BANCO DE MÉXICO

Quarterly Report

January – March 2018

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QUARTERLY REPORT

This report analyzes recent developments in economic activity, inflation and different economic indicators in Mexico, as well as the monetary policy implementation in the quarter January – March 2018, and, in general, the activities of Banco de México over the referred period, in the context of the Mexican and international economic environment, in compliance with Article 51, section II of Banco de México's Law.

FOREWARNING

This text is provided for readers' convenience only. The translation from the official Spanish version was made by Banco de México's staff. Discrepancies may arise between the original document in Spanish and its English translation. It should be noted that the original Spanish version is the only official document.

Unless otherwise stated, this document has been prepared using data available as of May 28, 2018. Figures are preliminary and subject to changes.

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1. Introduction

After having closed 2017 at its highest level since May 2001, during the first months of 2018 annual headline inflation fell significantly, consistent with the expectation presented by this Central Institute in the previous Quarterly Report. Indeed, annual headline inflation decreased from 6.77% to 4.46% between December 2017 and the first fortnight of May 2018. This performance reflects the monetary policy actions implemented by Banco de México, which have contributed to prevent second-round effects on the price formation process of the economy. Thus, medium- and long-term inflation expectations remained anchored, although above 3%, and the Mexican peso adjusted in an orderly manner in light of an uncertain environment, which has included tighter external financing to the economy over the last three years. In this respect, monetary policy has operated, among other channels, through its effect on interest rate spreads between Mexico and the U.S., allowing the orderly adjustment in the exchange rate market through the risk-taking channel. At the beginning of the year, the exchange rate appreciated in response to monetary policy actions, to the weakness of the U.S. dollar in that period and to a perception of improvement in the NAFTA negotiations. However, during recent weeks the Mexican peso weakened, which was associated to higher external interest rates and the U.S. dollar strengthening, as well as the uncertainty caused by the NAFTA renegotiations and the presidential elections in Mexico.

The decrease in headline inflation in the reported period also reflects the fading of the effects on annual inflation resulting from higher energy prices in January 2017. Both core inflation and, especially, the growth rate of merchandise prices, and non-core inflation have shown a clear downward trend this year so far.

In this context, during the period covered by this Report, Banco de México focused on maintaining a monetary stance that would preserve the anchoring of inflation expectations and would reinforce the downside trend of annual headline inflation towards its target in the forecast horizon. Indeed, in view of the deteriorated inflation outlook in late 2017 and considering the estimated tighter monetary conditions in the U.S. economy, in the February 2018 policy meeting the Governing Board decided to recalibrate the monetary policy stance by raising the target for the Overnight Interbank Interest Rate by 25 basis points to a level of 7.50%. Subsequently, in the April and May policy meetings, the Governing Board decided to maintain the target rate unchanged, considering that the adopted monetary policy stance was consistent with the declining trend of annual headline inflation towards its target in the forecast horizon.

Banco de México's monetary policy stance during this period was determined in a global environment of greater uncertainty. Indeed, although in the first quarter of the year the world economic expansion remained solid and broad-based, and for the rest of 2018 and 2019 solid growth of the economic activity is still anticipated, risks to the global economy have increased in the medium and long terms. Among these risks, higher volatility in international financial markets stands out, given the possible additional inflationary surprises across some advanced economies, especially in the U.S., the escalation of protectionist measures and the materialization of certain geopolitical events. Some of these risks have started to be recently reflected in greater volatility in financial markets, higher interest rates, the appreciation of the U.S. dollar against the main currencies, a lower appetite for risk, a moderation in capital flows to emerging economies and a considerable depreciation in most currencies of these economies, which are facing increasingly tighter financing conditions.

Meanwhile, in the first quarter of 2018 domestic economic activity maintained a more generalized recovery, which stands in contrast with the deceleration over the first three quarters of 2017 and with the weakness in certain aggregate demand components up to the third quarter of that year, especially in investment. Going forward, following the rebound in the first quarter of 2018, the Mexican economy is expected to grow at a rate close to its potential, reflecting a gradual growth of private investment, greater spending on certain public infrastructure projects and the expansion of exports as a result of higher dynamism in the U.S. industrial production. Thus, slack conditions in the economy are expected to remain tight, although no additional

tightening that could strongly affect inflation is anticipated.

The higher dynamism of the economy in the first quarter of 2018 seems to be transitory. Therefore, in the horizon of the monetary policy impact, the balance of risks to the economic growth remains biased to the downside, given the persistent uncertainty in the economy, in particular, the possible impact of a change in trade conditions with the U.S. and of other domestic factors.

The decline in annual headline inflation in the first months of 2018 is consistent with the forecast for this variable presented by Banco de México in the previous Quarterly Report. In the future, based on available information and considering the current monetary stance, the evolution of inflation in the horizon in which monetary policy operates is estimated to be similar to that published in the last Quarterly Report. That is, the forecast for headline inflation presented in this Report does not imply considerable changes with respect to those published in the last Report. However, reflecting the recent evolution of the different CPI components and of the different inflation determinants, a relatively lower trajectory of core inflation is anticipated, which is offset by slightly higher levels of non-core inflation, as a result of gasoline and LP gas prices that are higher than the estimate published in the previous forecast. In this sense, annual headline inflation is expected to continue subsiding, approach the 3.0% target throughout the year and stay close to that target in 2019. These forecasts consider an orderly exchange rate evolution, the absence of labor market-related pressures and that non-core inflation will continue declining in the remainder of 2018 at the anticipated pace. The balance of risks for inflation vis-à-vis the expected trajectory maintains an upward bias, in an environment of a high degree of uncertainty.

To guide its monetary policy actions, the Governing Board will closely follow the inflation evolution with respect to its forecast trajectory, considering the adopted monetary policy stance and the horizon at which it operates, as well as the available information on all inflation determinants and medium- and long-term inflation expectations, including the balance of risks. In particular, the Board will maintain a prudent monetary policy stance and will continue to closely monitor the potential pass-through of exchange rate fluctuations to prices, the monetary policy stance relative to that of the U.S. and the evolution of slack conditions in the economy. In the face of the factors that, by their nature, may involve risks to inflation and inflation expectations, if necessary the monetary policy will act in a timely and firm manner to achieve its convergence to the 3.0% target and to strengthen the anchoring of medium- and long-term inflation expectations, for these to reach the said target.

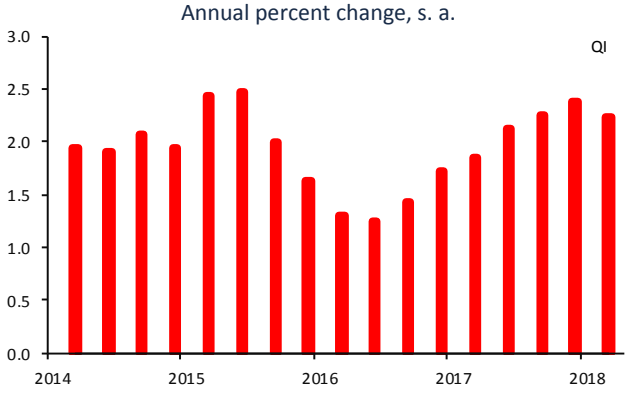
In accordance with the above, it is relevant to stress that Banco de México's transparency is key to generate confidence and credibility over this Central Bank's actions to comply with its constitutional mandate to procure price stability. Consistent with the above and in order to continue with the implementation of better practices of the monetary policy communication strategy, in addition to the adjustments to the manner of presenting inflation forecasts and the incorporation of a comprehensive analysis of the cyclical conditions of the economy starting from the previous Report, on April 30, 2018 the Governing Board announced a number of modifications to its communication strategy: i) Minutes of the Monetary Policy Decisions will include the voters' identity, and, in case of dissent over the vote, an explanation of the reasons will be included; ii) transcripts of Board of Governors' meetings, in which monetary policy decisions are made will be released to the public on Banco de México's web page three years after the respective meeting (a shorter period as compared to other central banks); iii) the Press Release of the Announcement of Monetary Policy Decisions, as well as the corresponding Minutes will be published in Spanish and English simultaneously on the corresponding dates; and iv) public speeches and presentations of the Governing Board members will be published on Banco de México's web page. These modifications will contribute to greater transparency and accountability among the Governing Board, both as a collegiate body and on the personal level. Similarly, they will provide the public with more information regarding the factors considered during monetary policy decisions, and will expand the scope of the messages contained in different communication instruments.

2. Economic and Financial Environment

2.1. External Conditions

As a reflection of the continuous recovery of investment and international trade, the world economy maintained a generalized upswing during the first quarter of 2018, although it was at a more moderate pace than in the fourth quarter of 2017.[1] The more moderate growth rate in the first quarter, especially in some of the main advanced economies (Chart 1) seems to have largely stemmed from transitory factors. In this environment, the reduced slack in advanced economies has led to gradual wage increments, increases in inflation and inflation expectations in some of these economies.

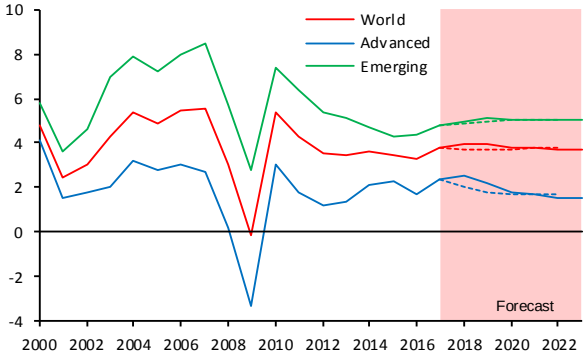
Chart 1
Growth in Advanced Economies (G7)
Real GDP
Annual percent change, s. a.



s. a. / Seasonally adjusted figures.
Note: G7 is formed by the U.S., Japan, Germany, France, Italy, Canada and the U.S. The data on Canada for the first quarter is an estimate. It refers to the average annual change weighted by the purchasing power parity.
Source: Prepared by Banco de México with data from Haver Analytics, J. P. Morgan and IMF.

The outlook for the rest of 2018 and 2019 continues pointing to the recovery of the world economic activity, supported by a further improvement in the labor markets, higher confidence among economic agents and the effects of a greater fiscal stimulus in the U.S. (Chart 2). Nevertheless, for the medium and long terms, uncertainty and risks to growth, both cyclical and potential, and to financial stability have increased. The risks are: i) the possibility of higher volatility in international financial markets, given likely inflation shocks in a number of advanced economies, especially in the U.S.; ii) a further escalation of protectionist trade measures, both in trade and investment; and iii) the materialization of certain geopolitical events. Throughout the analyzed period, especially over the last weeks, this perception of greater risks has been reflected in higher volatility in international financial markets, and, especially, it affected most emerging economies' currencies, which have faced tighter financing conditions.

Chart 2
World Economic Activity
Growth Forecast of Global Real GDP
Annual percent change



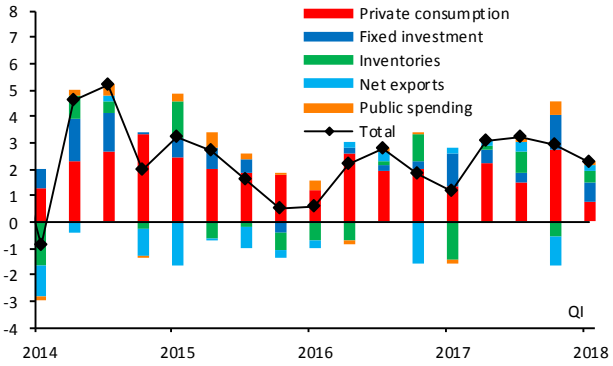
Note: Dotted lines refer to October 2017 forecasts.
Source: IMF, WEO October 2017 and April 2018.

2.1.1. World Economic Activity

The U.S. economy expanded at an annualized rate of 2.3% in the first quarter of the year, which compares to 2.9% in the previous one. The GDP growth largely moderated due to the marked slowdown in spending on private consumption. Among other factors, it reflected the delay in the tax return associated to the fiscal reform. In contrast, non-residential fixed investment grew at a solid pace, supported by the rebound in investment in structures, which offset the deceleration of equipment investment. Meanwhile, the accumulation of inventories and net exports positively influenced the GDP growth (Chart 3). The economic activity indicators and high consumer and businesses' confidence point to a rebound in production in the second quarter.

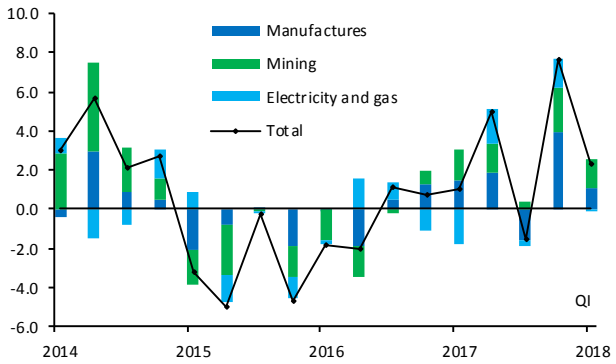
[1] Considering the average annual change weighted by the relative weight of each economy in the global GDP adjusted by the purchasing power parity.

Chart 3
Economic Activity in the U.S.
Real GDP and Components
Annualized percent change and contribution in percentage points, s. a.



s. a. / Seasonally adjusted figures.
Source: BEA.

Chart 4
Industrial Activity in the U.S.
Industrial Production and Components
Annualized percent change and contribution in percentage points, s. a.



s. a. / Seasonally adjusted figures.
Source: Federal Reserve.

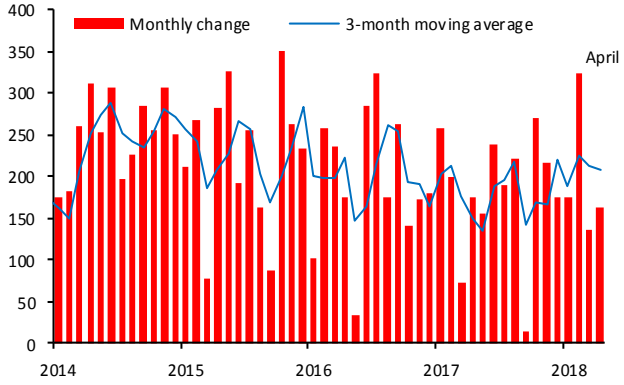
Following a strong growth at an annualized rate of 7.7% in the U.S. industrial activity in the fourth quarter of 2017, principally thanks to the reconstruction efforts in the aftermath of the hurricanes Harvey and Irma, the industrial production grew 2.3% in the first quarter of the year, as a result, among other factors, of the drop in demand for electricity given an unusually warm weather (Chart 4). However, by the end of the first quarter and in April, the dynamism of industrial production further increased, in particular in mining, due to the rebound in oil and gas extraction activities derived from a hike in their prices, from the electricity and gas supply as a result of the normalization of temperature, and from the manufacturing production, in particular of capital goods.

The dynamism of the U.S. economy continued to be reflected in the declining slack in its labor market. Indeed, non-farm payroll expanded, on average, by 200 thousand jobs a month over the first four months of the year, which was higher than 177 thousand jobs created in the same period of 2017 and above the required increment to absorb the increase in the labor force (Chart 5a). Thus, the unemployment rate grew by 3.9%, its lowest level since 2000. Furthermore, other indicators, such as the difficulty to fill vacancies and fluctuations in hiring and resignation rates reached the pre-crisis levels. However, the labor participation rate has remained relatively stable over the last months, despite the demographic trends in the U.S., which implied that a higher number of workers could join the labor market, although this margin seems to be declining.[2] In this environment, the wage growth rate increased in the reported period (Chart 5b). Nevertheless, there is still uncertainty over how much these lower slack conditions in the labor market could be reflected in significant wage pressures and, therefore, in higher inflation. This derives from the fact that recently, and especially starting from the recovery after the global financial crisis, these indicators have been at particularly low levels, which possibly implied a flattening of the Phillips curve in view of the greater trade openness and the technological change. If the said openness of the economy happens to reverse, it

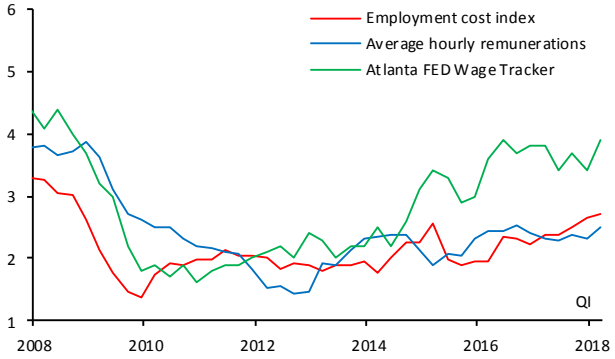
[2] The trend of the labor participation rate largely responds to structural factors, such as demographic changes, public health aspects and education, among others.

could lead to new inflation pressures, as it could make this curve steeper (see Box 1).

Chart 5
Labor Market in the U.S.
a) Non-farm Payroll
In thousands of jobs, s. a.



b) Wage Indicators
Annual percent change, s. a.

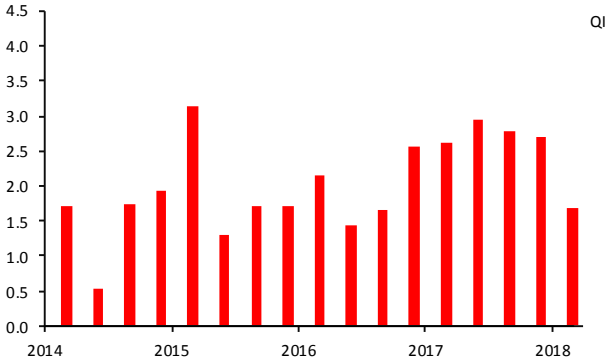


s. a. / Seasonally adjusted figures.
Source: Federal Reserve Bank of Atlanta and BLS.

For the remainder of 2018 and 2019, the consensus of analysts still anticipate a solid expansion of the U.S. economy, in part supported by the fiscal impulse and households and businesses' confidence that remain high. However, the growth outlook for this economy in the medium term could be affected insofar as certain recently approved tax provisions expire and greater fiscal restraint is observed.[3] As mentioned above, risks associated with the implementation of protectionist measures persist as well, which could reduce the potential growth by affecting productivity and increasing input costs, in addition to the effects that these measures could have on consumption and investment.

In the Eurozone, the growth rate of the economic activity moderated during the first quarter of 2018, as it expanded at an annualized rate of 1.6% after growing 2.7% in the last quarter of 2017 (Chart 6). This partly derived from strong snowfalls that struck northern Europe, strikes and weakness in some demand indicators. Meanwhile, the industrial production declined at an annualized rate of 2.4% in the first quarter of 2018. In this environment, the unemployment rate dropped to its lowest level since December 2008, marked 8.5% in March, while the labor shortage increased and the growth rate of wages accelerated. The economic activity in the region is expected to recover in the second quarter, supported by high households and businesses' confidence, as well as by credit conditions that remain accommodative.

Chart 6
Economic Activity in the Eurozone
Real GDP
Annualized percent change, s. a.

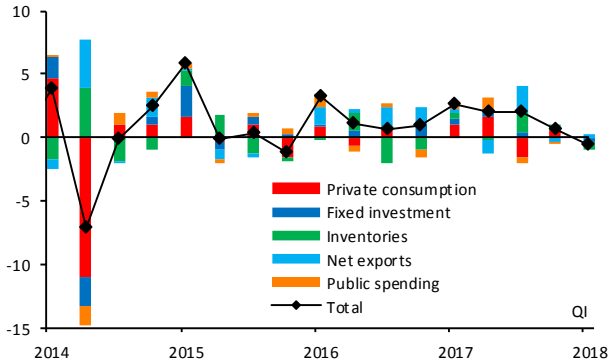


s. a. / Seasonally adjusted figures.
Source: Eurostat.

The GDP of Japan contracted at an annualized rate of 0.6% during the first quarter of the year, reflecting the drop in fixed and residential investment and the stagnation of private consumption, as it was affected by winter storms at the beginning of the year (Chart 7). Nevertheless, the unemployment rate continued to decline and wages increased moderately. Thus, for the second quarter of the year, the economic activity is anticipated to recover driven by higher labor incomes and corporate revenues, as well as a rebound in net exports.

[3] In this regard, there are different viewpoints on the possible impact of a higher fiscal deficit and public debt on the potential growth in the future, given the U.S. position as an issuer of a currency that is the reserve asset.

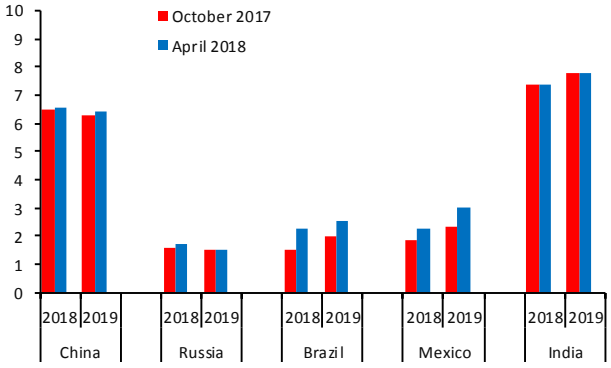
Chart 7
Economic Activity in Japan
Real GDP and Components
Annualized percent change and contribution in percentage points, s. a.



s. a. / Seasonally adjusted figures.
Source: The Cabinet Office.

Emerging economies continued to recover during the first quarter of the year, and the prospective indicators suggest that this trend will persist during the rest of 2018 (Chart 8). However, although commodity-exporting economies could still benefit from higher prices of these products, the countries with high indebtedness levels and those in need of external funding could be affected by stricter and more volatile international financial conditions. In addition, the growth rate in the Asian region is expected to moderate over the next years, as a result of the policies encouraged by China to procure a more moderate and sustained growth. Likewise, the high indebtedness level and the persistent uncertainty over the future economic relations with the U.S. could affect China's growth outlook. Still, in the analyzed period, the indicators of domestic and external demand in China still reflected strong dynamism.

Chart 8
Economic Activity in Emerging Economies
GDP Growth Forecast in Selected Economies
Annual percent change



Source: IMF, WEO October 2017 and January 2018.

2.1.2. Commodity Prices

The environment of sustained growth of the world economy continued to be perceived in a higher demand for commodities, which, along with supply factors, such as the introduction of economic sanctions against different producer countries, generated price hikes. In this respect, the lower oil production in Venezuela, the risk of restrictions onto crude oil exports from Iran and the escalation of the military conflict in the region, in view of the recent U.S. withdrawal from the nuclear agreement and the relocation of the Israel embassy to Jerusalem pushed crude oil prices up (Chart 9a). Industrial metal prices, in particular aluminum and nickel, went up, in part, due to the concern over the impact that the U.S. sanctions on Russia could have on their global supply (Chart 9b). Finally, grain prices (corn and wheat) exhibited progress in light of the unusually warm weather conditions that prevailed in the U.S. (Chart 9c).

Box 1. The Phillips Curve at the Center of Global Debate

1. Introduction

The cyclical recovery after the global financial crisis (GFC) has been characterized by a clear trend towards lower slackness conditions in the main advanced economies, in particular in labor markets. However, over a large part of this process, the lower slack has not been reflected in considerable wage pressures, and, therefore, in higher inflation.

Thus, failure of wages and inflation to respond to lower slack conditions suggests a possibility that the Phillips Curve has flattened.[1] According to this line of thought, this can be mainly attributed to the structural factors, such as the emergence of global value chains in the world integration process and the technological change. In particular, it is argued that the international market gives access to cheaper intermediate goods, which lowers the margin for producers and workers to raise their prices and wages at the local market (Auer, Borio and Filardo, 2017). Thus, an economy can import certain intermediate goods produced by another country's labor before facing wage pressures, even if its own market is in tight conditions. Similarly, better technology and automating processes that used to be labor-intensive have generated significant savings in production costs, along with an additional "competition" factor that decreases the bargaining power of workers. Consistent with the above, globalization and the technological progress directly affect inflation, via lower costs of inputs and goods, and indirectly, via the flattening of the Phillips Curve.

In contrast, another line of argument indicates that low inflation that has been observed after the GFC is accounted for by cyclical or transitory factors. In particular, one of these factors is high slack during the first part of this period. It is argued that, despite a slight uncertainty as to which factors have pushed inflation downwards, they are possibly transitory, and some of them are related to the drop in commodity prices (FED, 2018). In line with this stance, inflation will go up once slackness decreases in the economy and the effect of other transitory factors fade. Finally, as an argument against the global factors, it is stated that prices of tradable goods behaved similarly before and after the crisis (IMF, WEO April 2018).

To sum up, on the one hand, it is argued that the main determinants that explain low inflation are global and structural. In contrast, another point of view is that they are essentially transitory factors, reason why inflation will increase once their effect fades. This discussion is highly relevant for the U.S. case, due to the possible risks of the recently approved fiscal impulse onto inflation, in a context of lower slack conditions and the possibility of the implementation of protectionist measures on trade and investment, that may reverse the globalization process and the diffusion of technological innovations, that is, that the negative impact of globalization on the Phillips Curve slope and possibly on inflation reverses. Below, a model is presented seeking to illustrate the risks to inflation in the case of the U.S. It should be noted that the used model only considers one of the channels by which global factors impact inflation: the one related to intermediate goods and inputs used in global production chains. Other elements that can also affect inflation, such as the imposition of duties, are not explicitly considered in the model.

2. Estimates

This box uses a dynamic model composed by a system of two Phillips curves, one for inflation of goods and services, and the other one for inflation of wages, and an equation to determine the GDP gap. The goal is to research for the case of the U.S. the relative importance of a number of structural factors, induding global and transitory factors on the inflation dynamics. In particular, three estimated equations are summarized as follows:

$$\pi_t = c_\pi + \sum_{i=1}^{4} \gamma_{\pi,i}\, \pi_{t-i} + \sum_{i=0}^{4} \theta_{\pi,i} \pi^w_{t-i} + \sum_{i=0}^{4} \kappa_{\pi,i} \hat{y}_{t-i} + \sum_{i=0}^{4} \lambda_{\pi,i} \hat{A}_{t-i} + \varepsilon_{\pi,t},$$

$$\pi^w_t = c_w + \sum_{i=1}^{4} \gamma_{w,i}\, \pi^w_{t-i} + \sum_{i=0}^{4} \theta_{w,i} \pi_{t-i} + \sum_{i=0}^{4} \kappa_{w,i} \hat{y}_{t-i} + \lambda_w A_{t-1} + \delta_w \omega_{t-1} + \sum_{i=0}^{4} \beta_{w,i} \omega_{t-i} \hat{y}_{t-i} + \varepsilon_{w,t},$$

$$\Delta\hat{y}_t = c_y + \sum_i \varphi_i \Delta def_{t-i} - \sigma\Delta(i_{t-1} - \pi_{t-1}) + \sum_i \eta_i \Delta\hat{y}^w_{t-i} + \varepsilon_{y,t}$$

Where:

π_t = Annual change of personal consumption expenditure deflator,
π^w_t = Annual change of the hourly remuneration in the non-agricultural sector,
$\hat{y}_t$ = Estimate of the GDP gap,
ω_t = Share of imported intermediate goods with respect to GDP (proxy of trade openness),
ΔA_t = Change in the ratio of the average monthly labor income of employments listed as at high risk of being replaced by automatized processes, with respect to low-risk employments (proxy of the automatization inverse), [2]
def_t = Fiscal balance with respect to GDP (negative corresponds to deficit),
i_t = Federal funds interest rate
$\Delta\hat{y}^w_{t-i}$ = Estimate of the world GDP gap (excluding the U.S.), and
ε_t = Error terms.

[1] The Phillips Curve is an equation that relates the unemployment rate, or another measure of economic activity, with a measure of wage or prices inflation. Traditionally, it has been believed that there is an inverse relation between the unemployment rate and inflation.

[2] This variable was estimated with data from the population survey of the U.S. Census Bureau and from Frey and Osborne (2017) occupations classification.

Equations (1a) and (1b) are Phillips curves of prices and salaries, while equation (2) refers to the determination of the GDP gap. Note that the inclusion of variable A_t and its lags in the first two equations allows to estimate the impact of the technological change, represented by the possible effect of the automatization on salaries and prices. In turn, variable ω_t and its lags in equation (1b) allow to estimate the impact of the foreign cheaper inputs on the inflation of prices and salaries. In addition, via the product of ω_t and $\hat{y}_t$ and their lags, it is possible to estimate the degree in which these global variables have caused the flattening of the Phillips Curve. Finally, equation (2) models the output gap as dependent on the fiscal deficit, which will allow to estimate the response of inflation to the fiscal impulse. This equation also includes the world output gap, constructed using the information from the data base of the OECD publication "Economic Outlook", to capture the effect of global conditions on the cyclical position of the U.S.

Parameters in equations (1a) and (1b) were estimated together using maximum likelihood methods, while parameters in equation (2) were estimated using ordinary least squares. The fact that the first two equations are estimated as a system allows to establish the effect, for example, of automatization on inflation not only directly but also via its impact on wage inflation. That is, the joint estimation of equations (1a) and (1b) allows the model to show the existing interactions among some of the considered variables.

Similarly, the general-to-specific procedure was used in the estimation, which implied starting in each case with a high number of lags, which were eliminated when no longer statistically significant. Thus, the use of a dynamic model allows to consider the possibility that, for example, a technological improvement may lower inflation not only at the moment when it emerges, but also via a lagged impact over time.

3. Results

The estimates were realized at a quarterly frequency (1998-2017). The results can be summarized as follows:

$$\pi_t = \underset{(1.78)}{0.31} + \underset{(8.5)}{0.78}\pi_{t-1} + \underset{(1.32)}{0.059}\pi^w_{t-2} - \underset{(-2.08)}{0.28}\hat{y}_{t-1} + \underset{(2.36)}{0.32}\hat{y}_t + \underset{(0.90)}{0.34}\Delta A_{t-2} - \underset{(-0.89)}{0.32}\Delta A_{t-4} + \varepsilon_{\pi,t}, \quad (1a)$$

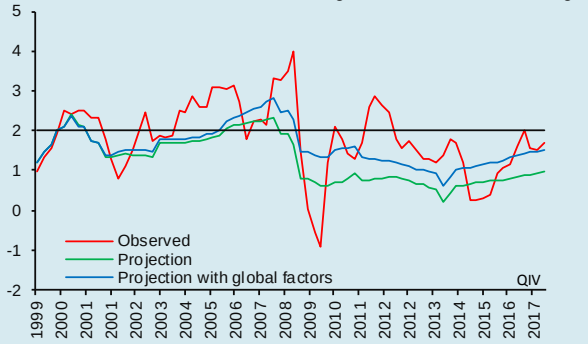
$$\pi^w_t = \underset{(3.72)}{3.03} + \underset{(2.46)}{0.26}\pi^w_{t-1} + \underset{(2.41)}{0.21}\pi^w_{t-2} + \underset{(4.24)}{0.67}\pi_{t-4} + \underset{(3.54)}{0.57}\hat{y}_{t-1} + \underset{(0.94)}{0.15}\Delta A_{t-2} - \underset{(-3.08)}{0.58}\omega_{t-4} - \underset{(-2.76)}{0.10}\omega_{t-2}\hat{y}_{t-2} + \varepsilon_{w,t}, \quad (1b)$$

$$\Delta\hat{y}_t = \underset{(1.23)}{0.06} - \underset{(-2.38)}{0.06}\Delta def_{t-4} - \underset{(-1.83)}{0.04}(i_{t-1} - \pi_{t-1}) + \underset{(7.64)}{0.37}\Delta\hat{y}^w_{t-1} + \varepsilon_{y,t}. \quad (2)$$

Note in equation (1b) that the coefficient associated to $\omega_{t-2}\hat{y}_{t-2}$ is negative, which suggests that the global impact captured by variable ω has indeed flattened the wage Phillips curve, so this impact has lowered the effect of the output gap on wage inflation, and, indirectly, on price inflation. Similarly, automatization seems to negatively affect price inflation directly and indirectly, via its impact on wage inflation. On the other hand, results also suggest that transitory factors, such as the output gap, affect both price inflation and wage inflation. That is, the results are congruent with some of the elements of the stances mentioned in the introduction.

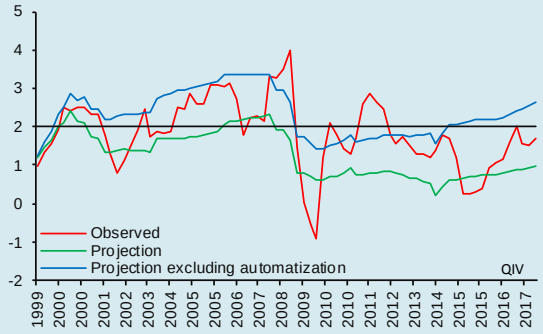
Considering these results, Charts 1 and 2 present exercises that illustrate the total impact on inflation generated by the variables of global factors and automatization. In particular, Chart 1 shows two inflation trajectories, the one obtained using the observed values of ω (global effects) and the one obtained assuming that this variable does not change after 1999, that is if the inflow of imported inputs in the U.S. had not been greater. Chart 2 repeats the exercise for the case of variable A (the technological change). The results suggest that both global factors and automatization contributed to lowering inflation in the U.S. during the analyzed period.

Chart 1
Inflation Forecast within the Sample
Base scenario and scenario with constant global factors, annual change



Source: Prepared by Banco de México with data from the Federal Reserve Bank of St. Louis, the U.S. Census Bureau, Frey and Osborne (2017), OECD and IMF.

Chart 2
Inflation Forecast within the Sample
Base scenario and scenario excluding automatization, annual change



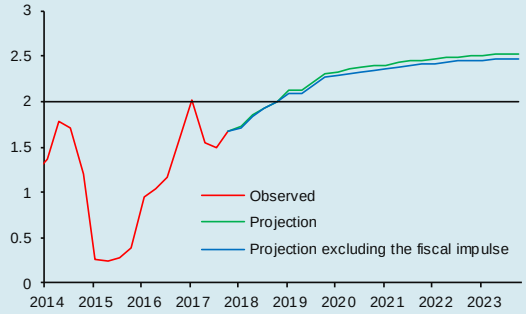
Source: Prepared by Banco de México with data from the Federal Reserve Bank of St. Louis, the U.S. Census Bureau, Frey and Osborne (2017), OECD and IMF.

4. Out-of-sample Projections and Risks to Global Financial Stability

The obtained econometric results are used to estimate the impact on inflation in the U.S. caused by the fiscal impulse or the possibility that the effect of global factors is smaller (that is, that the Phillips Curve steepens again), due to the surge in protectionist measures. As mentioned above, the used model only considers one of the channels through which global factors affect inflation. Other elements that can also affect it are not considered explicitly. Chart 3 shows the inflation forecast that would be obtained including and excluding the impact of the fiscal impulse. Chart 4 repeats the exercise for the case of global factors. The results suggest that both the greater fiscal impulse and a scenario in which a protectionist policy is adopted could raise inflation in the U.S.

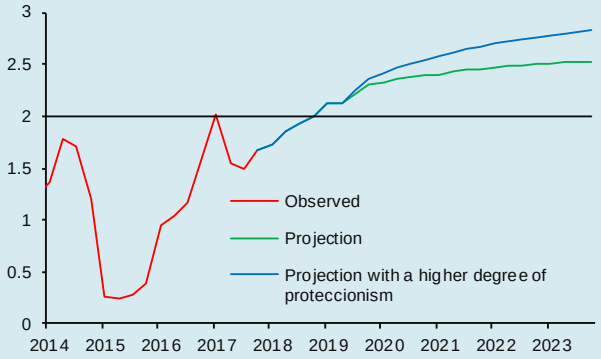
Thus, the expansionary fiscal policy and greater protectionism are risk factors that could lead to inflation surprises in the U.S., and, therefore, to higher unanticipated interest rates, prompting higher volatility in international financial markets.

Chart 3
Out-of-sample Inflation Projection
Base scenario and scenario excluding the fiscal impulse, annual change



Note: Charts should not be interpreted as inflation forecasts in the U.S., but rather as illustrative exercises to evaluate the possible impact of the fiscal expansion and greater protectionism on inflation in the U.S. That is regardless of the fact that its level also depends on other factors.
Source: Prepared by Banco de México with data from the Federal Reserve Bank of St. Louis, the U.S. Census Bureau, BEA, US Congressional Budget Office CBO, Frey and Osborne (2017), OECD and IMF.

Chart 4
Out-of-sample Inflation Projection
Base scenario and scenario with higher protectionism, annual change



Note: Charts should not be interpreted as inflation forecasts in the U.S., but rather as illustrative exercises to evaluate the possible impact of the fiscal expansion and greater protectionism on inflation in the U.S. That is regardless of the fact that its level also depends on other factors.
Source: Prepared by Banco de México with data from the Federal Reserve Bank of St. Louis, the U.S. Census Bureau, BEA, US Congressional Budget Office CBO, Frey and Osborne (2017), OECD and IMF.

5. Final Remarks

The results of this exercise show that, indeed, globalization and automatization have negatively affected the inflation dynamics. The results also allow to derive the projections of the inflation dynamics that are consistent with the estimated model. These projections suggest that the fiscal impulse approved in the U.S. and the potential implementation of the protectionist measures could exercise upward pressure on the inflation dynamics, generating a series of risks to global financial stability.

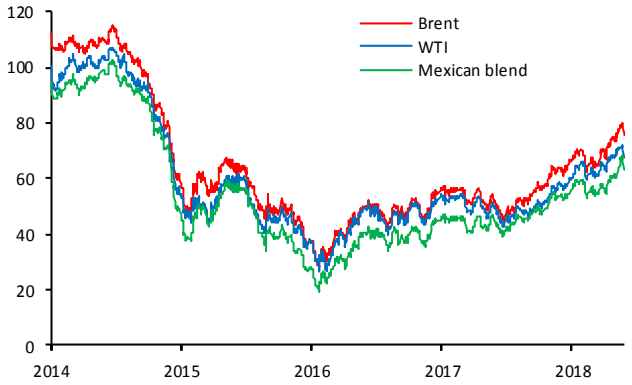
References

Auer, R. A., Borio, C. E., and Filardo, A. J. (2017). "The globalisation of inflation: the growing importance of global value chains." BIS Working Papers No.602.

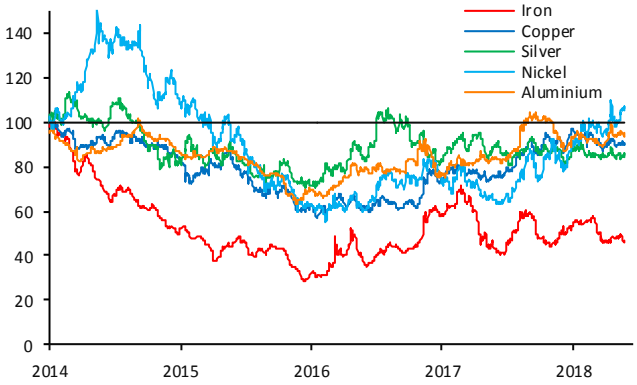
Frey, C. B., and Osborne, M. A. (2017). "The future of employment: how susceptible are jobs to computerisation?" Technological Forecasting and Social Change, 114, 254-280.

International Monetary Fund (April, 2018). World Economic Outlook: Cyclical Upswing, Structural Change, Washington, DC.

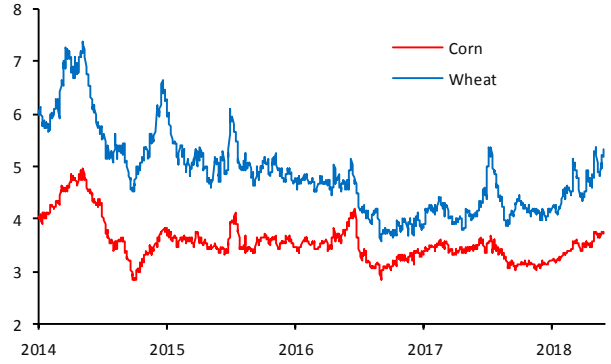
Chart 9
International Commodity Prices
a) Crude Oil
USD/barrel



b) Prices of Selected Metals
Index 01/01/2014=100



c) Prices of Selected Grains
USD/bushel

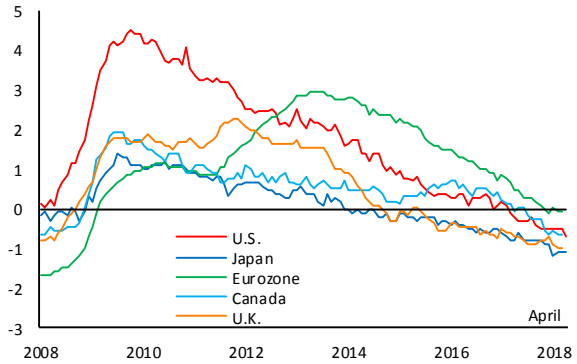


Source: Bloomberg.

