with their share falling from 61.2% to 59.8%. As for civil engineering, SMEs increased value added at an average annual rate of 6.3%, raising their contribution from 41.5% to 49.4% within the sub-sector.

Figure 3a.7 **BUILDING SME INDICATORS**
(% CHANGE)



Source: BBVA Research based on data from INEGI Economic Censuses

Figure 3a.8 **CIVIL ENGINEERING SME INDICATORS**
(% CHANGE)



Source: BBVA Research based on data from INEGI Economic Censuses

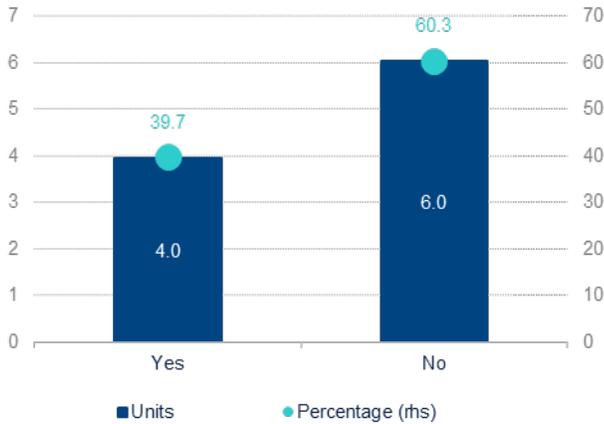
Overall, the main building indicators improved over the five-year analysis period despite the contraction of construction from a GDP perspective. Of the most important indicators, Gross Fixed Capital Formation (GFCF) was the only indicator to fall during this period. This coincides, especially from 2018 to date, with a widespread decline in investment in the Mexican economy and even more so in construction in particular. On the contrary, the main SME indicators in civil engineering recorded a decline, as did this sub-sector's GDP, except for the value added as indicated above. Value added has increased in both sub-sectors, as has the average value added per economic unit or establishment. Again, this points to improved efficiency of SMEs in the sector.

Financing remains the task ahead for SMEs

Given the relative growth of SMEs in construction, financing demand should increase. However, there is still considerable room for improvement when it comes to access to this financing and from formal sources. According to the 2019 economic census, only 40% of SMEs in construction obtained financing considering all available sources. By sub-sector, 39% of SMEs in building and 41% of those in civil engineering were granted some form of credit.

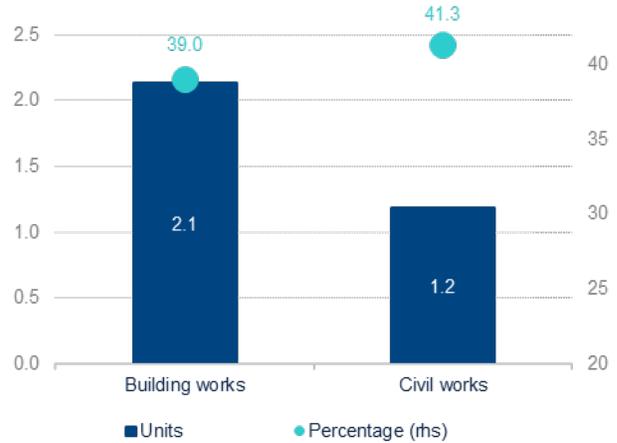
The lifespan of SMEs and their involvement in the formal sector of the economy are often the main barriers to obtaining credit in financial markets. Other factors that impact this are the low use of collateral or guarantees for lower amounts of investment in physical capital and limited knowledge of banking alternatives. In the first two points, the role of economic policy, for example through formalization, would have a mostly positive effect on the viability of such companies. In the second group of factors, the financial system has a greater role to play in terms of making credit viable.

Figure 3a.9 **ACCESS TO FINANCING 2019**
(THOUSANDS OF UNITS AND %)



Source: BBVA Research based on data from INEGI Economic Censuses

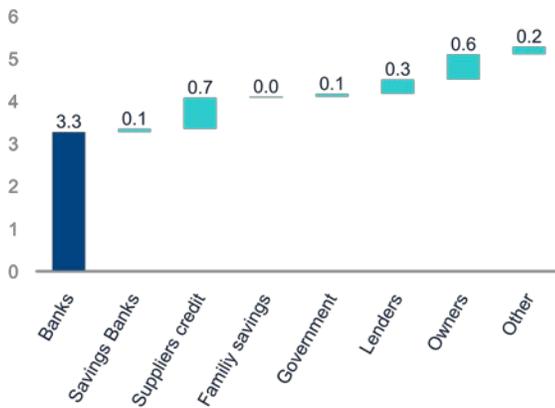
Figure 3a.10 **ACCESS TO FINANCING 2019**
(THOUSANDS OF UNITS AND %)



Source: BBVA Research based on data from INEGI Economic Censuses

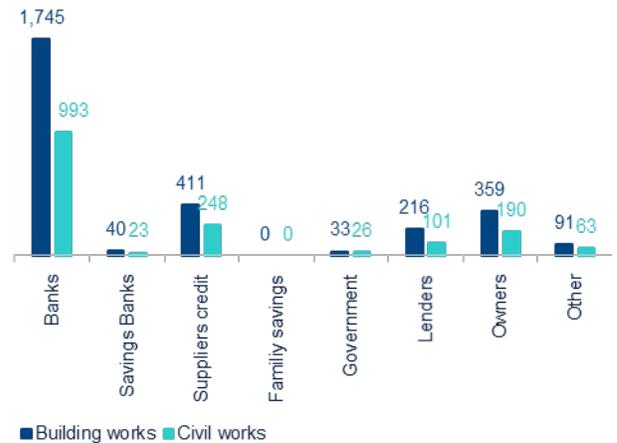
The banking system remains the main source of financing for SMEs in the construction sector in terms of the number of units accessing said financing. Secondly, there is the financing that suppliers provide to these companies, which does not generally represent cash flow. The longer period for payment of the suppliers has a similar effect, but could have an impact on higher prices. Thirdly, there are the capital or credit contributions through the owners and shareholders themselves. This order of precedence is maintained when broken down by sub-sector. Bank credit is the main source of financing for SMEs in both building and civil engineering, followed by suppliers and owners or shareholders. The number of SMEs that use lenders has not reduced and may be a risk factor for their financial health.

