



BANCO DE MÉXICO

# Quarterly Report

July – September 2016





*BOARD OF GOVERNORS*

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## **QUARTERLY REPORT**

This report analyzes recent developments in economic activity, inflation and different economic indicators of Mexico, as well as the monetary policy implementation in the quarter July – September 2016, 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. Discrepancies may possibly arise between the original document and its translation to English. The original and unabridged Quarterly Report in Spanish is the only official document.*

*Unless otherwise stated, this document has been prepared using data available as of November 18, 2016. Figures are preliminary and subject to changes.*

## CONTENTS

1. Introduction .....	1
2. Recent Development of Inflation.....	5
2.1. Inflation .....	5
2.2. Producer Price Index .....	14
3. Economic and Financial Environment .....	16
3.1. External Conditions .....	16
3.1.1. World Economic Activity.....	16
3.1.2. Commodity Prices .....	20
3.1.3. Inflation Trends Abroad.....	21
3.1.4. International Monetary Policy and Financial Markets .....	22
3.2. Evolution of the Mexican Economy .....	25
3.2.1. Economic Activity .....	25
3.2.2. Labor Market .....	35
3.2.3. Financial Saving and Financing in Mexico .....	37
4. Monetary Policy and Inflation Determinants .....	44
5. Inflation Forecasts and Balance of Risks .....	59
Annex Calendar of Monetary Policy Decision Announcements, Minutes of the Board of Governors' Meetings regarding Monetary Policy Decisions and Quarterly Reports in 2017 .....	64

## BOXES

1. Long-term Relation in the Mexico – U.S. Bilateral Real Exchange Rate, and Relative Prices of Merchandise with respect to Services .....	6
2. Considerations on the Evolution of the Neutral Interest Rate in Mexico. ....	47





## 1. Introduction

The Mexican economy is one of the most integrated with the global economy, and, in particular, with the U.S. Its trade and financial integration has offered considerable benefits, allowing to seize increased opportunities of shared trade and production, a wider diversity in terms of sources for financing its growth and a greater development of its financial system. However, as a consequence, the national economy and financial markets have become more vulnerable to external events. In this context, during the period covered by this Report, the Mexican economy faced a complex juncture. Indeed, the outlook for the world economy has become more challenging, as a consequence of the elections in the U.S. and their outcome, among other factors. The events related to the aforementioned process led to higher volatility in all regional financial markets, strongly affecting the national ones, in light of the relevance represented by the outcome of such process for Mexico. Thus, asset prices dropped and high volatility was observed. In particular, the national currency depreciated significantly and interest rates observed increments for all terms. In this context, the preemptive measures that Banco de México adopted during the year, acting with total flexibility and in line with what the conditions demanded, have prevented headline inflation and its expectations from being affected by the above referred factors. Thus, despite the challenges implied by the current juncture and its consequences for the exchange rate, the low pass-through of exchange rate fluctuations onto the prices of goods and services has allowed to maintain an environment of low inflation and relatively stable inflation expectations. The referred low pass-through is precisely one of the fundamental consequences of the conduct of monetary policy, which has focused on anchoring inflation expectations, and on preventing second round effects in view of adjustments in relative prices.

Delving in the above, in the said international environment, capital inflows to emerging economies started to revert and interest rates exhibited an upward trend both in advanced and emerging economies. These episodes of volatility affected emerging economies in a differentiated manner, with the Mexican peso showing higher volatility and depreciation with respect to other currencies. In this context, as pointed out by the national authorities, it is important to acknowledge that it is still difficult to identify the elements that will define the economic policy stance of the U.S. regarding its bilateral relation with Mexico starting from 2017. Thus, as previously announced, the Mexican authorities will continue to exercise caution, analyzing any policy announcements made by the next administration of the U.S., and guiding their decisions on the received solid information and, at all times, keeping a vision of what is more convenient for Mexico in the medium and long terms. Likewise, in the short term, authorities will remain vigilant of the evolution of the domestic financial markets, in order to take the necessary measures in a coordinated manner, so as to maintain the sound functioning of these markets.