2.1.3. Inflation Trends Abroad

A number of advanced economies exhibited a recovery in wages prompted by a lower slack in their respective labor markets, which, along with higher energy prices starting from the second half of 2017, contributed to a gradual increase in inflation and inflation expectations (Chart 10).

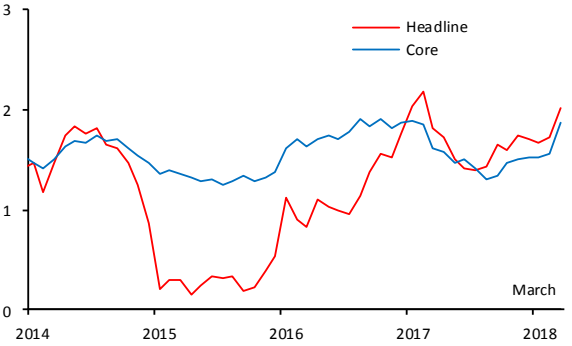
Chart 10
Slack Conditions in the Labor Market in Advanced Economies
Unemployment Gap
In percentage points



Source: Prepared by Banco de México with data from CBO, OECD, Economic Outlook, November 2017 and National Statistical Offices.

In particular, in the U.S., inflation continued to increase during the analyzed period, which reflected a lower slack in the economy, the rebound in energy prices that had been observed since mid-2017, and, recently, the fading of the impact generated by a drop in telecom prices at the beginning of last year. Thus, the personal consumption deflator attained the Federal Reserve 2% target in March, after having lied at 1.7% in December, while the core component increased from 1.5% to 1.9% in the said period (Chart 11).

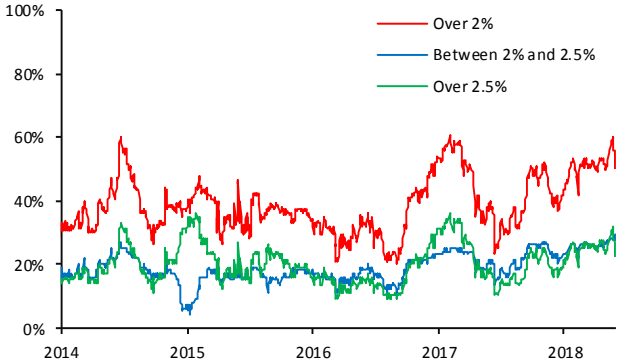
Chart 11
Inflation in the U.S.
Personal Consumption Deflator
Annual percent change, s. a.



s. a. / Seasonally adjusted figures.
Source: BEA.

In addition, other indicators, such as the producer price indices and import indices kept reflecting higher upward pressures, which could eventually pass through to consumer inflation. In addition, inflation expectations derived from financial instruments have approached the Federal Reserve 2% target, although they imply a higher risk that inflation could exceed this target over the following months (Chart 12).

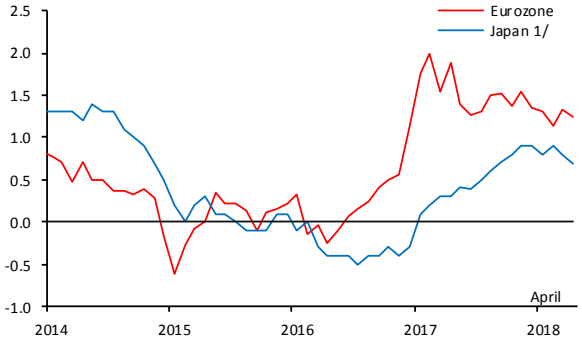
Chart 12
Inflation Expectations in the U.S.
Distribution of 2-year Inflation Expectations Implicit in Financial Instruments
Probability in percent



Note: Expectations obtained from swap contracts in which one counterparty agrees to pay a fixed rate in exchange for receiving a referenced payment at an inflation rate over a specified period.
Source: Prepared by Banco de México with data from Bloomberg.

Both in Japan and in the Eurozone inflation has remained below the respective central banks' targets. In addition, inflation has been interrupted in both cases by its gradual upward trend caused by some idiosyncratic factors (Chart 13). In the Eurozone, headline inflation went down from 1.4% in December to 1.2% in April, despite higher prices of food and energy products, while the core indicator shifted from 0.9% to 0.7%, as a result of the effect of the month change of the Holy Week between 2017 and 2018 onto some items in the price index. In Japan, consumer inflation subsided from 0.9% to 0.7% in annual terms in the referred period due to the lagged effect of the drop in energy prices. The measurement excluding fresh foods and energy products went up from 0.3% to 0.4% between December and April, a rebound which is in part attributed to the fading out of the effect of significant discounts on cell phones at the beginning of last year.

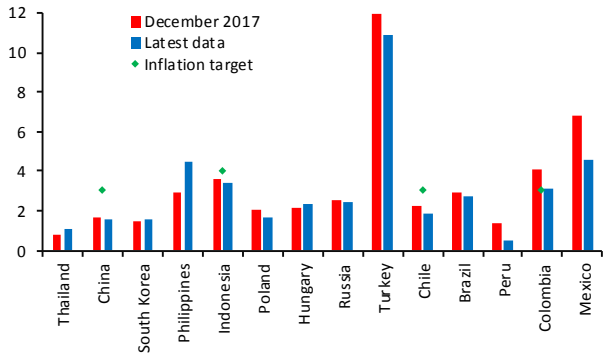
Chart 13
Inflation in the Eurozone and Japan
Annual percent change



1/ Excludes the effect of the higher consumption tax.
Source: Eurostat and Japan Statistics Bureau.

A number of emerging economies, including those whose cyclical position was more affected by drops in commodity prices several years ago, tended to maintain a relatively low inflation, in many cases below the targets of the respective central banks (Chart 14). However, in the economies such as Argentina, Turkey, Ukraine, among others, it remained above its target, largely due to idiosyncratic factors.

Chart 14
Inflation in Emerging Economies
Annual Headline Inflation
Percent



Source: Haver Analytics.

2.1.4. International Monetary Policy, and Financial Markets

In the period covered in this Report, some of the central banks of developed economies continued to shift at different rates towards a more neutral monetary policy stance, in line with each country's position relative to its economic cycle and inflation pressures each of them face. Although this process is expected to continue at a gradual pace, there is greater uncertainty over the inflation evolution in some of these economies, especially in the U.S. Thus, a sudden inflation hike in the U.S. could lead to higher-than-expected interest rates and could prompt higher volatility in international financial markets.

As anticipated, in its May meeting the Federal Reserve maintained its federal funds rate within the range of 1.5% and 1.75%, after increasing it by 25 basis points in March. In its last projections, this Institute adjusted its growth forecast for 2018 and 2019 upwards, in light of the expected impact of the fiscal impulse, while it lowered its expectations for the unemployment rate, suggesting that it would lie

below its estimate for the long term. Although the Federal Reserve confirmed its projection of gradual increments for this target range, it observed a shift towards higher rates in its forecasts for subsequent years. In its last press release, the Federal Open Market Committee noted that inflation approached its 2% symmetrical goal, and expected inflation to fluctuate around this level in the medium term. In addition, it its last Minute it was stressed that most Federal Open Market Committee members considered it necessary to increase its reference rate again in the near future.

In its last two meetings, the European Central Bank (ECB) left unchanged its monetary policy stance and reiterated that the benchmark interest rates will remain unchanged after the asset purchase program has been concluded. The ECB noted that this program will persist at least until September and that the moderation of the economic activity in the first quarter of the year could mainly derive from transitory factors. In addition, it indicated that, although risks are balanced, the external ones have increased, in particular those relative to the implementation of protectionist policies.

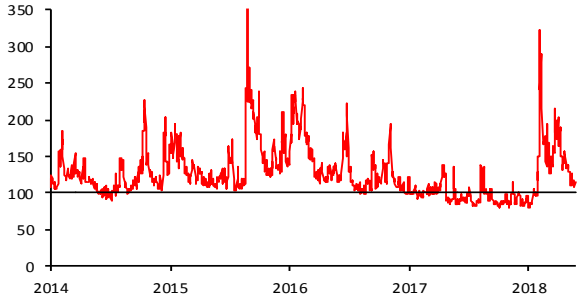
In its last meetings, the Bank of Japan maintained unchanged its short-term deposit rate, the target for long-term government bonds and the amount of its asset purchase program. In its quarterly report on the economic outlook, the Bank of Japan marginally increased its growth forecasts and inflation, and eliminated the sentence stating that inflation would reach its target in 2019.

Meanwhile, since its meeting of November, the Bank of England has maintained its reference interest rate unchanged. Although in its meeting of May the Bank of England reiterated the need to continue with the gradual adjustment of its monetary policy, it stressed that the effects of the Pound Sterling depreciation on prices have faded faster than expected, despite a greater uncertainty over the growth outlook in the short term.

Among emerging economies, the outlook for monetary policy actions remained heterogeneous. On the one hand, there was a certain easing in such countries as Brazil, Colombia, Peru, Russia and South Africa, where inflation continued to subside or remained low. Meanwhile, reference rates increased in Argentina, Indonesia, the Czech Republic, Romania and Turkey, in some cases as a response to their position in the economic cycle and in others due to greater instability and inflation pressures.

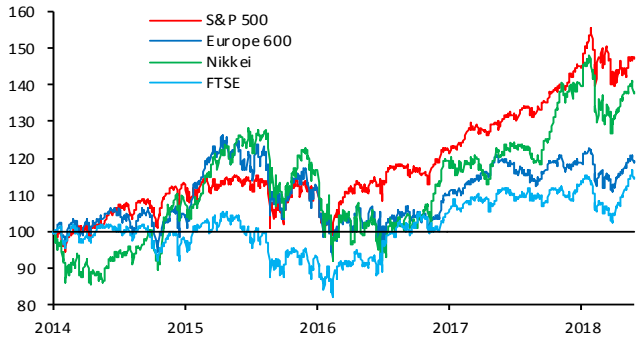
International financial markets displayed volatility in the period covered by this Report (Chart 15). In particular, stock markets in advanced economies presented bouts of strong falls at the end of January and March, although recently there has been a certain recovery, backed by solid corporate reports (Chart 16a). In the U.S., greater uncertainty over the inflation trajectory and the increase in the issuance of Treasury instruments as a consequence of the fiscal stimulus prompted higher interest rates throughout the yield curve during the reported period, especially in short- and medium-term instruments (Chart 16b). In the same vein, interbank and corporate bond interest rate spreads expanded. Meanwhile, after the depreciation of the U.S. dollar at the beginning of the year, during the last weeks it appreciated, supported by greater interest rate spreads, and, as mentioned above, by the expectation of a greater divergence in the monetary policy adjustment rates between the U.S. and other advanced economies.

Chart 15
Volatility in International Financial Markets
Index VIX 1/
Index 01/01/2007=100

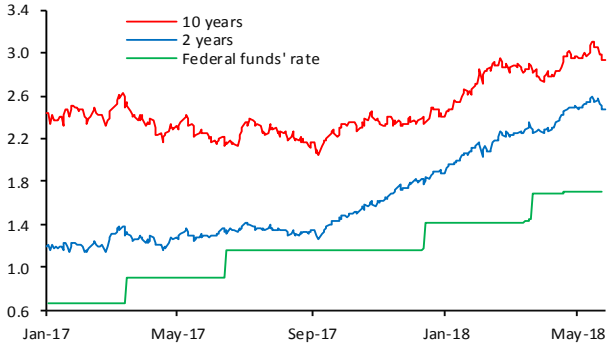


1/ The VIX index is a weighted indicator that measures implied volatility in the options' market for S&P 500.
Source: Bloomberg.

Chart 16
Financial Markets in Advanced Economies
a) Stock Markets
Index 01/01/2014=100



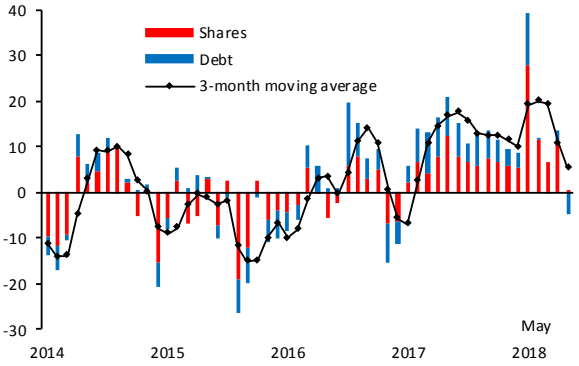
b) U.S.: Yield on Federal Funds and Treasury Bonds
Percent



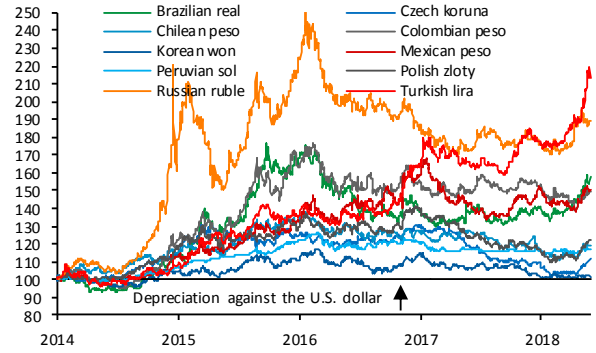
Source: Bloomberg and Federal Reserve Bank of St. Louis (FRED).

After the demand for emerging economies' financial assets remained solid during the first quarter of the year, capital flows to these economies have moderated strongly over the last weeks, reflecting a lower appetite for risk (Chart 17a). This also led to a significant depreciation of most emerging economies' currencies and to interest rate hikes, which in some cases were accompanied by interventions in the exchange markets (Chart 17b). Thus, spreads between interest rates of advanced economies broadened and there was a fall in stock markets, in particular in economies with more pronounced macroeconomic imbalances (Chart 17c).

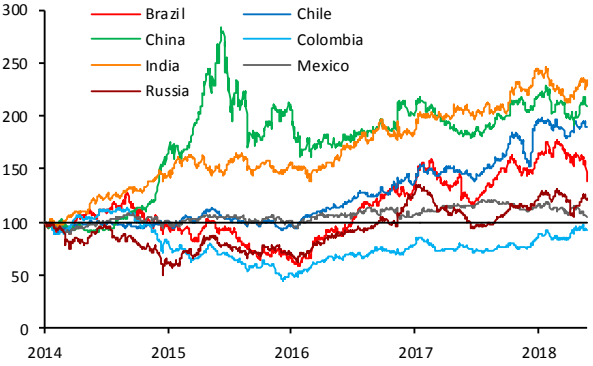
Chart 17
Financial Markets in Emerging Economies
a) Monthly Flows of Funds to Emerging Economies 1/
USD billion



b) Exchange Rate
Index 01/01/2014 = 100



c) Stock Markets
Index 01/01/2014 = 100



1/ The sample covers the funds used for the sale and purchase of emerging countries' shares and bonds, registered in advanced economies. The flows exclude the portfolio performance and exchange rate adjustments.
Source: Emerging Portfolio Fund Research; Bloomberg.

2.1.5. Risks to World Economic Outlook

In conclusion, risks to the world economic outlook in the short term appear balanced. Indeed, the expectation that growth will continue is congruent with the fiscal impulse in the U.S. and the recent evolution of productive activity and global trade, which is reflected in the performance of consumers and businesses' confidence indices, and other

prospective indicators of the global economy. Nonetheless, weakness of economic indicators of some of the main European economies and other risk factors have raised the uncertainty over the duration of the current expansion cycle. In addition, for the medium and long terms, risks to the world expansion have increased. Some of them are:

i. A change to the regional and global integration model, if the amount of initiatives in favor of trade liberalization continues to decrease and the imposition of tariff and non-tariff measures increases, which could imply serious repercussions to the global economy, negatively affecting growth, inflation and financial markets.[4] In this context, there is still uncertainty related to the NAFTA renegotiations and the future relation between the U.K. and the European Union. On the other hand, despite the recent easing of trade conflicts between the U.S. and China, new scenarios of tensions cannot be ruled out insofar as the negotiation process between the two countries is not concluded.[5]

ii. A greater-than-anticipated economic deceleration in China could affect global demand. Among other reasons, this may be due to possible disruptions caused by a sudden and abrupt adjustment in the financial system of China, or as a consequence of the implementation of protectionist trade measures in the U.S. against the said country.

iii. The materialization of geopolitical events in different regions. This could influence economic agents' confidence levels, and thus affect financial markets, consumption and investment. In particular, a greater risk of an escalating conflict in the Middle East should be mentioned, as it would remain a source of uncertainty, mainly relative to crude oil prices.

In addition, there are risks that can generate an environment of greater volatility in international financial markets, further limiting the sources of financing to emerging economies. Some of them are:

i. A further increase in the uncertainty over the inflation evolution in some advanced economies, possibly leading to higher interest rates than those that are currently expected.

ii. A deterioration in the balance sheets of some financial intermediaries caused by a global environment of higher interest rates.

iii. High indebtedness levels of the private sector and macroeconomic imbalances in some emerging economies.

Finally, it should be noted that one of the main risks to the world economy is that the current period of generalized growth would promote the complacency of the authorities in charge of economic policies. In particular, that they would fail to adjust the monetary policy stances in view of the current risks to growth and stability in international financial markets.

[4] In particular, higher production costs of businesses and households' lower purchasing power would have consequences on consumption, investment and employment. In addition, higher uncertainty generated by this environment would delay consumption and investment decisions, and higher volatility would be observed in financial markets. Similarly, the potential growth would be lower due to a smaller increase in productivity.

[5] In March, the U.S. government announced 25% and 10% duty on imports of steel and aluminum articles, respectively, from a number of countries, including China. In response, China announced an increase in duties on imports from the U.S., which amounted to USD 3 billion. Subsequently, the U.S. stated its intention to impose higher duties on Chinese imports by an amount of USD 150 billion, which, in turn, resulted in an announcement that China would impose equivalent retaliatory measures. Commercial tension between China and the U.S. subsided at the end of May, in light of a tentative agreement so that China increases its imports of agricultural and energy products from the U.S. Given the possible agreement between the two countries to generate more favorable conditions for trade in manufactures and services, to strengthen the cooperation in the field of intellectual property, the U.S. government specified that for the moment it would not impose tariff measures on China.

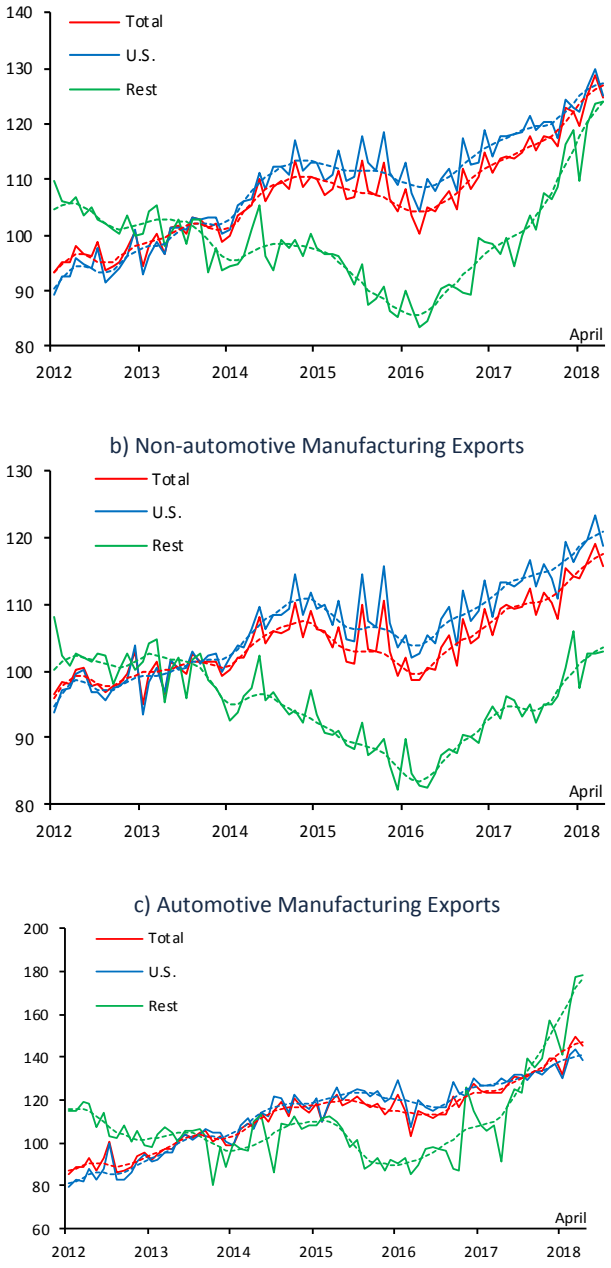
2.2. Evolution of the Mexican Economy

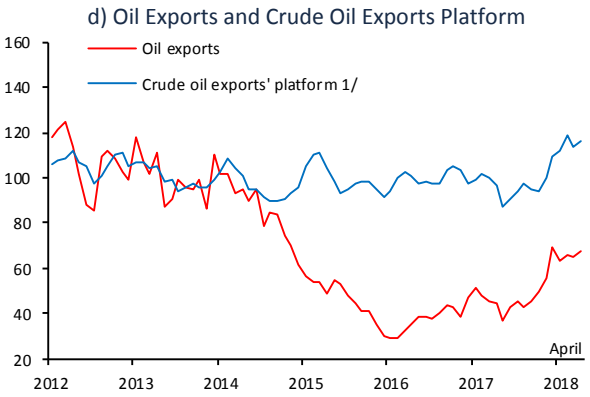
2.2.1. Economic Activity

In the first quarter of 2018, economic activity in Mexico continued to gain strength, and even registered a growth rate higher than in the previous one. This rebound was especially fuelled by the dynamism of the services' sector and by the recovery in industrial activity. Thus, this development stands in contrast with the slowdown in the first three quarters of 2017 and with the weakness of some aggregate demand components that has been observed until the third quarter of that year, especially in investment. In particular, in the first quarter of 2018 exports maintained high dynamism and private consumption kept expanding, although at a lower rate as compared to the previous quarters, while investment rebounded relative to the weakness it had displayed since late 2015.

Delving in the performance of external demand, in the period of January – March 2018 manufacturing exports maintained a marked growing trend, both destined to the U.S. and the rest of the world, which was in line with the persistent strengthening of global economic activity (Chart 18a). By type of good, this performance was observed both in automotive and in non-automotive exports (Chart 18b and Chart 18c). In the reference quarter, oil exports increased, although they are still lower than the ones registered before the drop in oil prices in mid-2014. This progress was due to a higher average price of the Mexican crude oil blend for exports, while the platform of exported crude oil remained at a level similar to that of the previous quarter (Chart 18d).

Chart 18
Exports in Mexico
Index 2013=100, s. a.





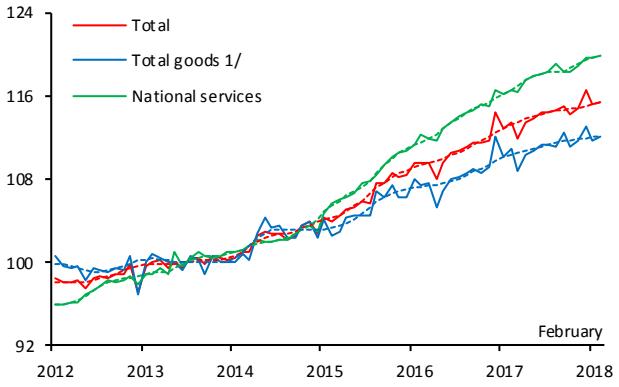
s. a. / Seasonally adjusted and trend series based on data in nominal dollars. The former is represented by a solid line, the latter by a dotted line.
1/ 3-month moving average of daily barrels of the seasonally adjusted series.
Source: Banco de México with data from *PMI Comercio Internacional*, S.A. de C.V; and SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

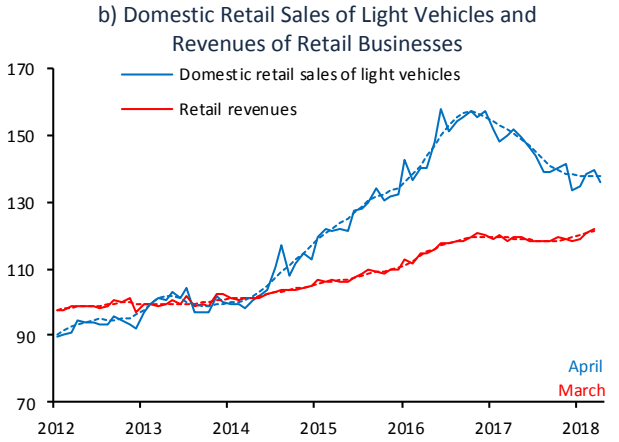
As regards the evolution of domestic demand, the increase in private consumption in the reference period is mainly accounted for by the recovery in the consumption of services, which could have reflected the fading of the negative effects of the September 2017 twin earthquakes, while the consumption of goods had a weak performance (Chart 19a).

i. Regarding the consumption determinants, in the first quarter of 2018 the real wage bill increased, prompted by the increment in salaried employed population, and the fact that the real average income reduced at a lower rate, which stands in contrast with the reported decreases throughout 2017 (Chart 20a). Consumer credit kept expanding at moderate rates, which were higher than in the previous quarter. Finally, incomes from remittances remained particularly high (Chart 20b), while consumer confidence grew in April, although it still remains at relatively low levels (Chart 20c).

ii. More timely consumption indicators, although of a smaller coverage, performed heterogeneously. In particular, light vehicles sales maintained a negative trajectory, while the revenues of retail businesses slightly recovered with respect to the evolution during most of 2017 (Chart 19b).

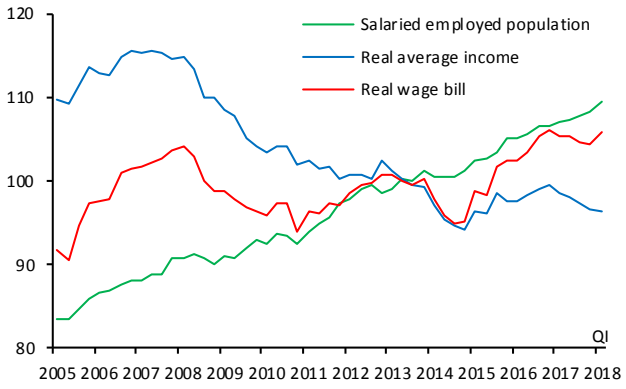
Chart 19
Consumption Indicators
Index 2013=100, s. a.



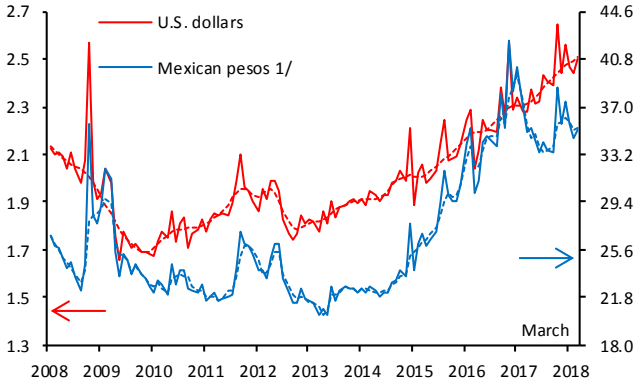


s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.
1/ Prepared and seasonally adjusted by Banco de México. Includes national and imported goods.
Source: a) Mexico's National Accounts System (SCNM), INEGI. b) Prepared by Banco de México with data from the Mexican Automotive Industry Association (AMIA) and the Monthly Survey of Commercial Establishments (EMEC), INEGI.

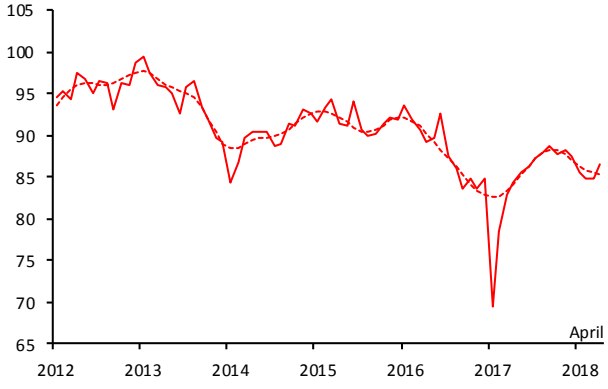
Chart 20
Determinants of Consumption
a) Total Real Wage Bill
Index 2013=100, s. a.



b) Remittances
Billions, USD and constant MXN, s. a.



c) Consumer Confidence
Index January 2003=100, s. a.



s. a. / Seasonally adjusted and trend series. The former is represented by a solid line, the latter by a dotted line.
1/ Prices as of the second fortnight of December 2010.
Source: a) Prepared by Banco de México with data from the National Employment Survey (ENOE), INEGI. b) Banco de México and INEGI. c) National Consumer Confidence Survey (ENCO), INEGI and Banco de México.

In December 2017 and the first two months of 2018 investment recovered, as compared to its weak performance since late 2015 (Chart 21a). This growth reflected the rebound of investment in construction, which was largely associated to the reconstruction efforts in the wake of the September earthquakes, more construction in some cities in the Northern region of Mexico, certain public infrastructure projects; as well as the recent recovery of investment in machinery and equipment (see Box 2).

i. Within spending on construction, in December 2017 and during January – February 2018, the residential component displayed a favorable change of trend, which could have been prompted by the aforesaid reconstruction efforts and the recovery of this activity in the Northern region. In contrast, non-residential construction maintained a negative trajectory, mainly derived from lower construction of industrial premises and shopping malls (Chart 21b). By contracting sector, in the analyzed period, private investment in construction recovered, which reflected a better performance of the housing component, while the non-residential component appears to have stopped declining. Similarly, in early 2018 the improvement in spending on public investment in construction (that had been observed during the second half of 2017) persisted, after it showed a declining trend since late 2015, which was associated to a number of public infrastructure projects and the reconstruction of buildings and the infrastructure damaged in the September earthquakes, hospitals, schools, offices, hydraulic constructions, among others (Chart 21c).

ii. Within the machinery and equipment component, in the period of January – February 2018, the domestic component improved incipiently, while the imported component maintained the strong dynamism that had been observed since late 2017. The performance of the latter reflected higher capital goods imports in the mining and power generation sectors, which could be related to the impact of the Energy Reform, as well as in the subsector of transport equipment and transport services, among others.

Box 2. Recent Evolution of Spending on Gross Fixed Investment in Mexico

1. Introduction

In December 2017 and in the first two months of 2018, gross fixed investment reactivated considerably, both in the construction sector and in spending on machinery and equipment, after the stagnation that had been observed since the second half of 2015.

The analysis presented in the Box suggests that the recent recovery of investment seems to be concentrated in specific projects and activities. Therefore the performance of spending on investment in the remaining sectors of the economy is still weak. In addition, the evolution of investment seems to have responded to transitory factors, in a context in which high uncertainty persists as a result of domestic and external factors. Thus, high dynamism of investment as a whole over the last months will not necessarily sustain in the future.

2. Gross Fixed Investment Structure

Based on the Mexico's National Accounts System (SCNM), in 2017, 57% of gross fixed capital formation corresponded to spending on construction and 43%, to spending on machinery and equipment. Within construction, the shares of the residential and non-residential components were similar, around 50%. Within spending on machinery and equipment, 58% corresponded to imported goods, while the remaining 42% was of domestic origin. From a perspective of a demanding sector, around half of private sector investment was in machinery and equipment, and the other half was in construction, while over 90% of public investment was channeled to construction (Table 1).

Table 1
Gross Fixed Investment Structure, 2017

Item	Percent		
	Total	Private	Public
Gross fixed investment	**100**	**100**	**100**
Total mach. and equip.	**43**	**49**	**9**
National	18	--	--
Imported	25	--	--
Construction	**57**	**51**	**91**
Residential	27	--	--
Non-residential	30	--	--

Source: Mexico's National Accounts Systems, SCNM (INEGI).

3. Recent Evolution of Investment

The weakness of investment exhibited from mid-2015 to late 2017 caused this aggregate to negatively contribute to economic activity growth in this period. However, between December 2017 and February 2018, spending on gross fixed investment recovered significantly, which prompted a better performance of aggregate demand and industrial activity in that period (see Chart 21a). The rebound in December last year was widespread across the different components of investment, while the recovery in the first two months of 2018 was principally fomented by spending on imported machinery and equipment, and, to a lower degree, by residential construction (Table 2).

Table 2
Contributions to Monthly Growth of Investment
Percentage points, s. a.

Item	2017		2018	
	Nov	Dec	Jan	Feb
Gross fixed investment	**-1.52**	**4.32**	**1.13**	**0.49**
Total mach. and equip.	**-0.32**	**1.79**	**0.95**	**1.07**
National	-0.40	0.73	0.36	-0.02
Imported	0.24	1.16	0.33	0.62
Construction	**-0.36**	**2.56**	**-0.15**	**0.18**
Residential	0.03	0.89	0.41	0.51
Non-residential	-0.03	1.05	-0.61	-0.45

s. a. / Seasonally adjusted data. The sum of components is different from the total, as they are seasonally adjusted separately.
Source: Mexico's National Accounts Systems, SCNM (INEGI).

3.1. Investment in Construction

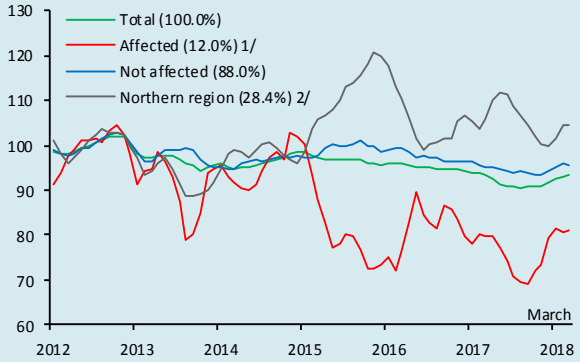
The recent impulse of spending on investment in construction stemmed from a higher investment in residential works (housing), while the non-residential component remains weak (see Chart 21b).

The above is consistent with the evolution of the real value of production in the formal sector of the construction industry, as reported in the National Survey of Construction Companies (ENEC) conducted by INEGI. Indeed, both private housing constructed by the formal sector and by the public one have had a favorable change of trend since the second half of 2017, the development that persisted over the first two months of 2018. In contrast, private construction excluding housing remained weak, essentially due to the lower construction of industrial facilities and shopping malls, and service facilities (see Chart 21c).

The rebound in construction could have been associated to the reconstruction efforts in the wake of the September earthquakes. This reconstruction implied a larger spending of the private sector for the reconstruction of housing and other construction projects, and of the public sector for the reconstruction of damaged buildings and infrastructure, such as hospitals, schools, offices, hydraulic construction, highways, among others. Thus, exclusively considering the construction works in the formal sector, starting from October 2017, the real value of production in construction across the states most affected by earthquakes recovered considerably as compared to the previous negative trend, while in the rest of the country the rebound was a lot more moderate and seems to be associated to specific projects of public infrastructure and to housing projects in the Northern region. The reconstruction efforts in the wake of the earthquakes could incipiently fuel the construction sector over the next months, but it is likely to tend to dissipate (Chart 1). [1]

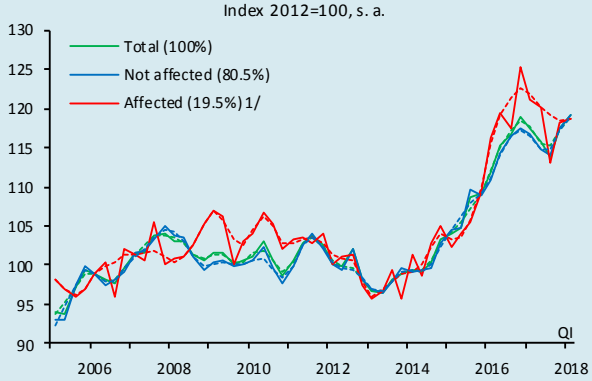
[1] As stated above, information from ENEC exclusively considers projects constructed by the formal sector. However, according to data from INEGI's Satellite Account of Housing, self-construction and self-production amount to around 66% of the total and are also considered as spending on gross fixed investment. Thus, a considerable part of reconstruction activities in the wake of the earthquakes is likely to have been part of the self-construction and self-production segment, while in the most affected

Chart 1
Real Value of Production in Construction
Index 2012=100, s. a.



s. a. / Seasonally adjusted data.
1/ Includes CDMX, Morelos, Oaxaca, Puebla and Chiapas.
2/ Includes Baja California, Chihuahua, Coahuila, Nuevo León, Sonora and Tamaulipas.
Source: Prepared by Banco de México with data from ENEC, INEGI.

Chart 2
Population Employed in Construction in the Informal Sector
Index 2012=100, s. a.



s. a. / Seasonally adjusted and trend data.
1/ Includes CDMX, Morelos, Oaxaca, Puebla and Chiapas.
Source: Prepared by Banco de México with data from ENOE, INEGI.

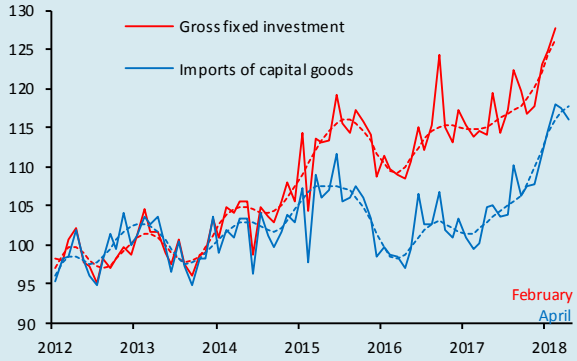
Although there are no direct indicators to measure self-construction and self-production activities, an indirect manner to estimate their performance is by measuring the population employed in the informal sector in construction, as reported in the National Employment Survey (ENOE), conducted by INEGI. In this sense, in late 2017 employment in the informal sector construction recovered across the entities that were affected the most by the earthquakes, after the contraction was more marked than in the remaining entities at the beginning of that year (Chart 2).

Similarly, in late 2017 and in early 2018 there was progress in certain important projects of public infrastructure, such as highway expansion, the construction of the new airport in Mexico City and the Toluca-Mexico City intercity train, as well as the projects of expanding the Veracruz port, among others, which has also contributed to the recovery in construction. In the future, some of these projects are expected to continue favorably affecting the performance of this sector.

3.2. Investment in Imported Machinery and Equipment

Since late 2017 and, more notably, during the first two months of 2018, the component of imported machinery and equipment of the gross fixed investment has accelerated significantly (Chart 3). In this context, in order to single out the sectors of the economy that have contributed the most to this recovery, the indicators by sector of economic activity were constructed based on the disaggregated information of capital goods imports.[2]

Chart 3
Gross Fixed Investment in Imported Machinery and Equipment, and Imports of Capital Goods
Index 2013=100, s. a.



s. a. / Seasonally adjusted and trend data.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest; and INEGI.

The results of this exercise indicate that the recent dynamism in imports of capital goods has been concentrated in specific economic sectors (Table 3).

Table 3
Imports of Capital Goods by Sector
Contribution to growth with respect to the previous period

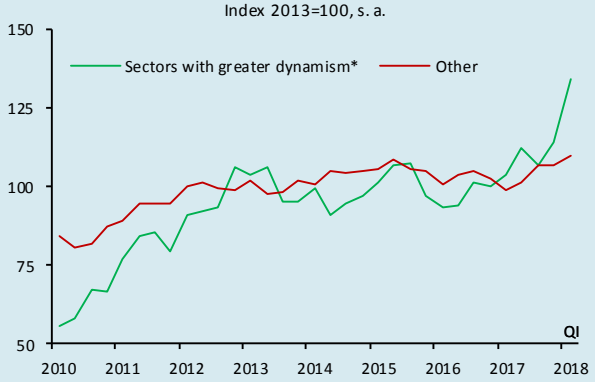
	2016	2017	2017*				2018*
			I	II	III	IV	I
Total	**-3.69**	**3.26**	**-1.86**	**4.35**	**2.21**	**2.03**	**7.05**
Manufacturing of transport equipment	0.56	1.21	0.91	0.66	-1.24	1.31	1.28
Basic metal industries	-0.43	0.14	0.05	0.01	-0.81	-0.14	1.26
Plastic and rubber industry	0.35	0.21	0.25	-0.18	-0.28	-0.03	0.83
Transport, mail and warehousing	-0.47	0.66	0.95	0.07	-0.10	-0.28	0.80
Power generation and gas distribution	-0.09	0.98	-1.23	1.90	1.02	-0.05	0.46
Mining	-0.84	0.07	0.02	-0.03	-0.22	0.35	0.45
Construction	-0.62	-0.02	0.14	-0.05	0.15	0.78	0.27
Paper industry	0.06	0.01	-0.15	0.02	-0.05	0.07	0.12
Agriculture	-0.01	-0.02	0.00	0.01	0.02	-0.04	0.03
Mass media information	-0.27	-1.15	-0.43	0.17	0.51	-0.46	-0.02
Food, beverages and tobacco industry	-0.50	-0.09	0.10	-0.50	0.69	0.69	-0.19
Trade	-0.76	0.89	-0.45	1.49	0.75	0.28	-0.21
Other	-0.67	0.38	-2.01	0.78	1.77	-0.44	1.99
Services	-0.57	-0.44	0.64	-0.67	0.09	0.08	0.58
Manufactures	-0.15	0.42	-2.12	0.89	1.95	-1.12	0.25
Other	0.05	0.40	-0.53	0.56	-0.27	0.59	1.16

*/ Seasonally adjusted data.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest; and SE.