Figure 3a.11 **SOURCE OF FINANCING 2019**
(THOUSANDS OF UNITS)



Source: BBVA Research based on data from INEGI Economic Censuses

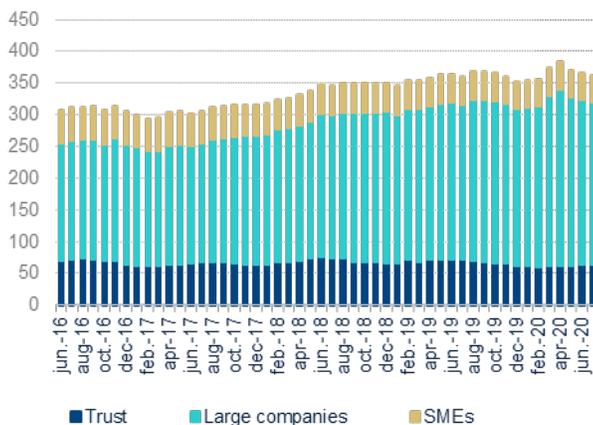
Figure 3a.12 **SOURCE OF FINANCING 2019**
(THOUSANDS OF UNITS)



Source: BBVA Research based on data from INEGI Economic Censuses

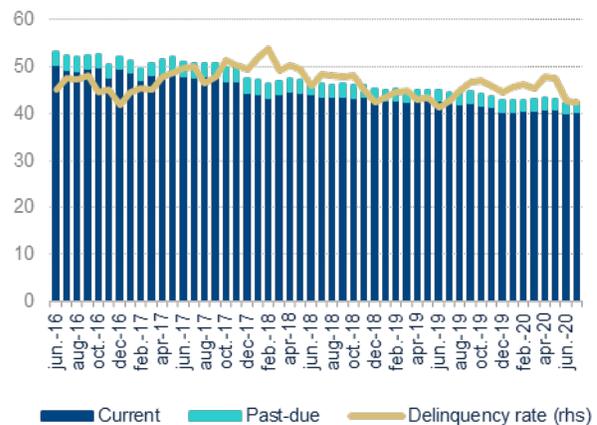
Based on information from the CNBV (*Comisión Nacional Bancaria y de Valores* — National Banking and Securities Commission), the credit balance of SMEs in construction has the lowest share with respect to large companies and trusts. The balance of the SME portfolio in mid-2020 stands at MXN 42.4 billion. This amount has fallen since April, reflecting the decline in the rest of the economy due to ceased activities in response to the health emergency. However, when compared to the MXN 53.2 billion recorded in June 2016, the reduction in this portfolio is 20.3%. Despite the above, bank credit to SMEs remains healthy. Delinquency is around 5% so far this year and has not exceeded 7% in the last five years. We attribute this result to the high origination standards across banking as a whole for this company segment, and also to the low penetration, whereby risks are mitigated. In any case, we estimate a further decline before the end of 2020, but hope that it will not continue throughout 2021 depending on how long it takes for the economy in general, and this sector in particular, to recover.

Figure 3a.13 **CONSTRUCTION CREDIT BALANCE (MXN BILLIONS)**



Source: BBVA Research based on CNBV data

Figure 3a.14 **CONSTRUCTION CREDIT BALANCE (MXN BILLIONS AND %)**

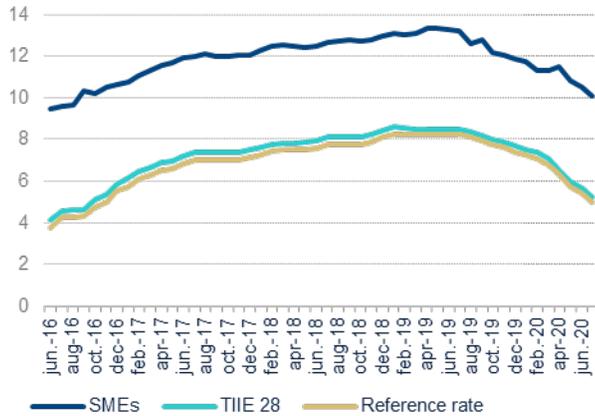


Source: BBVA Research based on CNBV data

The easing of monetary policy by the central bank has led to lower reference rates. At the close of this report, the target rate was already below 5%. This has led the interbank interest rate to follow the same trend and fall proportionately, closely mirroring what happened in mid-2016. The cost of financing for SMEs has therefore also reduced, as we can see for these companies in construction.

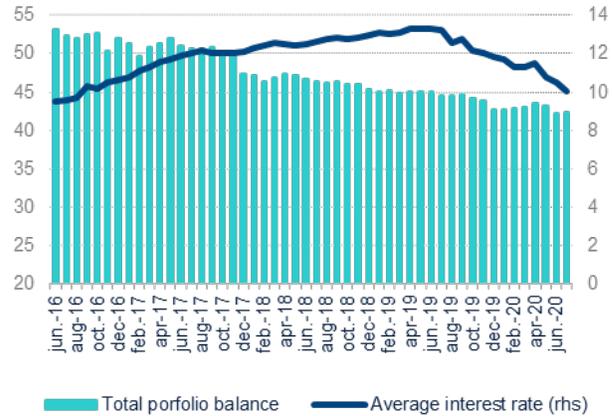
However, the lower cost of credit has not led to higher demand by these companies and the credit balance has fallen as indicated. In what can be compared to a "liquidity trap" effect, higher availability, measured by its lower cost, has failed to boost construction activity or investment. It is clear that the dominant effect is the lack of demand for products in this sector, as well as economic uncertainty.

Figure 3a.15 **INTEREST AND REFERENCE RATES (ANNUAL RATE)**



Source: BBVA Research based on Bank of Mexico and CNBV data

Figure 3a.16 **SME CREDIT AND INTEREST RATE (MXN BILLIONS AND ANNUAL RATE)**



Source: BBVA Research based on CNBV data

Time to innovate to increase credit flow to SMEs

One of the structural changes occurring in construction is the greater importance of SMEs. This trend can be seen in the medium and long term in various indicators such as the number of units, employment, output and value added. This dynamic is set to continue for as long as the sector remains stagnant and also due to the practice of segmentation in larger works. The sustainability of SMEs will therefore be a requirement for the efficiency and recovery of construction and its sub-sectors.

In addition to increased demand for certain types of work such as housing, industrial buildings and infrastructure to name a few, improving the viability of SMEs will be essential for a return to growth. For example, by including SME viability in formality and in the most dynamic value chains. This, in turn, will help in gaining more access to sources of formal financing for the various uses that are required, including working capital and investment. In terms of banking, innovation is required in designing products that help in these efforts; more in an environment where digital markets will become the common factor.

3b. The structural dynamics of housing prices in Mexico

Introduction

In our previous issue of *Mexico Real Estate Outlook*, we presented a comparative analysis of the crises or recessions experienced by the mortgage market. In this study, we highlighted the main supply and demand factors that have affected the business cycle of this sector over the past twelve years. One of the indicators that most closely reflects the stages of the real estate cycle is the housing price index.

In light of the economic crisis triggered by the COVID-19 pandemic, the mortgage financing market is facing one of its greatest challenges. The contraction in demand will undoubtedly be one of the most significant in modern history and, as such, we therefore consider it essential to discern in this section the short- and medium-term effects that such a crisis could have on the value of housing in Mexico.

The evolution of house prices in the face of demand shocks

As already analyzed in the Market Conditions section of this issue, the housing price index developed by the SHF (Federal Mortgage Company) was first published in 2009, right in the middle of the economic crisis that hit the mortgage market hard for a full year and a half.