Mexico is in a position of strength to face this new environment, as a result of achievements reached and foreseen in terms of consolidation of public finances; of applying preemptive monetary policy measures that have been adopted this year; of a solvent and well-capitalized financial system with no liquidity problems; and of an unprecedented process of structural reforms. Nevertheless, it is inevitable to continue dealing with both existing and emerging risks, by further strengthening the

macroeconomic fundamentals of the country. Accordingly, Banco de México continued to respond with total flexibility and at the moment and magnitude required by conditions, in order to counteract inflation pressures and to maintain inflation expectations anchored. Thus, even though in its monetary policy decision of August the Board of Governors kept the target for the Overnight Interbank Interest Rate unchanged, in its decisions of September and November the said rate was increased by 50 basis points in each occasion, marking a level of 5.25 percent. This was done in order to counteract inflation pressures and to maintain inflation expectations anchored.

Aside from the volatility experienced by financial markets, in the third quarter of the year, world economic activity recovered moderately, supported by higher growth in the U.S. and other advanced economies, along with a continuous expansion of some of the main emerging ones. In this environment, derived from a possible implementation of a highly expansionary fiscal policy that will be carried out, in principle, by the incoming administration of the U.S., there was a spike in inflation expectations in the markets. Hence, even though the Federal Reserve is still anticipated to increase the federal funds' rate in December and to continue with its monetary stance normalization process at a gradual rate, in view of the recent events in financial markets, this rate is now estimated to possibly be faster and of a greater magnitude than previously anticipated. In turn, other central banks are expected to maintain an accommodative monetary policy stance for an extended period.

The incipient growth in global activity contributed to the moderate recovery of the Mexican economy in the third quarter of 2016, following the contraction in the second one. Indeed, Mexico's external demand improved, after the negative trend in exports during 2015 and in early 2016, while private consumption displayed a greater dynamism at the beginning of the reported period. In contrast, the weakness in gross fixed investment, registered since mid-2015, prevailed. In this context, economic activity has somewhat decelerated and no significant aggregate demand-related pressures onto the prices of the economy have been observed.

Annual headline inflation registered, until September 2016, seventeen consecutive months below 3 percent, even though in October it slightly exceeded this figure, as a result of the gradual upward trend maintained by core inflation, as well as the impact generated by the increment in gasoline prices at the Northern border. The performance of core inflation is mainly accounted for by the evolution of the merchandise price subindex, which has been responding to the depreciation of the national currency. The persistently low inflation during the reported period stemmed from the conduct of monetary policy, from the absence of significant aggregate demand-related pressures onto prices, from low international prices of most commodities and from price reductions in some widely-used inputs, which derived, in part, from the efforts of the structural reforms.

Even though the global economy is still expected to recover, the outlook for world growth and trade has continued its downward revision, suggesting that Mexico will likely face a lower external demand than previously anticipated. Furthermore, the outcome of the U.S. electoral process heightened the risk of the implementation of policies that could hamper foreign trade and foreign investment in Mexico. Domestically, the forecast for crude oil production was adjusted downwards. This

suggests that GDP growth in Mexico over the following quarters could be lower than estimated in the previous Report. Still, it should be noted that the central scenario for economic growth presented in this Report assumes that, by and large, trade relations between Mexico and the U.S. will remain sound, and that the adjustment in financial markets will continue to be carried out in a relatively orderly fashion. Hence, it is forecast that Mexican GDP will grow between 1.8 and 2.3 percent in 2016 (between 1.7 and 2.5 percent in the last Report). The forecast interval for GDP growth in 2017 is adjusted to a range between 1.5 and 2.5 percent (between 2.0 and 3.0 percent in the previous Report). Nonetheless, this year and the following one, economic activity is expected to benefit from the continued implementation of structural reforms, as well as from the strengthening of macroeconomic fundamentals, foreseen in light of the announced adjustments in fiscal policy. For 2018, a more evident recovery of the U.S. industrial activity is anticipated. In this context, Mexican GDP growth rate for that year is estimated to lie between 2.2 and 3.2 percent. Note that these forecasts should be taken with caution, as, insofar as there is more available information regarding the economic policies of the incoming U.S. administration, growth provisions may need to be adjusted.