[2] In the case of imports of capital goods, a NAICS code (North American Industry Classification System) was assigned depending on the main economic activity of economic agents that made the transaction. To do so, data bases were used provided by the National Registry of Foreign Investments, the Mexican Business Information System, and the statistics on foreign trade in goods prepared by SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest. For agents who have not had a match in the referred catalogues and who made considerable imports of capital goods, a NAICS code was assigned, in accordance with the activity that was considered as the main one.

Indeed, after excluding the operations of seven productive activities with the highest contribution, imports of capital goods of the rest of the economy remain stagnant. In order of contribution, the seven main sectors that account for the expansion in the first quarter of 2018 are: manufacturing of transport equipment; basic metal industries; plastic and rubber industry; transport, mail and warehousing; power generation and gas distribution; mining; and construction (Chart 4).

Chart 4
Imports of Capital Goods
Index 2013=100, s. a.



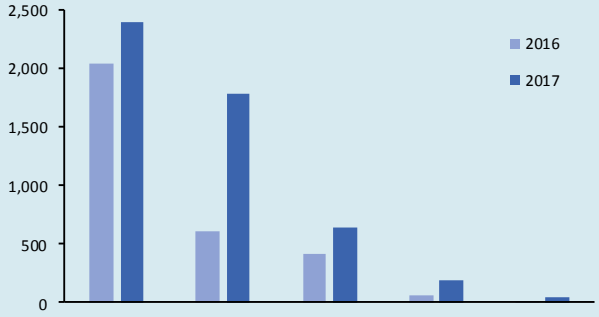
s. a. / Seasonally adjusted data.
* The concept "Sectors with greater dynamism" correspond to seven activities that have contributed the most to growth in the first quarter of 2018 (Table 3).
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest; and INEGI.

Manufacturing of transport equipment, and, specifically, the terminal automotive industry stand out among these sectors. This could be associated to automotive plants' installation and expansion. Indeed, Nissan, Toyota and Volkswagen increased their installed capacity over the last years; while Kia, Audi and Infinity started production in Mexico in May and September 2016, and in November 2017, respectively. At the same time, this has implied an increment in capital goods imports of businesses related to this activity in sectors such as basic metal industries, that supply steel sheets for the production of car bodies, and plastic and rubber industry that supplies car tires.

Most purchases of capital goods abroad in the transport, mail and warehousing sector could be linked to specific infrastructure projects, such as the construction of the Mexico-Toluca Intercity train. In the same vein, imports in the mining sector and power generation sector are generally related to certain investment projects associated to the Energy Reform. In this sense, currently there are projects under development aimed to generate electric power in Coahuila, Guanajuato, Hidalgo, Nuevo León, Sonora and Tamaulipas. Meanwhile, the construction sector has directly imported considerable capital goods, which could be related to the rebound that, in turn, was perceived in the above said investment in construction.

It should be noted that the sectors that have recently presented the greatest dynamism in capital goods purchases from abroad observed a considerable flow of direct investment in 2017, in particular in the item of new investments. Indeed, the aggregates of manufacturing of transport equipment, construction, mining, basic metal industries and power generation displayed a significant increase in the flow of direct investment with respect to 2016, which could reflect one of the main sources of financing to make, among others, imports of capital goods and do infrastructure projects (Chart 5).

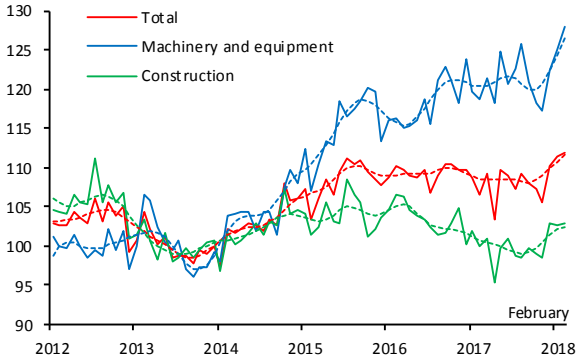
Chart 5
Flow of Direct Investment in Mexico Possibly Associated to Fixed Capital Formation in Selected Sectors
USD millions



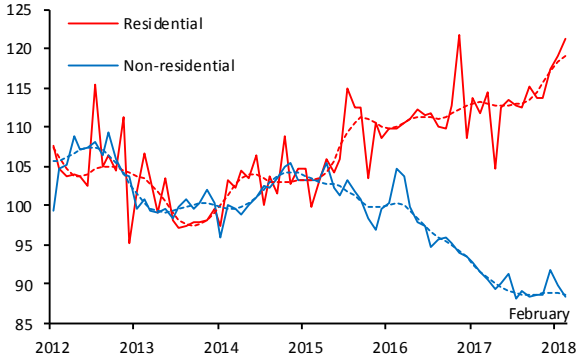
Source: Banco de México.

Despite the above, it should be kept in mind that in the case of specific sectors, such as basic metal industries and the automotive industry, certain operations in recent quarters could possibly be reflecting the decision of some businesses to fast-track the consolidation of their operations to take advantage of the current NAFTA trade framework, given the uncertainty prevailing around its renegotiation and a potential escalation of protectionist trade measures. If this is the case, the rebound observed in capital goods imports in this type of sectors could dissipate.

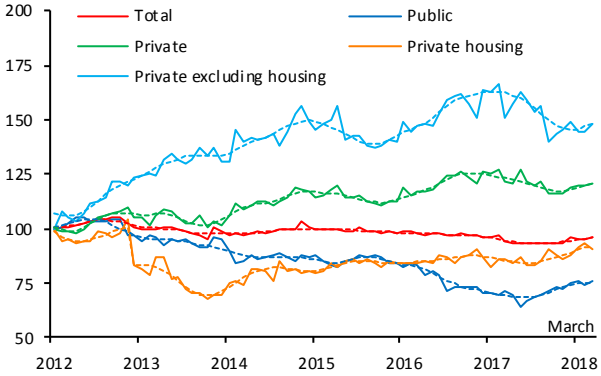
Chart 21
Investment Indicators
a) Investment and its components
Index 2013=100, s. a.



b) Investment in Residential and Non-residential Construction
Index 2013=100, s. a.



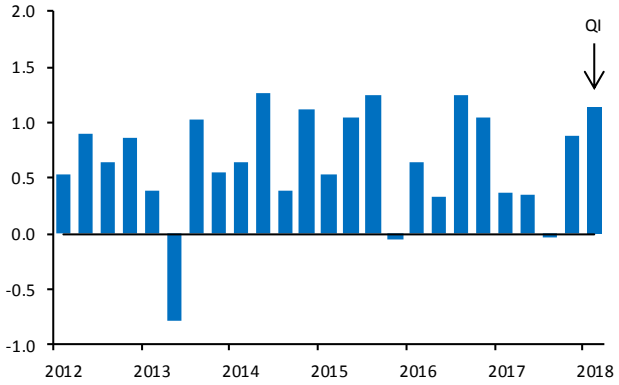
c) Real Value of Production in Construction by Contracting Institutional Sector
Index January 2012=100, s. a.



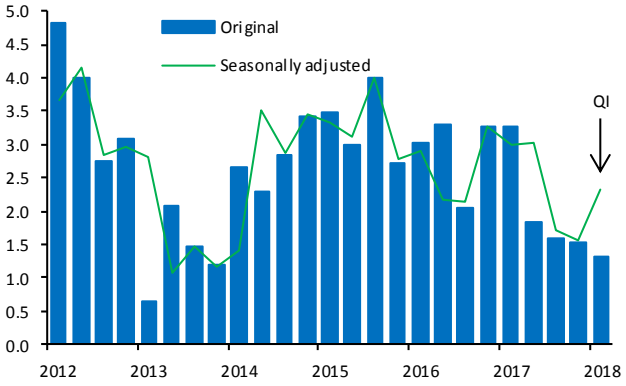
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.
Source: a) and b) Mexico's National Accounts System (SCNM), INEGI. c) Prepared by Banco de México with data from ENEC, INEGI. Seasonally adjusted by Banco de México, except for the total.

Regarding the evolution of economic activity from the production side, in the first quarter of 2018 GDP in Mexico expanded at a seasonally adjusted quarterly rate of 1.13% (a 1.3% annual change with original data and 2.3% with seasonally adjusted data), after having increased 0.88% in the last quarter of 2017 (Chart 22a and Chart 22b).[6]

Chart 22
Gross Domestic Product
a) Quarterly Changes
Percent, s. a.



b) Annual changes
Percent



s. a. / Seasonally adjusted series.
Source: Mexico's National Accounts System, INEGI.

The GDP growth in the first quarter of 2018 reflected the dynamism of the services sector and the industrial activity recovery as compared to the negative trend observed during most of 2017. It is also noteworthy that during the first quarter of 2018 the favorable evolution displayed by the agricultural sector since the second half of 2017 persisted, which could be related to the evolution of agricultural exports, prompted by a higher external demand for this type of goods (Chart 23, see Box 3). In particular:

[6] In the first quarter of 2018, the annual growth rate of GDP (using original series) was lower than that estimated with seasonally adjusted data, given that the Holy Week took place in March 2018, while in 2017 it was in April.

i. During the period of January – March 2018, the services sector maintained a growing trend, mainly supported by the contribution of trade; real estate and rental services; transportation, mail and warehousing; government-related services; professional, scientific and technical services; financial and insurance services (Chart 24).

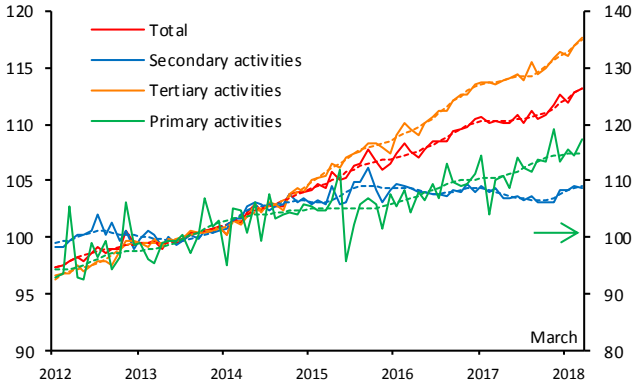
ii. Within the industrial activity, in the first quarter of 2018 the following stood out: the aforementioned strong recovery of construction, and the incipient recovery of manufactures relative to the weak performance during most of 2017. In particular, in the period analyzed by this Report, both the subsector of transport equipment and the aggregate of the rest of manufactures improved relative to the levels attained in late 2017 (Chart 25a and Chart 25b). Mainly, the following sectors have contributed to the favorable evolution of the latter: the manufacturing of computer equipment, measurement and other equipment; electronic components and accessories; food industry; beverages and tobacco industry; the manufacturing of power generation equipment and electric equipment and accessories.

   Although the aggregate of manufactures excluding transportation had a heterogeneous performance in its subsectors, in general those that have recently reactivated their production levels more are the activities that have also performed better in exports. This evolution is correlated with the pattern of comparative advantages in Mexico. That is, the manufactures that have managed to expand their production and exports more tend to be those in which Mexico has a more notable comparative advantage (Chart 26a and Chart 26b).

iii. Meanwhile, derived from the drop in the crude oil production platform, the mining sector maintained a negative trajectory and continued at particularly low levels (Chart 25c).

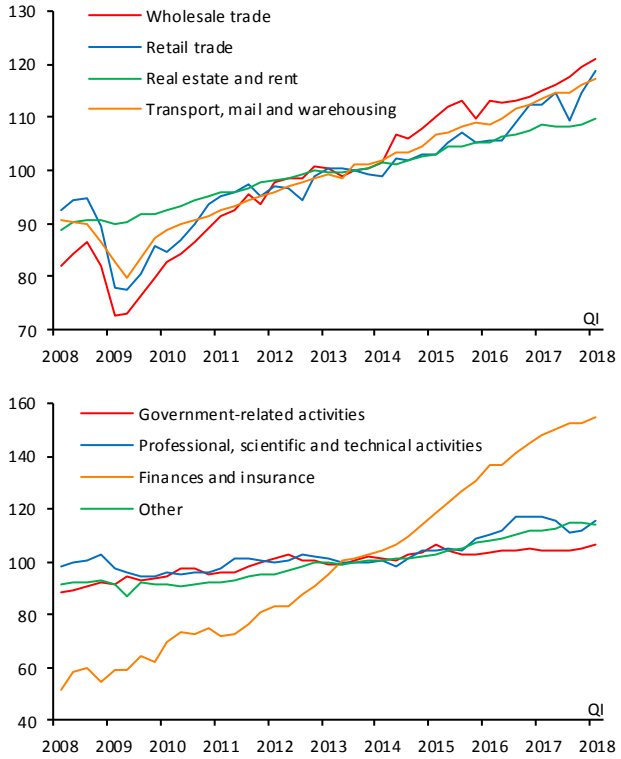
iv. Finally, the seasonally adjusted quarterly expansion of primary activities in the first quarter of 2018 was largely caused by a greater cultivated area in the autumn-winter cycle, in addition to the larger production of asparagus, green chili, sugar cane, beans, grapes, lemon and fodder sorghum, along with egg for consumption and beef.

Chart 23
Global Economic Activity Indicator
Index 2013=100, s. a.



s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.
Source: Mexico's National Accounts System (SCNM), INEGI.

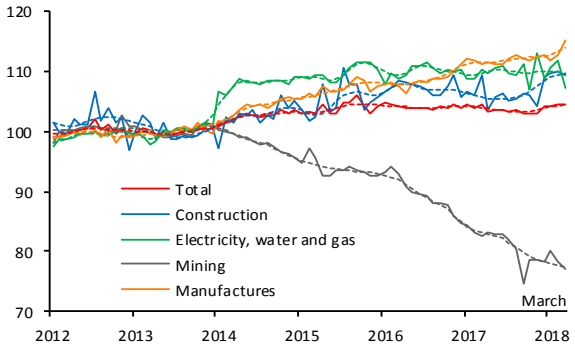
Chart 24
Gross Domestic Product: Services
Index 2013=100, s. a.



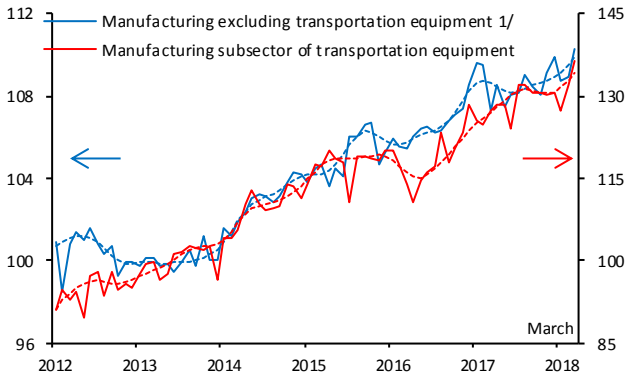
s. a. / Seasonally adjusted series.
Source: Mexico's National Accounts System, INEGI.

Chart 25
Production Indicators
Index 2013=100, s. a.

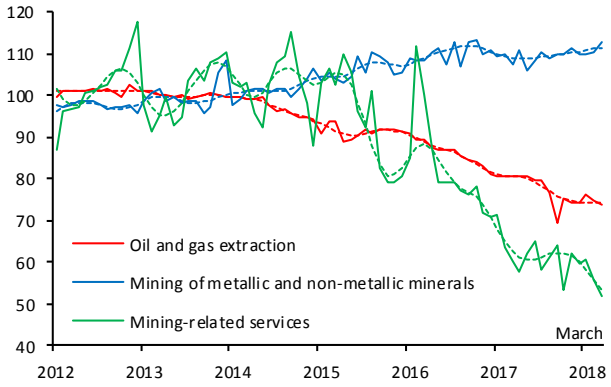
a) Industrial Activity



b) Manufacturing Sector



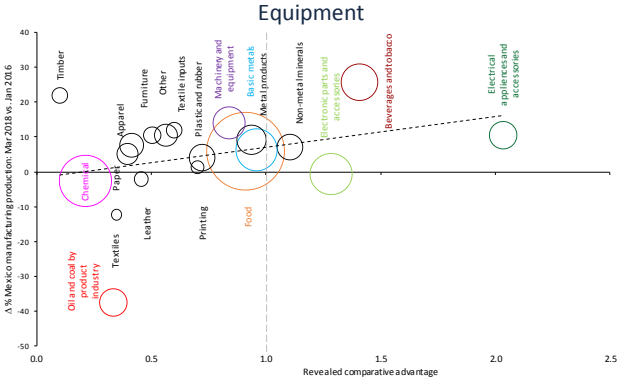
c) Mining Sector Components



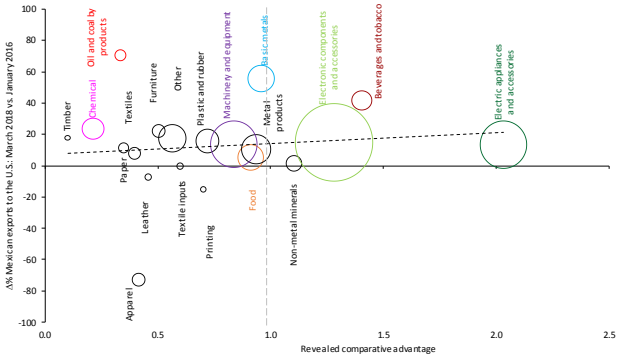
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.
1/ Prepared and seasonally adjusted by Banco de México.
Source: Monthly Industrial Activity Indicator, Mexico's National Accounts System (SCNM), INEGI.

Chart 26
Revealed Comparative Advantage of Mexico in the U.S. Market 1/

a) With Manufacturing Production Excluding Transport Equipment



b) With Manufacturing Exports Excluding Transport Equipment from Mexico to the U.S.



1/ In the panel a) and b), the size of circles is proportional to the structure of Mexico's manufacturing production excluding transport in 2013 and to U.S. imports of Mexican products in 2017, respectively. The revealed comparative advantage (RCA) refers to the average of each subsector for the period 2008-2015. For the RCA estimate, see Chiquiar, D., Fragoso, E. and Ramos Francia, M. (2007), "Comparative Advantage and the Performance of Mexican Manufacturing Exports during the period 1996-2005", Banco de México Working Paper No. 2007-12.
Source: Prepared by Banco de México with data from INEGI U.S. Department of Commerce.

Box 3. Impact of International Price Dynamics on the Volume of Agricultural Goods Exports

1. Introduction

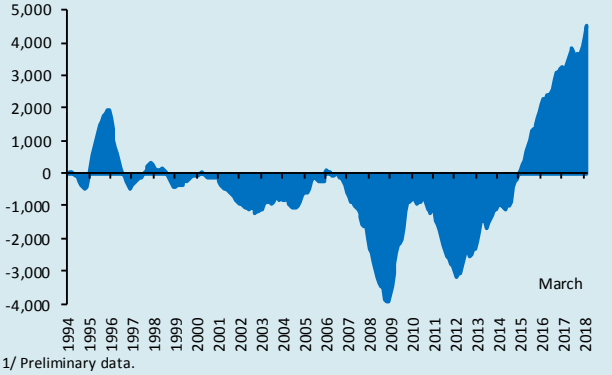
Over the last years, Mexico's agricultural exports increased significantly, which seem to respond to higher external demand, which, in turn, has resulted in higher international prices of a number of these goods. Mexican producers have focused on increasing the exports of products characterized by a comparative advantage, especially, in this context, the exports of certain fruit and vegetables. As a consequence, domestic agricultural production has expanded and this has translated into a better performance of agricultural GDP, as well as in the improved agricultural trade balance. In particular, the latter, after being systematically negative over a number of decades, has turned positive starting from 2015.

Consequent on a greater integration of the agricultural sector in some international markets of agricultural products, domestic prices have become more sensitive to their international references. In particular, given that these products are tradable goods, agents tend to face a perfectly elastic demand to the international price of their products in the external market. In this context, producers would not be willing to sell these goods at the domestic market for a lower price, as it is more cost-effective to export them. Therefore, the domestic price tends to match the international price, measured in Mexican pesos. Thus, since Mexico has entered markets of some products to a greater degree, not only these exports and their production have grown, but also their prices have become more linked to the international price fluctuations in U.S. dollars and to the performance of the exchange rate.

2. Recent Evolution of Value of Agricultural Products Exports

The foreign trade of Mexico's agricultural sector has not registered a positive trade balance in decades, a situation that changed in 2015 and remains so this year so far. This has largely derived from a higher demand for these goods worldwide (Chart 1).

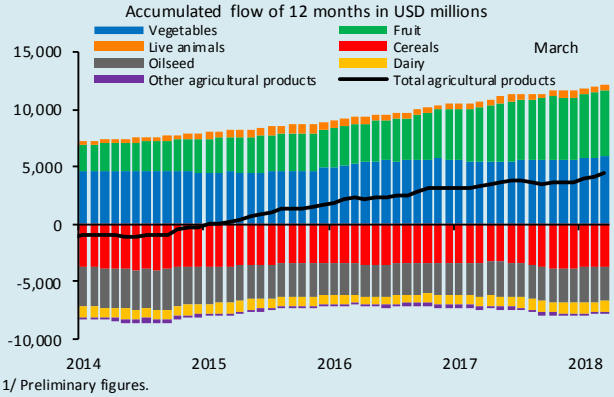
Chart 1
Trade Balance of Agricultural Products 1/
Accumulated flow of 12 months in USD millions



1/ Preliminary data.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

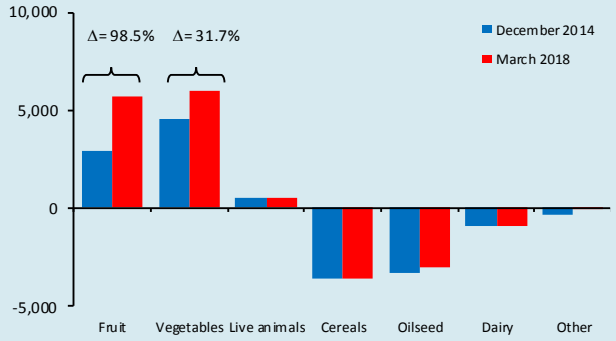
Specifically, higher demand for these products has translated into their higher prices in U.S. dollars, which, combined with the exchange rate performance in recent years, has given incentives to the national producers to increase their exports of goods with the comparative advantage (Chart 2). In particular, within the agricultural sector, starting from December 2014, the trade balance of fruit and vegetables, which has already reflected a positive balance due to the general comparative advantage of these products, has displayed more notable increments as compared to other groups (Chart 3).

Chart 2
Trade Balance of Selected Groups in the Agricultural Sector 1/
Accumulated flow of 12 months in USD millions



1/ Preliminary figures.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

Chart 3
Agricultural Sector Trade Balance [1/]
Accumulated flow of 12 months in USD millions



1/ Preliminary figures.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

Moreover, from December 2014 to March 2018, groups characterized by a greater growth in the value of their exports were precisely the ones of fruit and vegetables, as they exhibited growth rates of 74.3% and 30.9%, respectively. These data are compared to the lower growth in the groups mentioned below: cereals with a change rate of 23.5%, oilseeds -8.1%, live animals -13.4% and dairy -16.0%. Avocado, nuts and strawberries can be listed in the group of fruit characterized by the greatest growth in the export activity. These goods have complemented the favorable evolution of exports of certain vegetables, such as tomato, lettuce and cabbage, and green chili (Table 1).

Table 1
Main Contributions to Growth of the Value of Exports in the Agricultural Sector between December 2014 and March 2018 [1/]
Accumulated flow of 12 months

Item	Percentage Change	Contribution to percentage change
Total agricultural products	**37.8**	**37.8**
Vegetables		
Tomato	20.2	2.7
Lettuce and cabbage	116.3	1.7
Other leafy vegetables	52.7	1.8
Green chili	19.8	1.5
Zucchini	46.4	1.2
Cucumber	24.4	0.8
Onion	28.9	0.7
Fruit		
Avocado	124.3	14.2
Nuts	80.7	2.3
Strawberries	92.7	1.8
Mango	61.6	1.3
Lemon	51.0	1.3
Raspberry, blackberry and other berries	53.5	0.9
Grapes	60.6	0.8
Banana	37.8	0.5
Other agricultural products		
White corn	224.3	2.3
Shrimp and other seafood	54.8	1.5
Cotton	144.4	0.5
Watermelon and melon	-7.5	-0.2
Natural honey	-33.9	-0.4
Beef cattle	-13.6	-0.9
Wheat	-52.3	-1.7
Other agricultural products	12.5	2.8

1/ Preliminary figures.
Source: Banco de México with data from SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

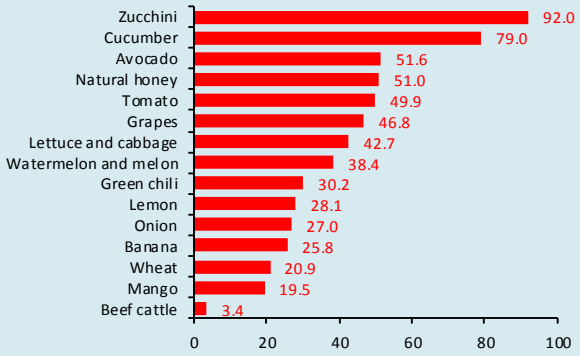
The next section shows that goods with the greatest growth in their international prices in Mexican pesos during the period from 2014 to March 2018 tend to be the ones that also had the greatest increase in their exports. This analysis will list products that have contributed the most to the value of exports in the period from April 2017 to March 2018. These are: avocado, lettuce and cabbage, banana, lemon, mango, grapes, zucchini, green chili, cucumber, tomato, onion, beef cattle, watermelon and melon, natural honey and wheat, which represented approximately 65% of the value of exports during the specified period.

3. Evolution of Prices and the Volume of Agricultural Products Exports

The goods selected in the previous section had the following characteristics during the analysis period: a) growth in their international and domestic prices; and b) higher dynamism of their exports.

In addition, Chart 4 shows that a large proportion of the domestic production of these goods is destined to the exports market, especially in the case of zucchini, cucumber, avocado and honey, where 50% or more of production is channeled to the international market.

Chart 4
Share of the Volume of Exports with respect to the National Production of Selected Products from April 2017 to March 2018 [1/]
In percent



1/ Preliminary data.
Source: Banco de México with data from SAGARPA.

Table 2 presents the accumulated change between 2014 and March 2018 for the volume of exports, international prices, both in U.S. dollars and Mexican pesos, and consumer prices for selected goods. Evidence suggests that generally most goods that had a higher increment in their international prices in Mexican pesos in the referred period also presented higher growth rates in their volume of exports. In fact, Chart 5 shows the positive correlation between the growth rates of international prices in Mexican pesos and the volume of exports for selected goods. These results suggest that when external demand for these goods goes up, their prices in international markets rise, thus generating incentives to Mexican producers to increase their exports. In addition, given that these goods are tradable, their domestic prices also increased to a greater degree. In particular, Chart 6 shows a positive correlation between the change rate of the analyzed

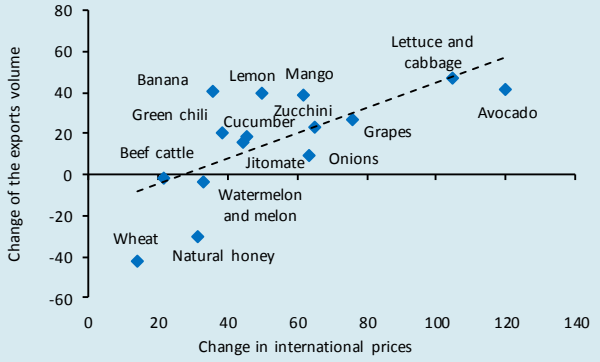
goods' consumer prices in Mexico and the volume of their exports.

Table 2
Accumulated Growth Rate of Different Variables for Selected Items [1/ 2/]
In percent

Item	Volume of exports	CPI	International price [3/]	
			USD	MXN
Lettuce and cabbage	46.79	32.59	47.36	104.54
Avocado	41.82	69.02	58.20	119.58
Banana	40.78	25.70	-2.12	35.86
Lemon	40.02	20.35	7.85	49.70
Mango	38.50	30.47	16.67	61.94
Grapes	26.62	28.33	26.83	76.05
Zucchini	23.03	31.65	19.03	65.21
Green chili	20.26	26.83	-0.34	38.32
Cucumber	18.56	32.27	4.93	45.64
Tomato	15.37	45.20	4.18	44.60
Onion	9.57	19.79	17.68	63.34
Beef cattle [4/]	-1.43	27.97	-12.31	21.71
Watermelon and melon	-3.64	20.03	-3.98	33.28
Natural honey [4/]	-30.23	31.99	-5.24	31.53
Wheat [4/]	-42.07	11.33	-17.72	14.20

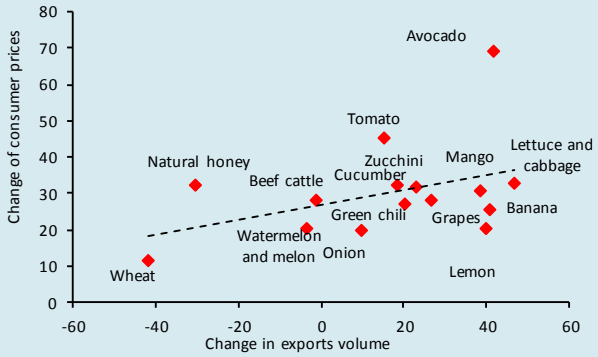
1/ Preliminary data.
2/ Change of each item's average index of the last 12 months (April 2017 to March 2018) divided by the average 2014 index.
3/ The international price corresponds to the unit export price estimated by Banco de México.
4/ The price change corresponds to this item in the PPI.
Source: Banco de México with data from INEGI and SAGARPA.

Chart 5
Exports and Increase in International Prices of Selected Products [1/]
In percent



1/ Preliminary data. Change of the average index of each product of the last 12 months (April 2017 to March 2018) divided by the average 2014 index.
Source: Banco de México with data from INEGI and SAGARPA.

Chart 6
Exports and CPI of Selected Products in Mexico [1/]
In percent



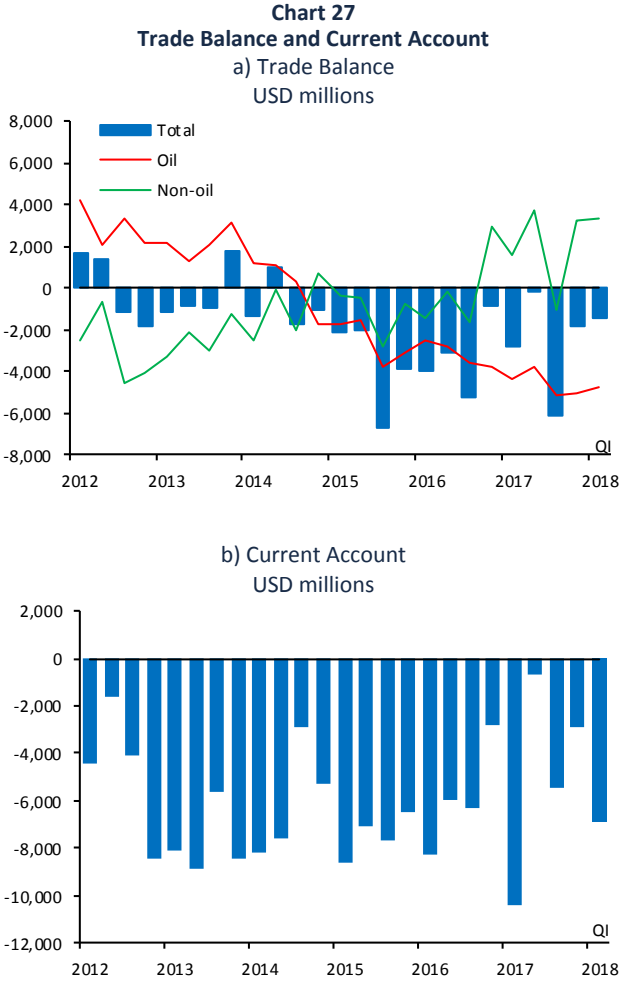
1/ Preliminary data. Change of each item's average index of the last 12 months (April 2017 to March 2018) divided by the average 2014 index.
Source: Banco de México with data from INEGI and SAGARPA.

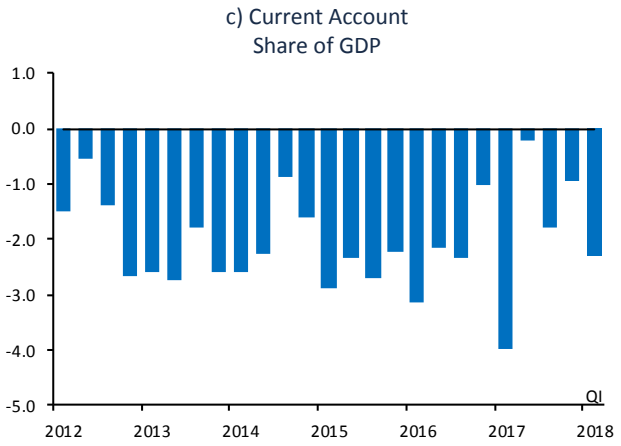
4. Final Remarks

This Box presents the evidence that exports of agricultural products have strongly grown since 2015, prompted by higher external demand. Growth of the world demand for certain agricultural products pushed their international prices upwards, which, combined with the performance of the exchange rate over the last years, prompted Mexican producers to increase their exports, especially of the goods with a comparative advantage. This resulted in a surplus in agricultural trade balance starting from 2015, which had shown a deficit for decades, and drove upwards the relative prices of these goods in the domestic market as well.

Regarding Mexico's external accounts, in a context in which, given the strengthening of global economic activity, the dynamism of manufacturing exports in Mexico remained significant, in the first quarter of 2018 the deficit of the current account lied at 2.3% of GDP, which is lower than 4% of GDP observed in the same period of 2017. It should be stressed that this deficit was the lowest on record for the first quarter over the last 6 years, both in U.S. dollars and as a share of GDP (Chart 27b and Chart 27c). The annual decrease of deficit reflected the higher surplus of the non-oil trade balance, although the annual decrease of the primary income deficit and a greater surplus of the remittances account were also contributing factors. In contrast, the deficit of the oil trade balance continued to expand (Chart 27a).

Chart 27
Trade Balance and Current Account





Source: a) SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest., b) Banco de México and c) Banco de México and INEGI.

2.2.2. Labor Market

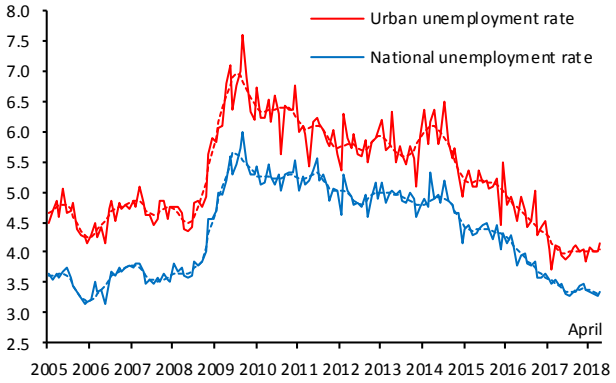
Labor market conditions remained tight in the reported period. In the first quarter of 2018, the national unemployment rate maintained a decreasing trajectory, and, based on seasonally adjusted figures, it marked its lowest level since ENOE started to be conducted in 2005, while the urban unemployment rate persisted at especially low levels (Chart 28). In addition, broader measurements of the unemployment and underemployment rates also suggest that slackness conditions in the labor market remain tight (see Box 4). It should be stressed that the unemployment gap, both estimated based on the national unemployment rate and that estimated based on a measure that also considers informal salaried workers, do not appear to have increased their tightness at the margin (Chart 29). This has been observed in a context in which the employed population and the number of IMSS-affiliated jobs maintained a growing trend, and in which the labor informality rate lied around the lowest levels for the last 13 years.[7] The labor participation rate, albeit still at low levels, has maintained a growing trend since mid-2017, as a result of a larger participation of women in the labor force, while the male participation has declined. A lower participation

[7] Currently, both the unemployment rate and the labor informality rate are measured based on the results of the National Employment Survey (ENOE), which started to be conducted in 2005.

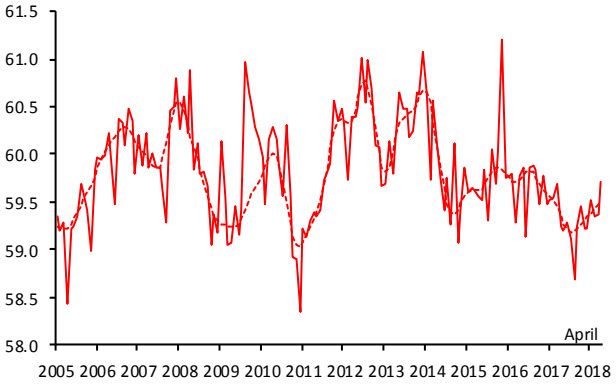
among population between 15 and 19 years old should also be noted.

Chart 28
Labor Market Indicators

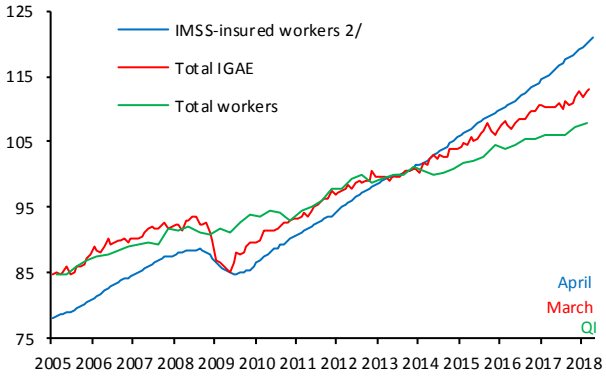
a) National and Urban Unemployment Rates
Percent, s. a.



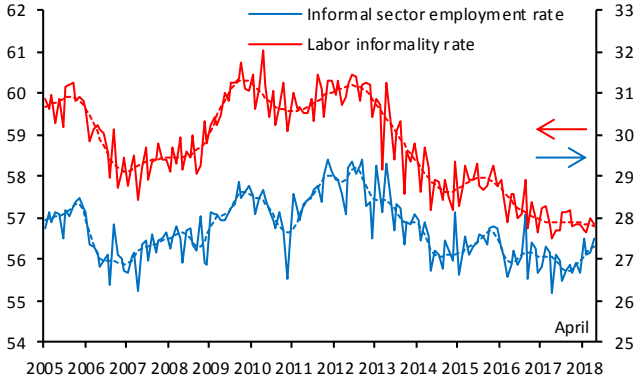
b) National Labor Participation Rate [1/]
Percent, s. a.



c) IMSS-insured Workers, Total IGAE and Working Population
Index 2013=100, s. a.



d) Informal Sector Employment [3/]
and Labor Informality [4/]
Percent, s. a.



s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.
1/ Percentage of Economically Active Population (EAP) with respect to the population of 15 years and older.
2/ Permanent and temporary jobs in urban areas. Seasonal adjustment by Banco de México.
3/ It refers to individuals working in non-agricultural economic units, operating with no accounting records and using households' resources.
4/ It includes workers who, besides being employed in the informal sector, work without social security protection, and whose services are used by registered economic units, and workers self-employed in subsistence agriculture.
Source: Prepared by Banco de México with data from IMSS and INEGI (SCNM and ENOE).

Box 4. Alternative Measures of Labor Underutilization

1. Introduction

In the context of the labor market, the traditional indicator of the degree of labor utilization is the unemployment rate. Under international standards, the information to estimate this rate comes from household surveys, in which the members of households are asked if, in the event of not being employed, they actively looked for employment during the week prior to the data collection, which is known as the reference week. This rate is one of the indicators used by Banco de México to evaluate slack conditions in the labor market, induding its comparison with the estimates of the unemployment rate consistent with low and stable inflation (see Chart 28a and Chart 29).

Nevertheless, the unemployment rate is not necessarily a sufficient indicator of slack conditions in the labor market. In particular, the economic literature has argued that the unemployment rate could fail to fully reflect the degree of labor underutilization. This could occur when, for instance, there is a significant amount of people, who, although do not search for jobs actively, would be willing to work should an adequate job offer arise. These people are not considered a part of the labor force and would not be captured by the unemployment rate. Given this possibility, the empirical literature based on workers' flows has shown that in the labor market analysis it is important to consider the behavior of people that are not part of the labor force.[1] In this sense, some theoretical models have sought to advance in the understanding of decisions around the margin of participation in the labor market and its impact on economic activity.[2] Another element that could make the reading of the degree of slack difficult based on using solely the unemployment rate is the presence of underemployed workers, that is people who are employed, but who, due to market-related reasons, work fewer hours than desired given the labor demand conditions, as this represents the underutilization of the available labor force.