Since then, the SHF has updated the base year of the index twice so as to accurately reflect changes in consumer preferences and incorporate new characteristics that consumers acquire over time into the value of housing. While the first version of the index comprised almost 80% social housing, the 2017 base year index, published in the first quarter of 2019, consisted of 50% social housing with the rest accounted for by mid-range and residential segments. This indicator should be considered the most representative for Mexico, as it is estimated using the National Appraisals Database, following the regulatory guidelines established by the SHF.

Differences in the composition of the index are key to understanding the role and magnitude of supply and demand factors in housing finance cycles and in periods of recession and/or crisis in particular. In a competitive market context, for any normal good, provided that more of said good is demanded, its price tends to increase and vice versa.

In the case of housing prices, the index would need to reflect more or fewer housing sales. While not all transactions are carried out through a mortgage loan, around 80% are, so the origination of mortgage financing by commercial banks is an indicator of market demand.³

3: While commercial banking mortgage financing accounts for 50% of the total credit granted, we omit the activities of housing institutes from this analysis to avoid reflecting public policy decisions outside of market performance.

Figure 3b.1 **SHF HOUSING PRICE INDEX (YoY % CHANGE)**



Source: BBVA Research based on SHF data

During the 2006–2008 real estate boom, the overall housing price index appreciated at annual rates of between 7.5% and 8.2%, where the subindex for the mid-range residential segment reached rates above 9%. Meanwhile, the price of affordable housing, which, as we have already mentioned, accounted for the majority of transactions, appreciated at a rate of 6.2% before the 2009 crisis.

While the 2009 crisis formally began following the Lehman Brothers bankruptcy in October 2008, it would take a few months for the Mexican market to feel the effects. Indeed, the slowdown in housing prices became evident in the course of 2009, closing the year with an appreciation of only 2.8%.

On that occasion, the real estate market would be affected mainly by a demand shock, where mortgage financing origination contracted to 36% in nominal terms (40.3% in real terms).⁴ The drop in demand for mortgage loans was in turn explained by the contraction in formal employment, measured by the number of workers insured at the IMSS.

Between November 2008 and December 2009, just over half a million formal jobs were lost. Although the number of IMSS insured workers began to recover in January 2010, demand for mortgage loans would not move into positive ground until almost a year later, due to the lag effect between these two variables, as previously documented in several editions of *Mexico Real Estate Outlook*.

4: Constant prices updated using the SHF Base Price Index 2017=100.

Figure 3b.2 **HOUSING PRICES AND MORTGAGE FINANCING AMOUNT (YoY % CHANGE)**



Source: BBVA Research based on CNBV and SHF data

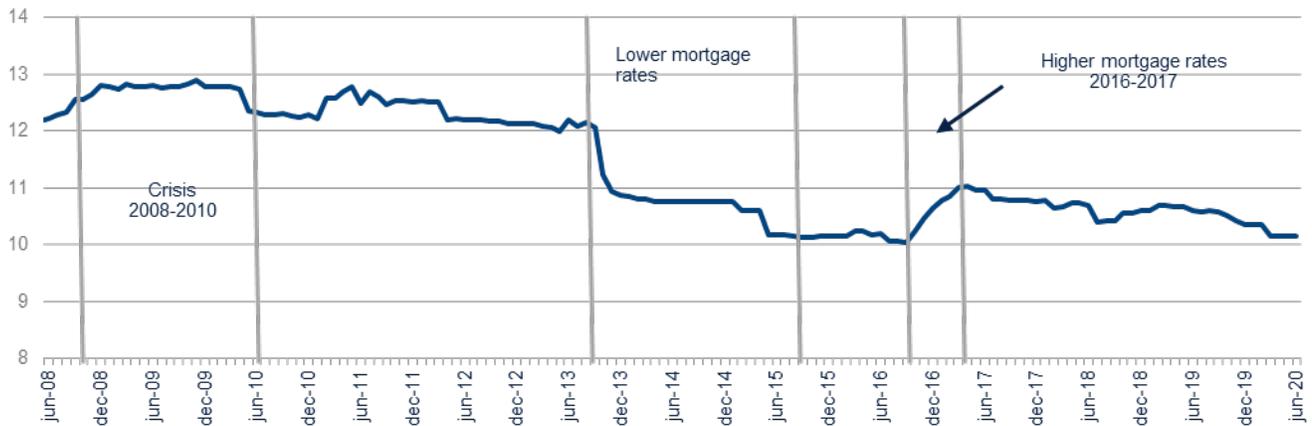
Figure 3b.3 **IMSS EMPLOYMENT AND MORTGAGE FINANCING AMOUNT (YoY % CHANGE)**



Source: BBVA Research based on CNBV and IMSS data

In Figure 2, we can see that the acceleration of housing prices recovered months after recovery in mortgage origination was consolidated, following a stable trend between 2011 and 2013. Credit demand experienced a strong rebound from 2014, caused by the sharp drop in mortgage interest rates.

Figure 3b.4 **MORTGAGE RATE (% YoY NOMINAL)**



Source: BBVA Research based on Banxico data

In Figure 3, we see that following the 2008–2010 crisis, demand for mortgage loans was driven by a marginal decline in mortgage rates in mid-2013 (Figure 4). However, the decline was not strong enough to stimulate faster growth. In this regard, job recovery played a key role in consolidating recovery because, as previously mentioned, the employment formalization programs during those years generated significant growth in the IMSS insured worker

register. As such, from 2013, when mortgage interest rates fell sharply, demand for credit experienced strong growth with greater emphasis on higher-value housing segments.

Thus, as the change in consumer preferences for more expensive housing was reflected from 2015 with much faster growth in the housing price index, as we saw in Figure 2, this was supported by formal employment growth rates of up to 5% per year in some periods (Figure 3).

Main supply factors in housing appreciation

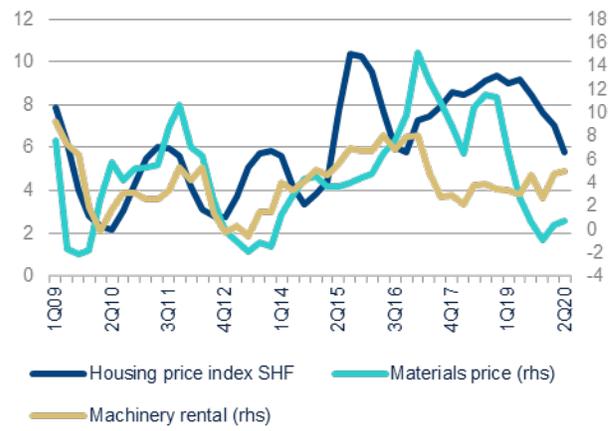
In terms of supply, housing prices have reflected the increase in the construction producer price index, mainly from 2014, when the cost of materials such as steel and concrete began to rise steadily. In the years immediately following the 2009–2010 crisis, prices of materials and machinery rental had recorded very similar appreciation rates that aligned more closely with the housing appreciation cycles.