Annual headline inflation is expected to continue gradually increasing, to lie slightly above 3 percent by the end of this year. Core inflation is also forecast to close the year moderately above this level. In 2017, both headline and core inflations are estimated to exceed the inflation target, albeit lying within the variability interval, and getting closer to 3 percent by the end of 2018.

The environment currently faced by the Mexican economy is characterized by high uncertainty. In addition to the possible impact of the U.S. elections outcome on the bilateral relation with Mexico, lies the possibility of new volatility episodes related to several risks still prevailing in the international economy. Among them, the following should be listed: doubts regarding the course of trade relations between the U.K. and the European Union, high vulnerabilities faced by some of the main emerging economies and the persistent uncertainty regarding the possible consequences of the U.S. monetary policy normalization process. To face these risks, and, thus, to contribute to the strengthening of the macroeconomic framework in Mexico, the monetary policy actions were complemented by fiscal consolidation measures drafted by the Ministry of Finance in the 2017 Economic Package and approved by the Mexican Parliament. These actions, along with the recently announced PEMEX 2016-2017 business plan, which establishes the guidelines for the financial strengthening of the State-owned Production Company, will contribute to solidifying the economic fundamentals of the economy, allowing to efficiently absorb external shocks and, in turn, fostering greater financial stability.

It is important to recognize that recent international events can plausibly affect the structural relation of Mexico with its main trade partner, both in its trade and financial aspects. In this context, it is both natural and necessary to observe a real exchange rate depreciation, as it is the most efficient adjustment mechanism and shock absorber. Given its mandate, Banco de México's main contribution during this adjustment process is to foster an orderly change in relative prices, in order to prevent inflation expectations from being significantly affected, so that no second round effects that could negatively affect the price formation process of the economy are observed.

In this context, the Board of Governors will closely monitor the evolution of all inflation determinants and its medium- and long-term expectations, especially the potential pass-through of exchange rate adjustments onto prices, without implying any established goal for this variable. Likewise, it will be watchful of the monetary position of Mexico relative to the U.S., without overlooking the evolution of the output gap. This will be done in order to be able to continue taking the necessary measures to consolidate the efficient convergence of inflation to its 3.0 percent target, with total flexibility, whenever and to the extent that conditions may demand so.

## 2. Recent Development of Inflation

### 2.1. Inflation

Despite the complex international environment, which, among other things, was reflected in a high exchange rate depreciation, the conduct of monetary policy and the absence of aggregate demand-related price pressures allowed annual headline inflation to accumulate, as of September 2016, seventeen consecutive months below the permanent 3 percent target. Low international prices of most commodities, as well as reductions in telecommunication services' prices in Mexico, as a result of the structural reform in this sector, also contributed to such result.

Indeed, during the period analyzed in this Report, annual headline inflation continued evolving as anticipated. In particular, it exhibited a modest upward trend and rebounded above 3 percent in October. This reflected both the upward trend in core inflation and an increment in non-core inflation in recent months. The evolution of core inflation is principally explained by the performance of the merchandise price subindex, which responded to the depreciation of the national currency (see Box 1). On the other hand, higher inflation of the non-core component was largely due to increments in gasoline prices during the third quarter, which were partially offset by falls in L.P. gas prices starting from August 17. It should be stressed that despite the above, no second round effects on the price-setting process of the economy have been observed so far.

Thus, annual headline inflation shifted from an average of 2.56 to 2.78 percent between the second and the third quarters of 2016, and registered a level of 3.06 percent in October. In the same quarters, average annual core inflation went up from 2.91 to 3.00 percent, and further to 3.10 percent in October. Meanwhile, the average annual change of the non-core component increased from 1.46 to 2.10 percent over the referred quarters, and marked 2.95 percent in October (Table 1 and Chart 1).