Having broader measures of unemployment and underemployment could be useful for a more comprehensive reading of the degree of labor utilization. Thus, this box describes three measures that complement the national unemployment rate that respond, to a certain extent, to the previous remarks. Subsequently, their performance is analyzed, taking as a reference point the period prior to the outbreak of the 2008-2009 Global Financial Crisis. The main conclusion is that the complementary indicators are congruent with the reading derived from the performance of the traditional unemployment rate, which suggests that the labor market currently has tight conditions.

2. Alternative Unemployment and Underemployment Rates [3]

The traditional unemployment rate (TD1) is calculated based on the following formula:

$$TD1 = D/(D+O), \quad (1)$$

where D is the unemployed population –the working-age people who are not employed, but who actively looked for jobs during the reference week- and O is the employed population –the working-age people who have a job–.[4]

The first alternative measure (TD2) is calculated as follows:

$$TD2 = (D+N)/(D+O+N), \quad (2)$$

where N is the population with a marginal connection to the labor market –working-age people that are not part of the labor force, but who are available to work and who, in addition, looked for employment at least once during the three months prior to the week when the survey was conducted, although they did not look for employment during the reference week.[5] In principle, these people represent a group highly linked to the labor force and that could quickly incorporate in it.

The second complementary measure (TD3) is calculated with the following formula:

$$TD3 = (D+P)/(D+O+P), \quad (3)$$

where P is the population that is not part of the labor force, but that is available to work if a job offer is received.[6] In addition to the population with a marginal connection to the labor market, this group includes people with a weaker link to the labor market, who, despite showing interest in a job, have not actively searched for one during the last three months.

Finally, the last complementary measure (TD4) is calculated as follows:

$$TD4 = (D+P+B)/(D+O+P), \quad (4)$$

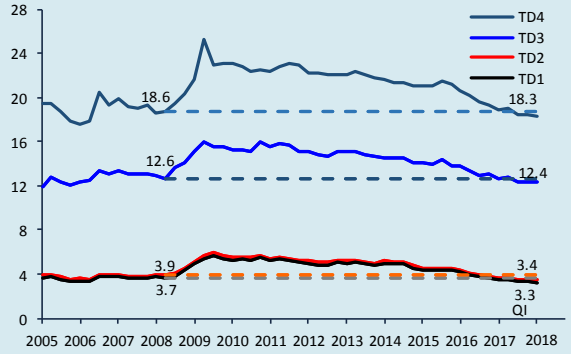
where B is the underemployed population –the population that is employed, but that wishes to work longer hours as compared to the current situation–. Although this group is already part of the labor force, its willingness to work more hours without the opportunity to do so represents an underutilization of the labor factor.

[1] See, for example, Clark and Summers (1979) and Elsby et al. (2015).
[2] See, for example, the research of Krusell et al. (2011, 2017), which aimed to complement the canonical Mortensen-Pissarides search models (1994) with decisions at the margin of the labor force participation.
[3] All indicators are calculated based on information in ENOE, conducted by INEGI.
[4] In Mexico, the working-age population corresponds to people 15 years and older.
[5] The ENOE allows to take a maximum reference of three months to establish if a person has actively looked for employment.
[6] It should be noted that N is a subgroup of P.

3. Evolution of Complementary Measures of Unemployment and Underemployment

Chart 1 shows the evolution of the national unemployment rate and the evolution of the described complementary rates. It stands out that the population with a marginal connection to the labor market is relatively small. Hence, the difference between the TD1 and TD2 rates is practically imperceptible. In contrast, people who are available to work, but have a weaker link to the labor market and the underemployed population are more numerous, which can be observed given a notable difference between the TD3 rate and the TD2 rate, as well as the gap between the TD4 and the TD3 rates. Still, this does not necessarily reflect slack in the labor market, but rather it represents structural factors that mainly determine the relative sizes of the population groups under analysis. In this sense, the evaluation of slack conditions based on these complementary rates should be based on their dynamics and not necessarily on their level.

Chart 1
Alternative Unemployment and Underemployment Rates
Percent, s. a.



s. a. / Seasonally adjusted data.
Note: The definition of this indicators is explained in Section 2 of this Box.
Source: Prepared by Banco de México with data from ENOE, INEGI.

In this sense, it is observed that all rates have had similar patterns since the 2008-2009 Global Financial Crisis. In particular, all measures show an important increase at the beginning of the crisis, although the TD4 rate seems to go up at a greater magnitude than the rest. Indeed, the magnitude of rate changes shows that the populations that grew the most were the unemployed, the available population, especially the part with a weak link to the labor market, and underemployed workers. That is, in addition to a considerable increment in the unemployed population, a significant share of the working-age population left the labor force, while still willing to work, and another fraction remained employed but wished to work more hours than demanded by the market.

Over the subsequent years, all rates point to a gradual strengthening of the labor market. Chart 1 includes horizontal lines with the value of each rate exhibited in the quarter prior to the Global Financial Crisis. They are used to evaluate the degree of the cyclical recovery in the labor utilization that was observed in the wake of the said crisis. It stands out that TD1 and TD2 rates attained levels observed prior to the recession in the fourth quarter of 2016, while TD3 and TD4 rates seem to remain lagged for several quarters with respect to the performance of TD1 and TD2 rates, as they attained their pre-crisis level in the third quarter of 2017. This lag could imply that part of the population available to work but with weak links took longer to incorporate into the labor force as compared to other groups. Based on these results, all unemployment and underemployment rates have recovered with respect to the levels prior to the outburst of the Global Financial Crisis. In addition, all measures have continued to decline and are currently at the minimum levels on record since the beginning of ENOE in 2005, which seems to indicate that labor market conditions are currently tight.

4. Final Remarks

This box presents complementary measures to the national unemployment rate (TD1) as alternative indicators of the degree of slack in the labor market. These measures successively incorporate the population with a marginal connection to the labor market (TD2), the population available with a weaker link to the labor market (TD3), and the underemployed population (TD4). It stands out that all considered measures are at levels lower than those on record since ENOE started to be conducted in 2005, which suggests that slack conditions in the labor market have remained tight for a number of quarters.

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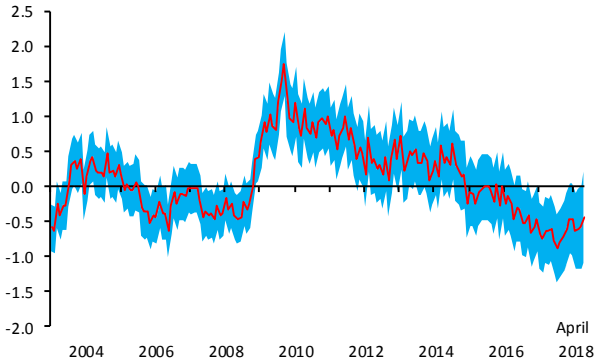
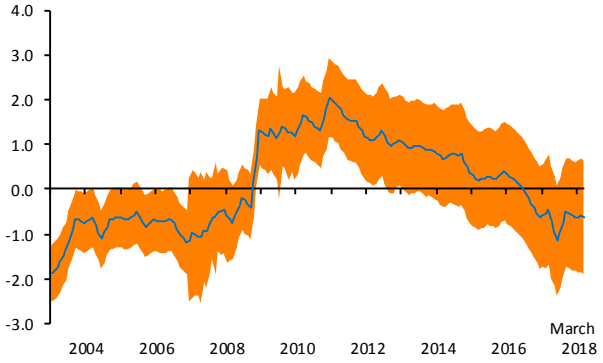
Mortensen, D. T., Pissarides, C. A. (1994). Job creation and job destruction in the theory of unemployment, *Review of Economic Studies*, 61(3), pp. 397–415.

Chart 29
Estimate of the Unemployment Gap [1/]
Percent, s. a.

a) Unemployment Rate



b) Unemployment Rate and Informal Salaried Workers



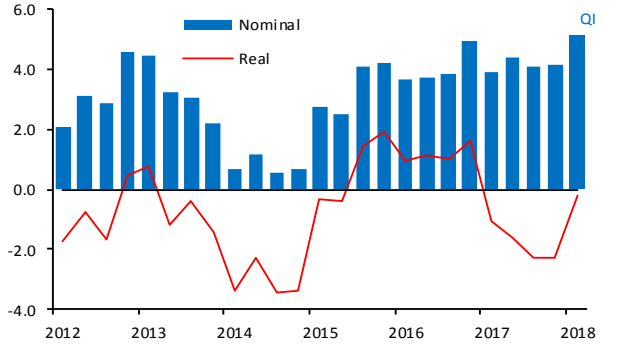
s. a. / Seasonally adjusted data.
1/ Shaded areas represent confidence intervals. An interval corresponds to two average standard deviations among all estimates.
Source: Prepared by Banco de México with data from INEGI (ENOE).

In the reported quarter, the main wage indicators exhibited higher nominal growth rates than in the previous one (Chart 30). In particular, the average wage of salaried workers in the economy as a whole had an annual growth rate of 5.1%, a higher adjustment than the 4.1% reported in the previous quarter. In contrast, the daily wage associated to IMSS-affiliated workers presented an annual increase of 5.5%, as compared to 5.2% in the previous quarter. The average adjustment of contractual wages negotiated by firms under federal jurisdiction was 5.3% in the first quarter of the year. Thus, as a result of nominal wage increases, combined with the evolution of annual inflation in the first quarter of 2018, and in contrast to negative real changes in 2017, real wage increases in the analyzed quarter were close to zero for the economy as a whole and, by the end of the quarter, they were positive for IMSS-affiliated workers. In a comparison with the expected inflation in the first quarter of the year for the next 12 months, wage adjustments implied progress in real terms, both for the economy as a whole and for IMSS-affiliated workers.

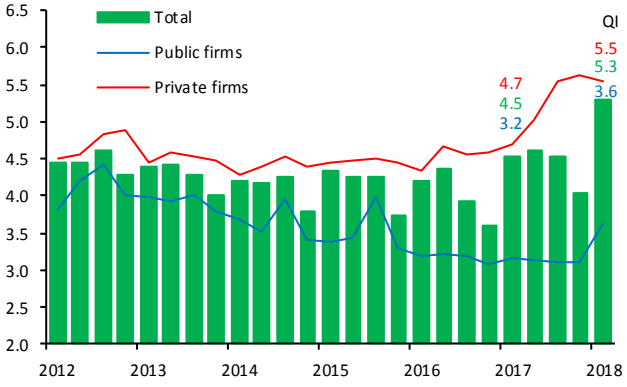
Derived from the performance of productivity and inflation in the first quarter of 2018, labor unit costs for the economy as a whole in real terms stopped decreasing and persisted at a level similar to that in the last quarter of 2017. This development stands in contrast with the one corresponding to the labor costs in the manufacturing sector, which maintained an upward trend at the beginning of 2018 (Chart 31a and Chart 31b).

Chart 30
Wage Indicators
Annual change in percent

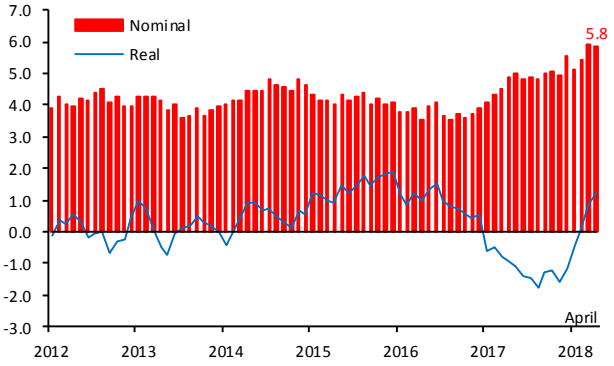
a) Average Wage of Salaried Workers according to the National Employment Survey [1/]



b) Nominal Contractual Wage [2/]

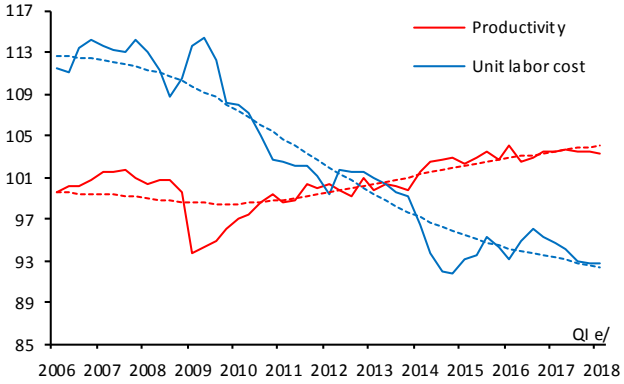


c) Daily Wage of IMSS-affiliated Workers 3/

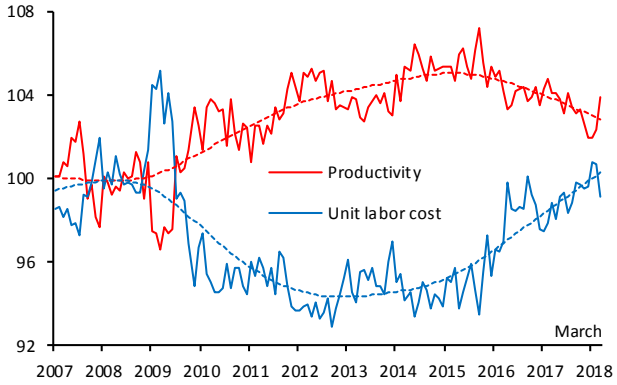


1/ To calculate average nominal wages, the bottom 1 percent and the top 1 percent in the wage distribution were excluded. Individuals with zero reported income or those who did not report it are excluded.
2/ The contractual wage increase is an average weighted by the number of involved workers. The number of workers in firms under federal jurisdiction that report their wage increases each year to the Secretary of Labor and Social Welfare (STPS) is approximately 2.3 million.
3/ During the first quarter of 2018, on average 19.7 million workers were registered at IMSS.
Source: Calculated by Banco de México with data from IMSS, STPS and INEGI (ENOE).

Chart 31
Productivity and Unit Labor Cost
a) Total of the Economy 1/
Index 2013=100, s. a.



b) Manufactures 1/
Index 2008=100, s. a.



s. a. / Seasonally adjusted and trend series. The former is represented with a solid line, the latter with a dotted line.
1/ Labor productivity based on hours worked.
e/ The figure of the first quarter of 2018 is Banco de México's estimate based on the GDP data published by SCNM and ENOE by INEGI.
Source: Prepared by Banco de México with seasonally adjusted data from the Monthly Manufacturing Business Survey and the Monthly Indicator of Industrial Activity of Mexico's System of National Accounts. 2013 base series, INEGI.

2.2.3. Financing Conditions of the Economy [8]

2.2.3.1. Total Funding of the Mexican Economy

The sources of financial resources of the economy continued growing at relatively low rates during the first quarter of 2018, although there was a certain acceleration relative to its growth rate in 2017. In particular, its growth was 2.3% in the reference quarter, which compares to 1.2% in 2017. The relatively weak growth of the sources of financial resources largely derives from a larger restriction in external financing that the Mexican economy has faced since late 2014 as a consequence of a series of negative shocks. Some of them are a decline in the terms of trade –mainly due to lower international crude oil prices relative to the years prior to 2014-, the effects that the uncertainty over the renegotiation of NAFTA has had on Mexican financial markets, and the impact of the monetary policy normalization process in the U.S. on emerging economies, including Mexico. In this respect, while in the period of 2013-2014 flows of external resources exceeded the 4% of GDP, between 2015 and 2017 its annual average was around 1.5% of GDP (Table 1).

[8] Unless stated otherwise, in this Section growth rates are expressed in real annual terms and are estimated based on balances adjusted for exchange rate and asset price variations.

Table1
Total Funding of the Mexican Economy (Sources and Uses)

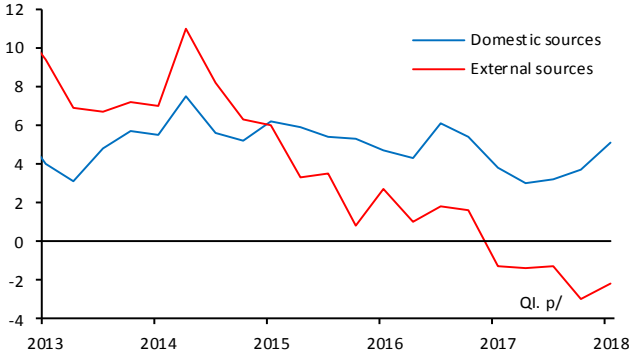
	2013	2014	2015	2016	2017	2018 T1	2013	2014	2015	2016	2017	2018 Q1
	Annual flows as percentage of GDP						Real annual change in percent					
Total sources	**10.0**	**9.7**	**5.8**	**7.4**	**7.9**	**7.4**	**6.3**	**5.6**	**3.5**	**4.0**	**1.2**	**2.3**
Domestic sources (F1) 1/	5.7	5.6	4.6	5.5	6.6	6.4	5.7	5.2	5.3	5.4	3.7	5.1
Monetary 2/	3.8	3.2	2.7	3.6	4.2	4.3	6.1	4.2	4.7	5.7	3.8	5.9
Non-monetary 3/	1.9	2.4	1.9	1.9	2.3	2.0	5.0	7.0	6.3	4.9	3.4	3.7
Foreign sources 4/	4.2	4.1	1.2	1.9	1.3	1.0	7.2	6.3	0.8	1.6	-3.0	-2.2
Total uses	**10.0**	**9.7**	**5.8**	**7.4**	**7.9**	**7.4**	**6.3**	**5.6**	**3.5**	**4.0**	**1.2**	**2.3**
International reserves 5/	1.0	1.3	-1.5	0.0	-0.4	-0.2	1.2	2.5	-9.6	-3.5	-8.7	-5.9
Public sector financing	4.1	4.7	4.2	2.9	1.1	2.6	4.8	6.0	6.4	2.5	-4.1	0.8
Federal public sector	3.7	4.5	4.0	2.8	1.1	2.6	4.6	6.2	6.7	2.7	-4.1	1.1
States and municipalities	0.4	0.2	0.1	0.1	0.1	0.0	9.1	2.5	2.9	-0.6	-4.6	-4.1
Private sector financing 6/	4.2	2.6	3.1	3.0	3.9	3.9	7.0	2.5	5.7	4.3	3.3	4.9
Domestic	2.5	1.7	3.0	3.0	3.3	3.3	5.4	2.3	9.0	7.5	4.6	6.4
Foreign	1.7	0.8	0.1	0.0	0.6	0.5	10.8	3.0	-1.5	-3.6	-0.4	0.5
Other 7/	0.7	1.2	0.1	1.6	3.2	1.0	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Note: Annual flows are expressed in % of average annual nominal GDP. The acronym "n.s." refers to non-significant data.
1/ It corresponds to the aggregate of domestic financial assets F1.
2/ It refers to financial instruments included in the monetary aggregate M3, which is composed of M2 plus federal government securities, Banco de México's securities (BREMS) and IPAB securities held by resident money-holding sectors. M2 is constituted by liquid instruments (banknotes and coins and deposit accounts payable on demand in banks and in savings and popular loan entities) and terms instruments (deposits with a residual term of up to 5 years in banks, in savings and popular loan entities and credit unions; investment fund shares and repo and creditors from repo operations).
3/ They include housing and pension saving funds, private securities, other public securities and other bank liabilities (debt securities issued by banks with a residual term of over 5 years and subordinated obligations).
4/ It includes monetary instruments held by non-residents (i.e., MNR aggregate that is equivalent to the difference between M4 and M3) and other non-monetary sources held by the external sector (foreign financing to the federal government, public institutions and enterprises; commercial banks' foreign liabilities; foreign financing to the non-financial private sector; deposits by agencies, among others).
5/ As defined by Banco de México's Law.
6/ It refers to credit portfolio of financial intermediaries, the National Housing Fund (Infonavit) and the ISSSTE Housing Fund (Fovissste), as well as the issuance of domestic debt and external financing of businesses.
7/ It includes capital accounts, and results and other assets and liabilities of commercial and development banks, non-bank financial intermediaries, of the National Housing Fund (Infonavit) and Banco de México –including the securities issued by this Central Institute for the purposes of monetary regulation, especially those related to neutralizing the monetary impact by the operational surplus –. Similarly, it includes non-monetary liabilities from the Institute for the Protection of Bank Savings (IPAB), as well as the effect of the change in the valuation of public debt instruments, among other concepts.
Source: Banco de México.

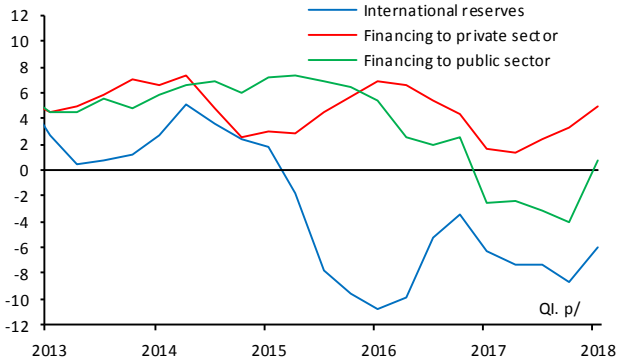
In this context of a low dynamism of external financing to the economy, the recovery of the sources of financial resources in the reference quarter is due to the gradual increase in the domestic sources (Chart 32a). In particular, the tighter monetary stance that has been implemented by Banco de México, besides contributing to anchoring medium- and long-term inflation expectations, has brought about a reallocation in the intertemporal spending of economic agents providing incentives for an increase in savings –especially through long-term instruments, given the increase in the opportunity cost of holding cash and other highly liquid instruments-. This, combined with an improvement in the fiscal stance – which starting from 2016 has implied a lower absorption of financial resources by the public sector, has contributed to mitigate the impact of a tighter external financing on the Mexican economy, and, in particular, on the financing conditions faced by the private sector (Chart 32b).

Thus, in the analyzed quarter, domestic sources of financial resources –as measured by the aggregate of domestic financial assets F1- grew at a real annual rate of 5.1%, which is higher than the rate of 3.7% registered in the previous quarter (Chart 33a). The recent recovery in the domestic sources has been reflected, first of all, in a greater holding of monetary instruments by the resident non-financial private sector, which would in part be due to a higher relative yield of these instruments, as well as the recovery of economic activity. Within the monetary instruments, resident sectors have favored long-term instruments over more liquid assets, which derives from higher relative yields of the former (Chart 33b). Growth of domestic sources also benefitted from the greater saving in non-monetary instruments, particularly in housing and retirement saving funds, which has reflected the dynamism of formal employment.

Chart 32
Total Funding of the Mexican Economy (Sources and Uses)
Real annual change in percent
a) Sources



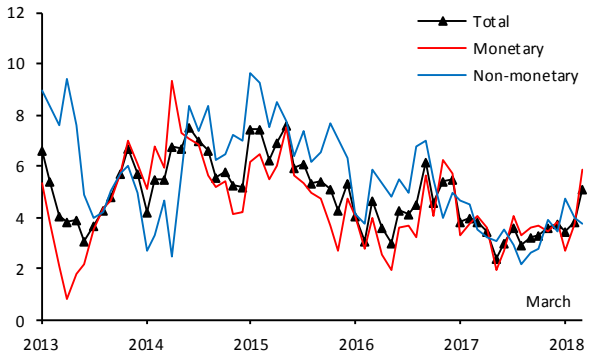
b) Uses



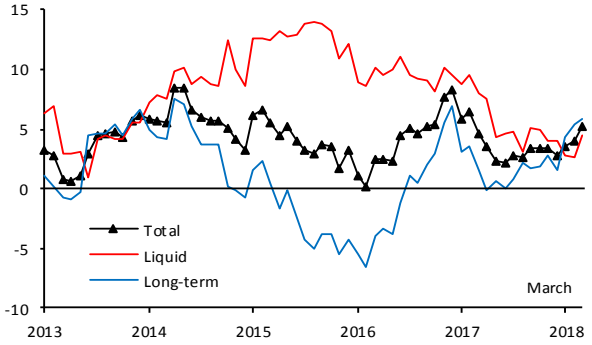
p/ Preliminary data.
Note: Each item's definitions are shown in Table 1.
Source: Banco de México.

The external sources of resources declined by 2.2% in real annual terms, a slightly lower contraction than that registered in the previous quarter (Chart 33c). Within it, negative growth rates were observed both in non-resident monetary instruments' holdings and in the external indebtedness of the public sector and banks. In addition, the external financing to non-financial private firms expanded at a relatively low rate of 0.5%. All this reflects the aforesaid greater restriction in external financing that the Mexican economy is currently facing.

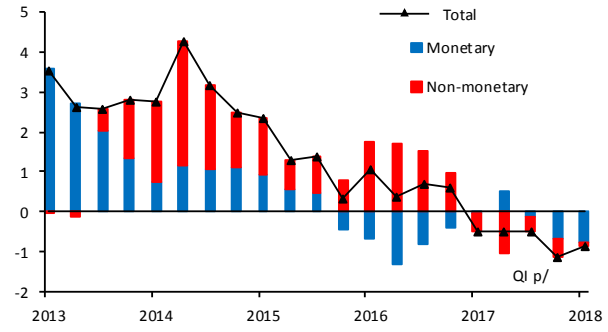
Chart 33
Sources of Financial Resources
a) Domestic Sources (F1)
Real annual change in percent



b) Monetary Aggregate M2
Real annual change in percent



c) External Sources
Real annual change in percent and contribution to growth

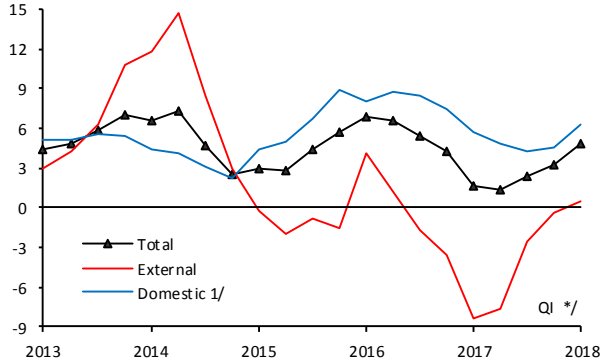


p/ Preliminary data.
Note: Each item's definitions are shown in Table 1.
Source: Banco de México.

The use of financial resources of the economy generally maintained a low dynamism. On the one hand, financing to the public sector kept expanding at relatively low rates, as compared to the period prior to 2016, when the fiscal stance began to improve. In particular, in the first quarter of 2018 public sector financing expanded at a real annual rate of 0.8%, and in 2017 it contracted at a rate of 4.1% in real terms, which is below the average growth displayed

between 2014 and 2016 of 5.0% in real terms (Table 1). Meanwhile, the balance of international reserves in the first quarter of 2018 had a real annual change of -5.9%, which is largely the consequence of the fact that Pemex has not sold U.S. dollars to Banco de México in 2017 and 2018, which in turn reflects the decline in the oil trade balance. Meanwhile, total financing to the non-financial private sector expanded at a rate of 4.9% in the analyzed quarter, which compares to the 3.3% growth in the previous one (Chart 34). The following section provides further detail on the evolution of financing to the public and private sectors.

Chart 34
Total Financing to Non-financial Private Sector
Real annual change in percent



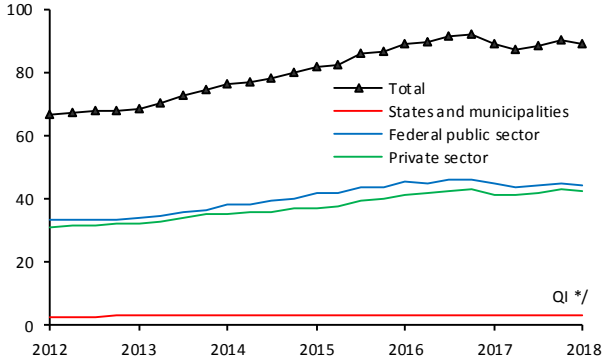
*/ Data on external and total financing corresponding to the first quarter of 2018 are preliminary.
1/ These data are adjusted due to the withdrawal from and the incorporation of some financial intermediaries to the credit statistics. It includes commercial banks' credit, development banks' credit and credit from other non-bank financial intermediaries.
Source: Banco de México.

2.2.3.2. Financing of the Economy

Below, there is an in-depth analysis of the recent evolution of financing to public and private sectors, understood as gross financing received by these sectors from external and domestic financial intermediaries, as well as via the debt issuance.[9] The public sector considers the Federal Government, public entities and enterprises, and states and municipalities. The private sector refers to non-financial agents, that is, non-financial businesses and households.

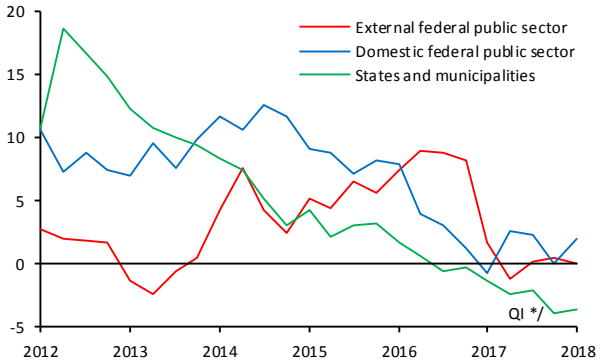
Gross financing to the federal public sector has had an upward trajectory as a share of GDP in recent years, and stabilized at a level around 45% of GDP starting from 2016 (Chart 35a). This reflects the fiscal adjustment that was implemented by the Federal Government starting from that year. Since then, the growth rate of the received domestic financing has moderated significantly, from an average above 9% in real terms between 2013 and 2015, to approximately 2.7% on average during the subsequent years. Although during 2016 the external financing to the federal public sector continued to expand at relatively high rates, as of 2017 it strongly decelerated and over the last four quarters it has remained stagnant. After attaining annual growth rates of over 15% in 2012, financing to states and municipalities presented a downward trend in its growth rate for over 5 years, and even contracted in real terms since mid-2016 (Chart 35b).

Chart 35
Financing to the Economy
a) Financing to Non-financial Sectors
Percent of GDP



[9] This measure of financing allows having a comparable indicator between the public and private sectors. Thus, for the public sector – unlike the Historical Balance of Public Sector Borrowing Requirements, which is a measure of net indebtedness and that in addition considers contingent liabilities-, the measure of financing that is used in this sector does not consider its holdings of financial assets or liabilities of this sector, such as those corresponding to IPAB and Fonadin (National Infrastructure Fund), ISSSTE Law bonds, Pemex and CFE pension bonds, among others.

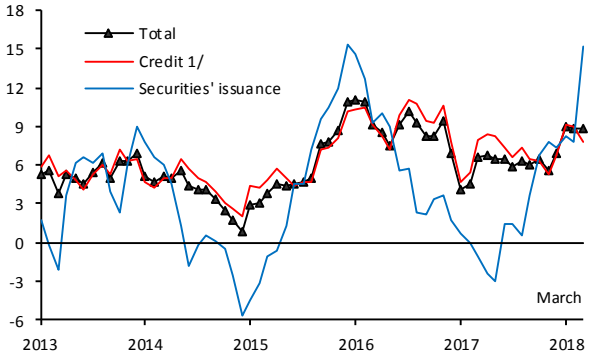
b) Financing to Non-financial Public Sector
Real annual change in percent



*/ Data on private sector and total financing corresponding to the first quarter of 2018 are preliminary.
Source: Banco de México.

Financing to non-financial private sector has exhibited an upward trajectory over the recent years, and reached 42% of GDP in the first quarter of 2018 (Chart 35a). In the reference quarter, its greater dynamism relative to the previous one is mainly attributed to the acceleration of domestic financing to firms that have been replacing their external liabilities with domestic ones, and have increased their preference for cash for precautionary reasons, in view of the uncertainty environment caused by external and domestic factors (Chart 36). In particular, in the first quarter of 2018 the issuance of private debt rebounded notably, which, as indicated by firms in their placement leaflets, was partly destined to the refinancing of other liabilities, mainly debts with commercial banks and external debts (Chart 37). Commercial bank credit kept expanding in a sustained manner (Chart 38), especially credit to large firms. Indeed, the Credit Market Survey conducted by Banco de México among Mexican businesses suggests that the share of businesses that reported to have used bank credit –both new credits and pre-existing credit lines–, remains high, in particular among firms with over 100 employees. Similarly, in the Survey on General Conditions and Standards in the Banking Credit Market (EnBan) commercial banks have reported that among larger firms demand for credit has increased. In turn, based on both surveys, it appears that these firms' higher demand for bank financing in recent years has been destined above all to cover their working capital requirements and the need to restructure liabilities, rather than spending on investment, which is consistent with the weakness of private investment during these years, although it has started to rebound (Chart 39).[10,11] Finally, development banks' credit to firms also expanded strongly in the reference quarter, although from relatively low levels (Chart 38).

Chart 36
Domestic Financing to Non-financial Private Firms [1/]
Real annual change in percent

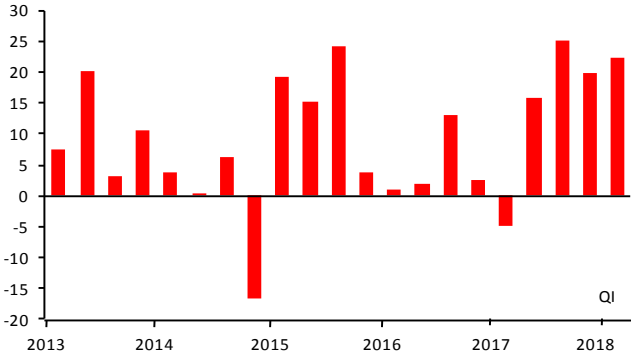


1/ These data are adjusted due to the withdrawal from and the incorporation of some financial intermediaries to the credit statistics. It includes credit from commercial banks, development banks and other non-bank financial intermediaries.
Source: Banco de México.

[10] For additional information, see the press release on the Quarterly Evolution of Financing to Firms during the quarter January – March 2018, available at the following link: http://www.banxico.org.mx/informacion-para-la-prensa/comunicados/sector-financiero/financiamiento-empresas/index.html

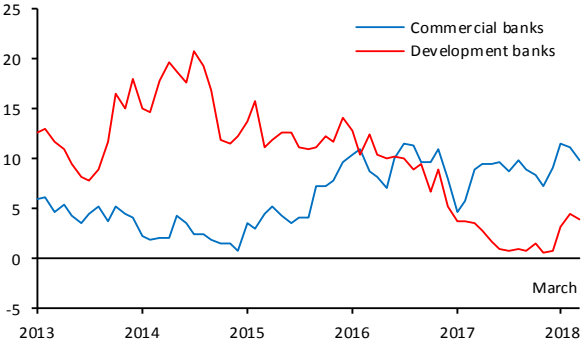
[11] For additional information, consult the press release of the Survey on General Conditions and Standards in the Banking Credit Market during the quarter January – March 2018, available at the following link: http://www.banxico.org.mx/informacion-para-la-prensa/comunicados/resultados-de-encuestas/encuesta-sobre-condiciones-generales-y-estandares-/condiciones-en-credito-bancar.html

Chart 37
Net Placement of Medium-term Securities of Non-financial Private Firms [1/]
MXN billion



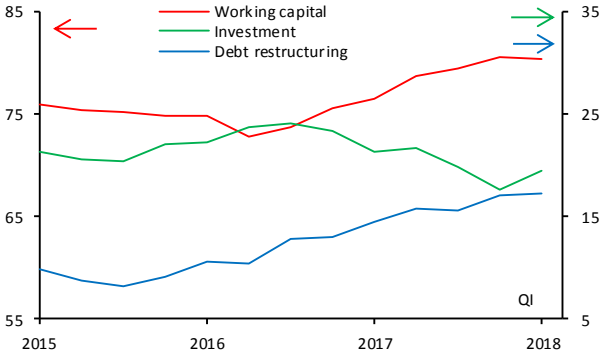
1/ Placements excluding amortizations (maturities and prepayments) in the quarter.
Source: Banco de México.

Chart 38
Performing Credit to Non-financial Private Firms
Real annual change in percent

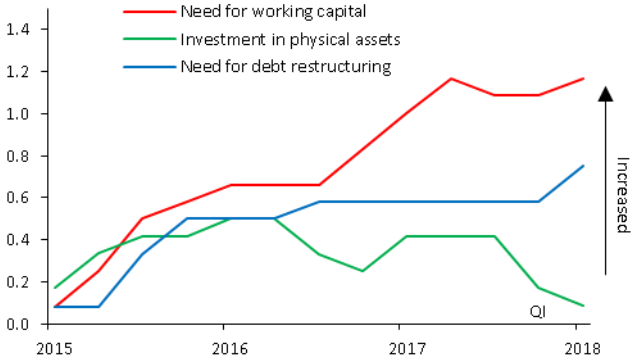


Source: Banco de México.

Chart 39
Use of Bank Credit by Large Businesses
a) Main Purpose of New Bank Credit according to Firms with over 100 Employees
Percentage of firms, 4-quarter moving average



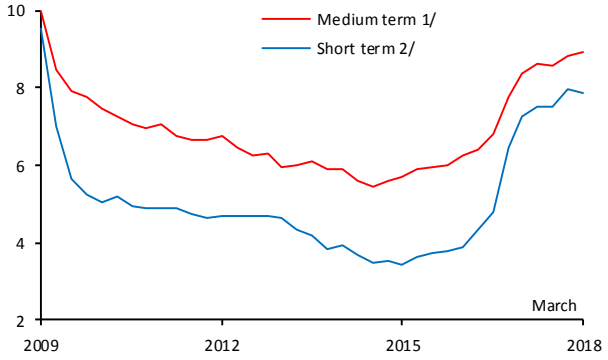
b) Factors Related to Large Firms' Credit Demand according to Banks with Greater Participation in the Segment
Accumulated diffusion indices, 2015Q1 – 2018Q1 [1/]



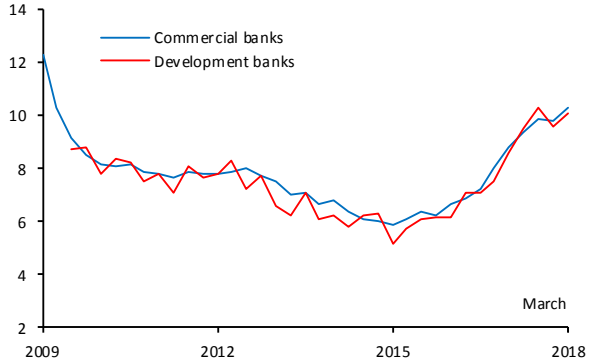
1/ For each quarter the diffusion index can take a value from -1 to 1, where the positive (negative) values denote increases (decreases) in the respective concept.
Source: The Credit Market Survey and the Survey on General Conditions and Standards in the Banking Credit Market, Banco de México.

The costs of financing to non-financial private firms remained practically unchanged with respect to the previous quarter, although they remain at higher levels than those observed on average during 2017, which largely reflects higher funding costs of financial intermediaries (Chart 40).

Chart 40
Financing Costs of Non-financial Private Firms
a) Annual Interest Rates of Private Securities
Quarterly average in percent



b) Annual Interest Rates of New Credits 3/
Quarterly average in percent



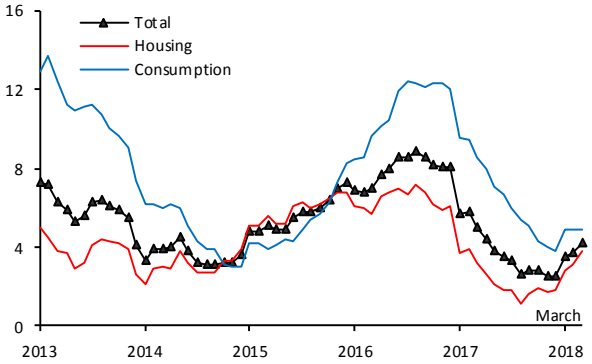
1/ Average weighted yield to maturity of issuances, with a term over 1 year, at the end of the month.
2/ Average weighted rate of private debt placements, with a term of up to 1 year, expressed in a 28-day curve. It only includes stock exchange certificates.
3/ The average rate weighted by the associated balance of performing credit for all terms.
Source: Banco de México.

In the reference quarter, credit to households –both housing credit and consumer credit- grew at a moderate rate, although it was higher than the registered during the previous quarter, which could be related to the recovery of economic activity and of the real wage bill. In particular, between the fourth quarter of 2017 and the first one of 2018, its real annual change shifted from 2.5% to 4.2% (Chart 41).