Figure 3b.5 SHF AND INPP CONSTRUCTION PRICE INDEX (YoY % CHANGE)



Source: BBVA Research based on SHF and INEGI data

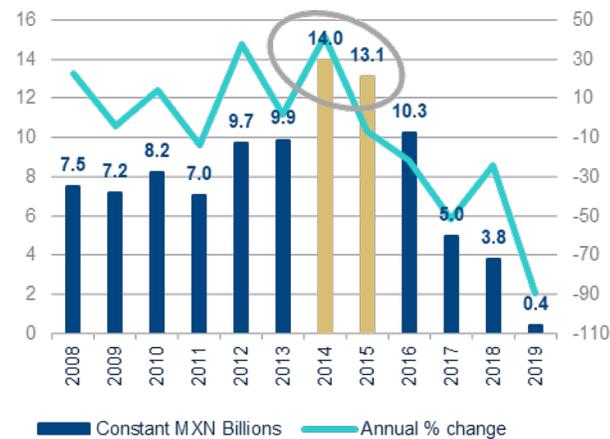
Figure 3b.6 SHF AND INPP CONSTRUCTION PRICE INDEX (YoY % CHANGE)



Source: BBVA Research based on SHF and INEGI data

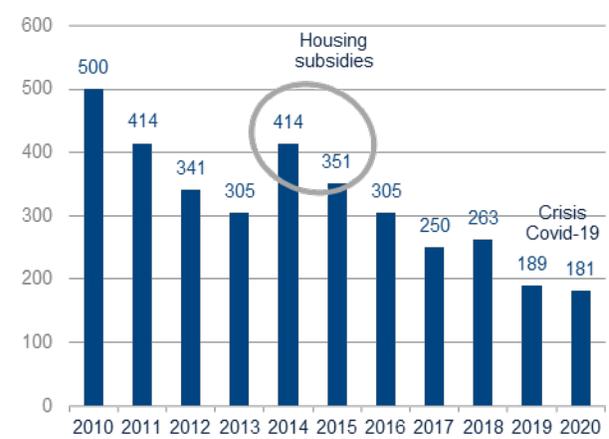
From 2014, in response to the surge in demand in 2013 and the expectation that mortgage rates would continue to fall, material prices began to record increasingly higher growth rates and the construction model shifted to focus on building more-expensive houses. Conversely, the machinery rental subindex experienced periods where the exchange rate depreciated, which affected the cost of rental, as the majority of builders do not own the machinery they use.

Figure 3b.7 **HOUSING ACQUISITION SUBSIDIES**
(CONSTANT MXN BILLIONS AND % CHANGE)



Source: BBVA Research based on CONAVI data

Figure 3b.8 **HOUSING CONSTRUCTION RECORDS IN THE RUV**
(THOUSANDS OF UNITS AND YoY % CHANGE)



Note: Data from 2Q20.

Source: BBVA Research based on RUV data

Finally, federal government subsidies for the acquisition of new housing also constituted a major supply shock between 2014 and 2016, at a time when the number of housing construction projects also recovered. Subsequently, the number of units to be built stabilized at around 250,000 units and we are already seeing contractions of around 20% in the second quarter of 2020. As discussed in other issues of *Mexico Real Estate Outlook*, we believe that this generated a negative factor, because although it revived demand for housing, this was not necessarily the result of real activity in the economy and may have prolonged the last cycle of housing appreciation, which, since last year, has already shown obvious adjustments for lower employment generation. This is a consequence of the contraction in GDP and is accentuated by the crisis caused by the pandemic in 2020.

Analysis of housing-price sensitivity in Mexico

In the final part of this section, we provide an analysis of the determinants of housing prices in Mexico with a model that allows us to establish the importance of each supply and demand factor. In terms of demand, we have seen that mortgage loans are the main determinant. However, the fact that mortgage loans evolve based on formal employment means that the effects must be estimated through a system of non-simultaneous equations. The econometric estimate would therefore be provided by the following dynamic specification:

$$Pv_{it} = \alpha_0 Pv_{it-n} + \beta_1 Crhip_{t-n} + \beta_2 ICR_{t-n} + \varepsilon_t \quad (1)$$

$$Crhip_{t-n} = \delta_0 Crhip_{t-n} + \gamma_1 Emp_{t-n} - \gamma_2 Thip_{t-n} + u_t \quad (2)$$

Whereby:

$Pviv_t$ = The SHF housing price index

$Crhip_{t-n}$ = Mortgage financing originated by commercial banking in MXN billions

ICR_{t-n} = The national construction producer price index

Emp_{t-n} = The number of IMSS insured workers

$Thip_{t-n}$ = The interest rate for mortgage loans from the Bank of Mexico

ε_t, u_t are the error margins of equations (1) and (2).⁵

All variables are expressed in annual growth rates to obtain the housing price elasticities of each variable and are stationary on a quarterly basis, whereas the expression $t-n$ represents the number of lags. As such, expressions (1) and (2) indicate that housing prices are determined by their lagging dynamics, the origin of commercial bank mortgage loans, the construction producer price index and a stochastic error term. In turn, the demand component, estimated based on mortgage financing origination, is determined by the number of workers in the IMSS and the commercial banking mortgage rate. The effect of our demand equation is therefore represented in the price function by a partial change. The short-term effects are therefore provided by the expressions in the following table.

Table 3b.1 **SHORT-TERM EFFECTS**

	$Crhip_{t-n}$	ICR_{t-n}	Emp_{t-n}	$Thip_{t-n}$
$Pviv_t$	$\frac{\partial Pviv_t}{\partial Crhip_{t-n}}$ = $\beta_1=0.018$	$\frac{\partial Pviv_t}{\partial ICR_{t-n}}$ = $\beta_2=0.095$	$\frac{\partial Pviv_t}{\partial Crhip_t} \times \frac{\partial Crhip_t}{\partial Emp_{t-n}}$ = $\beta_2 \times \gamma_1 = 0.047$	$\frac{\partial Pviv_t}{\partial Crhip_t} \times \frac{\partial Crhip_t}{\partial Thip_{t-n}}$ = $\beta_2 \times \gamma_2 = -0.011$
$Crhip_t$			$\frac{\partial Crhip_t}{\partial Emp_{t-n}}$ = $\gamma_1 = 2.51$	$\frac{\partial Crhip_t}{\partial Thip_{t-n}}$ = $\gamma_2 = -0.60$

Note: Percentage change in prices for each percentage point of change in each of the explanatory variables, considering the rest to be constant.
Source: BBVA Research

⁵: The system of equations is in accordance with the convergence conditions, the corresponding co-integration tests and the assumptions of the data-generating process.