## Box 1 Long-term Relation in the Mexico – U.S. Bilateral Real Exchange Rate, and Relative Prices of Merchandise with respect to Services

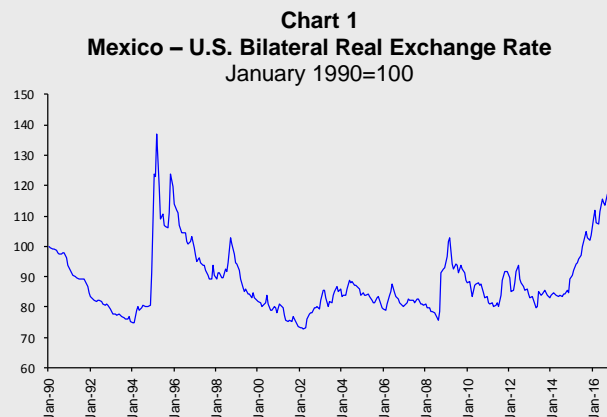
### 1. Introduction

The real exchange rate is one of the main adjustment variables in an open economy in case shocks affecting the country's external accounts should occur. By inducing changes in the relative prices of tradable goods with respect to non-tradable goods, the structure of spending and production of the economy mitigates the effects of such shocks. For instance, if a given external shock implies a lower potential of external revenues for the economy, a real exchange rate depreciation leads to a rise in the relative price of tradable goods with respect to non-tradable ones. This results in greater production and lower relative spending on the said goods, mitigating pressures on the country's external accounts.

In a context in which prices are not immediately adjusted in the short term upon external shocks, the nominal exchange rate indeed adjusts first. In this sense, the latter variable dominates short-term adjustments of the real exchange rate, and, only after a certain lag, domestic relative prices of tradable goods with respect to non-tradable goods are adjusted to the new environment. Therefore, it is important to do a statistical analysis that would allow to pinpoint if this transmission channel is indeed present in Mexico and to measure the speed of adjustment in relative domestic prices.

This analysis is especially important in the current juncture, given the considerable depreciation of the real exchange rate, as well as higher prices of tradable goods with respect to non-tradable ones, reason why it should be analyzed if the observed performance has been congruent with the relation between these variables from a theoretical and statistical points of view. In this sense, this Box presents an analysis of how the dynamics in relative prices of tradable goods with respect to non-tradable goods responded to the performance of the Mexico - U.S. bilateral real exchange rate (Chart 1).

The adjustment in the real exchange rate took place, for the most part, via a depreciation of the nominal exchange rate, while relative prices of tradable goods with respect to non-tradable goods in Mexico adjusted more gradually (Chart 2).



Source: Banco de México.

In this context, below we present the analysis of the joint dynamics between the real exchange rate and the relative prices of tradable goods with respect to non-tradable goods in Mexico, using a cointegration analysis. The aim is to quantify the effect of a depreciation of the real exchange rate in the long-term relation of these variables and to identify if there are potential inflation pressures derived from an adjustment required in the referred relative prices.

As shown later, the results indicate that the real exchange rate and relative prices of tradable goods with respect to non-tradable goods in Mexico are cointegrated; that is, they have a stable linear relation in the long term, and the latter variable is the one that adjusts to correct short-term imbalances relative to this long-term relation. In this sense, the observed gradual increment in the prices of tradable goods relative to non-tradable goods (in response to the observed depreciation of the real exchange rate) is natural.

In addition, the evidence suggests that these variables are currently somewhat distanced from their long-term relation. In particular, merchandise prices are still expected to grow faster than services' prices for a certain period of time, to then converge to their long-term relation with real exchange rate. However, the estimated speed of adjustment is very low, which implies a very gradual increase in relative prices of tradable goods with respect to non-tradable ones across time. That is, no considerable inflation pressures derived from this channel are anticipated.