Delving in the evolution of this indicator, mortgage portfolios of both the National Housing Fund (Infonavit) and commercial banks slightly recovered, although they maintain a moderate growth rate (Chart 42). This is congruent with a lower dynamism of demand for housing credit, as reported by the banks in the Survey on General Conditions and Standards in the Banking Credit Market since the fourth quarter of 2016 and during most of 2017. In turn, the interest rates of new credits for housing acquisition were similar to those observed on average in 2017 (Chart 43).

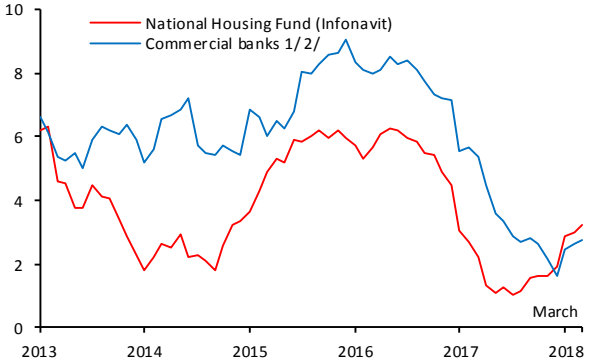
Commercial bank consumer credit incipiently recovered in the reference quarter. Within it, most components of the portfolio showed higher growth rates. Auto loans are an exception –they constitute 92% of credit for acquisition of consumer durables-, which kept decelerating in line with the low trajectory of light vehicle sales (Chart 44). Interest rates of different segments of consumer credit did not show important adjustments with respect to the previous quarter, although in general they are at levels above those observed on average during the previous year.

Chart 41
Total Credit to Households 1/
Real annual change in percent



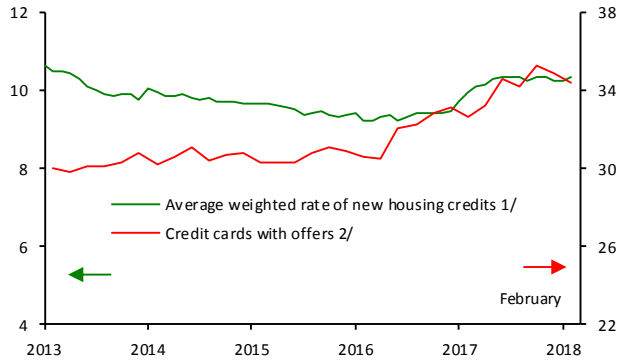
1/ These data are adjusted due to the withdrawal from and the incorporation of some financial intermediaries to the credit statistics.
Source: Banco de México.

Chart 42
Performing Housing Credit
Real annual change in percent



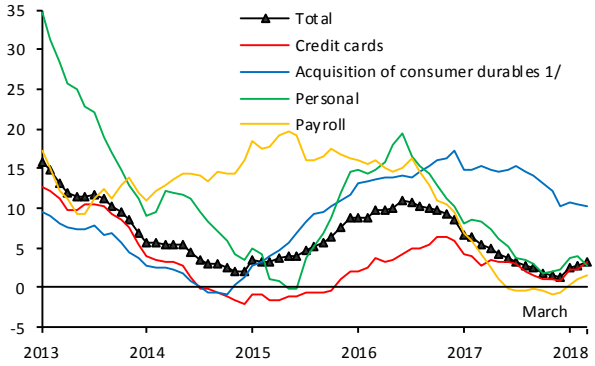
1/ These data are adjusted due to the withdrawal from and the incorporation of some financial intermediaries to the credit statistics.
2/ Figures are adjusted in order to avoid distortions by the transfer and the reclassification of direct credit portfolio, by the transfer from the UDIS trust portfolio to the commercial banks' balance sheet and by the reclassification of direct credit portfolio to ADES program.
Source: Banco de México.

Chart 43
Annual Interest Rate of Credit to Households
In percent



1/ The average rate weighted by the associated balance of performing credit. It includes credit for acquisition of new and used housing.
2/ The source is the information data base relative to credit cards. It refers to the average rate weighted by performing credit cards and the generalized use of non-revolving customers.
Source: Banco de México.

Chart 44
Performing Commercial Bank Consumer Credit
Real annual change in percent



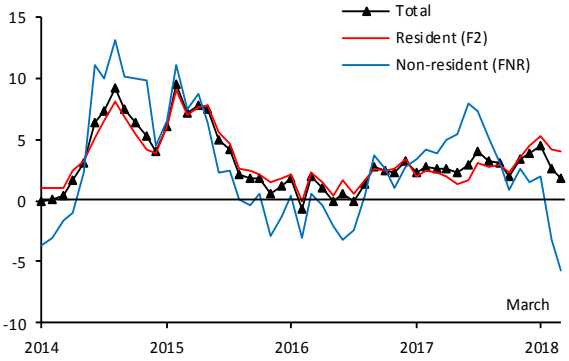
1/ It includes auto loans and credit for acquisition of other movable properties.
Source: Banco de México.

In sum, the adjustments in Mexico's macroeconomic stance, particularly in monetary and fiscal matters, have contributed to higher domestic saving and lower absorption of financial resources by the public sector, even in light of a larger restriction in external financing. In turn, this has attenuated pressures on loanable funds markets in Mexico, and, thus, mitigated the consequences that a larger restriction in external financing may have had on the private sector financing conditions. In the future, the sustained consolidation of public finances is especially important, as it would contribute to the orderly and efficient transition of the Mexican economy in an external environment characterized by the financing conditions that are estimated to become tighter.

2.2.3.3. Domestic Financial Assets (F)

Domestic financial assets –measured by the aggregate F-, grew at relatively low rates during the first quarter of 2018, mainly due to the unfavorable performance of equity instruments (Chart 45).[12] This is in part due to the negative impact of the valuation of shares issued by Mexican firms, the price of which decreased during the quarter, in line with the drop in advanced economies' stock market indices in an environment of higher volatility in international financial markets. Within the aggregate F, the stock of instruments held by non-residents (FNR) was affected, due to the high share of equity instruments that compose this portfolio and the lower holding of short-term fixed rate instruments.

Chart 45
Domestic Financial Assets (F)
Real annual change in percent



Source: Banco de México.

2.2.4. Slackness Conditions of the Economy

Regarding the cyclical position of the economy, in early 2018 slackness conditions generally seemed to have remained tight. In particular, such indicators as the estimate of the output gap excluding the oil sector and those related to the labor market point to tight conditions, while the indicators related to

[12] The aggregate F is calculated as the sum of aggregates F2 and FNR. F2 measures domestic financial assets held by residents and includes F1 plus variable rent and hybrid instruments held by money-holding resident sectors and are emitted by institutions based in Mexico (shares of private firms listed in the Mexican Stock Exchange; shares of variable rent investment funds; Real Estate Trust Certificates and Certificates of Capital Development). On the other hand, FNR measures domestic financial assets held by non-residents, which is constituted by this sector's holdings of financial instruments included in F2.

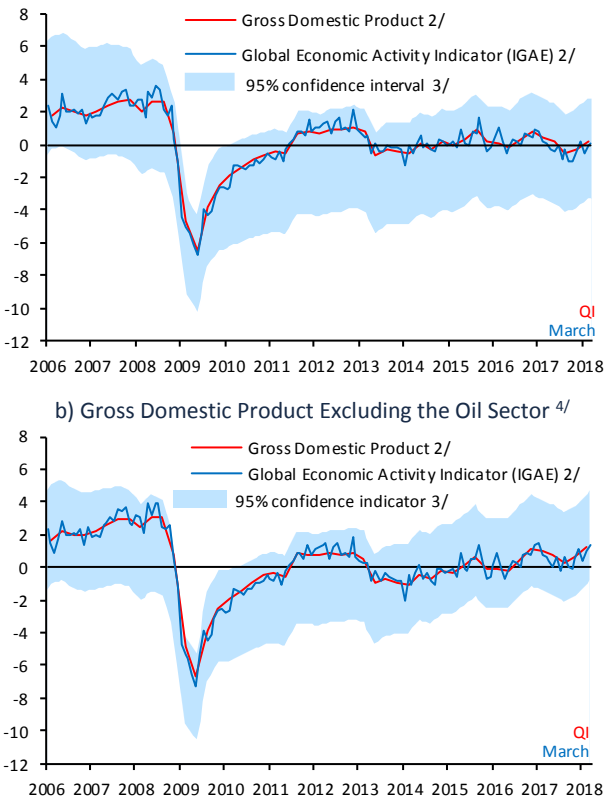
consumption and demand conditions in the loanable funds market presented a lower degree of tightness.

2.2.4.1. Slack Indicators

Derived from the performance of economic activity in the first quarter of 2018, the output gap lied at a level close to zero, while the positive output gap excluding the oil sector (which prevents the impact on oil supply from being interpreted as a cyclical weakness) presented higher levels than in the previous quarter (Chart 46a and Chart 46b).

In the fourth quarter of 2017, slackness conditions, in line with the index based on 12 quarterly indicators, remained at a level similar to that registered in the previous quarter, while the reading of slack conditions based on the 11-indicator monthly index suggests that they remained tight at the beginning of 2018 (Chart 47a and Chart 47b).[13] By groups of indicators, based on data as of the last quarter of 2017, the economic activity index and aggregate demand displayed tight conditions similar to those in the previous quarter. On the other hand, using the information as of February 2018, the index of the labor market seems to have tightened at the margin, while consumption and demand indices in the loanable funds market appear to have maintained similar levels to those registered at the end of the previous year (Chart 48). Thus, a number of abovementioned indicators signal that slack conditions remained tight in early 2018.

Chart 46
Output Gap Estimate 1/
Percentage of potential output, s. a.

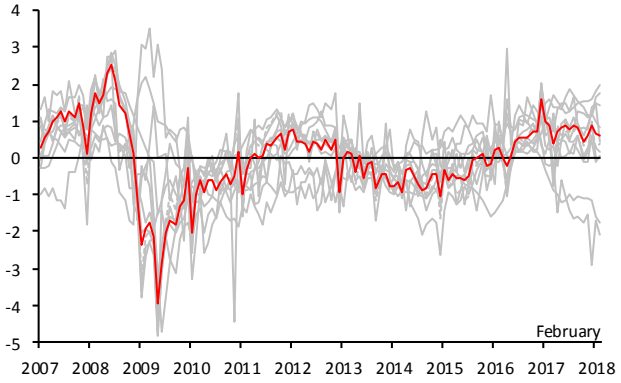


s. a. / Prepared with seasonally adjusted data.
1/ Estimated using the Hodrick-Prescott (HP) filter with tail correction; see Banco de México Inflation Report, April- June 2009, p.69.
2/ GDP figures as of the first quarter of 2018, IGAE figures as of March 2018.
3/ Confidence interval of the output gap calculated with an unobserved components' method.
4/ GDP excluding oil and gas extraction, excluding mining-related services and those derived from oil and carbon.
Source: Prepared by Banco de México with data from INEGI.

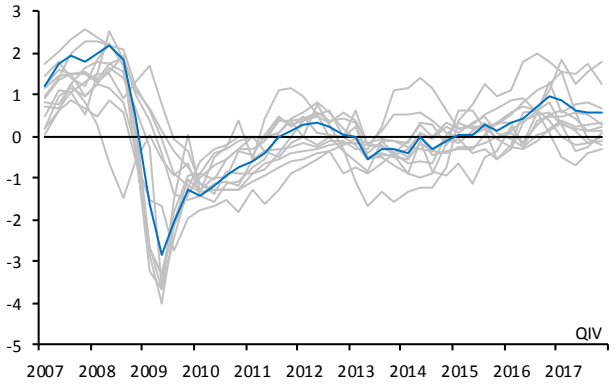
[13] See Box 4. "Slack Indicators to Identify Inflation Pressures", in the Quarterly Report October – December 2017, pp. 47-49.

Chart 47
First Principal Component by Frequency of Indicators [1/]
In percent

a) Monthly



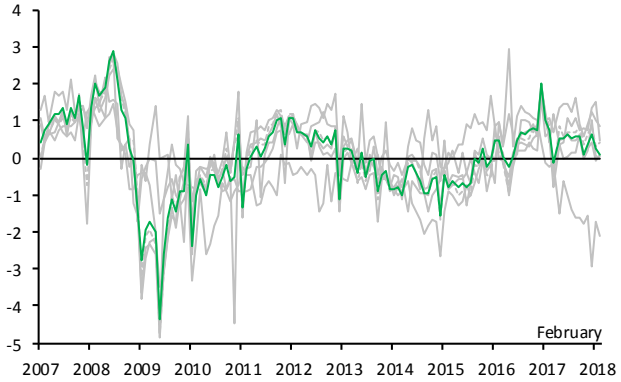
b) Quarterly



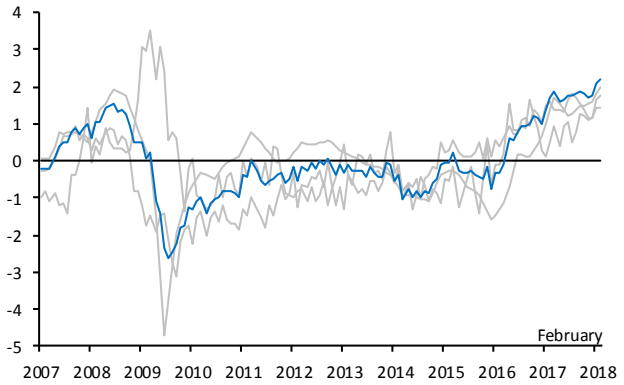
1/ The constructed indices are based on the MCS methodology; see Box 4 of the Quarterly Report October – December 2017. Monthly and quarterly slack indices are based on the first principal component of the sets comprising 11 and 12 indicators, respectively. The first component represents 51% and 58% of the joint variation of monthly and quarterly indicators, respectively. Grey lines correspond to individual slack indicators used in the principal components analysis.
Source: Estimated with data from INEGI and Banco de México.

Chart 48
First Principal Component by Group of Indicators [1/]
In percent

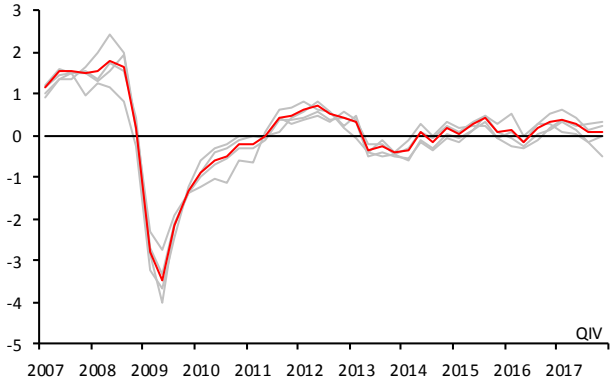
a) Consumption



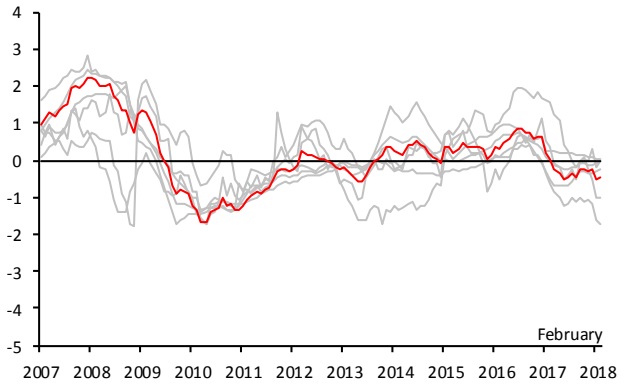
b) Labor Market



c) Economic Activity and Aggregate Demand



d) Demand Conditions in the Loanable Funds Market



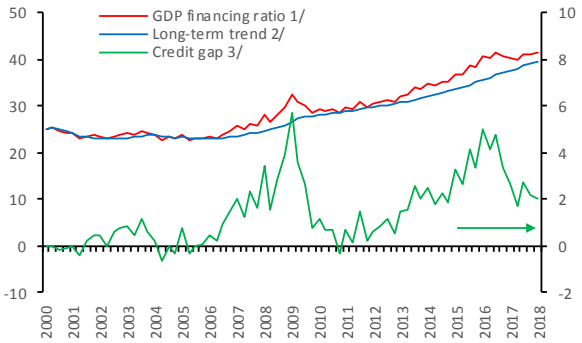
1/ The constructed indices are based on the MCS methodology; see Box 4 of the Quarterly Report October – December 2017. The slack indices related to consumption, labor market, economic activity and financial conditions are based on the first principal component of sets comprising 6, 3, 4, and 6 indicators, respectively. The first principal component represents 63%, 53%, 96% and 57% of the joint variation of the indicators of consumption, labor market, economic activity and financial conditions in the same order. The indices are based on monthly indicators, except for economic activity and aggregate demand, which use quarterly indicators. Grey lines correspond to individual slack indicators used in the principal component analysis.
Source: Prepared by Banco de México with data from INEGI and own data.

2.2.5. Stability of the Financial System

2.2.5.1. Aggregate Financing

Total financing to the non-financial private sector continued to expand during the first quarter of the year. Thus, its balance as a share of GDP is still above its long-term trend, albeit at lower levels as compared to those displayed in the previous years (Chart 49).

Chart 49
Ratio of Financing to Non-financial Private Sector to GDP and Long-term Trend
Percent

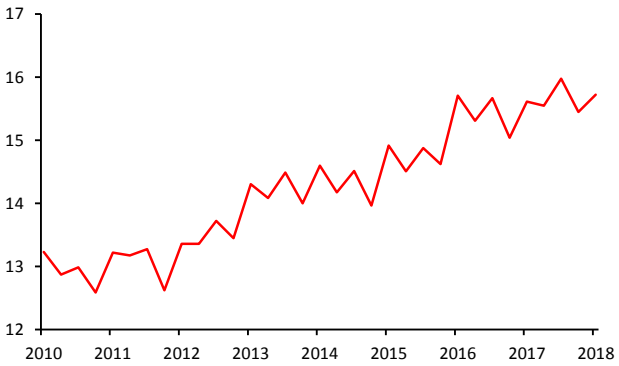


1/ The data of March 2018 are preliminary.
2/ The long-term trend is estimated using the one-tail Hodrick-Prescott filter with a smoothing parameter equal to 400,000.
3/ The credit gap is calculated as the difference of the financing-to-GDP ratio of the long-term trend.
Source: Banco de México.

Although this indicator (the deviation of credit-to-GDP ratio from its long-term trend) has been used to try to capture the excessive growth of credit, which could pose risks to the financial system, it presents a number of limitations. In particular, this indicator does not allow to capture the quality of the granted credit, or to identify if the observed dynamism responds to the increase in demand for credit or to a higher appetite for risk among lenders. Neither does it consider that credit can be increasing starting from relatively low levels as compared to GDP, which is the case when the comparison is made against other economies.

In the analyzed quarter, total financing to firms and households as a percentage of GDP marginally increased (Chart 50). With respect to payroll loans, the percentage of income destined to the payment of all received funding slightly went up in the quarter in an aggregated form, but the financial burden grew more considerably for lower income borrowers.

Chart 50
Total Financing to Households as Share of GDP 1/
In percent



1/ Data of March 2018 are preliminary.
Source: Banco de México.

2.2.5.2. Credit Risk

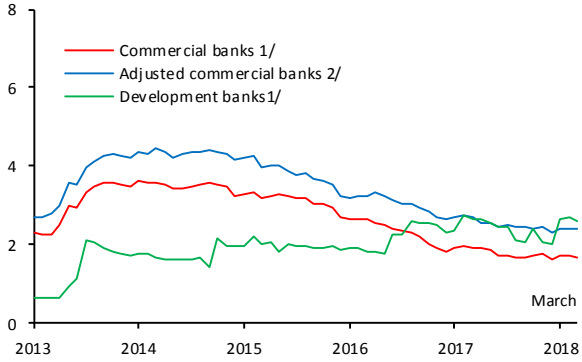
2.2.5.2.1. Bank Credit Risk

During the first quarter of the year, delinquency rates of credit to firms and housing have stabilized, with the respective average of 1.74% and 2.72%, levels that were close to the lowest figures on record for the last three years (Chart 51 and Chart 52). In the same vein, the evolution of the adjusted delinquency rate of these portfolios is similar (2.56% for business portfolio and 3.69% for housing portfolio). In contrast, the delinquency rate of credit to consumption has shown a growing trend since October last year, although it declined slightly at the end of the first quarter of 2018, with an average of the delinquency rate at 4.51% (Chart 53).

On the other hand, the price index of housing of the Federal Mortgage Society (FMS) increased 1.84% in real terms in the last quarter at the national level, without considerably affecting the origination conditions of mortgages granted by commercial banks (Chart 54).[14]

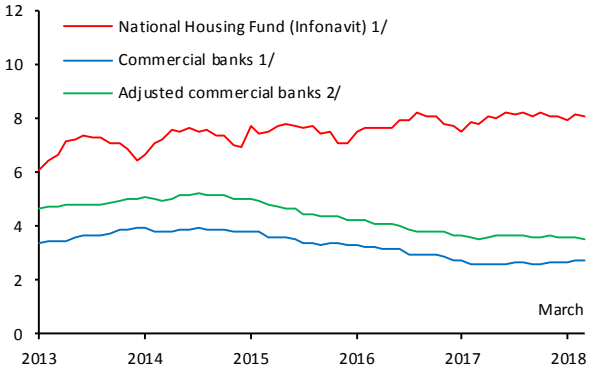
[14] The Federal Mortgage Society index includes new and used housing at the national level, housing of social, economic, medium and residential interest, and is constructed based on appraisals.

Chart 51
Delinquency Rates of Credit to Non-financial Private Firms
In percent



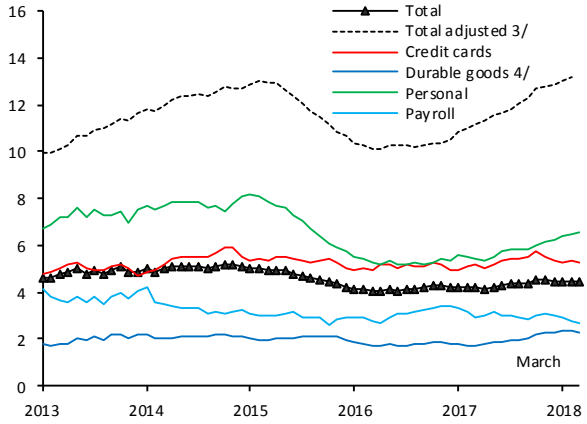
1/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.
2/ The adjusted delinquency rate is defined as the non-performing portfolio plus debt write-offs accumulated over the last 12 months divided by the total portfolio plus debt write-offs accumulated over the last 12 months.
Source: Banco de México.

Chart 52
Delinquency Rates of Housing Credit
In percent



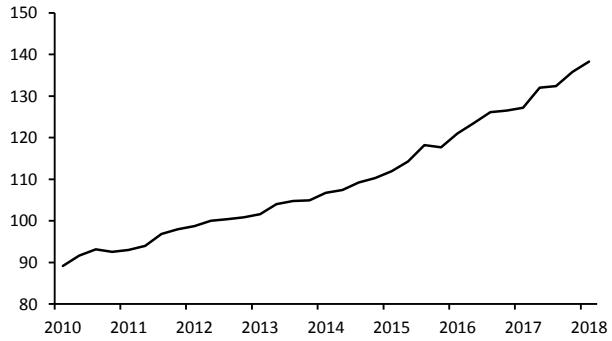
1/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.
2/ The adjusted delinquency rate is defined as the non-performing portfolio plus debt write-offs accumulated over the last 12 months divided by the total portfolio plus debt write-offs accumulated over the last 12 months.
Source: Banco de México.

Chart 53
Delinquency Rates of Commercial Bank Consumer Credit 1/ 2/
In percent



1/ It includes Sofomes ER subsidiaries of bank institutions and financial groups.
2/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.
3/ The adjusted delinquency rate is defined as the non-performing portfolio plus debt write-offs accumulated over the last 12 months divided by the total portfolio plus debt write-offs accumulated over the last 12 months.
4/ It includes auto loans and credit for acquisition of other movable properties.
Source: Banco de México.

Chart 54
FMS Index of Housing Prices in Mexico 1/
No units

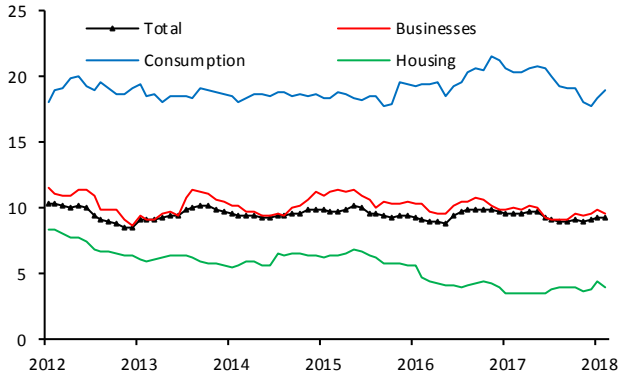


1/ The indicator at the national level includes new and used housing. The indicator is in real terms, as it consists in the constant quality index of fixed weights.
Source: Federal Mortgage Society (FMS).

The credit risk of the commercial banks' portfolio to the non-financial private sector remained at levels observed during the recent years, as measured with the Conditional Value at Risk (CVaR) as a share of total portfolio (Chart 55). [15]

[15] The Conditional Value at Risk (CVaR) gives a measure of potential losses that a credit portfolio may incur. The CVaR allows to analyze the losses in the distribution tail, as it represents the expected value of the loss when it is greater than VaR. The CVaR of credit is estimated using a capitalization model and credit risk. See Banco de México: Report on the Financial System, May 2017, pp. 64-67.

Chart 55
Annual Conditional Value at Risk at 99.9% by Type of Credit
In percent of portfolio



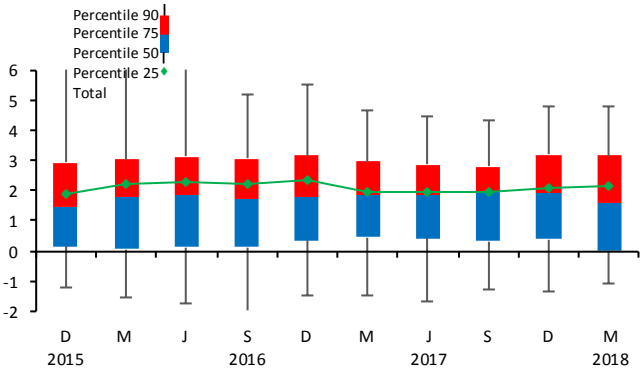
Source: Banco de México.

2.2.5.2.2. Non-financial Private Firms in the Mexican Stock Exchange

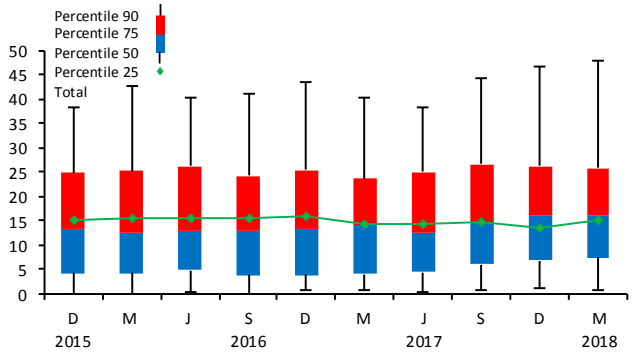
A considerable part of total indebtedness of non-financial private firms in Mexico is denominated in foreign currency (51.4%). In case of businesses listed in the Mexican Stock Exchange, this share is even higher (72.5%). Therefore, non-financial firms can be vulnerable to fluctuations in the exchange rate and in interest rates in U.S. dollars.

During the first quarter of the year, the decrease in net revenues of non-financial private firms listed in the Mexican Stock Exchange, albeit moderate, prompted leveraging risk indicators, indicators of debt service and of refinancing to increase slightly (Chart 56).

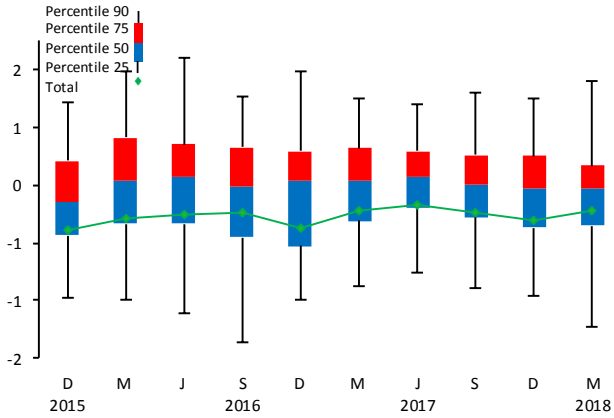
Chart 56
Leveraging, Debt Service Capacity and Risk of Refinancing of Non-financial Private Firms listed in the Mexican Stock Exchange
a) Net debt to EBITDA [1/]
In times



b) Debt service to EBITDA [1/]
In percent



c) Net debt to mature over next 12 months less liquidity to EBITDA
In times



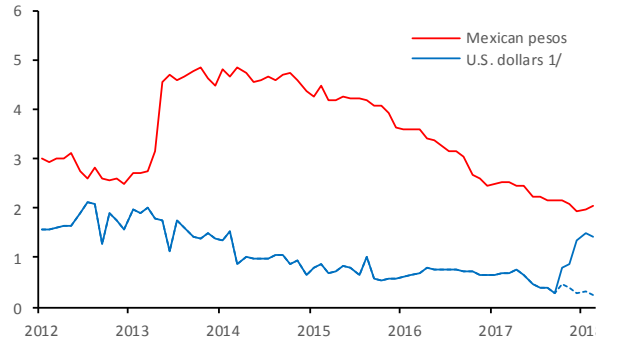
1/ Net debt = total debt with cost excluding liquidity divided by annual EBITDA. Debt service = annual accrued interests divided by annual EBITDA. EBITDA is earnings before interest, taxes, depreciation and amortization.
Source: Mexican Stock Exchange and Bloomberg.

However, most firms with liabilities in foreign currency have taken steps to mitigate exchange rate risks and interest rate risks they face. Therefore, the exchange rate depreciation and higher interest rates in U.S. dollars observed in recent months have not considerably affected the risk indicators of the set of these firms. Among the taken steps are the early amortization, refinancing liabilities on a longer-term basis, and, in some cases, replacing liabilities denominated in foreign currency by liabilities in Mexican pesos. Similarly, a number of businesses have acquired exchange rate and interest rate hedges. In addition, some firms have a natural hedge, as a considerable part of their revenues comes from abroad and is also denominated in foreign currency. Ultimately, an important increase in the accumulation of liquid assets has been observed over the last quarters.

2.2.5.3. Market Risk

The depreciation of the Mexican peso has raised the credit risk of the businesses with liabilities denominated in foreign currency. In case of commercial banks, although around 24% of the portfolio of non-financial private firms is denominated in U.S. dollars, the delinquency rate trend of this portfolio subset has consistently remained below the delinquency rate of the portfolio denominated in Mexican pesos (Chart 57). However, during the first three months of the year, the delinquency rate of the portfolio denominated in U.S. dollars strongly increased due to the breach of two firms.

Chart 57
Delinquency Rates of Credit to Non-financial Private Firms by Loan Currency
In percent



1/ The dotted line corresponds to delinquency that would have been observed but for the breach of the two firms.
Source: Banco de México.

2.2.5.4. Other Risks: Cyber Attacks

Progress in digital technology has implied important improvements in the operation of markets and financial institutions. However, they also gave rise to the emergence of new risks, the possible cyber-attacks against financial institutions and infrastructures, among them. As stated by Banco de México in previous reports, the sophistication, severity, potential and frequency of cyber-attacks at the international level have increased in recent years. [16]

The growing use of digital technologies, along with the high degree of interconnection among financial institutions have left the financial system particularly vulnerable to this type of attacks. The potential costs of cyber-attacks can be high, both for financial institutions and for their clients. These costs naturally include direct economic losses, suspension or loss of operations' agility and possible lawsuits.

Higher potential costs of cyber-attacks derive from affecting the financial stability. A cyber-attack that succeeds in affecting the performance of financial infrastructures can jeopardize the good functioning of the payment systems and can spread across the total financial system. Considering that the payment system allows the efficient settlement of a great number of transaction in the economy, the cyber-attacks that affect its functioning can strongly influence the economic activity (see Box 5). Damage to the financial system can be lasting if the reputation and the credibility of its institutions are affected, which could undermine users' confidence in the services provided.

Therefore, multilateral entities, central banks and national regulatory agencies, as well as the financial industry itself have acknowledged that cyber-attacks can become systemic. Furthermore, this potential source of a systemic risk has a very specific character, since, in principle, it is independent from economic and financial cycles, and can manifest at any given moment, which makes it less predictable. Similarly, the different techniques used to carry out these attacks and their fast evolution make them hard to predict. Lack of detailed and sufficient information on the occurrence of these attacks in Mexico and abroad makes the design of cyber security strategies even more complex. In addition, cyber-attacks represent a risk to information security.

Financial institutions' investment in information security as well as the full compliance with the measures established by the financial authorities in this matter have become a precondition to ensure the continued financial stability. The measures that can be taken in terms of information security not only lower the risk faced by institutions that implement them, but also the risk faced by their counterparties and their clients. As a consequence, the benefits of investing in information security for the financial system as a whole exceed the private benefits of the

[16] Banco de México: Report on the Financial System, October 2017, pp. 53-55.

individual institutions that carry them out. This highlights the key role of financial authorities in preserving the stability of the financial system in light of cyber-attacks.

The risk of simultaneous cyber-attacks against a number of institutions has materialized in Mexico in April 2018. The combination of technological sophistication and the logistics used is unprecedented in Mexico. The attack caused damage to the financial institutions' systems and working accounts. A large number of account holders across Mexico participated in this attack. Upon receiving the resources in their accounts, they withdrew cash at the counter during the minutes following the attack, which caused total losses of approximately MXN 300 million. The mentioned attack did not affect either clients' accounts or their resources (see Box 6).

It should be stressed that all financial institutions that make use of SPEI should comply with information security requirements established in the regulation issued by Banco de México in July 2017 (14/2017 Circular).

On May 16, 2018, Banco de México released 10 key points on the current situation with SPEI.[17] In the said press release, Banco de México requested the participants with a higher risk profile to migrate operations to a contingent platform, which slowed down the payment flows. This was done to safeguard the operational continuity. Priority was given to payments security, although the operating time has been affected. SPEI continues to process participants' payment orders. In fact, on April 30, 2018 a historical maximum of 6.8 million operations was processed, amounting to over MXN 1,400 billion. In the same vein, monitoring processes have begun to meet the information safety requirements, and the level of compliance among the participants was heterogeneous. Finally, Banco de México issued a number of provisions that grant space to credit institutions and other entities that transfer funds, so that they can implement additional control measures. Banco de México reiterates its commitment to normalize the operating time of all SPEI operations without delay.

[17] Banco de México: *Important Points on the Current Situation of SPEI*. This document can be consulted at: http://www.banxico.org.mx/inicio/banner/informacion-importante-sobre-la-situacion-del-spei/spei.html.

Box 5. Interbank Electronic Payment System (SPEI)

1. What is SPEI?

Interbank Electronic Payment System (SPEI) is Banco de México's payment infrastructure that allows the participant financial institutions (banks, brokerage firms, peoples financial companies (SOFIPOs) and other regulated financial entities) to send and receive funds transfers in Mexican pesos.

Thus, SPEI can be conceptualized as a pipeline or a central highway to which all participants connect and through which different participants' accounts are charged or credited with Banco de México in order to settle transactions, either sent independently or by their clients. SPEI allows the participant financial institutions to provide the end-users with the electronic transfer service in real time.

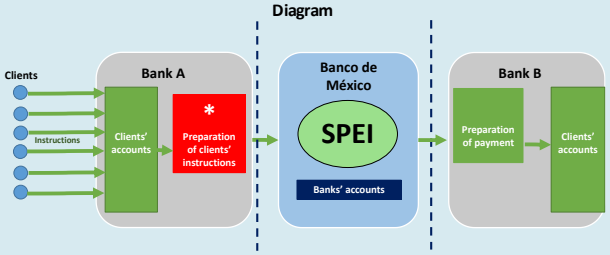
Currently, SPEI has 100 participants and functions 24 hours a day 365 days a year. Credit institutions, just like clearing houses are required to process payments under 8 thousand pesos at any time.

2. How does SPEI work?

To transfer funds via SPEI the following steps should be successfully followed (see diagram):

1. The end-client (the account holder) uses their electronic banking or mobile app to send an instruction to the participant institution indicating the payment they wish to make. This is done following tight security protocols, such as passwords, tokens and the proof of device possession (i.e., messages to pre-registered cell phones), among others.
2. The participant validates the security elements of the instruction and keeps evidence that the validation has been completed.
3. The participant prepares the instructions of their clients, including additional security elements (subject to 14/2017 Circular), which only they can control, and these are sent to Banco de México's SPEI. To make the connection with SPEI, participants make own developments or hire third parties to have this service (this is the stage that, in some participants' cases, was vulnerable in the operational events of April and May 2018).
4. Banco de México verifies the participants' electronic signatures, which gives certainty of the integrity of the payment instruction, and goes on to process and subsequently settle the payment with the receiving participant.
5. The participants involved in the funds' transfer are informed about it, the receiving participant confirms that the funds have been credited to the client's account and sends the information to Banco de México to generate the Electronic Proof of Payment.

Diagram



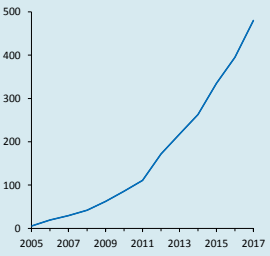
3. Use of SPEI

Since SPEI started its operations, the public's use of this means of electronic payments has expanded markedly. Thus, while in 2005, 5 million 520 thousand 597 transactions were conducted, in 2017 the number amounted to 480 million 4 thousand 665 transactions, which implied a compound annual growth rate of 45.1% during this period (Chart 1a).[1]

The amount of realized transactions using the SPEI platform shifted from MXN 93.5 trillion in 2005 to MXN 270.5 trillion in 2017, which implied a compound annual growth rate of 9.3% during the same period (Chart 1b).

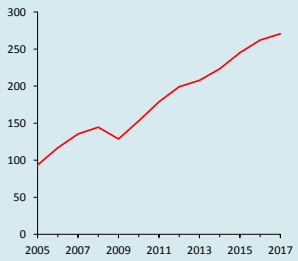
Chart 1
SPEI

a) Number of Transactions 1/



1/ Accumulated figures during the year.
Source: Banco de México.

b) Amount of Transactions 2/
MXN trillion



2/ Accumulated flows during the year.
Source: Banco de México.

[1] The compound annual growth rate is used to describe the average annual growth during a period over one year. The compound annual growth rate is calculated with the following formula:

$$\text{Compound annual growth rate} = \left(\frac{V_{t_n}}{V_{t_0}}\right)^{\frac{1}{t_n - t_0}} - 1,$$

where V_{t_n} is the value during last year, V_{t_0} is the value in the first year and $t_n - t_0$ corresponds to the number of years transpired.

Box 6. Information on Attacks on Users of Interbank Electronic Payment System (SPEI)

1. Introduction

Between the second half of April and the first half of May 2018, five participants of SPEI (Interbank Electronic Payment System) experienced attacks on applications used to prepare their payment orders and to connect to SPEI.

It should be stressed that, despite the said attacks, the central system of SPEI has not been affected and has not been the target. In the same vein, the resources of the financial institutions' clients are safe and have not been jeopardized.

In response to these events, Banco de México implemented a series of measures to contain the possible damage derived from these attacks on the affected participants, as well as in the payment system in general. Some of these measures are: (i) migrating the affected participants, as well as those with a higher risk profile to a contingent operational platform; (ii) the implementation of alerts in SPEI to detect anomalies in payment messages and the implementation of additional controls in applications used to connect SPEI with the participants; and (iii) introducing the regulation to create space so that the entities that give fund transfer services implement control measures to strengthen their systems of irregular transfers detection, to verify the integrity of their operations, as well as to verify the safety of cash withdrawals.

2. Summary of Operational Events in April and May

On April 17, Banco de México detected breach of a SPEI participant derived from the cyber-attacks. After that, four additional events were identified: two on April 24, one on April 26 and another one on May 8.

The attacks have focused on a number of elements of the applications used by participants to prepare their payment orders and to connect to SPEI, as well as on the computer and telecomm infrastructure of banks that use the said applications.

In this respect, it should be mentioned that Banco de México neither offers said applications to participants, nor certifies or validates them, but rather each participant is in charge of having the service, either granted by third parties (in most cases) or own developments. Notably, in all identified and reported cases of cybersecurity incidents, connection apps had been developed by a third party (see Table 1). However, the vulnerability could have been also associated to the systems, or the infrastructure where it had been installed.