According to Table 1, the effect of demand for mortgage financing and construction costs positively affect housing appreciation. The parameters therefore satisfy the condition β_1 and $\beta_2 > 0$. However, the effect of employment and the interest rate is provided by a cross-derivation, in which it is fulfilled in the same way as $\beta_2 \times \gamma_1 > 0$, because the higher the growth of employment, the greater the demand for housing and, simultaneously, the greater the appreciation of houses. Finally the mortgage interest rate effect would also be provided by a cross-effect, in which $\beta_2 \times \gamma_2 < 0$, because the greater the interest rate, the lower the demand for mortgage financing and, by extension, the lower the appreciation.

The result of the demand equation indicates that, in the short term, for each percentage point by which employment increases, the amount of mortgage financing increases by 2.5%, while the cross-effect on housing prices is 0.04%. Although the short-term effect on prices is small, this is due to the lag effect that occurs, as discussed at the beginning of this article. In the long term, however, the effect increases to 0.22%.

Furthermore, for each percentage point by which the mortgage interest rate increases, demand for mortgage loans decreases 0.60% in the short term. Similarly, the cross-effect on prices is small, at -0.01% in the short term, whereas, in the long term, sensitivity is -0.05% for each percentage point.

Table 3b.2 **LONG-TERM EFFECTS**

	$Crhip_{t-n}$	ICR_{t-n}	Emp_{t-n}	$Thip_{t-n}$
$Pviv_t$	$\frac{\beta_1}{(1-\alpha_0)}$ = 0.075	$\frac{\beta_2}{(1-\alpha_0)}$ = 0.386	$\frac{\beta_1}{(1-\alpha_0)} \times \frac{\gamma_1}{(1-\delta_0)}$ = 0.225	$\frac{\beta_1}{(1-\alpha_0)} \times \frac{\gamma_2}{(1-\delta_0)}$ = -0.054
$Crhip_t$			$\frac{\gamma_1}{(1-\delta_0)}$ = 2.98	$\frac{\gamma_2}{(1-\delta_0)}$ = -0.713

Note: Percentage change in prices for each percentage point of change in each of the explanatory variables, considering the rest to be constant.
Source: BBVA Research

As we can see in Table 2, the sensitivity of housing prices to any change in their determinants is greater in the long term, as the cross-effect of demand (as measured by mortgage financing origination) has a delayed effect on the price market.

Construction costs stand as the main determinant, since for each percentage point by which these costs increase, prices rise 0.38%. After that, formal employment is the second factor with the greatest impact on housing prices. For each percentage point by which employment increases, house prices rise 0.22%.

Conclusions

Housing prices in Mexico have experienced two boom periods in recent history, both of which have preceded an economic crisis. Following the 2006–2008 boom, where appreciation rates hovered around 8% per year, the 2009 crisis erupted. The contraction of the mortgage market in those years as a result of job losses further explained the slowdown in price growth, the minimum appreciation of which was reached during 2009 at rates of around 2% per year.

Recovery took around a year and a half to see a revival in mortgage financing demand and, in turn, prices, which rose steadily between 2011 and 2013. In subsequent years, the change in the consumer profile, low mortgage interest rates, job recovery and, momentarily, public policies that granted subsidies in excess for the acquisition of new homes, boosted the purchase of increasingly higher-value homes.

The structural change became apparent in 2014 and, since then, in addition to employment, construction costs have begun to impact appreciation cycles more strongly. These are the reasons as to why, during the current economic crisis (which actually began last year and was aggravated by the COVID-19 pandemic), the effect of job losses, which exceeds that experienced in 2009, has also resulted in a slowdown in input prices. This is a consequence of the fall in the number of construction projects.

The results of the estimated model confirm the importance of employment and input costs on the trend outlined by the housing price index, which has continued to grow and which we hope will continue to do so, albeit at lower rates. Recovery in appreciation rates may take some time as, although mortgage interest rates are experiencing significant declines and the construction input price is low, formal employment, the main determinant of housing demand, could take two or three years to recover its pre-crisis level. The effect will therefore not be visible on prices in the short term, due to the lag effect toward the mortgage market.

4. Statistical Annex

 Table 4.1 **ANNUAL MACROECONOMIC INDICATORS**

	2012	2013	2014	2015	2016	2017	2018	2019	2020e
Real GDP (Annual % change)	3.6	1.4	2.8	3.3	2.6	2.1	2.2	-0.3	-10.0
Real private consumption (Annual % change)	2.3	1.8	2.1	2.7	3.7	3.2	2.4	0.4	
Real government consumption (Annual % change)	3.4	0.5	2.6	1.9	2.6	0.7	2.8	-1.4	
Real construction investment (annual % change)	2.1	-5.3	2.0	1.2	-0.8	-2.2	-0.5	-3.7	
Residential	1.4	-5.0	3.2	3.7	4.2	1.9	1.1	-1.6	
Non-residential	2.7	-5.5	1.2	-0.7	-4.8	-5.7	-2.0	-5.8	
Total formal private employment (IMSS)									
Thousands of persons (average, sa)	15,899	16,418	17,032	17,751	18,431	19,244	19,988	20,427	
Annual % change	4.7	3.3	3.7	4.2	3.8	4.4	3.9	2.2	
Average salary (IMSS)									
Nominal pesos per day, average	270.8	281.5	294.1	306.4	317.9	333.2	352.2	375.7	
Real annual % change	0.0	0.1	0.4	1.4	0.9	-1.1	0.8	2.9	
Real total wages (IMSS, annual % change)	5.1	3.6	4.0	5.8	4.8	3.2	4.9	5.3	
Minimum general salary (daily)									
Nominal pesos	60.5	63.1	65.6	69.2	73.0	80.0	88.4	102.7	
Real annual % change	-0.1	0.4	-0.1	2.8	2.6	3.1	5.5	12.2	
Consumer prices (eop, annual % change)	3.6	4.0	4.1	2.1	3.4	6.8	4.8	2.8	
TIIE 28 average (%)	4.8	4.3	3.5	3.3	4.5	7.1	8.0	8.3	
10-year interest rate, Govt. bond (M10)	5.7	5.7	6.0	5.9	6.2	7.2	8.0	7.5	

Source: BBVA Research with Banco de Mexico, Conasami, Inegi & IMSS data

 Table 4.2 **ANNUAL CONSTRUCTION AND HOUSING INDICATORS**

	2012	2013	2014	2015	2016	2017	2018	2019	2020e
Real construction GDP (annual % change)	2.6	-1.5	2.6	2.1	1.7	-0.3	0.5	-4.9	-19.2
Building	2.9	-3.0	3.3	2.9	3.9	1.0	1.3	-3.0	-19.7
Civil engineering and major works	0.7	3.0	-1.9	-0.2	-8.9	-9.5	-5.8	-6.0	-17.1
Specialized construction work	4.2	-2.2	8.6	2.6	10.4	7.2	5.4	-12.8	-19.4
Total construction employment (IMSS)									
Thousands people, average	1,275.2	1,289.8	1,383.5	1,504.0	1,537.1	1,602.4	1,682.6	1,656.3	
Annual % change	6.3	1.1	7.3	8.7	2.2	4.2	5.0	-1.6	
Hydraulic cement sales (tons, annual % change)	2.1	-2.7	5.3	7.5	2.8	1.1	0.8	-6.9	
Construction companies ¹									
Real production value (annual % change)									
Total	3.4	-4.9	-0.5	-0.2	-3.2	-1.3	-2.7	-8.1	
Building	2.0	-7.9	3.9	-2.9	2.6	2.7	-7.3	-4.3	
Public works	0.5	-8.0	-5.2	4.7	-8.1	-8.7	-4.2	-6.8	
Water, irrigation and sanitation	1.9	-13.5	-3.9	-11.2	4.5	-7.5	11.8	-14.3	
Electricity and communications	-6.8	10.2	-10.4	5.3	13.9	-2.5	-1.1	-10.0	
Transportation	-2.7	-12.9	-1.3	-4.7	-2.3	1.4	-7.9	-9.5	
Oil and petrochemicals	14.7	-3.9	-11.0	36.0	-34.5	-42.3	-5.2	17.6	
Other	36.4	29.3	2.4	-9.1	-4.3	12.7	20.7	-23.1	
Construction prices (annual % change)									
Headline	0.4	-0.7	6.5	2.3	8.7	7.9	10.3	-0.1	
Construction materials	-0.2	-1.4	4.5	4.5	9.8	8.7	11.3	-0.9	
Labor	3.2	2.9	3.5	4.2	2.9	4.4	5.3	4.9	
Equipment rental	-0.2	1.4	4.1	7.8	7.9	3.0	3.4	2.6	

1: Considers companies affiliated and not affiliated to the Mexican Chamber of the Construction Industry.

Source: BBVA Research with Banco de Mexico, Conasami, Inegi, IMSS, Infonavit and Fovissste data

Table 4.3 **ANNUAL HOUSING CREDIT INDICATORS**

	2012	2013	2014	2015	2016	2017	2018	2019	2020*
Number of loans granted (thousands)									
Total	607.0	583.7	609.4	599.2	572.3	565.4	545.6	519.8	494.4
Infonavit	421.9	380.6	387.0	393.0	369.1	388.8	370.8	335.1	323.1
Fovissste	64.3	65.9	63.1	64.4	63.4	51.6	48.7	48.9	49.7
Commercial banks and Sofomes	120.7	137.1	159.3	141.8	139.7	124.9	126.1	135.8	121.5
Reduction**	45.4	58.7	82.5	56.6	51.1	36.8	29.4	36.1	27.3
Individual credits									
Financing flow ¹	561.6	525.0	527.0	542.6	521.2	528.6	516.2	483.7	467.0
Total	387.7	382.6	420.5	426.1	411.5	393.5	402.7	404.4	376.4
Infonavit	186.4	160.6	170.6	171.8	155.8	168.7	166.0	163.2	154.1
Fovissste	55.5	54.9	59.4	57.3	54.9	42.3	38.7	36.9	37.0
Commercial banks and Sofomes	145.8	167.2	190.5	197.0	200.8	182.4	198.0	204.3	185.2
Commercial banks current loan portfolio									
Balance end of period ¹	605.7	627.8	653.9	719.4	778.7	795.3	819.2	872.4	902.6
Delinquency rate (%)	3.1	3.5	3.3	2.8	2.4	2.5	2.5	2.8	3.0

Notes: Between 2011 and 2016, data do not consider Sofoles/Sofomers. As of 2008, the SHF index of housing prices is used as a price deflator.

* Annualized to June 2020. Billions of constant pesos of June 2020.

** It refers to financing (loans and grants) that are considered in two or more institutions. Do not consider "Infonavit Total" nor Second loan granted by the Infonavit.

Source: BBVA Research with Banco de Mexico & CNBV data

 Table 4.4 **SHF QUARTERLY HOUSING PRICE INDEX BY STATE (ANNUAL % CHANGE)**

	3Q17	4Q17	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20
National	7.9	8.6	8.4	8.7	9.0	9.3	9.0	9.2	8.4	7.7	7.0	5.8
Aguascalientes	7.9	8.5	8.3	8.3	8.4	8.2	7.9	8.3	8.3	8.3	7.8	6.5
Baja California	7.0	8.2	8.7	9.1	9.5	9.6	8.9	9.0	9.1	8.8	8.4	7.5
Baja California Sur	6.3	7.0	7.6	8.2	9.1	10.1	9.5	9.5	9.3	8.6	8.5	7.8
Campeche	7.1	8.3	8.6	8.9	9.3	9.6	8.9	8.7	8.2	7.6	7.3	6.7
Chiapas	6.3	7.3	7.5	8.1	8.4	8.4	7.8	7.4	7.2	6.9	6.6	5.9
Chihuahua	6.2	6.5	6.4	6.8	7.5	8.3	8.0	8.2	7.7	6.9	6.7	6.1
Coahuila	6.7	6.7	6.5	6.8	7.5	8.4	8.3	8.7	8.1	7.3	7.0	6.2
Colima	7.2	8.3	8.5	8.8	9.2	8.9	8.5	8.7	8.1	7.7	7.0	6.1
Durango	5.1	5.7	5.8	6.6	7.1	7.3	7.0	6.6	6.2	6.0	5.9	5.8
Guanajuato	7.8	9.0	9.1	9.6	9.9	9.7	9.4	9.3	8.6	8.1	7.2	6.3
Guerrero	6.8	7.3	7.3	7.7	7.9	8.0	7.3	7.2	6.7	6.6	6.3	5.3
Hidalgo	5.8	5.9	5.9	6.7	7.5	7.9	7.6	7.7	7.2	6.5	5.9	4.9
Jalisco	8.9	10.7	10.9	11.3	11.2	11.4	11.1	11.3	11.0	10.2	9.3	8.0
México	7.0	7.7	7.7	8.3	8.6	8.3	7.5	7.2	6.6	6.6	6.4	5.4
Mexico City	12.2	12.5	11.3	10.5	10.4	11.0	11.5	12.1	9.8	7.2	5.5	1.9
Michoacán	6.9	7.9	8.0	8.8	9.0	8.8	8.6	8.2	7.9	7.8	6.9	6.1
Morelos	6.5	6.6	6.6	7.3	8.1	8.6	7.9	7.8	7.2	6.8	6.6	5.3
Nayarit	8.4	8.8	8.4	8.4	9.3	10.1	10.0	10.3	9.6	8.4	7.7	6.8
Nuevo León	8.8	9.7	9.6	9.6	10.0	9.9	9.4	9.5	8.6	8.0	7.6	6.8
Oaxaca	6.6	8.1	8.3	8.4	8.3	7.8	7.1	7.1	7.0	6.7	6.5	5.8
Puebla	7.8	8.9	9.0	9.3	9.5	9.4	8.7	8.5	8.3	7.9	7.5	7.0
Querétaro	7.0	7.7	7.9	8.4	8.7	8.6	7.8	7.6	7.2	7.3	7.1	6.1
Quintana Roo	7.3	6.4	6.4	6.7	8.5	10.8	11.0	11.8	11.2	9.2	8.3	6.8
San Luis Potosí	7.7	8.4	8.5	9.1	9.6	9.7	9.4	9.0	8.1	7.4	7.0	6.9
Sinaloa	7.5	8.3	8.3	8.6	9.1	9.3	9.4	9.8	9.6	9.2	8.4	7.4
Sonora	5.9	5.9	5.8	6.1	6.7	7.2	7.0	7.7	7.7	7.6	7.7	7.1
Tabasco	6.3	7.8	8.1	8.8	8.7	8.1	7.2	6.4	6.1	6.2	6.1	5.7
Tamaulipas	5.6	5.7	5.5	5.9	6.6	7.4	7.3	7.8	7.5	6.8	6.5	5.7
Tlaxcala	7.0	7.3	6.6	6.6	6.6	7.1	6.8	6.6	6.0	4.8	4.6	4.5
Veracruz	5.6	6.1	6.0	6.4	6.8	7.0	6.6	6.5	6.0	5.4	5.3	5.1
Yucatán	7.7	7.6	7.5	7.8	8.7	9.4	9.1	9.4	8.9	8.2	7.8	6.6
Zacatecas	6.6	7.7	7.8	8.1	8.6	8.7	8.2	8.3	7.8	7.0	6.5	5.1