Although the attacks are still under investigation, the modus operandi that has been identified so far is described below:

- Attackers damage the participants' technological infrastructure and insert illegitimate transactions at a certain stage of the process carried out by applications to connect to SPEI (see Chart 2).
- Illegitimate transactions include the inexistent sender account and a real receiving account.
- Participants sign and send these illegitimate transactions to SPEI via their applications, which validates them.
- SPEI confirms that operations are signed by participants, processes them and credits funds to the participant receiving account.
- The receiving participant makes the respective payment to their clients' accounts, in this case, the recipient of illegitimate resources.
- Finally, the illegitimate resources are withdrawn as cash.

Table 1
Share of the Market of Different SPEI Participants
Percent of total

	Number of transactions	Amount of transactions[1/]
Directly attacked institutions: 5	13.1	7.6
Affected institutions and with a higher risk profile[2/]	19.5	28.8
Institutions not affected with the external provider	7.2	14.7
Institutions not affected with own developments	73.4	56.5

1/ The amounts of the transactions exclude the securities settlement system, because there are no direct instructions of the general public.
2/ It includes directly attacked institutions.
Source: Banco de México.

The affected participates have noticed these illegitimate instructions through two channels: (i) via internal alerts as a result of the processes of transaction validation and (ii) via alerts from other participants that have received suspicious operations. Thanks to these alert mechanisms, some of the identified transactions were stopped by the receiving participants, which prevented the improper withdrawal of these fraudulent resources.

The clients' resources have not been jeopardized. The attackers' goal was to damage the connections of participants with SPEI, which only involves the resources of the affected institution. In fact, clients' resources are stored in a separate system with individual authenticity validations by transaction and present no sign of having been breached. In contrast, clients have been affected by the slowing down of those transactions that involve an affected institution, or an institution with a high risk profile to send payment orders via SPEI.

3. Reaction Protocol to Cybersecurity Incidents

In each case of a cybersecurity incident, a protocol is applied which implies cutting off the attacked institution and initiating operations via the contingency schemes.

To this end, Banco de México has a back-up system to make SPEI transactions called Alternative SPEI Client Operation (COAS). The operation via this contingency scheme lowers the risk, as it is a different infrastructure from the one that has been affected. However, the operation through this scheme is semiautomatic, as a result of which transfers are not sent and/or deposited in real time.

Once attacks to a given institution are identified, common risk elements are pinpointed among other participants. Based on this information, a statement is released to those participants in whose cases a higher risk was identified, who would have to connect to SPEI via COAS in their facilities in the future.

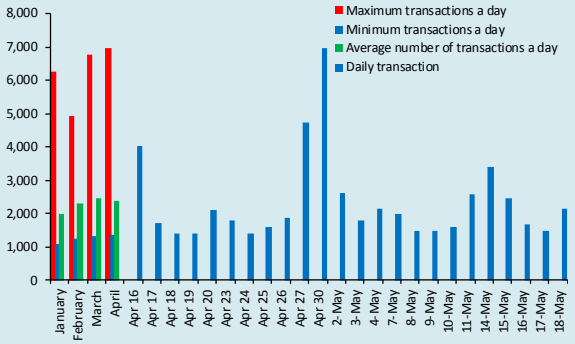
Despite the attacks, SPEI has continued to provide services in a safe manner and to process large quantities of payments. It should be noted that on April 30, this payment system reached its historical record maximum as it processed over 6.8 million payments. In the same way, the affected participants have recovered the operational level in SPEI, once the contingent processes have stabilized (See Chart 1).

4. Cybersecurity Requirements Applicable to Participants

Some of these requirements are related to the safety of SPEI connection applications and to the alternative operation scheme (COAS), such as:

- Have procedures to evaluate the communication protocols used in the technological infrastructure and waive the ones that are considered unsafe.

Chart 1
Number of Transactions Processed by SPEI during the Operational Contingency



- Have procedures that allow to manage vulnerabilities to computer security, derived, among other factors, from changes, updates or errors in technological infrastructure.
- Have procedures to detect and manage computer security incidents that would ensure the identification, containment and adequate recollection and safeguarding of safety evidence.
- Have procedures to ensure that the components granting security to computer systems are up-to-date.
- All SPEI participants should comply with strict requirements in the field of computer cybersecurity and operational continuity.
- These requirements were presented to SPEI participants and to the entities seeking to enter the system in the 14/2017 Circular issued in July 2017 and that came into force on January 31, 2018, time frame that is deemed sufficient by Banco de México for the participants to do the necessary modifications to their computer systems, as well as other necessary modification to comply with the regulation.
- Participants' compliance with the technical standards in 14/2017 Circular and with respect to Banco de México in February (extensions were given to a number of participants) has to be assessed by an external auditor.
- The requirements of cybersecurity and of operational continuity specified in 14/2017 Circular include the preemptive measures aimed at preventing the attacks such as those in the last weeks.
- Full compliance with the required provision to connect to SPEI is an indispensable element for all SPEI participants.
- Failure of certain participants to comply with the provisions seriously affects the whole system, raising the probability of further attacks such as described above, with clear impacts on all users of electronic transfer services. Supervision processes are being reinforced to ensure full compliance with the norms by all participants.
- Requirements related to the safety of SPEI connection applications and to the alternative operation scheme (COAS) (cont.):
  - ✓ Have procedures that allow to monitor, audit and track operations carried out via computer systems;
  - ✓ Have procedures to hire and train personnel to ensure that the staff involved with the SPEI operation have the required skills, competence and knowledge for the position they hold; and
  - ✓ Prove that they can continue with the operation after the activation of the "SPEI Alternative

Operation Procedure", as well as using the contingency procedure referred to as "SPEI Alternative Operation Customer".

- Following the supervision processes that started in 2017, the participants of SPEI and other payment systems operated by Banco de México showed a heterogeneous level of compliance in terms of cybersecurity requirements and operational continuity.
- It should be mentioned that Banco de México will intensify its supervision processes in this area.

5. Communication with Participants and the Public

Communication with participants

Bulletins have been delivered for all participants, prompting them to increase monitoring and surveillance in operations and to reduce the probability of further attacks:

- On April 17, vulnerabilities in one institution were detected, and it was requested to exercise caution.
- On April 24, a second event was reported, elements of concern were specified and additional measures and controls were requested.
- On May 8, controls were requested to be set up in all connection with all infrastructures.
- On May 10, it was reiterated that institutions should have the connection to COAS for safety reasons.

In addition, on April 26 and May 7 and 8, statements were extended to higher-risk participants with requests of specific actions.

Communication with the public

The following press releases have been issued:

- On April 27, operational events were reported in 3 institutions, along with the system slowdown on the side of clients.
- On April 30, more details are given regarding the previous statement, including the explanation of some of the preemptive measures that had been adopted by instutitions (in conjunction with the Ministry of Finance and the National Banking and Securities Commission).
- On May 14, actions taken by Banco de México in terms of cybersecurity, operational and regulatory areas are made known to the public.
- On May 16, Banco de Mexico's web page incorporates a micro-site with important data on the situation of SPEI that will incorporate new information on an ongoing manner.

6. Risk Mitigation

Technological actions

- Participants with detected incidents operate via alternative ways and maintain their capacity to send transfer orders to SPEI infrastructure.
- Alerts were established in the central SPEI to detect anomalies in messages.
- Reinforced 24/7 technical support has been maintained for the participants.
- Providers of SPEI connection services have been obliged to incorporate additional controls in their applications.
- Participants have been requested to conduct a deep analysis of their infrastructures to detect dormant software.

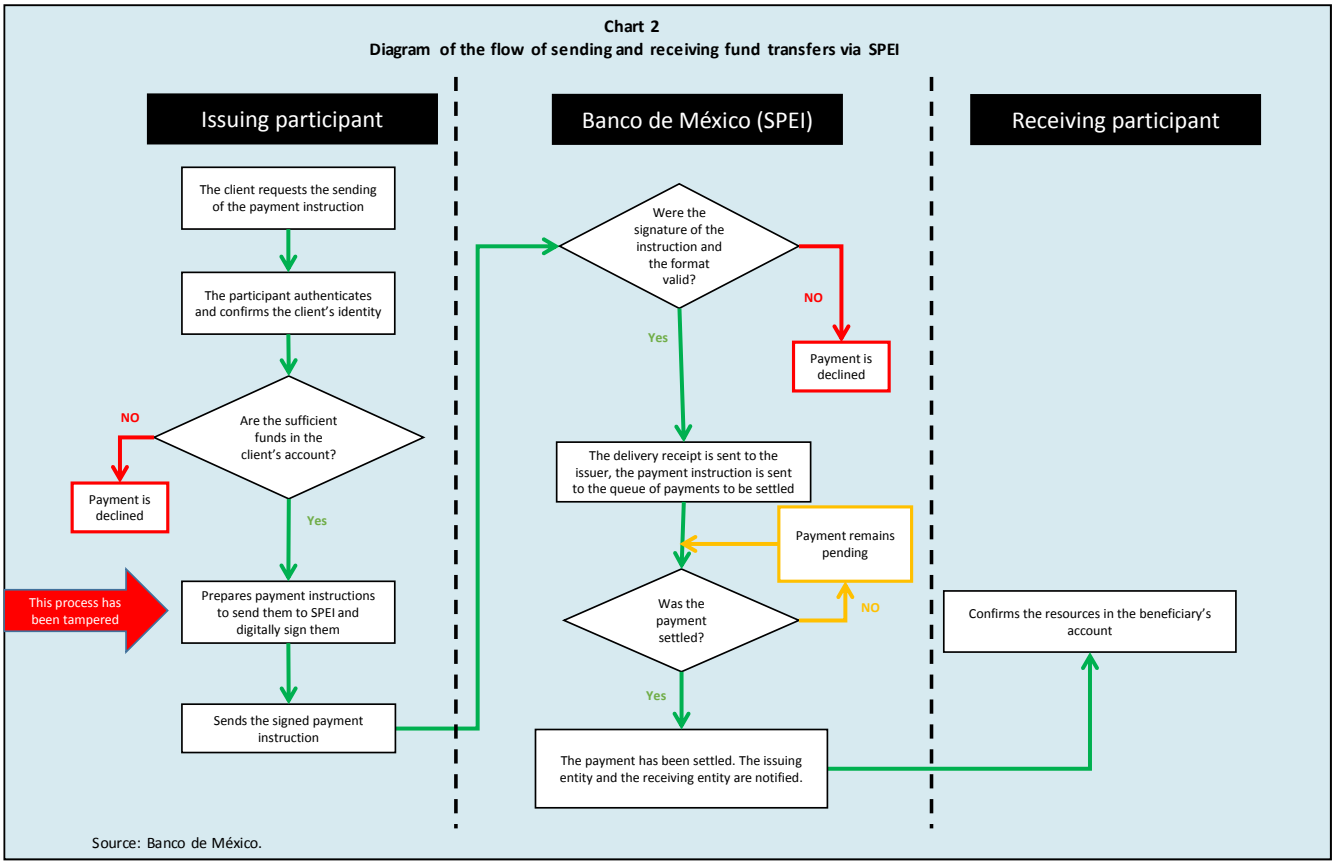
Operational measures

- Participants whose applications and computer infrastructure to connect to SPEI were affected have been required to take measures to renew their operators' security elements to authenticate in the payment systems operated by Banco de México, while this Central Institute has expanded and strengthened the support scheme of all participants of the system.
- Banco de México reinforced the monitoring of its infrastructure and the systems to detect any performance anomaly.

Regulatory measures

- Banco de México published provisions (4/2018 Circular and 5/2018 Circular) that grant credit institutions and other entities that give the fund transfer service space, for them to implement additional control measures in order to strengthen their systems of irregular transfers detection, verify the integrity of their operations and prevent possible impacts to these institutions, the rest of the participants and the system as a whole.
- In addition, these provisions consider space to verify the safety of cash withdrawals.

Chart 2
Diagram of the flow of sending and receiving fund transfers via SPEI



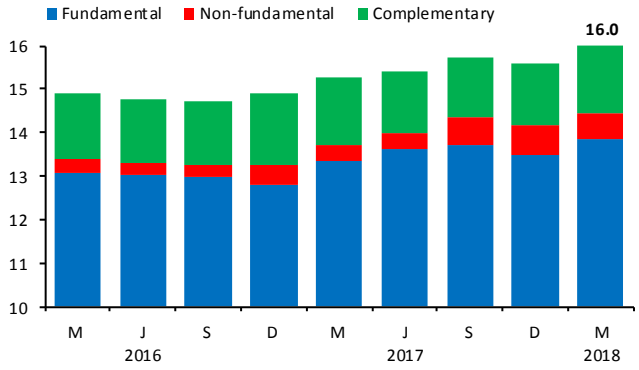
Source: Banco de México.

2.2.5.5. Financial Situation of Commercial Banks

Considering the above described risks, it should be stressed that Mexico's banking institutions are in a position of strength. In this respect, banks' capitalization indexes improved last year (Chart 58).

Commercial banks' capacity to absorb negative shocks depends on their capitalization level, measured with the Capital Weighted Index (CWI), which increased last year, mainly due to the growth in fundamental capital, associated to higher retained earnings. In March 2018, it lied at 16%. In addition, the Leverage Ratio is around 9.9%, which considerably exceeds the minimum 3% established in the Basil III agreement.

Chart 58
Evolution of Regulatory Capital
In percent of risk-weighted assets



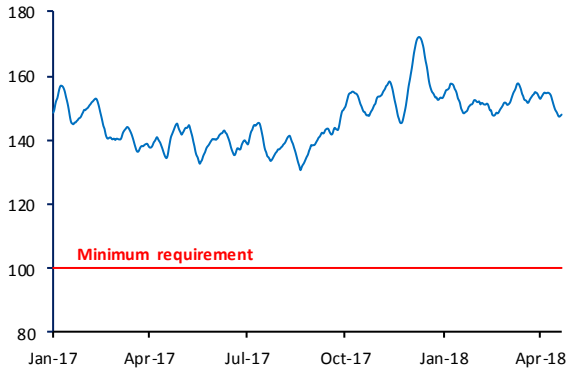
Source: Banco de México.

Mexican banks' capitalization levels are well above the regulatory minimums, which is translated in a considerably soundness of institutions. Similarly, banks' strength is attributed to high indexes of liquidity coefficients. On the one hand, banks continue to comply with the Liquidity Coverage Ratio

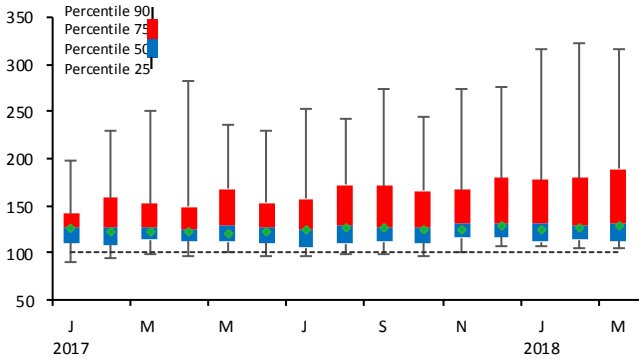
(LCR) (Chart 59a).[18] Although the minimum LCR requirement is between 80% and 90%, depending on the commercial bank,[19] most banks show levels above 100%. In addition, starting from January 1, 2018, banks are required to report and meet the LCR on a daily basis, which implies that banks permanently meet the minimum LCR requirement. In other words, these financial institutions have sufficient liquid assets to meet their net liquidity outflows, in a liquidity-stress scenario that may last for at least 30 days.

Meanwhile, based on the information provided by commercial banks to the authorities, most banks comply with the Net Stable Funding Ratio (NSFR)[20] at 100% (Chart 59b). Although this requirement has not come into force yet, banks have adjusted their balance sheets. In particular, they have increased their stable financing, so that most banks with NSFR below 100% until several months ago have already attained this level. This allows to prevent a situation in which banks' liquidity could deteriorate abruptly, in a negative scenario in financial markets, while the institutions fund their assets, mainly the credit portfolio and less liquid assets using stable capital and financing.

Chart 59
Commercial Banks' Profitability and Solvency
a) Commercial Banks' Liquidity Coverage Ratio 1/
Percent



b) Net Stable Funding Ratio (NSFR)
In percent



1/ 10-day moving average.
Source: Banco de México.

[18] For a detailed description of the Liquidity Coverage Ratio, see Box 2 in Banco de México: Report on the Financial System, October 2014, p. 68.

[19] The minimum LCR requirement started with 70% in 2015 in the case of the biggest banks of the system and it goes up by 10 percentage points a year, reason why it has to be met 100% starting from January 2019. For the remainder of banks the timeline has been adjusted. In particular, for banks that have been operating for at least five years at the moment when this rule came into force, the minimum requirement was compulsory starting from July 2015, and it goes up by 10 percentage points in July each year.

[20] The Net Stable Funding Ratio (NSFR) is a structural liquidity requirement that prompts banks to finance their activities using stable funding sources, consistent with their assets' liquidity and maturity, mitigating the risk of liquidity stress episodes in the future. For a detailed description of NSFR, see Box of the Report on the Financial System released by Banco de México in October 2017.

3. Recent Evolution of Inflation

3.1. Inflation

After having closed 2017 at its highest level since May 2001, over the first months of 2018 annual headline inflation notably reduced, which was congruent with this Central Institute's forecast in the previous Quarterly Report. In particular, while in the fourth quarter of 2017 annual headline inflation displayed an average of 6.59%, reached 6.77% in the last month of that year, in the first quarter of 2018 its average lied at 5.31% and marked 4.46% in the first fortnight of May. This result has been attributed to a number of factors. First, the implemented monetary policy actions are noteworthy. Despite a number of shocks on inflation, the referred actions did not generate second-round effects on the price formation process of the economy. Medium- and long-term inflation expectations have remained well-anchored, albeit above 3%. The referred monetary policy actions also contributed to an orderly adjustment in Mexican financial markets, in an uncertain environment, including the exchange market. In particular, it stands out that the monetary stance has operated via the interest rate spreads between Mexico and the U.S., and allowed the referred orderly adjustment in the foreign exchange market via the risk-taking channel.

In early 2018, the exchange rate appreciated, which derived from the monetary policy actions and the U.S. dollar weakness in this period, as well as the perception of a certain improvement relative to the NAFTA negotiations. However, in recent weeks the Mexican peso has weakened, which was associated to higher interest rates in the U.S. and the strengthening of the U.S. dollar, as well as to a number of domestic factors. The decrease in the general inflation level this year so far has been a consequence of the fading of shocks that had been registered the previous year, which derived from higher energy prices, particularly gasoline and LP gas prices at the beginning of 2017. Meanwhile, both core inflation and in particular the annual growth rate of merchandise prices, and non-core inflation showed a clear downward trajectory throughout the year (Table 2 and Chart 60).

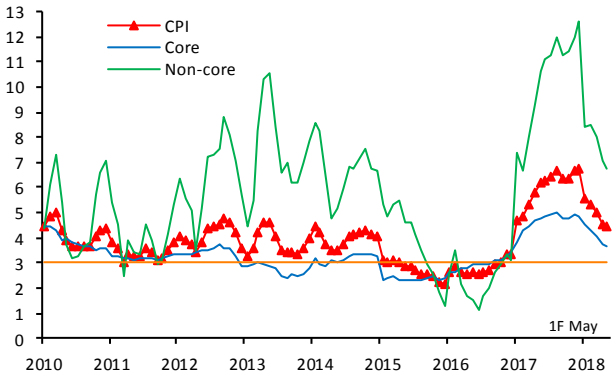
In particular, annual core inflation shifted from an average of 4.85% to 4.29% between the fourth quarter of 2017 and the first one of 2018. This trend kept consolidating in the first fortnight of May and marked 3.69%. Annual non-core inflation declined from 12.00% to 8.32% in the same time span, and reached 6.79% in the first fortnight of May (Table 2).

Table 2
Consumer Price Index, Main Components and Trimmed Mean Indicators
Annual change in percent

	2017				2018	
	I	II	III	IV	I	1F May
CPI	**4.98**	**6.10**	**6.48**	**6.59**	**5.31**	**4.46**
Core	**4.19**	**4.78**	**4.91**	**4.85**	**4.29**	**3.69**
Merchandise	**5.33**	**6.22**	**6.37**	**6.11**	**5.20**	**4.06**
Food, beverages and tobacco	5.93	6.82	7.29	6.80	5.93	4.77
Non-food merchandise	4.83	5.73	5.60	5.53	4.58	3.47
Services	**3.23**	**3.55**	**3.68**	**3.77**	**3.50**	**3.37**
Housing	2.52	2.56	2.61	2.66	2.57	2.58
Education (tuitions)	4.37	4.39	4.56	4.74	4.79	4.82
Other services	3.62	4.34	4.53	4.63	4.07	3.75
Non-core	**7.38**	**10.31**	**11.51**	**12.00**	**8.32**	**6.79**
Agriculture	**-0.20**	**6.39**	**12.07**	**8.99**	**9.39**	**3.12**
Fruit and vegetables	-6.88	9.60	21.80	15.59	14.93	-0.33
Livestock	4.02	4.54	6.50	5.06	6.25	5.21
Energy and government approved fares	**12.28**	**12.90**	**11.14**	**13.92**	**7.70**	**9.09**
Energy	16.85	15.72	13.68	17.03	8.00	11.60
Government approved fares	3.91	7.99	6.82	8.20	7.08	4.54
Trimmed mean indicator [1/]						
CPI	4.21	4.59	4.61	4.69	4.21	3.85
Core	4.01	4.41	4.51	4.49	4.00	3.51

1/ Prepared by Banco de México with data from INEGI.
Source: Banco de México and INEGI.

Chart 60
Consumer Price Index
Annual change in percent



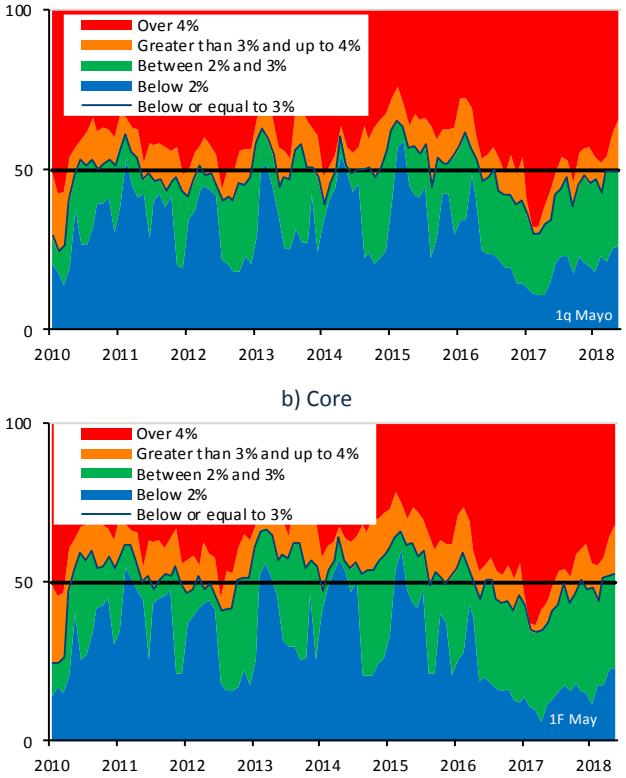
Source: Banco de México and INEGI.

To analyze headline and core inflation trends and their performance at the margin, some indicators that yield complementary information are analyzed below.

In the first place, the proportion of the CPI basket is analyzed, which presents monthly (seasonally adjusted and annualized) price changes that are grouped into different intervals. Thus, the items that are part of the headline and core baskets are grouped into four different categories: i) items with a price change below 2%; ii) between 2% and 3%; iii) greater than 3% and up to 4%; and iv) over 4%. In the same vein, the percentage of these baskets is presented in two additional categories: the one with monthly price changes smaller or equal to 3%, and the one with monthly price changes over 3% (Chart 61).

This analysis shows that the percentage of both the headline index and core index basket (with price increments less than 3%) has increased recently (blue and green areas, Chart 61). In particular, the share of the basket of the headline index with monthly annualized price changes below or equal to 3% (the area below the black line) was 45% in the fourth quarter of 2017 and 46% in the first one of 2018, and lied at 50% in the first fortnight of May. For the core index basket, the shares were 46% and 47% in the respective quarters, and marked 53% in the first fortnight of May.

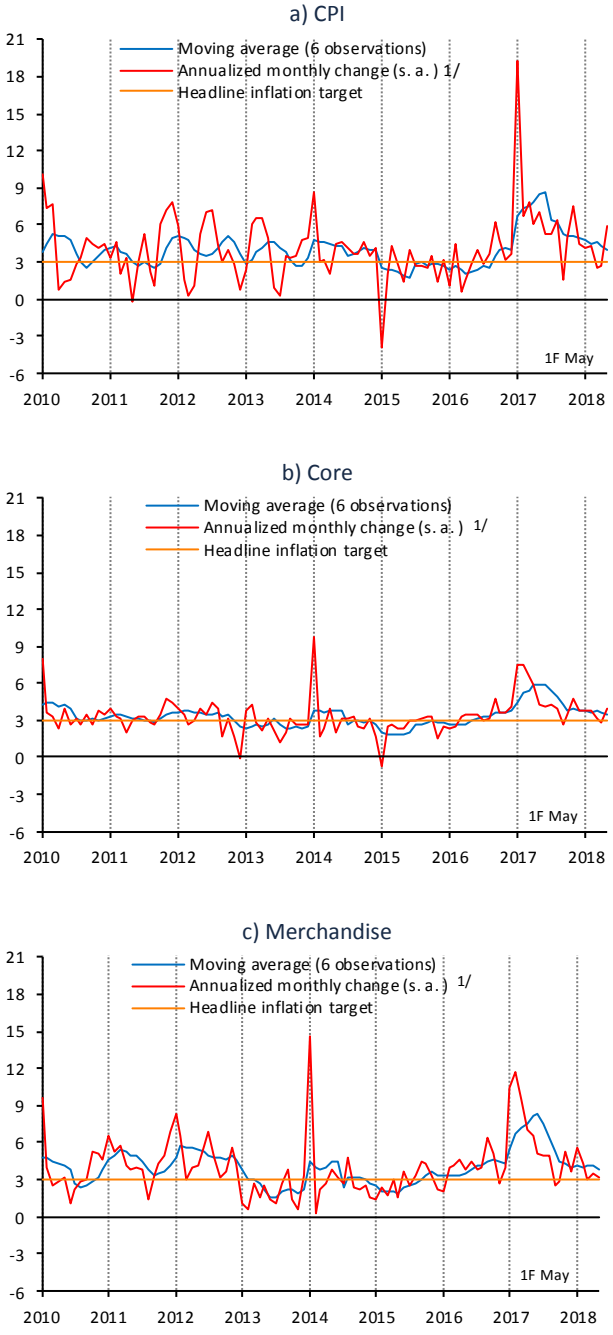
Chart 61
Percentage of CPI Basket according to Intervals of Monthly Annualized Increment, s. a. 1/
Percent

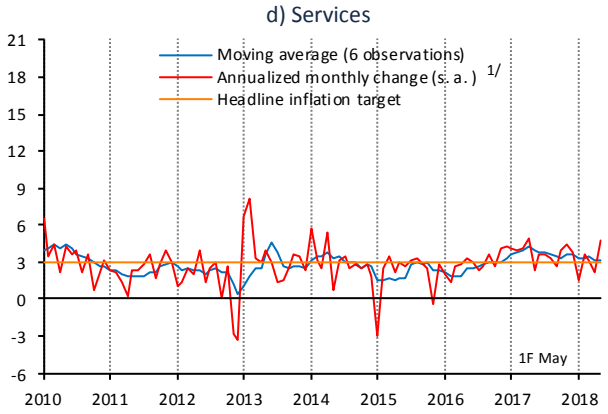


s. a. / Seasonally adjusted data.
1/ 3-month moving average.
Source: Banco de México and INEGI.

Secondly, the evolution of monthly (seasonally adjusted and annualized) changes of both headline and core indices was generally to the downside this year, although in the first fortnight of May these changes rebounded. In the case of core inflation, this rebound is attributed to higher prices of certain tourism services, which plunged during the previous month, while the uptick in the headline index, in addition, reflects the recent price hikes of LP gas. In turn, the measurement of the trend, represented by a 6-observation moving average of both indices, shows a downward trajectory, which is slightly more accentuated in the case of headline inflation. The monthly (seasonally adjusted and annualized) changes of merchandise have declined since early 2018, and have recently somewhat stabilized close to 3%. The monthly (seasonally adjusted and annualized) changes of services have subsided, and lied below this level. At the margin, this indicator rebounded, which was associated, as stated above, to the price adjustments in some tourism services. However, the measurement of the trend of the services price subindex has declined and is currently very close to 3% (Chart 62).

Chart 62
Annualized Seasonally Adjusted Monthly Change and Trend
Percent

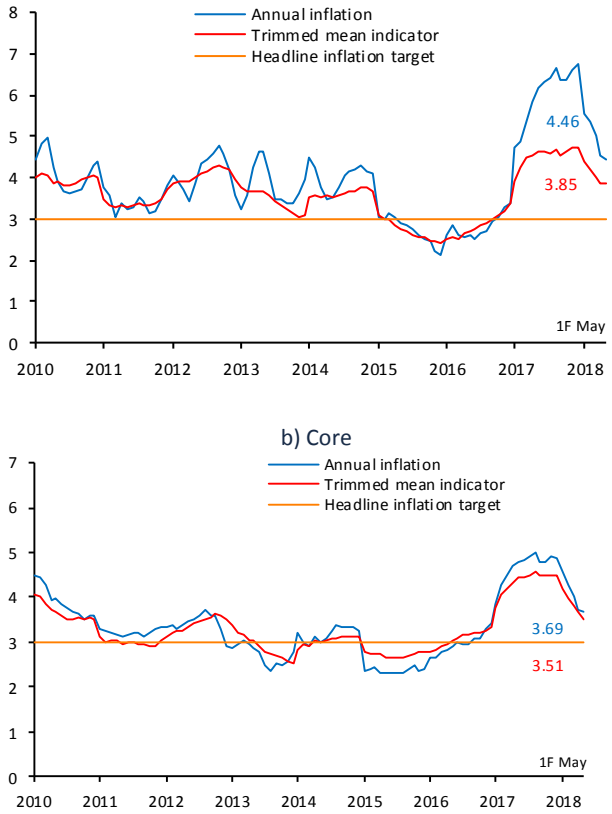




s. a. / Seasonally adjusted data.
1/ For the last observation, the annualized biweekly change is used.
Source: Seasonal adjustment prepared by Banco de México with own data and data from INEGI.

Trimmed Mean indicators are below the inflation levels, although this difference has been decreasing. In the case of headline inflation, this difference suggests that certain changes in particular prices have been affecting its level, although at the margin the impact of these extreme changes has been dissipating and, thus, contributing to lower headline inflation. In the case of core inflation, despite a certain difference, at the margin both indicators are already at very similar levels, which implies that the downward trend of this index is relatively widespread in the prices of goods and services that comprise it, and do not derive from the performance of some generic items. In particular, the Trimmed Mean Indicator for headline inflation shifted from 4.69% in the fourth quarter of 2017 to 4.21% in the first quarter of 2018, and marked 3.85% in the first fortnight of May. As regards annual core inflation, the Trimmed Mean Indicator marked 4.49% and 4.00% in the said quarters and 3.51% in the first fortnight of May (Chart 63 and Table 2).

Chart 63
Price Indices and Trimmed Mean Indicators 1/
Annual change in percent



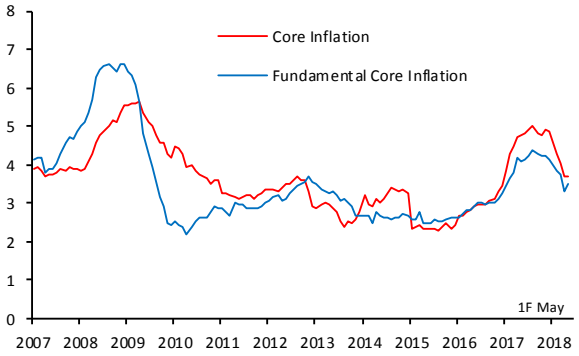
1/ The Trimmed Mean Indicator excludes the contribution of extreme variations in the prices of some generic items from the inflation of a price index. To eliminate the effect of these changes, the following is done: i) monthly seasonally adjusted changes of the generic items of the price index are arranged from the smallest to the largest value; ii) generic items with the biggest and the smallest variation are excluded, considering in each distribution tail up to 10 percent of the price index basket, respectively; and iii) using the remaining generic items, which by construction lie closer to the center of the distribution, the Trimmed Mean Indicator is calculated.
Source: Prepared by Banco de México with own data and data from INEGI.

3.1.1. Core Inflation

Fundamental Core Inflation maintains a trajectory similar to that of core inflation, which is consistent with a consolidation of a downward inflation trend, even in the case of the index that better responds to the cyclical conditions of the economy (Chart 64).[21] However, Fundamental Core Inflation rebounded slightly at the margin, which was essentially attributed to price increases in the referred tourism services.

[21] In the Quarterly Report October – December 2017, an indicator "Fundamental Core Inflation" was presented, which is based on the methodology applied in the European Central Bank (ECB). See Box 5 "Fundamental Core Inflation".

Chart 64
Core Inflation and Fundamental Core Inflation
Annual change in percent



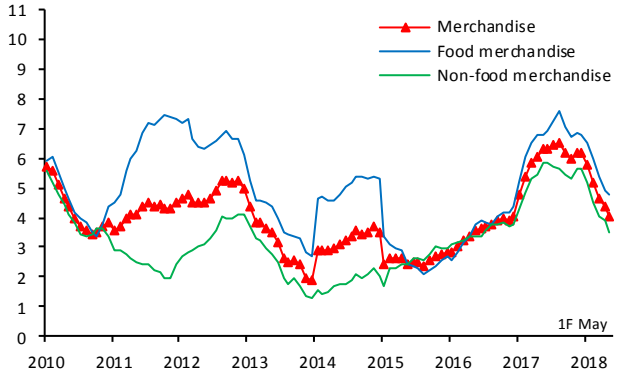
Source: Banco de México and INEGI.

The dynamics of core inflation derive from lower annual growth rates of merchandise and services prices. This resulted both from the monetary policy actions implemented by Banco de México and the fading of the indirect effects of the shocks that had affected the prices of a number of inputs used to manufacture different items comprising this subindex during the previous year. Regarding core inflation components, the following was observed:

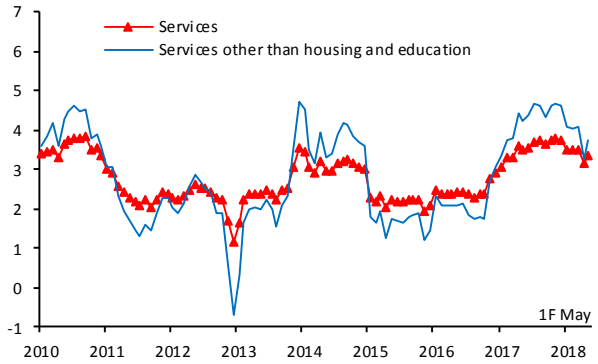
i. The average annual change of the merchandise price subindex declined from 6.11% in the last quarter of 2017 to 5.20% in the first quarter of 2018, and marked 4.06% in the first fortnight of May. Both the price subindex of food merchandise and non-food merchandise displayed a decreasing trend in the reported period (Chart 65a). Thus, the former fell from an average annual change rate of 6.80% to 5.93% between the said quarters and lied at 4.77% in the first fortnight of May. Meanwhile, the non-food merchandise price subindex declined from 5.53% to 4.58% in the same quarters, and further to 3.47% in the first fortnight of May.

ii. The average annual change rate of the subindex of services prices also decreased from 3.77% to 3.50% between the fourth quarter of 2017 and the first one of 2018. An important part of this performance derived from lower annual change rates of the segment of services other than education and housing, which shifted from an average of 4.63% to 4.07% in the same time span. In addition, the prices of certain food-related services decreased their growth rates between January and the first fortnight of May, in part, as a reflection of the fading out of the indirect effects generated by energy products and agricultural price increases onto costs in 2017. In the first fortnight of May, the annual change of the services price subindex lied at 3.37% (Chart 65b).

Chart 65
Core Price Index
Annual change in percent
a) Merchandise



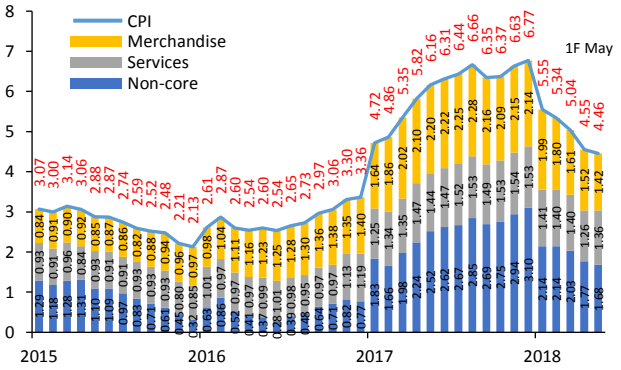
b) Services



Source: Banco de México and INEGI.

Thus, impacts on annual headline inflation of merchandise and services have tended to decrease this year (Chart 66).

Chart 66
Consumer Price Index
Annual impact in percentage points 1/



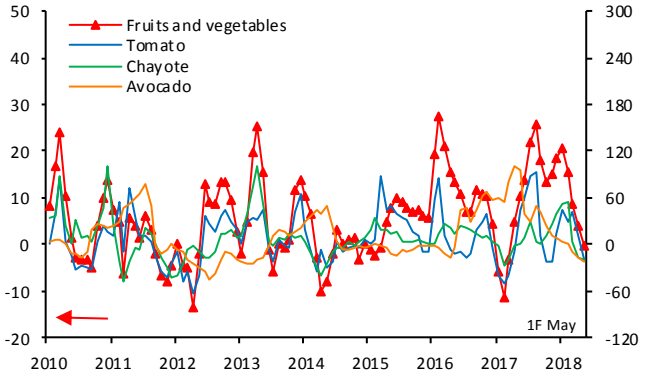
1/ In some cases, the sum of respective components can exhibit some discrepancies due to rounding.
Source: Prepared by Banco de México with data from INEGI.

3.1.2. Non-core Inflation

The impact of non-core inflation onto annual headline inflation has also been decreasing (Chart 66). In particular, between the last quarter of 2017 and the first one of 2018 reductions in the price growth rates of energy products and fruit and vegetables were notable. In the first fortnight of May, non-core inflation continued to decline, as a result of lower price increments of agricultural products, which was in part offset by additional price hikes in gasoline and LP gas. In particular:

i. The average annual change rate of the subindex of agricultural product prices increased slightly from 8.99% in the last quarter of 2017 to 9.39% in the first one of 2018. This derived from higher annual growth rates of livestock product prices, which went up from 5.06% to 6.25% in this time span, especially chicken and egg price, while the annual growth rate of agricultural product prices continued subsiding in this period. Nevertheless, in the first fortnight of May, the annual change of the agricultural price subindex declined to 3.12%, reflecting, among other factors, price decreases of a number of fruit and vegetables, such as tomato, avocado and chayote (Chart 67).

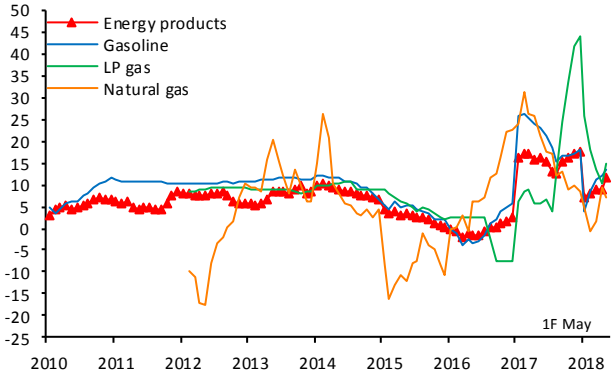
Chart 67
Price Index of Selected Fruits and Vegetables
Annual change in percent



Source: Banco de México and INEGI.

ii. The average annual change of the price subindex of energy products and government approved fares subsided between the fourth quarter of 2017 and the first one of 2018 from 13.92% to 7.70%. This decrease is mostly attributed to lower annual change rates in various energy products, especially gasoline and LP gas, as a result of the fading of impact generated by a strong price hike at the beginning of last year. In the first fortnight of May, this subindex increased 9.09%, which derived from higher prices of gasoline and LP gas (Chart 68).

Chart 68
Price Indices of Selected Energy Products
Annual change in percent



Source: Banco de México and INEGI.

Delving in the above:

- In the reference quarter, the average monthly price change of gasoline was 2.89%, while in the fourth quarter of 2017 it was 0.77%, and 0.62% in the first fortnight of May. The evolution of these energy prices reflects the performance of their international references converted to the

Mexican peso, which have displayed a certain upward trend, while its impact on consumer prices has been mitigated by the Federal Government price smoothing policy.