Source: BBVA Research with Sociedad Hipotecaria Federal data

Table 4.5 **QUARTERLY MACROECONOMIC INDICATORS**

	3Q17	4Q17	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20
Real GDP (annual % change)	1.6	1.8	1.5	3.3	2.8	1.3	1.1	-1.1	-0.4	-0.7	-1.3	-18.7
Real private consum. (annual % chge.)	3.1	2.2	2.4	3.4	2.6	1.3	0.8	-0.4	0.5	0.7	-0.5	-20.6
Real gvmnt. consum. (annual % chge.)	-0.8	0.7	2.9	5.2	2.5	0.5	-0.6	-2.8	-1.7	-0.4	3.4	2.4
Real const.investment (annual % chge.)	-0.7	-1.7	0.4	4.3	-0.9	-5.5	1.0	-6.0	-5.0	-5.0	-7.3	-32.6
Residential	3.3	5.0	7.1	7.4	-3.3	-6.0	2.9	-6.2	-2.7	-0.2	-6.3	-34.9
Non-residential	-4.2	-7.2	-5.4	1.4	1.4	-5.0	-0.8	-5.9	-7.1	-9.5	-8.3	-30.3

Source: BBVA Research with Inegi data

 Table 4.6 **QUARTERLY CONSTRUCTION AND HOUSING INDICATORS**

	3Q17	4Q17	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20
Real construction GDP	0.6	-0.1	2.9	5.0	-0.3	-5.4	-0.2	-7.0	-6.9	-5.7	-8.2	-34.2
Vol. index 2003=100 (annual % chge.)												
Building	2.5	1.4	4.4	6.1	-1.0	-4.2	2.6	-5.8	-5.4	-3.5	-6.3	-35.7
Const. engineering and major works	-9.5	-4.8	-6.7	0.8	-4.0	-13.4	-4.5	-7.3	-3.9	-8.3	-17.5	-31.1
Specialized construction work	5.8	-0.9	8.4	4.9	8.1	0.0	-8.1	-12.5	-17.4	-13.1	-7.5	-30.1
Construction companies ¹												
Real production value (annual % chge.)												
Total	-1.1	-2.3	-1.4	1.5	-2.0	-8.2	-2.9	-8.3	-9.7	-11.3	-16.0	-32.8
Building	4.1	-4.0	-4.0	-4.0	-8.7	-11.8	0.3	-5.0	-6.2	-6.2	-11.6	-34.6
Public works	-10.6	-3.0	-6.0	1.3	-1.4	-9.8	-4.2	-6.1	-4.7	-12.0	-21.3	-33.1
Water, irrigation and sanitation	-2.1	-23.2	10.9	9.8	11.7	14.6	-8.3	-5.1	-18.9	-24.4	-37.0	-45.4
Electricity & communications	-15.3	1.3	-8.7	-6.4	3.9	6.2	-1.7	0.3	-3.1	-29.9	-32.7	-48.9
Transportation	-0.6	5.8	-6.2	2.3	-3.8	-21.4	-9.7	-15.7	-10.3	-1.5	-18.2	-29.2
Oil and petrochemicals	-38.2	-22.1	-15.5	3.2	-8.7	0.7	24.8	31.8	33.1	-10.2	-5.0	-17.5
Other	14.8	7.5	28.9	23.0	21.0	12.0	-9.8	-24.1	-31.9	-24.9	-15.0	-24.8

1: Considers companies affiliated and not affiliated to the Mexican Chamber of the Construction Industry.

Source: BBVA Research with Inegi and Banco de México data

 Table 4.7 **QUARTERLY HOUSING MARKET INDICATORS**

	3Q17	4Q17	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20
Home sales by organization (thousands of credits)												
Infonavit	101.8	110.8	74.7	101.7	98.4	96	66.6	85.9	87.7	94.9	67.1	72.8
Fovissste	12.0	14.3	9.8	13.1	13.1	12.7	9.5	12.5	13.2	13.8	13.7	9.0
Banks	20.9	25.4	20.8	23.9	24.7	27.2	21.3	24.7	24.8	28.8	23.7	16.9
Total	134.7	150.5	105.2	138.7	136.2	135.9	97.4	123.0	125.7	137.6	104.4	98.7
Financing (billions of December 2019 pesos)												
Infonavit	46.5	50.4	33.3	45.6	43.6	43.6	33.0	41.7	42.4	46.0	31.8	33.8
Fovissste	10.1	11.2	8.2	10.8	9.9	9.8	7.0	9.6	10.3	10.1	9.9	6.8
Banks	44.2	50.5	41.9	50.7	50.5	54.9	47.0	51.2	51.3	54.7	44.0	35.2
Total	100.8	112.1	83.4	107.1	104.0	108.3	87.0	102.5	104.0	110.8	85.8	75.8
Infonavit: number of credits to buy a house (thousands)												
Economic + Popular ²	64.1	68.3	47.8	65.4	62.6	57.0	37.0	49.4	49.0	51.0	35.6	38.0
Traditional	23.5	26.1	16.2	22.1	21.8	23.9	17.0	22.0	23.5	26.5	19.5	22.9
Middle income	10.9	13.0	8.5	11.3	10.8	11.8	9.7	11.2	11.9	13.6	9.3	9.4
Residential	2.8	3.1	1.9	2.6	2.7	2.9	2.4	2.8	2.9	3.3	2.2	2.1
Residential Plus	0.5	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.3
Total	101.8	110.8	74.7	101.7	98.4	96.0	66.6	85.9	87.7	94.9	67.1	72.8

Note: Price ranges expressed in times the minimum monthly wage (TMMW); Economic and Popular Segment (118-200), Traditional (201-350), Middle income (351-750), Residential (751-1500) and Plus (1500 and more). MMW=2,046 pesos in 2014 in the "A" zone.

2: Includes new and used homes

Source: BBVA Research with INEGI, Infonavit, Fovissste, Banxico data

Table 4.8 **QUARTERLY HOUSING CREDIT INDICATORS**

	3Q17	4Q17	1Q18	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20
Commercial banks current loan portfolio												
Delinquency rate (%)	2.4	2.5	2.5	2.4	2.5	2.5	2.5	2.6	2.7	2.8	3.0	3.0

Source: BBVA Research with Inegi, Infonavit, Fovissste, Banxico data

 Table 4.9 **MONTHLY MACROECONOMIC INDICATORS**

	J.19	J	A	S	O	N	D	J.20	F	M	A	M	J
IGAE (annual % change)	-1.5	0.4	-1.1	0.0	-0.6	-1.4	0.3	-0.7	-0.5	-2.2	-19.9	-22.7	-13.3
Real constr. vol. (ann. % change)	-7.0	-8.8	-3.1	-8.5	-9.3	-3.7	-3.9	-8.1	-9.0	-7.5	-39.7	-36.8	-26.2
Building	-5.6	-7.3	0.3	-8.7	-9.0	1.0	-2.5	-6.6	-7.5	-4.6	-42.9	-38.2	-26.3
Civil engineering & major works	-6.2	-4.8	-2.3	-4.7	-5.5	-12.7	-6.8	-17.2	-17.2	-18.0	-31.8	-32.4	-29.2
Specialized construction work	-15.0	-20.6	-18.8	-12.1	-15.4	-14.8	-8.2	-5.1	-7.8	-9.4	-33.6	-34.4	-21.5
Total formal private empl. (IMSS)													
Thousand people	20,369	20,385	20,422	20,567	20,727	20,804	20,421	20,490	20,614	20,483	19,928	19,583	19,500
Annual % change	2.4	2.2	1.8	1.9	1.8	1.7	1.7	1.6	1.5	0.7	-2.2	-3.9	-4.3
Average salary quote (IMSS)													
Nominal daily pesos	376.6	380.7	379.7	374.5	373.2	375.8	378.1	396.2	397.6	399.3	403.6	408.0	407.3
Real annual % change	2.5	2.6	3.3	3.3	3.3	3.5	3.8	3.1	2.6	3.7	5.7	5.1	4.6
Real total wages (IMSS)													
Annual % change	5.0	4.9	5.2	5.3	5.2	5.2	5.5	4.7	4.2	4.4	3.4	1.0	0.2
Minimum general wage (daily)													
Nominal pesos	102.7	102.7	102.7	102.7	102.7	102.7	102.7	123.2	123.2	123.2	123.2	123.2	123.2
CPI (end of period)													
Annual % change	3.9	3.8	3.2	3.0	3.0	3.0	2.8	3.2	3.7	3.2	2.1	2.8	3.3
TIIE 28 (average, %)	8.5	8.5	8.4	8.2	8.0	7.9	7.7	7.5	7.4	7.1	6.5	6.0	5.6
10-year Gov. bond int. rate (M10)	7.6	7.5	7.0	6.9	6.8	7.1	6.9	6.6	6.9	7.1	6.6	6.2	5.8

Source: BBVA Research with Inegi, Banco de México, IMSS data

 Table 4.10 **MONTHLY CONSTRUCTION AND HOUSING INDICATORS**

	J.19	J	A	S	O	N	D	J.20	F	M	A	M	J
Const. employment (IMSS)													
Total (thousand people)	1,654	1,674	1,676	1,685	1,707	1,695	1,574	1,608	1,627	1,594	1,396	1,364	1,462
Annual % change	-2.1	-2.3	-3.4	-2.9	-2.3	-1.0	-0.8	-1.4	-1.3	-2.7	-15.0	-17.3	-11.6
Hydraulic cement sales (tons)													
Annual % change	-6.6	-4.4	-4.2	-11.1	2.4	-4.7	-1.0	4.9	7.5	-0.6	-9.1	-11.4	-0.7
Resid. cons. prices (ann. % chge.)													
Headline	3.1	2.0	1.7	1.3	1.0	0.2	-0.1	-0.4	0.3	1.2	2.9	2.0	1.4
Materials	2.7	1.5	1.1	0.6	0.3	-0.6	-0.9	-1.2	-0.6	0.5	2.4	1.4	0.8
Labor	5.4	4.9	5.4	5.0	4.9	4.9	4.9	4.4	5.9	5.2	5.3	4.6	4.5
Machinery rental	3.0	3.8	4.8	4.7	4.4	2.7	2.6	2.4	1.7	4.8	7.7	6.8	4.9

Source: BBVA Research with Banxico, INEGI, IMSS data

 Table 4.11 **MONTHLY HOUSING CREDIT INDICATORS**

	J.19	J	A	S	O	N	D	J.20	F	M	A	M	J
Commercial banks loan portfolio													
Balance in billion pesos*	853.6	858.3	864.5	869.5	870.6	872.2	872.4	873.1	874.4	882.9	895.6	901.4	902.6
Annual % change	4.8	5.1	6.1	6.0	6.2	6.3	6.5	6.1	5.7	6.0	7.2	6.3	5.7
Total annual cost (CAT, average)	13.3	13.3	13.3	13.2	13.2	13.1	13.0	13.0	13.0	12.8	12.8	12.8	12.8

* June 2020 pesos

Source: BBVA Research with Banco de México, Conasami, INEGI, IMSS, CNBV data

5. Special topics included in previous issues

First Half 2020

The mortgage burden is low, but should increase in 2020
FIBRAs and the real estate market in Mexico
Mortgage sector contractions in Mexico

First Half 2019

Real estate services and their economic determining factors
High concentration of demand for bank mortgage credit

Second half 2018

Construction performance below its potential
An approach to the prices faced by builders
Population, lag and employment; their contribution to the state distribution of the mortgage market

First Half 2018

The significance of business expectations in construction
Low mortgage debt of households

First Half 2017

The determining factors of the housing supply in Mexico
Infrastructure still awaits reform effect

Second Half 2016

Commercial building construction and its cycle of appreciation
Rising house prices due to increased costs

First Half 2016

The evolution of housing prices in regional clusters in Mexico
Methodology to assess the spatial dependence of housing prices
Mortgage essential in housing demand
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The significance of consumer expectations in mortgage lending
The Infonavit 2015-19 Financial Plan. Financial soundness and a greater amount of lending are key features

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This report has been prepared by:

Chief Economist

Carlos Serrano
carlos.serrano@bbva.com

Fernando Balbuena
fernando.balbuena@bbva.com

Samuel Vázquez
samuel.vazquez@bbva.com

CONTACT DETAILS:

BBVA Research – BBVA: Paseo de la Reforma 510, Colonia Juárez, 06600 Mexico City, Mexico
bbvaresearch@bbva.com www.bbvaresearch.com