- Average monthly changes of LP gas price dropped from 5.04% in the fourth quarter of 2017 to -1.55% in the first one of 2018. Thus, following considerable price increments of this fuel during 2017, the price of LP gas declined in the first months of 2018, in part reflecting decreases in its international references. However, in the first fortnight of May its price increased 5.27%.

- The natural gas price is determined in accordance with its international references. Thus, between the fourth quarter of 2017 and the first one of 2018, its average monthly change shifted from 0.02% to 0.78%, and observed no adjustment in the first fortnight of May.

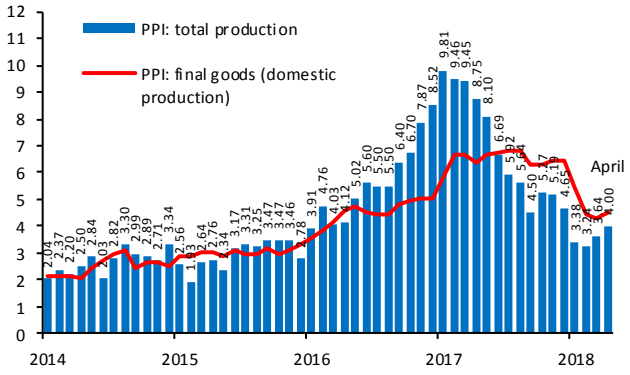
- Regarding electricity tariffs, following a 2% reduction in low consumption electricity tariffs for domestic sector in early 2016, they have remained unchanged. The evolution of high consumption electricity tariffs depends on the input costs required to generate electric power. Thus, during January, February and March, DAC tariffs observed monthly changes of 2.9%, 1.5% and 3.9%, respectively. In April and May, its monthly change was -4.2% and -0.1%, in the same order.

3.2. Producer Price Index

Between the fourth quarter of 2017 and the first one of 2018, the Producer Price Index (PPI) of total production, excluding oil continued registering a decrease in its average annual change rate from 5.03% to 3.42%, and marked 4.00% in April 2018 (Chart 69). Within this indicator, the average annual growth rate of the component of finished merchandise and services decreased between the mentioned quarters from 4.69% to 3.24% from the fourth quarter of 2017 to the first quarter of 2018, and reached 3.73% in April 2018. The average annual growth change of the subindex of merchandise and services for exports subsided from 2.68% to 0.27% between the fourth quarter of 2017 and the first one of 2018 and marked 2.39% in April. Meanwhile, the subindex of intermediate goods and services observed a reduction in its average annual change rate from 5.82% to 3.84% between the fourth quarter of 2017 and the first one of 2018, and lied at 4.61% in April.

The subindex of finished goods for domestic consumption has the most predictive power on the evolution of prices of the merchandise destined to consumers, included in the core subindex.[22] The average annual growth rates of this subindex also decreased between the referred quarters from 6.40% to 4.71%, while in April it was 4.48%.

Chart 69
Producer Price Index 1/
Annual change in percent



1/ Total Producer Price Index, excluding oil.
Source: Banco de México and INEGI.

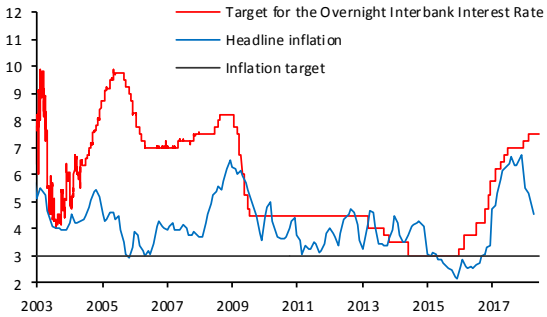
[22] See Box 1 of the Quarterly Report April – June 2016 "Can Inflationary Pressures be Identified when Measured with CPI by means of the Performance of PPI Merchandise Subindices?"

4. Monetary Policy and Inflation Determinants

To guide its monetary policy actions, Banco de México's Governing Board closely follows the evolution of inflation vis-à-vis its anticipated trajectory, considering the horizon at which monetary policy operates, as well as the available information concerning inflation determinants and medium- and long-term inflation expectations, including the balance of risks to them. Likewise, in the presence of risks that, by nature, imply a high degree of uncertainty over the consequences for inflation and inflation expectations, monetary policy is required to act in a timely and firm manner. This propitiates the inflation convergence to its target and strengthens the anchoring of medium- and long-term inflation expectations.[23]

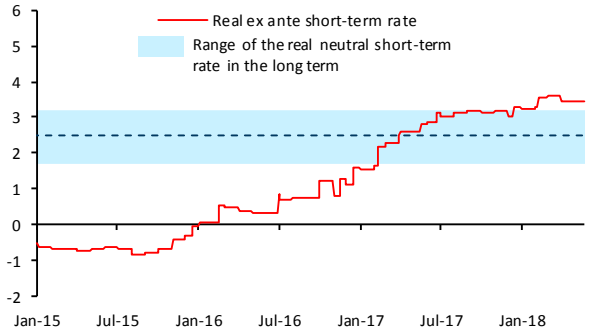
Thus, given the deteriorated inflation outlook in late 2017 and the expected tighter monetary conditions in the U.S. economy, in the meeting of February 2018 the Governing Board decided to adjust the monetary stance and raised the Overnight Interbank Interest Rate by 25 basis points to a level of 7.50%. The goal of this adjustment was to have a monetary policy stance that could face the deterioration in the inflation outlook, could prevent further inflation shocks from generating second round effects on the price formation process in the economy and that could strengthen the decreasing trend of annual headline inflation towards its target. The above should consider the cyclical position of the economy and the high inflation levels by the end of last year, which could make the assimilation of shocks difficult. Subsequently, in its April and May meetings the Governing Board has decided to maintain its reference rate unchanged (Chart 70). This, considering the recent inflation evolution relative to its forecast trajectory, which so far has been in line with the expectation presented in the last Quarterly Report, and that the current monetary policy stance is congruent with the downward trend of annual headline inflation towards its target implicit in such forecasts. It should be stressed that through these actions, and considering the evolution of 12-month inflation expectations, the interest rates have increased to a real ex ante level close to 3.5% (Chart 71). To put this level into perspective, consider that the estimated range for the short-term neutral rate is from 1.7% to 3.2%, with a median at 2.5%.[24]

Chart 70
Target for the Overnight Interbank Interest Rate and Headline Inflation 1/
Annual percent



1/ The Overnight Interbank Interest Rate is shown until January 20, 2008. The latest inflation figure corresponds to April.
Source: Banco de México and INEGI.

Chart 71
Real Ex Ante Short-term Rate and Estimated Range for Real Neutral Short-term Rate in the Long Term 1/
Annual percent



1/ Real ex ante short-term rate is calculated as the difference between the target for the Overnight Interbank Interest rate and the mean of inflation expectations for the next 12 months, derived from Banco de México's Survey. The dotted line corresponds to the mid-point of the range.
Source: Banco de México.

In particular, considering the horizon at which monetary policy operates, the actions taken during this period have been influenced by: i) the performance of inflation relative to its forecast trajectory; ii) the performance of the main inflation

[23] Box 8 presents the main changes in Banco de México's communication strategy over the last years.

[24] For a description of the estimation of the short-term neutral interest rate, see Box "Considerations on the Evolution of the Neutral Interest Rate in Mexico", in the Quarterly Report July-September 2016. For this Quarterly Report, the estimation was updated to include data up to December 2017.

determinants and its outlook; and, iii) the evolution of medium- and long-term inflation expectations.

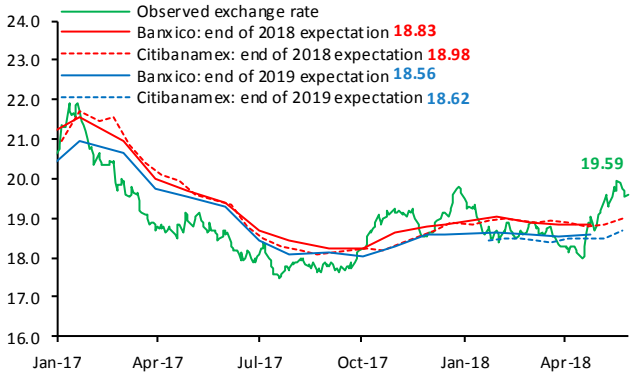
Regarding the evolution of inflation relative to its projections, it stands out that the decline in annual headline inflation over the first months of 2018 is congruent with the forecast presented by this Central Bank in the aforementioned Quarterly Report. Likewise, considering the recent data, the estimated performance of inflation in the horizon at which monetary policy operates is still very similar to the forecasts published in that Report. Therefore, generally, as will be seen below, this forecast remains practically unchanged.

As regards inflation determinants, the one referring to the potential pass-through of exchange rate adjustments into prices should be highlighted. It should be remembered that changes in the real exchange rate are a natural adjustment mechanism of the economy in view of different disturbances, and that they lead to changes in the relative prices of merchandise with respect to services. Thus, the role of monetary authority is to ensure that these adjustments take place in an orderly manner, without generating second-round effects on prices.

In this sense, relative to the performance of the exchange rate during the analyzed period, it stands out that from early January to mid-April 2018 the Mexican peso appreciated 7.75% against the U.S. dollar, and reached a level of MXN/USD 17.98. Similarly, its volatility decreased during this period. This was partly related to: i) Banco de México's monetary policy stance; ii) the generalized weakness of the U.S. dollar during this period and iii) the perception of an improvement in the NAFTA negotiations.

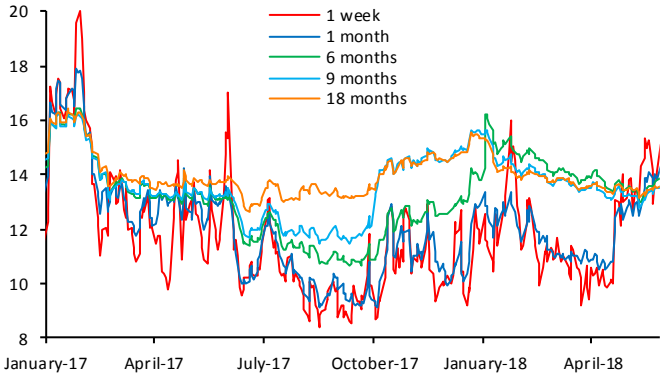
However, since mid-April to date, the Mexican peso has increased its volatility and has depreciated considerably, which placed it around MXN/USD 19.60 in late May. Among the factors that have pressured the exchange rate to the upside are higher interest rates in the U.S. and the generalized strengthening of the U.S. dollar, which has affected most emerging economies' currencies, as well as a number of domestic factors, such as the uncertainty associated with the NAFTA renegotiations, and the electoral process in Mexico. Regarding the above evolution, although the Mexican peso appreciated against other emerging economies' currencies in the period from late 2017 to the first quarter of this year, this performance reverted starting from the second half of April. In contrast, survey-based expectations for the exchange rate at the end of 2018 and 2019 have remained relatively stable at MXN/USD 18.80 and MXN/USD 18.60, respectively, over most of the reference period, although during the last month these expectations increased slightly (Chart 72 and Chart 73). It should be noted that, if the economy faces a scenario that prompts an adjustment in the real exchange rate, just like in the past, Banco de México will remain cautious to ensure it takes place in an orderly manner and without generating second-round effects on the price formation process.

Chart 72
Nominal Exchange Rate 1/
MXN/USD



1/ The observed rate is the daily FIX exchange rate. Expectations correspond to the average of the April survey by Banco de México and the Citibanamex survey of May 22, 2018.
Source: Banco de México.

Chart 73
Implied Volatility in FIX Options
Percent



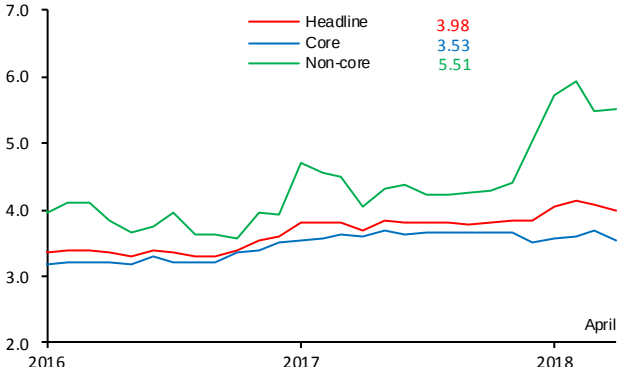
Source: Bloomberg.

Financial markets maintain an expectation of a less accommodative monetary policy stance in the U.S., including the program of reducing its balance sheet that started in October 2017, which will continue in a gradual manner. However, recently the number of estimated increments in the federal funds rate for this year has risen. This, along with an important increment of medium- and long-term interest rates in the U.S., contributed to a moderate decrease in interest rate spreads between Mexico and the U.S. for all terms, particularly medium and long terms, although recently they have increased. Nonetheless, they are still high in historical terms, at levels that had not been observed since late 2008, as well as relative to those of other emerging economies (Chart 83 and Chart 85).

The cyclical position of the economy, that is the slack conditions and their role in the price formation, remain tight, especially in the labor market.

With respect to inflation expectation, as a result of additional inflation shocks at the end of 2017, between December 2017 and February 2018 the mean of inflation expectations corresponding to the end of 2018 adjusted upwards from 3.85% to 4.13%. Nevertheless, after the observed inflation data lied below analysts' expectations from February to April this year, the mean of these expectations subsided, and is currently at 3.98%. In contrast, the mean for core inflation at the end of 2018 remained at 3.5% between December 2017 and April 2018, while the implicit expectation for the non-core component went up from 5.04% to 5.51% (Chart 74). [25] Similarly, the expectation for headline inflation at the end of 2019 continued at a level close to 3.60%, while the mean of core inflation expectations declined from 3.43% to 3.36%, and the implicit mean of the non-core component went up from 4.11% to 4.33% (Chart 75).[26] Finally, medium- and long-term expectations remained stable at 3.50% during the reference period (Chart 76).[27] Relative to the above described development, it should be noted that the dispersion of inflation expectations for the end of 2018 and 2019 reduced during the analyzed period. Thus, the data collected through surveys suggests that, given a number of shocks on inflation, medium- and long-term inflation expectations have remained stable, although above the target.

Chart 74
Average Headline, Core and Non-core Inflation Expectations as of End of 2018
Percent



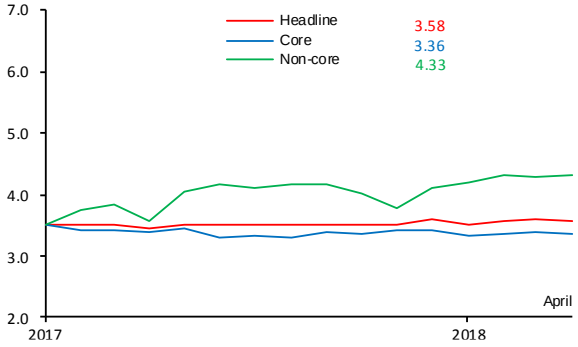
Source: Banco de México's Survey.

[25] The mean of headline inflation expectation for the end of 2018, based on the Citibanamex survey, declined from 4.05 to 3.90% between the surveys of December 19, 2017 and May 22, 2018.

[26] The mean of headline inflation expectation for the end of 2019, based on the Citibanamex survey of May 22, 2018, marked 3.60%.

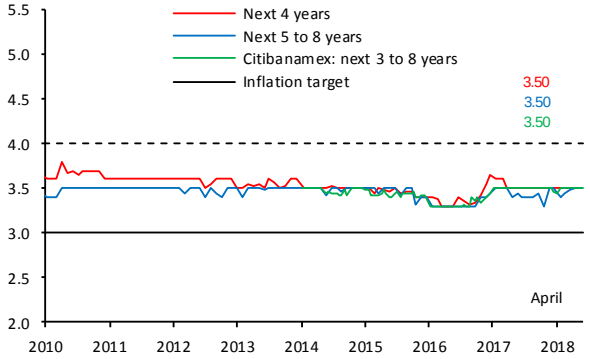
[27] Regarding the mean of long-term headline inflation expectations, based on the Citibanamex survey (for the next 3-8 years), it maintained around 3.5% between the surveys of December 19, 2017 and May 22, 2018.

Chart 75
Average Headline, Core and Non-core Inflation Expectations as of End of 2019
Percent



Source: Banco de México's Survey.

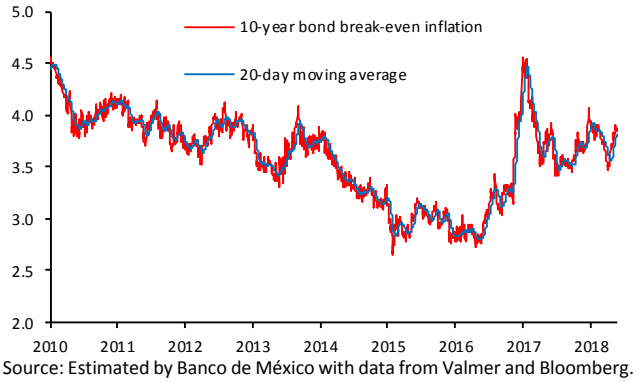
Chart 76
Average Headline Inflation Expectations for Different Terms
Percent



Source: Banco de México's survey and Citibanamex survey.

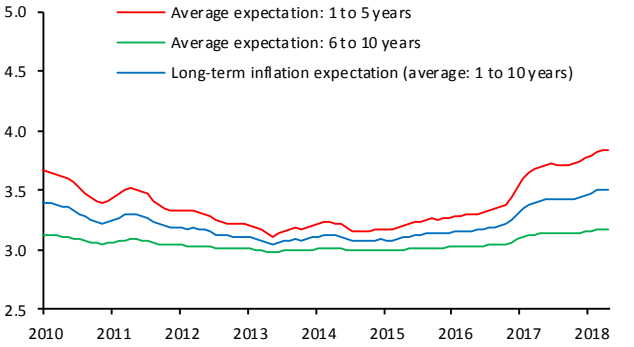
The break-even inflation (the difference between long-term nominal and real interest rates) declined between December and April (Chart 77). Regarding its components, inflation expectations implicit in market instruments with 10-year maturities somewhat increased. This rise mainly responds to the upward adjustment in shorter-term inflation expectations (1 to 5 years) in the same time horizon, while longer-term ones (6 to 10 years) remained stable (Chart 78). Meanwhile, the estimate of 10-year inflation risk premium declined in the same time period (Chart 79). [28]

Chart 77
Break-even Inflation and Inflation Risk Implicit in Bonds
Percent



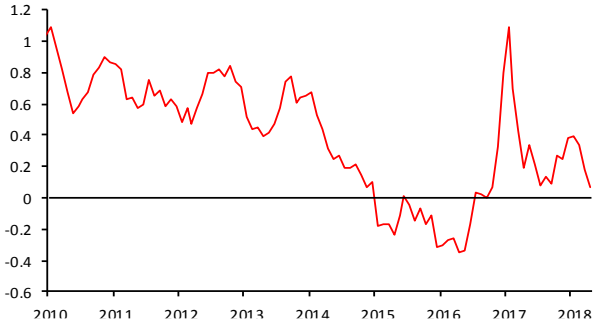
Source: Estimated by Banco de México with data from Valmer and Bloomberg.

Chart 78
Estimate of Annual Inflation Expectations Implicit in Market Instruments [1/]
Percent



1/ The inflation expectation is calculated based on a similar model using data from Bloomberg, PIP and Valmer, based on Aguilar, Elizondo and Roldán (2016).
Source: Estimated by Banco de México with data from Bloomberg, Valmer and PIP.

Chart 79
10-year Inflation Risk Premium [1/]
Percent

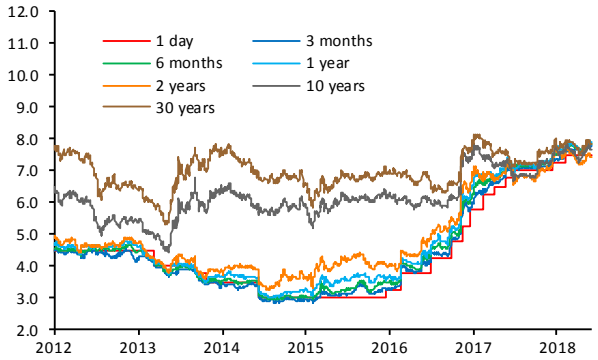


1/ The inflation risk premium is estimated based on an affine model using data from Bloomberg, PiP and Valmer, based on Aguilar, Elizondo and Roldán (2016).
Source: Estimated by Banco de México with data from Bloomberg, Valmer and PIP.

[28] For a description of the estimation of long-term inflation expectations, see Box "Decomposition of the Break-even Inflation" in the Quarterly Report October-December 2013. Starting from the Quarterly Report October–December 2017, the estimation includes data up to November 2017.

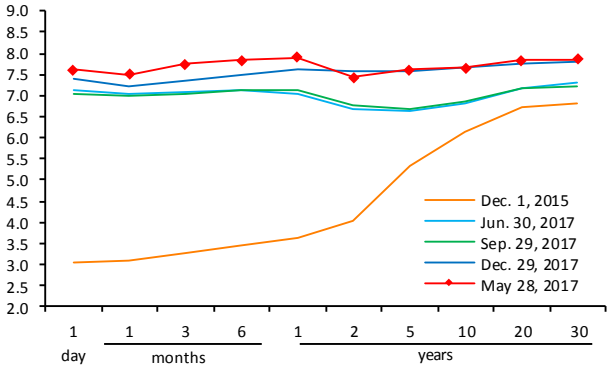
In the period covered by this Report, short-term interest rates (shorter than 1 year) in Mexico increased, consistent with the increment in the target for the Overnight Interbank Interest Rate. In particular, the 3-month interest rate went up 40 basis points from 7.3% to 7.7%. In contrast, although medium- and long-term rates closed the period at levels similar to those observed in late 2017, they dropped significantly between the beginning of the year and mid-April, and later went up again. Thus, in the total reference period, the 2-year rate declined 20 basis points, from 7.6% to 7.4%, while the 10-year rate persisted at 7.7% (Chart 80 and Chart 81). This prompted the slope of the yield curve (10-year and 3-month rate) to remain relatively flat (Chart 82).

Chart 80
Government Bonds Interest Rates in Mexico
Percent



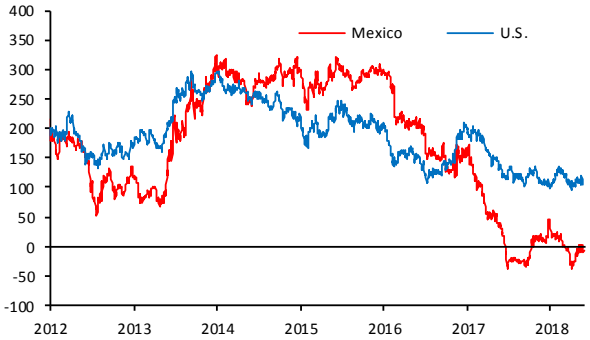
Source: *Proveedor Integral de Precios* (PiP).

Chart 81
Yield Curve in Mexico
Percent



Source: *Proveedor Integral de Precios* (PiP).

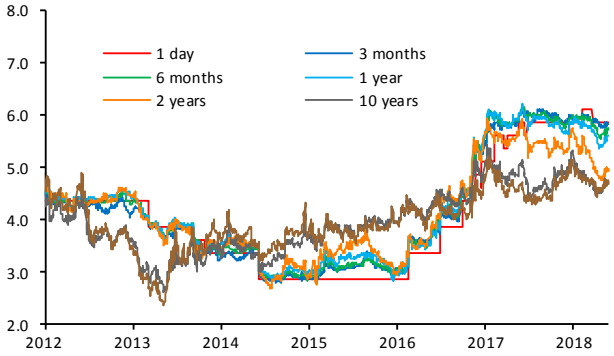
Chart 82
Slope of the Yield Curve
Basis points



Source: *Proveedor Integral de Precios* (PiP) and U.S. Department of the Treasury.

During the first quarter of 2018 and in the second quarter so far, spreads between Mexican and U.S. interest spreads have remained high, especially shorter-term ones. However, important hikes throughout the U.S. yield curve caused the yield spreads between Mexico and the U.S. to decrease in the analyzed period. Nonetheless, as previously mentioned, they remain high in historical terms, at levels that had not been observed since late 2008, as well as with respect to those of other emerging countries. Hence, the spreads of 3-month, 2-year and 10-year rates declined by 10, 80 and 60 basis points, respectively and in mid-May marked levels of 580, 490 and 470 basis points for said terms (Chart 83, Chart 84 and Chart 85). [29]

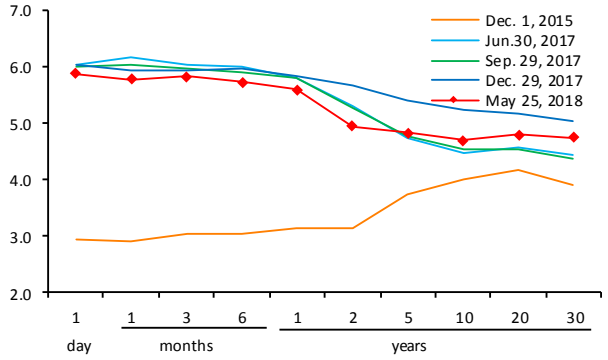
Chart 83
Spreads between Mexican and U.S. Interest Rates [1/]
Percent



1/ For the U.S. target rate, the average of the interval considered by the Federal Reserve is considered.
Source: *Proveedor Integral de Precios* (PiP) and U.S. Department of the Treasury.

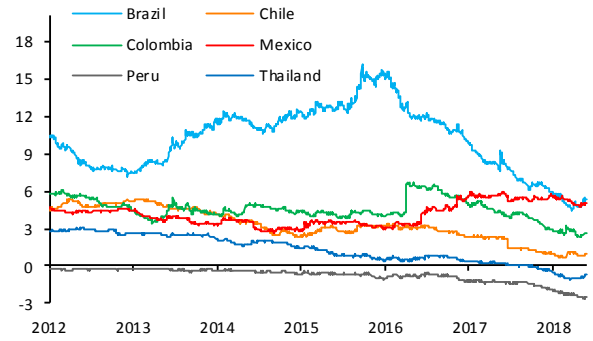
[29] See Box 7 as a reference on the development of financial markets in Mexico.

Chart 84
Curve of Spreads between Mexican and U.S. Interest Rates
Percentage points



1/ For the U.S. target rate, the average of the interval considered by the Federal Reserve is considered.
Source: *Proveedor Integral de Precios* (PiP) and U.S. Department of the Treasury.

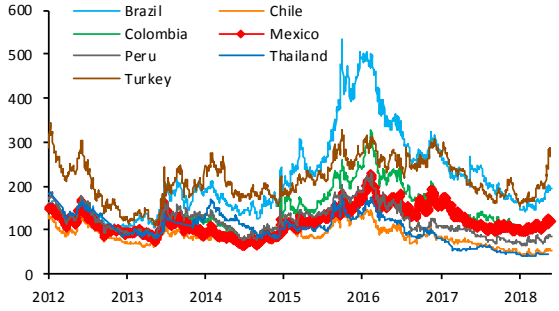
Chart 85
Spreads between Mexican and U.S. 2-year Interest Rates
Percentage points



Source: Bloomberg.

Finally, market indicators that measure the domestic sovereign credit risk increased slightly. Over the latest weeks, these indicators for Mexico and other emerging markets have adjusted upwards and exhibited higher volatility, which reflects a lower appetite for risk in an environment of a certain idiosyncratic deterioration in some of these economies, such as, for example, problems in public finances in Argentina and Turkey. Similarly, for the case of Mexico, the uncertainty related to the NAFTA renegotiation and the electoral process could also have an impact (Chart 86).

Chart 86
Market Indicators that Measure the Domestic Sovereign Credit Risk 1/
Basis points



1/ This refers to 5-y ear Credit Default Swaps.
Source: Bloomberg.

Box 7. Recent Evolution of Financial Markets in Mexico

1. Introduction

Over the last twenty years, foreign exchange markets and bond markets have evolved considerably. Indeed, the adoption of the floating exchange rate regime, along with other economic policy actions implemented in Mexico over the last decades, such as Banco de México's autonomy, the adoption of the inflation targeting regime and a better fiscal discipline, along with an adequate financial regulation to a large extent contributed to strengthening the macroeconomic framework of the country and to generating an environment of certainty and confidence, which, in turn, helped the development of Mexican financial markets.

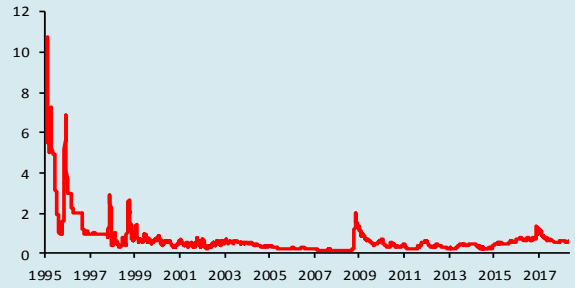
The existence of deep and efficient financial markets prompts the economic agents' adequate signal extraction and price discovery, which generates greater certainty and flexibility during the decision-making process. Similarly, it helps to develop the nominal system of the economy and favors a better functioning of the monetary policy transmission channels, thus fomenting the preservation of macroeconomic stability in Mexico.

This Box briefly describes the evolution of the exchange rate markets and government bond markets, as well as its current structure and characteristics.

2. Evolution of Exchange Market

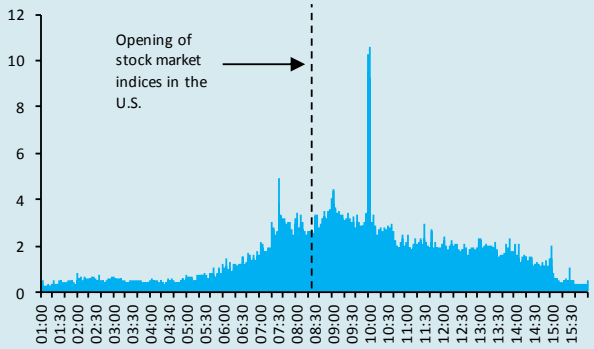
Since the adoption of the flexible exchange rate regime, the macroeconomic strength of Mexico and the measures implemented by this Central Institute to foment the creation of new instruments, such as the authorization in 1995 to trade in derivatives on the Mexican peso and free convertibility, have favored the deepening of Mexico's exchange market, which in turn allowed the development of liquid and deep exchange rate derivatives (Charts 1 and 2).[1]

Chart 1
Sell-Buy Spread of the Mexican Peso
Cents (20-day moving average)



Note: Until 2002 the spread of closing prices was used, since 2003 the intraday average spread has been used.
Source: Reuters with estimates by Banco de México.

Chart 2
Average Number of Events Operated by Minute of the Mexican Peso
Number of events



Note: Considers the events in the Reuters Matching platform. Data starting from January 2018.
Source: Banco de México with data from Reuters.

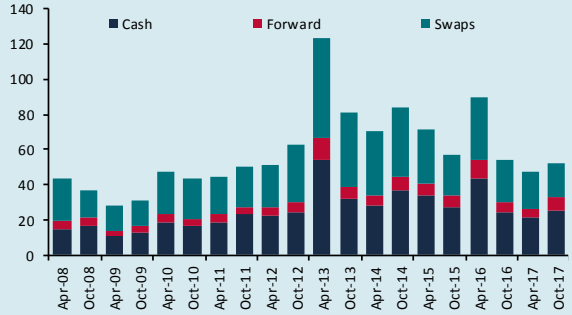
Likewise, the derivatives market, the underlying of which is the Mexican peso, has grown significantly, which has been reflected in higher transaction volumes of financial instruments, such as forwards, futures, options and foreign exchange swaps. This has given significant advantages to the participants of Mexico's exchange rate market. Some of these are: i) a better price determination; ii) broadening options to distribute and cover risk of different economic agents; and, iii) greater certainty in businesses' decision-making process.

Thus, based on the updated data from the Bank for International Settlements' Triennial Central Bank Survey of foreign exchange and OTC derivatives markets, Mexican foreign exchange market attained an average daily operational amount of around USD 97 billion in April 2016.[2] Locally, on a daily basis the operations with the Mexican peso amount to approximately USD 20 billion in spot markets of forwards, futures, foreign exchange swaps and options (Chart 3).[3] That is, it stands out that a great part of the operational volume with Mexican pesos is realized by counterparties based abroad, the U.S. dollar being the main currency against which the Mexican peso operates. In this way, consistent with the said BIS Survey, the Mexican peso is the 11th most operated currency in the world, even above some developed countries' currencies. It is also the second most operated currency among emerging countries, second only to the Chinese renminbi (Chart 4).

[1] Free convertibility refers to the legal possibility to freely convert from one currency to another.
[2] It refers to the amount of transactions in over the counter markets.
[3] The volume of Mexican peso transactions includes Mexican peso exchange rate transactions against the U.S. dollar and other currencies in the spot market, forwards, exchange rate swaps, cross-currency swaps and options.

Chart 3

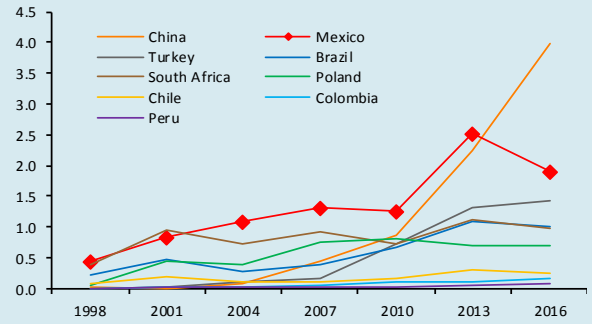
Total Volume of Transactions in the MXN/USD Exchange Market
USD billions (daily average)



Source: Banco de México, Bank for International Settlements (BIS), Federal Reserve and the Bank of England.

Chart 4

Volume of Market Transactions in Different Markets
Distribution % of the average daily volume



Source: Bank for International Settlements.

The financial authorities in Mexico at all times have maintained the free floating of the national currency, and exchange rate interventions have been occasional and through mechanisms characterized by pre-established rules that are consistent with the exchange rate regime. Thus, for over 22 years the interventions in the exchange rate market have sought to provide liquidity in the market during the bouts of high volatility.

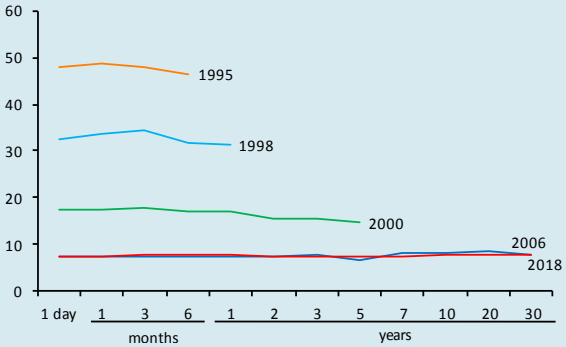
Recently, by reinforcing its commitment to foster the development and efficient functioning of the exchange rate wholesale market in Mexico, Banco de Mexico published its announcement of the adoption of the principles of good practices and the Declaration of Commitment to the Global Code of Conduct of the Exchange Market.[4] In the same sense, on November 7, 2017, this Central Bank set up the Mexican Foreign Exchange Committee, which serves as a discussion forum among local exchange rate market participants. Its goal is to promote integrity and the adequate functioning of the said market, in line with the internationally accepted global principles of good practices.

3. Evolution of Government Securities' Market

In recent decades, Mexico has managed to establish an adequate macroeconomic environment that has allowed to develop the government securities' market. This was a dynamic process, in which the authorities' efforts to build and maintain the Federal Government credibility as the debt issuer were involved. The following factors are noteworthy: i) lower vulnerability to external shocks thanks to the policies propitiating greater macroeconomic stability; ii) the release of capital flows that led to the inflow of more international investors; iii) clear and predictable debt issuance policy; iv) 1997 and 2008 reforms to the pension system, which allowed the transition to the individual account system managed by pension funds (AFORES) that currently invest in securities issued by the Mexican government; v) the development of derivatives markets of the TIIE rate that has allowed the coverage of longer-term risks; vi) the introduction of the market makers scheme, which are credit institutions and brokerage firms seeking to actively participate in the government bond market; and, finally, vii) modifications in the financial system regulations that allow greater legal certainty, which include the regulation issued by this Central Bank to trade in securities, including securities lending, repos and derivatives under the international standards, along with the mechanisms and infrastructure to settle them, in conjunction with the INDEVAL.

Chart 5

Yield Curve: Government Securities [1/]
Percent

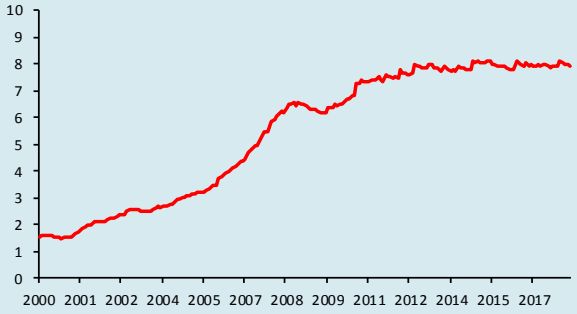


1/ Annual average. For 2018 the average is as of May 28.
Source: *Proveedor Integral de Precios.*

As a result of the above, the Mexican authorities managed to have the debt market expand its maturity structure in the period of 7 years (from 1999 to 2006). In 1999 the yield curve only reached one year and was extended to include maturities of 30 years (Chart 5). Deep and liquid secondary market was developed in all terms. Thus, the average maturity term of the Mexican debt shifted from 6 months in January 1990 to 1.5 years in 2000 and 7.9 years in March 2018 (Chart 6).

[4] The Foreign Exchange Global Code is a set of global principles of good practice developed to provide a common set of guidelines to promote a robust, just, liquid, open and transparent market for the participants of the global foreign exchange market.

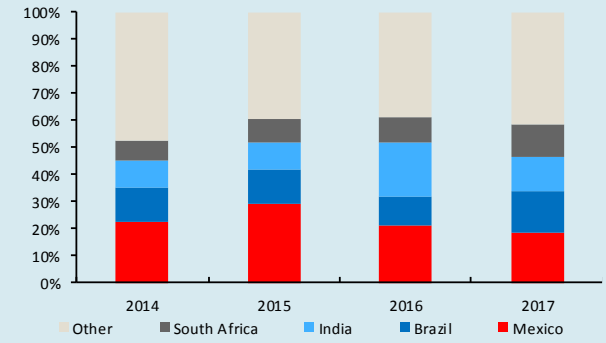
Chart 6
Average Weighted Term: Government Bonds
Years



Source: Banco de México.

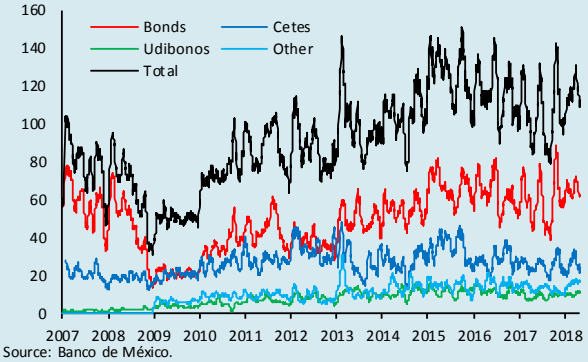
Meanwhile, the volumes of transactions in Mexican sovereign bond market have increased considerably and, in accordance with the survey conducted by the Emerging Markets Trading Association (EMTA), Mexican bonds denominated in Mexican pesos have the highest number of transactions across emerging economies (Chart 7). According to this survey, the daily volume of Mexican debt transactions shifted from approximately MXN 30 billion in 2005 to around MXN 120 billion in 2018 in daily terms (Chart 8).

Chart 7
Volume of Transactions of Debt Instruments in Emerging Markets Denominated in Local Currency by Selected Countries
Percentage



Source: EMTA.

Chart 8
Daily Volume of Transactions: Government Bonds
MXN billion, 20-day moving average

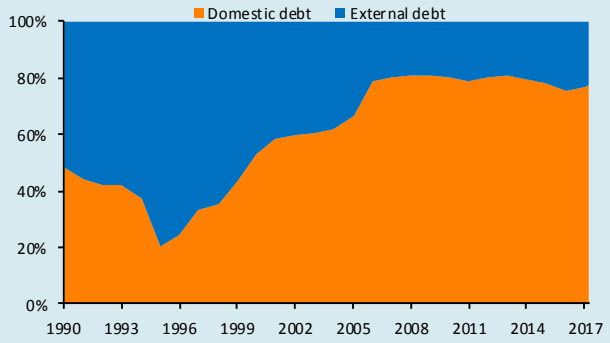


Source: Banco de México.

A developed government bonds market should be backed by an efficient and liquid secondary market. The Federal Government reforms have allowed to adjust the debt market microstructure and to prompt the development of the secondary market in Mexico. The figure of market makers has contributed to making the primary government bond market more efficient and sophisticated and to fostering their secondary market. When market makers emerged in 2000, the government's domestic financing was focused on short-term instruments and bonds with revisable coupons. Market makers have helped to considerably increase liquidity in the secondary market, as they have the obligation to provide bids in government bonds' purchases and sales.

The development of the domestic market of government bonds has presented great benefits. Some of them are: i) more alternatives of financing for the government and for the private sector, which are reflected in longer terms and lower costs of financing; ii) issuing securities in Mexican pesos lowers the exchange-rate risk, which has been translated in a composition of the federal government debt, when the share of external debt vs the domestic debt decreased (Chart 9); iii) the development of the curve of securities lowers the renewal risk; iv) a deeper investors base, with different interests and investment horizons, which promotes the secondary market of securities; v) the attainment of Banco de México's goals and functions, as interest rates can be used to transmit monetary policy signals throughout a whole array of events; and, vi) Banco de México acquires the Federal Government securities to attain its monetary policy operational target to sterilize liquidity surpluses.

Chart 9
Composition of Federal Governments' Net Debt
Percentage

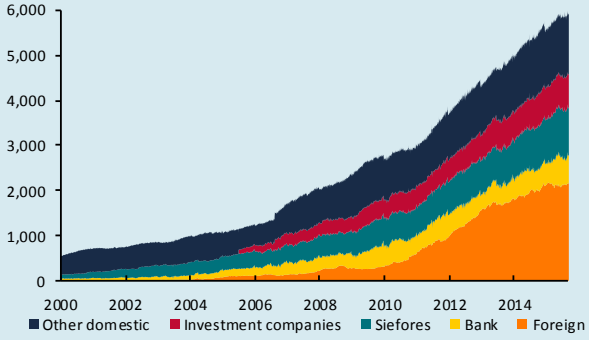


Source: Ministry of Finance (SHCP).

In recognition of the positive changes in the government bond market, the free-floating and capital flows regime, as well as the macroeconomic fundamentals reflected in the degree of investment granted by credit rating agencies which Mexico has maintained since 2002, Mexican sovereign debt instruments denominated in Mexican pesos were included among the main international fixed-income indexes. It stands out that in October 2010 Citigroup decided to incorporate fixed-rate Mexican government bonds denominated in Mexican pesos to the World Government Bond Index (WGBI), Mexico being the first Latin American country to be part of this index. The inclusion of these indices fostered the increment and the diversification of Mexican bond holdings by foreigners in long-term investment, as well as the medium term of the Mexican government debt (Charts 10 and 11).

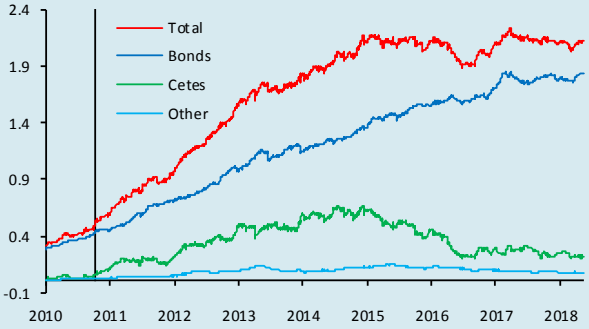
Similar to the case of the exchange market, in November 2017 the financial authorities and financial institutions in Mexico prepared The Code of Conduct for the Money and Fixed Income Market in Mexico to establish the guidelines to promote a robust, equal market, free of favoritism or discrimination, liquid, open and transparent, that would preserve its integrity, protect investors' interest, minimize the risks derived from debt transactions and foster sound competition.[5]

Chart 10
Historical Holdings by Sector of Government Bonds
MXN millions



Source: Banco de México.

Chart 11
Holdings of Government Bonds held by Foreigners
MXN billion



1/ The vertical line corresponds to October 2010 when Mexican government bonds were included in the WGBI index.
Source: Banco de México.

4. Final Remarks

Despite the severity and the magnitude of external and domestic shocks faced by the Mexican economy, financial markets have continued an orderly functioning, supported by the persistence of responsible fiscal and monetary policies. Therefore, given the short-term and long-term risks to the Mexican economy, it is key to maintain the adequate coordination between the fiscal and monetary authorities. The manner in which Banco de México conducts its monetary policy strongly affects the structure and development of government bonds. Finally, the foreign exchange and bond markets also generate more flexibility in the economic agents' decision-making process and propitiate greater certainty for medium- and long-term investment decisions.

[5] It should be noted that, although each participant's adhering to the Code is voluntary, one of the first steps in its implementation was to establish the adhering to it as an obligatory requirement for institutions that wish to participate in the Market Shapers program.

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Box 8. Improvements in the Communication Strategy, Transparency and Accountability of Banco de México

1. Importance of Communication for Central Banks

A central bank's communication strategy is a key instrument for the conduction of its monetary policy, as well as a mechanism of accountability closely related to the central banks' autonomy.[1] In accordance with the literature, the effectiveness of the monetary policy largely depends on the clear and transparent communication of monetary authorities.[2] Providing more information on the monetary policy reaction to different scenarios (the reaction function) helps the economic agents' expectations converge to the target announced by the authority.[3]

Although it is difficult to define the elements of an effective communication strategy, a number of studies suggest that the central bank's communication should be simple and useful in the formation of economic agents' expectations based on relevant and necessary information ("creating news") and should prevent misinformation ("reducing the noise").[4] In this sense, in recent years central banks have made considerable efforts to broaden and improve their communication mechanisms with the public.

Central banks adopted diverse communication strategies. Most have tried to improve their communication via the publication of press bulletins, press conferences, presentations and speeches, as well as the periodical publication of minutes and monetary policy and inflation reports. It should be noted that since several years ago Banco de México incorporated some of these instruments as part of a continuous process to improve its strategy of communication with the public. This Box briefly summarizes the main changes and improvements of Banco de México's communication strategy in recent years, emphasizing the recently announced measures.

2. Banco de México's Communication Strategy

The counterweight of Banco de México's autonomy, granted in April 1994, is the regime of accountability, transparency and access to information. In this sense, Banco de México is required to report on its policies, activities and budget to the Congress and the President, as well as to present its monetary policy program at the beginning of each year, among other requirements. In particular, certain instruments contemplated in Banco de México's Law that sustain the accountability mechanism and thus strengthen the autonomy of the Institution are:

- Appearance before the Senate [5]
- Monetary Program [6]
- Quarterly Report [7]

Although these elements have been established in the framework of a democratic process of accountability, they have also contributed to a better comprehension of the Central Bank's decisions by different economic agents.

The formal implementation of the inflation targeting regime by Banco de México in 2001, as a framework to conduct monetary policy, requires the institutional commitment to attain an explicit inflation target; as well as the implementation of the monetary policy in a framework of transparency, under the principle of clear communication with the public. On acknowledging the importance of these elements, Banco de México has sought to improve and make progress in its communication strategy. In this sense, the information dissemination and the communication of Banco de México's goals, instruments, forecasts and decisions have been key elements in performing its functions to comply with its constitutional mandate and to generate confidence and credibility in its actions. Thus, some additional instruments to those established in Banco de México's Law are:

- Press releases on the monetary policy decisions announcements
- Minutes of the monetary policy decisions
- Quarterly Report press conferences
- Presentations and speeches
- Policies for Public Consultation of General Provisions Issued by Banco de México

The next section briefly describes the evolution of these instruments over time.

2.1 Banco de México's Communication Strategy (2000 – 2017)

Banco de México has made continuous efforts to improve its communication, transparency and accountability (Table 1). As part of these efforts, and as an additional step in the transition towards the implementation of the inflation targeting regime, since 2000 Banco de México has published a number of instruments that have allowed to communicate the aspects considered in its monetary policy decisions to the public. Among them are a press release to announce the modification in the operational target used to implement the monetary policy, and a Quarterly Inflation Report, accompanied by a presentation and a press conference. Similarly, in order to

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1 Blinder et al. (2008), Woodford (2005).
2 Blinder et al. (2008),Woodford (2005).
3 Kahveci & Odavas (2016).
4 Blinder et al. (2008), Haldane & McMahon (2018).
5 Article 47, Section XIII of Banco de México´s Law establishes that the Governor has to appear before the committees of the Senate of the Republic each year to present a report on compliance with the mandate.
6 In line with Article 51, Section I of Banco de México's Law, in January each year this Central Institute has to present to the President and to the Congress of the Union or to the Permanent Commission the guidelines to be followed regarding the monetary policy conduct for the corresponding year.
7 These Reports started to be published in 2000 by order of Banco de México's Governing Board. However, after a decree published in Mexico's Official Gazette on January 10, 2014, there was an adjustment in Article 51 of Banco de México's Law, by which the obligation to present the annual report was waived. Instead, it became legally binding for Banco de México to present to the President of the Republic and the Congress of the Union a Quarterly Inflation Report on the performance of the economic indicators of the country (Article 51, Section Ii of Banco de México's Law).

enhance the effectiveness of its policies, in 2003 the pre-established dates to announce monetary policy decisions began to be released. As a result of achievements in curbing inflation and its volatility, the number of these meetings decreased from 23 in 2003 to 8 starting from 2011.

In 2010, fan charts were introduced to present inflation and economic activity forecasts in the above mentioned Report.[8] Similarly, since 2011 Banco de México has started to publish the Minutes of each monetary policy decision.[9] Finally, starting from 2017 the Report includes central trajectories of inflation and economic activity forecasts and their comparison with the previous report.

2.2 Recent Actions with regard to Communication (2018)

Recently, Banco de México has made efforts to provide the public with more information on the analysis and the elements considered by the Board of Governors in the monetary policy decision. The Quarterly Report October – December 2017 included a technical box, explaining the different indicators that allow the Board of Governors to have a more comprehensive assessment of the degree of slack in the economy. These indicators continued to be published in the Report together with information on Fundamental Core Inflation, which allows to better identify pressures on inflation, especially pressures associated to the cyclical evolution of the economy.

For the first time, this Quarterly Report incorporated the publication of a point forecast of average annual quarterly inflation changes for the next 8 quarters. This strengthens the role of Banco de México in shaping expectations and providing a reference to evaluate the observed inflation trajectory relative to Banco de México's forecast, and, thus, in identifying possible deviations, which in turn should be analyzed by the Institution and taken into account in its monetary policy actions. In addition, when inflation is at levels different from its target, when announcing the expected inflation trajectory by Banco de Mexico in the horizon in which monetary policy operates, both the time horizon and the speed at which inflation is estimated to return to its target are communicated to the public. Thus, the monetary policy instruments to impact the inflation expectations are reinforced.[10]

Similarly, as part of the efforts in terms of accountability, and considering its capacities to issue general provisions on an array of matters, on March 7, 2018 the Governing Board published "Policies for Public Consultation of General Provisions Issued by Banco de México". With these public consultations, the Bank strengthens its compliance with the principles that it must follow when issuing directives that by law it is permitted to, since, among these principles an especially important one is the protection of the public's interest. These public consultations of policies stem from Banco de México's regulatory improvement objective, which it seeks to promote. And they have the ultimate goal of advancing a process by which general provisions are established through consultations open to any interested party, allowing, in particular, agents subject to the regulation by Banco de México to comment and provide opinions on provisions that the Bank intends to issue. The above processes are undertaken in a context of transparency and openness, adopting regulatory principles and good practices. Following these principles, up to the time of publication, Banco de México has released four public consultations.[11]

Giving continuity to the above mentioned efforts, on April 30, 2018, the Governing Board announced a number of modification to its monetary policy communication strategy, in order to continue improving it.[12]

i. **Minutes** of the Governing Board meetings regarding monetary policy decision will disclose voters' identities, and in case of dissent over the vote, an explanation of the reasons will be included.
ii. **Transcripts** of the Governing Board meetings, during which monetary policy decision-making takes places will be available to the public three years after the respective meeting.
iii. The Press Release of the Announcement of monetary policy decisions, as well as the corresponding minutes will be published in **Spanish** and **English** simultaneously on the corresponding dates.
iv. Public **speeches** and **presentations** of the Governing Board members will be available to the public.

These modifications will contribute to greater transparency and accountability among the Governing Board members, both as a collegiate body and on an individual level. Similarly, they will provide the public with more information regarding the elements taken into consideration during monetary policy decisions, and will expand the reach of the messages contained in different communication instruments to a non-Spanish speaking community.

Thus, Banco de México continues making progress in the implementation of better practices in the monetary policy communication strategy.

3. Conclusions

The implementation of a transparent and clear communication strategy with the public is a key component for the effective monetary policy in an inflation-targeting regime, used by Banco de México to conduct monetary policy, as it helps to generate confidence and credibility in the Institution and thus comply with its constitutional mandate to procure price stability.

[8] See the Inflation Report July - September 2010.
[9] See the Inflation Report July - September 2010.
[10] See the Monetary Program for 2018 and Quarterly Report October - December 2017.
[11] See Press Releases on the public consultations referent to "Regulation of exchange rate operations with credit and debit cards", "Regulation of credits to workers via the use of their payroll account", and "Regulation applicable to subordinated debentures that credit institutions seek to issue".
[12] See the Press Release "El Banco de México modifies its monetary policy communication strategy". April 30, 2018.

Progress achieved in this area over the last decades has represented important efficiency gains for this Central Bank in terms of the convergence process to its inflation target.[13] Banco de México confirms its commitment to proceed with its efforts to improve its communication strategy, as well as to strengthen the autonomy of this Institution through greater transparency and accountability.

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Table 1. Evolution of Banco de México's Communication Strategy

Year	Actions in the field of Communication Strategy
2000	Publication of the press statement to announce mondifications in the operational target, using which monetary policy is conducted.
	Beginning of the publication of the Quarterly Inflation Report.
2001	The formal adoption of the inflation targeting regime.
2003	Release of the preestablished dates of MPD.
	Publication of at least one monetary policy press statement at the end of the month, and an intermediate one if the monetary policy is modified.
2006	Reduction in the number of MPD from 23 to 12 a year.
2008	Reduction in the number of MPD from 12 to 11 a year.
2010	Use of fan charts to announce inflation forecasts and economic activity forecasts in QR.
2011	Publication of MPD minutes.
	Reduction in the number of MPD from 11 to 8 a year.
	QR video transmission.
2017	Incorporation of the central inflation and economic activity forecasts in fan charts.
2018	Publication of current forecasts of average annual quarterly changes of inflation in QR.
	Establishment of the policies to submit general draft provitions to public consultation before Banco de México intends to issue them by virtue of the powers confered to it by the law.
	Inclusion of the voters' identities in MPD minutes, and in case of dissent during the vote, an explanation of the reasons.
	Simultaneous publication in English and Spanish of the press release of the MPD announcement on the correponding dates.
	Announcement that the transcrpits of the Board of Governors' meetings in which MPD are made will be available to the public three years after the meeting.
	Speeches and presentations of the Board of Governors' members are made available to the public.

[13] See Box 2 "Recent Changes in the Transmission Mechanism of Monetary Policy in Mexico"; Quarterly Report January - March 2016.

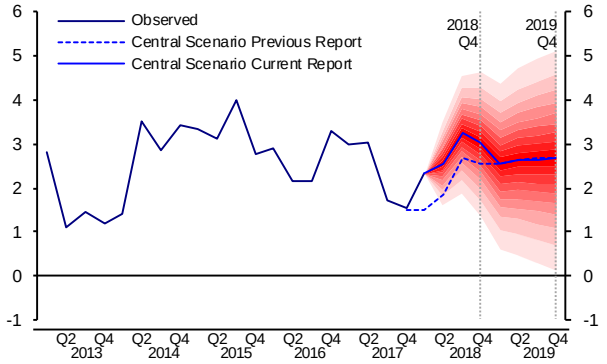
5. Forecasts and Balance of Risks

5.1. Forecasts for Economic Activity

GDP growth: The forecasts for economic growth in Mexico remain unchanged with respect to those published in the previous Quarterly Report. Thus, for 2018 GDP is still estimated to grow between 2.0% and 3.0%, while for 2019 GDP is still expected to expand between 2.2% and 3.2% (Chart 87 and Chart 88). Derived from the higher-than-anticipated dynamism of economic activity in the first quarter of 2018, growth for 2018 could lie in the upper range of the abovementioned interval. The expected growth trajectory for the remainder of the year and for 2019 is based on estimation forecast of a moderate recovery of private investment and spending on public infrastructure projects, as well as of a strengthening of external demand, which would continue to support economic activity in Mexico.[30] These forecasts assume that the authorities will remain committed to preserving a solid macroeconomic framework, along with sustainable public finances and policies to promote investment and productivity growth.

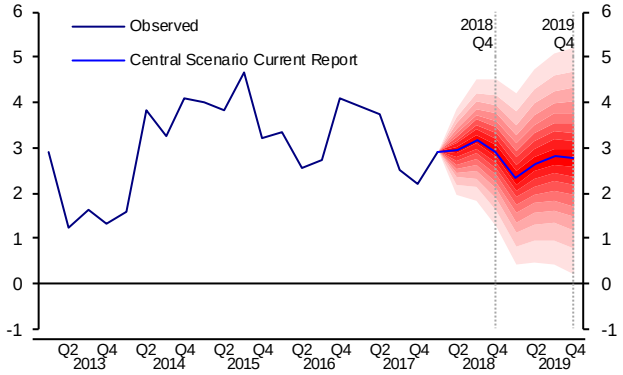
Given that the forecasts for economic activity consider growth close to its potential and a balance of risks biased to the downside, tight slack conditions of the economy are estimated to ease throughout the forecast horizon. In particular, it is anticipated that the positive levels of the output gap estimate that exclude the oil sector and of the quarterly slack indicator will decline gradually over the next quarters, and the estimate of total output gap is expected to remain at levels close to zero (Chart 89, Chart 90 and Chart 91). Therefore, in the forecast horizon, no additional tightening of slack conditions is expected in the economy, which could considerably affect inflation.

Chart 87
Fan Chart: GDP Growth, s. a.
Annual percent



s. a. / Seasonally adjusted data.
Source: INEGI and Banco de México.

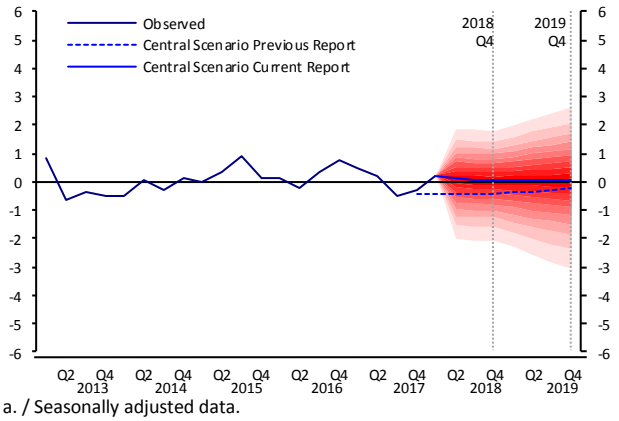
Chart 88
Fan Chart: GDP Growth Excluding Oil Sector, s. a.
Annual percent



s. a. / Seasonally adjusted data.
Source: INEGI and Banco de México.

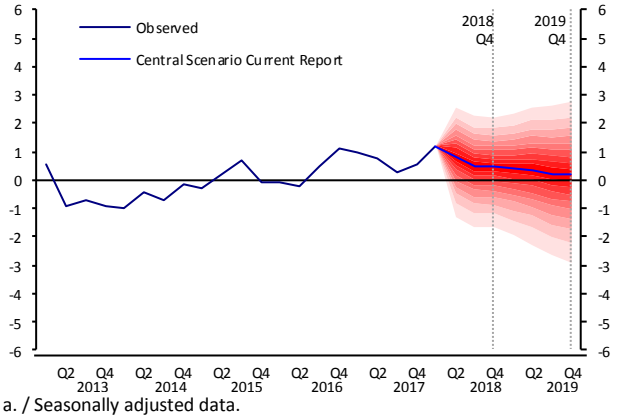
[30] In particular, the expectations for the U.S. industrial production in 2018 and 2019 were adjusted from 3.3% and 2.4% in the previous Report to 3.6% and 2.6% in the current one, based on the consensus among business analysts surveyed by Blue Chip in May 2018.

Chart 89
Fan Chart: Output Gap Estimate, s. a.
Percentage of potential output



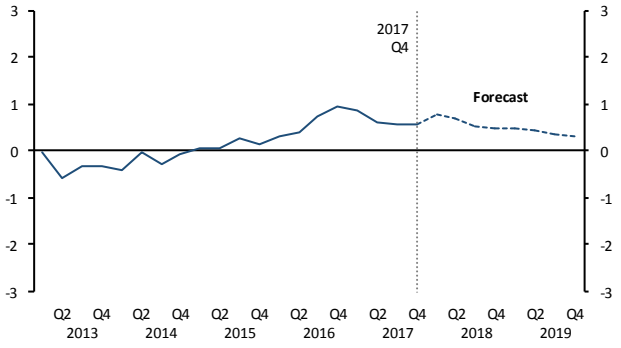
s. a. / Seasonally adjusted data.
Source: Banco de México.

Chart 90
Fan Chart: Output Gap Estimate Excluding Oil Sector, s. a.
Percentage of potential output



s. a. / Seasonally adjusted data.
Source: Banco de México.

Chart 91
Quarterly Slack Index



Notes:
i) The estimated performance of this indicator is consistent with the GDP forecasts excluding the oil sector.
ii) A fan chart for the quarterly slack index cannot be calculated, given the manner in which its forecast was estimated.
Source: Banco de México.

Employment: The forecasts for the number of IMSS-affiliated jobs for 2018 and 2019 remain unchanged with respect to the previous Report. In particular, in 2018 an increase by between 680,000 and 780,000 jobs is expected, while for 2019 growth of between 690,000 and 790,000 is projected.

Current Account: For 2018, deficits in the trade balance and the current account are anticipated to amount to 1.1% and 2.1% of GDP, respectively (US$ 14.0 billion and US$25.2 billion, in the same order), which ae similar to the projections in the previous Report of US$13.7 billion and US$25.9 billion, in the same order. For 2019, deficits in the trade balance and the current account are estimated to be 1.1% and 2.3% of GDP, respectively (US$15.0 billion and US$30.5 billion, in the same order), which compare to 1.2% and 2.3% of GDP released in the previous Report, respectively (US$15.0 billion and US$30.5 billion, in the same order).

Despite the recovery at the end of 2017 and in early 2018, the Mexican economy continues to face considerably downward risks, given the uncertainty persisting in the economy. Hence, the balance of risks for economic growth maintains its downward bias, especially in the medium term.

The main downward risks in the forecast horizon are:

i. Uncertainty associated to the NAFTA renegotiation and the electoral process in Mexico that could cause a number of businesses to delay their investment plans in Mexico or prompt Mexican consumers to cut down their spending as a precaution. Regarding the NAFTA renegotiation, this risk could be exacerbated as the timeline for this process lengthens.

ii. Volatility bouts in international financial markets, derived, among other factors, from inflation surprises in the U.S. that generate higher-than-expected increases in interest rates in that country, or from geopolitical events that constrain the sources of financing.

One of the main upward risks to growth in the forecast horizon is that:

i. Uncertainty over NAFTA renegotiation is resolved, reinvigorating investment in a sustained manner.

In addition to the above, the Mexican economy is facing a number of additional risks that, if they materialize, not only could affect the cyclical growth, but also could negatively influence its growth potential in the medium and long terms. Some of these risks are:

i. An unfavorable outcome in the NAFTA negotiations for the Mexican productive sector, or, even, that the failure of these negotiations leads to its cancellation.

ii. An escalation of protectionist measures worldwide, which would negatively affect global economic growth and the role of certain economies (including Mexico) in the global value chains.

iii. A number of factors (external or domestic) affect competitiveness of the Mexican economy. Among them are corporate tax cuts in the U.S. and public safety issues in Mexico.

5.2. Inflation Outlook

Inflation: The decline in inflation during the first four and a half months of 2018 is consistent with the forecast presented by Banco de México in its October-December Quarterly Report. Based on available information and considering the current monetary policy stance, in the horizon in which monetary policy operates the evolution of inflation is expected to be similar to that published in the last Report. That is, the forecasts for headline inflation presented in this Report are consistent with those announced in the previous one. Within this projection, the most recent data signal a relatively more favorable trajectory for core inflation, essentially due to the better-than-estimated evolution of merchandise prices, which is offset by an estimation of a slightly higher non-core inflation, derived from relatively higher prices of some energy products, as compared to those anticipated in the previous forecast (Table 3).

Annual headline inflation is expected to continue subsiding, to approach its 3.0% target throughout the year and to stay close to that target in 2019. During 2018, as mentioned above, the trajectory of core inflation is expected to show a slightly better-than-anticipated performance. Hence, annual core inflation is forecast to continue declining gradually to consolidate its convergence to 3.0% during 2019. The above estimates consider an orderly evolution of the exchange rate, the absence of labor market-related pressures and that non-core inflation will keep subsiding during the remainder of 2018 at the anticipated pace (Chart 92 and Chart 93).

Table 3
Headline and Core Inflation Forecasts
Annual change in percent

	2018				2019				2020
	I	II	III	IV	I	II	III	IV	I
CPI									
Current report	5.3 *	4.6	4.3	3.8	3.3	3.1	3.1	3.1	3.1
Previous report	5.5	4.8	4.3	3.8	3.2	3.0	3.1	3.2	
Core									
Current report	4.3 *	3.7	3.6	3.4	3.2	3.2	3.1	3.0	3.0
Previous report	4.4	4.0	3.8	3.6	3.3	3.2	3.1	3.0	

*/ Observed data.
Source: Banco de México and INEGI.

This scenario is subject to risks. The main upward risks are:

i. That the exchange rate remains under pressure due to an environment of higher external interest rates, U.S. dollar strength, and the uncertainty associated with the NAFTA renegotiation and Mexico's presidential elections this year.

ii. Shocks in agricultural product prices and upward pressures in the prices of certain energy goods.

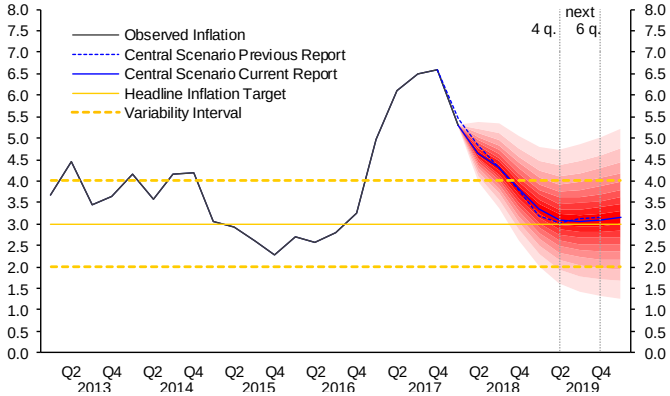
iii. Given the economy's cyclical conditions, unit labor costs could lead to inflationary pressures.

Downward risks:

i. The possibility of the peso appreciating if NAFTA negotiation is favorable.

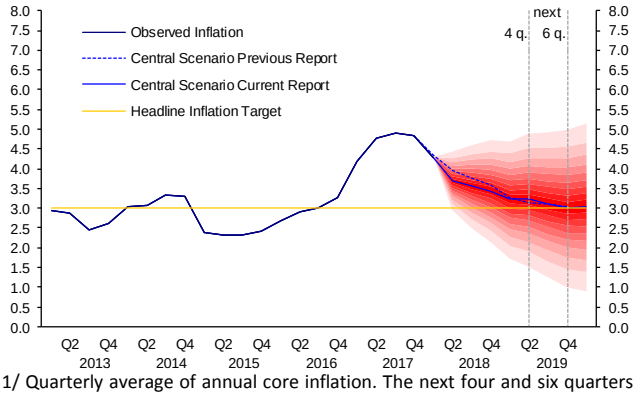
The balance of risks for inflation relative to the expected trajectory maintains an upward bias associated to the described risks, in an environment characterized by high uncertainty.

Chart 92
Fan Chart: Annual Headline Inflation 1/
Percent



1/ Quarterly average of annual headline inflation. The next four and six quarters are indicated, using as a reference the second quarter of 2018; that is, the second and the fourth quarters of 2019, time intervals over which monetary policy transmission channels fully operate.
Source: Banco de México and INEGI.

Chart 93
Fan Chart: Annual Core Inflation 1/
Percent



1/ Quarterly average of annual core inflation. The next four and six quarters are indicated, using as a reference the second quarter of 2018; that is, the second and the fourth quarters of 2019, time intervals over which monetary policy transmission channels fully operate.
Source: Banco de México and INEGI.

To guide its monetary policy actions, Banco de México's Governing Board closely follows the development of inflation vis-à-vis its anticipated trajectory, taking into account the monetary policy stance adopted and the time frame in which monetary policy operates, as well as available information on inflation determinants and medium- and long-term inflation expectations, including the balance of risks. Looking ahead, the Governing Board will maintain a prudent monetary stance and will continue to follow closely the potential pass-through of exchange rate fluctuations on prices, the monetary policy stance relative to that of the U.S., and the evolution of slack conditions in the Mexican economy. In the presence of factors that, by their nature, may involve risks to inflation and inflation expectations, if needed, monetary policy will be conducted in a timely and firm manner to attain the convergence of inflation to its 3.0% target and to strengthen the anchoring of medium- and long-term inflation expectations to reach this target.

The adopted monetary policy stance, combined with the attainment of the fiscal objectives and the resilience of the financial system has contributed to the continued growth of the Mexican economy, despite a number of severe and simultaneous shocks it has faced. The strengthening of the macroeconomic framework in Mexico has also placed the country in a better position to face a complex environment, while in the short and medium terms important risks persist. However, to take on the challenges that may arise and to enhance the

economy's ability to face adverse shocks, it is key that Mexico further strengthens its macroeconomic stance, particularly relative to the structural situation of its public finances. Similarly, actions should be taken to improve competitiveness across the country and to foment higher productivity of the economy. Efforts should also be made to develop infrastructure and to consolidate the recovery of investment. Additionally, as stated in previous Reports, it is important to undertake reforms and broad actions that improve public safety conditions, legal certainty and economic competition, all of which would be beneficial for investment and economic growth, in an environment of low and stable inflation, for the benefit of the Mexican population.

6. Annex 1. Banco de México's Publications in the Quarter January – March 2018

1. Publications

1.1. Monetary Policy Programs

30/01/2018	Monetary Policy Program for 2018

1.2. Quarterly Reports

28/02/2018	Quarterly Report, October - December 2017

1.3. Regional Economic Report

15/03/2018	Regional Economic Report, October - December 2017

1.4. Reports on current expenditure budget and physical investment

07/02/2018	Report on the approved budget of current expenditure and physical investment in 2018

1.5. Budget exercise reports

31/03/2018	Budget Exercise Report as of the First Quarter of 2018

2. Working Papers

04/01/2018	2018-01 Labor Heterogeneity and the Pattern of Trade
04/01/2018	2018-02 Ethnic and Racial Disparities in Saving Behavior
19/02/2018	2018-03 The Effect of Uncertainty on Foreign Direct Investment: the Case of Mexico

3. Speeches and presentations by Governing Board members

3.1. Speeches

18/01/2018	"La política monetaria en México al inicio de un año complejo", Javier Guzmán, Deputy Governor of Banco de México (available only in Spanish)
16/02/2018	"Mexico's monetary policy and economic outlook", Javier Guzmán, Deputy Governor of Banco de México
08/03/2018	"81° Convención Nacional Bancaria", Alejandro Díaz de León, Governor of Banco de México (available only in Spanish)
16/03/2018	"Educación económica y financiera: implicaciones para la economía y papel del banco central", Javier Guzmán, Deputy Governor of Banco de México (available only in Spanish)
22/03/2018	"Celebración del octogésimo quinto aniversario de la fundación del Banco Nacional de Obras y Servicios Públicos (BANOBRAS)", Alejandro Díaz de León, Governor of Banco de México (available only in Spanish)
11/01/2018	"Retos para la política monetaria en México", Alejandro Díaz de León, Governor of Banco de México (available only in Spanish)
15/01/2018	"Mexico's monetary policy: outlook and challenges", Javier Guzmán, Deputy Governor of Banco de México

4. Press Releases

4.1. Monetary Policy

4.1.1. Announcements of Monetary Policy Decisions

08/02/2018	Target for the Overnight Interbank Interest Rate will increase by 25 basis points

4.1.2. Minutes of the meeting of Banco de México's Governing Board on the occasion of the monetary policy decision

22/02/2018	Minutes of the meeting of Banco de México's Governing Board on the occasion of the monetary policy decision announced on February 8, 2018

4.2. Banco de México

4.2.1. Weekly balance statement

03/01/2018	Banco de México's balance statement of the week of December 29 and December 2017
09/01/2018	Banco de México's balance statement of the week of January 5, 2018
16/01/2018	Banco de México's balance statement of the week of January 12, 2018
23/01/2018	Banco de México's balance statement of the week of January 19, 2018
30/01/2018	Banco de México's balance statement of the week of January 26, 2018
07/02/2018	Banco de México's balance statement of the week of February 2 and January 2018
13/02/2018	Banco de México's balance statement of the week of February 9, 2018
20/02/2018	Banco de México's balance statement of the week of February 16, 2018
27/02/2018	Banco de México's balance statement of the week of February 23, 2018
06/03/2018	Banco de México's balance statement of the week of March 2 and February 2018
13/03/2018	Banco de México's balance statement of the week of March 9, 2018
21/03/2018	Banco de México's balance statement of the week of March 16, 2018
27/03/2018	Banco de México's balance statement of the week of March 23, 2018

4.2.2. Weekly information of the Consolidated Account Statement

03/01/2018	Weekly information as of December 29, 2017
09/01/2018	Weekly information as of January 5, 2018
16/01/2018	Weekly information as of January 12, 2018
23/01/2018	Weekly information as of January 19, 2018
30/01/2018	Weekly information as of January 26, 2018
07/02/2018	Weekly information as of February 2, 2018
13/02/2018	Weekly information as of February 9, 2018
20/02/2018	Weekly information as of February 16, 2018
27/02/2018	Weekly information as of February 23, 2018
06/03/2018	Weekly information as of March 2, 2018

13/03/2018	Weekly information as of March 9, 2018
21/03/2018	Weekly information as of March 16, 2018
27/03/2018	Weekly information as of March 23, 2018

4.3. Financial Sector

4.3.1. Monetary aggregates and financial activity

31/01/2018	Monetary aggregates and financial activity in December 2017
28/02/2018	Monetary aggregates and financial activity in January 2018
28/03/2018	Monetary aggregates and financial activity in February 2018

4.3.2. Quarterly evolution of financing to firms

26/02/2018	Quarterly evolution of financing to firms during October - December 2017

4.4. External sector

4.4.1. Balance of payments

23/02/2018	Annual balance of payments 2017

4.4.2. Revised information of foreign trade

11/01/2018	November 2017
09/02/2018	December 2017
09/03/2018	January 2018

4.5. Survey results

4.5.1. National survey on consumer confidence

11/01/2018	Consumer confidence index: December 2017
06/02/2018	Consumer confidence index: January 2018
06/03/2018	Consumer confidence index: February 2018

4.5.2. Surveys among private sector specialists

01/02/2018	Survey among private sector specialists: January 2018
01/03/2018	Survey among private sector specialists: February 2018

4.5.3. Survey on General Conditions and Standards in the Banking Credit Market (EnBan)

12/02/2018	Survey on General Conditions and Standards in the Banking Credit Market during the quarter October - December 2017

4.5.4. Business opinion indicators

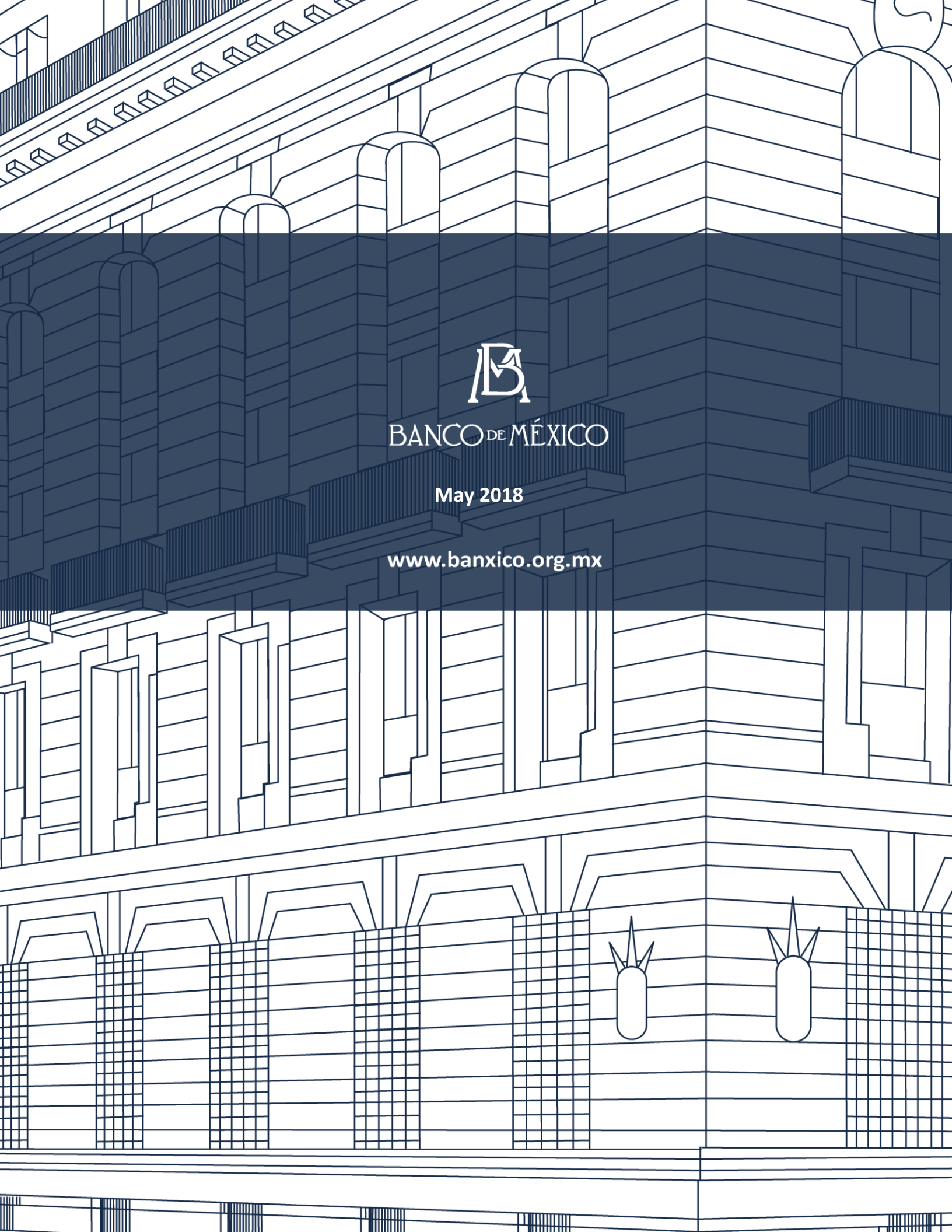
04/01/2018	Manufacturing orders' index: December 2017
01/02/2018	Manufacturing orders' index: January 2018
01/03/2018	Manufacturing orders' index: February 2018

4.6. Miscelaneous

02/01/2018	Publication of guidelines for the third issue of *Reto Banxico*, an academic competition among Bachelor's degree students in Mexico
24/01/2018	The Permanent Commission of the Congress of the Union voted through Irene Espinosa Cantellano as a Deputy Governor of Banco de México
26/01/2018	First meeting of the Central Banks and Supervisors Network for Greening the Financial System, on January 24, 2018 in Paris
29/01/2018	Banco de México releases to the public a tool to conduct credit card market analysis
31/01/2018	Redefinition of monetary aggregates and improvements in the financial activity statistics in Mexico
12/02/2018	Publication of the Survey on General Conditions and Standards in the Banking Credit Market
07/03/2018	Policies for the public consultation of general provisions issued by Banco de México
13/03/2018	Second Session on Labor Equality and Non-discrimination in Banco de México
15/03/2018	The Financial System Stability Council Updates its Balance of Risks
16/03/2018	Banco de México is the first central bank to obtain the leading global certification in workplace gender equality and has been recognized with the EDGE Certified Foundation's EDGE Assess level
21/03/2018	Public consultation of Banco de México's provisions projects: regulation of exchange rate transactions with credit and debit cards

4.7. Circulars issued by Banco de México

26/01/2018	1/2018 Circular. Procedures for market makers and Udibonos market makers to have the right to purchase government bonds and take loans on these bonds with Banco de México as the financial agent of the Federal Government (market makers)
26/01/2018	2/2018 Circular. Government bond auctions (market makers)
26/01/2018	3/2018 Circular (Published in DOF on January 26, 2018). Auctions to place Udibonos segregated coupons (market makers)



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