## 2. Relation between the Real Exchange Rate and Relative Prices of Merchandise with respect to Services

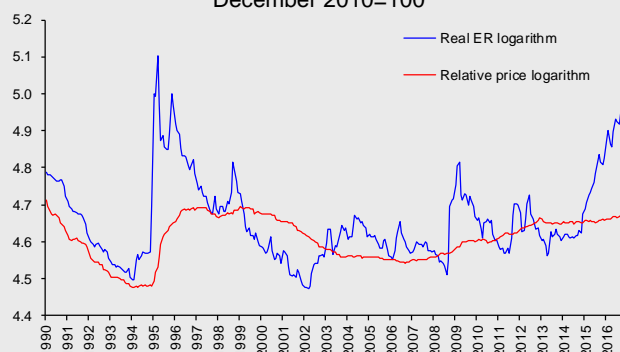
Merchandise goods are mostly internationally traded goods, while services, with certain exceptions, are not. Hence, this analysis considers merchandise as tradable goods and services as non-tradable ones.

Considering that the nominal exchange rate tends to be the first variable to adjust upon different shocks affecting real parity, from a statistical point of view it would be expected that causality would move from the bilateral real exchange rate towards relative prices; that is, that the future performance of relative prices would respond to the changes observed in the real exchange rate.

In the case of Mexico, the adjustment in relative prices in light of the changes in the real exchange rate does not seem instantaneous, but rather is takes place over a relatively ample time frame. Additionally, changes in relative prices are smoother and seem to exclusively follow the long-term trend of the bilateral real exchange rate, without reflecting its intrinsic volatility (Chart 2).

Chart 2

### Real Exchange Rate and Relative Prices of Merchandise with respect to Services December 2010=100



Source: Estimated by Banco de México with own data and data from INEGI.

The cointegration analysis carried out to study the above is realized using monthly data from January 1990 to September 2016. A vector autoregressive model with error correction (VEC) is calculated in order to estimate the long-term relation between the real exchange rate and the relative prices of merchandise with respect to services, as well as their adjustment speed in view of possible imbalances.<sup>1</sup> The equations corresponding to VEC in each estimate are the following:

$$(1) \pi_t^{RP} = \gamma_1 (z_{t-1}) + \sum_{j=1}^p \alpha_{1,j} \pi_{t-j}^{RP} + \sum_{j=1}^q \beta_{1,j} \pi_{t-j}^{RER} + \eta_{1,t}$$

$$(2) \pi_t^{RER} = \gamma_2 (z_{t-1}) + \sum_{j=1}^p \alpha_{2,j} \pi_{t-j}^{RER} + \sum_{j=1}^q \beta_{2,j} \pi_{t-j}^{RP} + \eta_{2,t}$$

$$(3) z_{t-1} = \ln(RP_{t-1}) - \varphi_1 \ln(RER_{t-1})$$

where:

$\pi_t^{RP}$  is the monthly percentage change of relative prices of merchandise with respect to services,  $\pi_t^{RER}$  is the monthly percentage change of the real exchange rate,  $RP_t$  is the relative price of merchandise with respect to services,  $RER_t$  is the real exchange rate,  $\eta_{i,t}$  is white noise  $i = \{1,2\}$ ,  $z_{t-1}$  is the error correction term and  $\varphi_1$  is the cointegration coefficient. Specifically, the following tests are carried out:

Table 1  
Cointegration between the Real Exchange Rate and Relative Prices of Merchandise and Services <sup>1/</sup>

Johansen test (number of cointegration relationships)	[0]	[1]
Trace statistics	38.47 ***	3.14
Maximum Eigenvalue statistic	35.33 ***	3.14
Relative price elasticity to the real exchange rate	0.97 ***	
Adjustment speed		
Of the real exchange rate	0.02	
Of relative prices	-0.01 ***	
Granger causality test		
Of the real exchange rate to relative prices	3.43 *	
Of relative prices to the real exchange rate	0.24	

Source: Estimated by Banco de México with own data and data from INEGI.

1/ The optimal number of lags was calculated based on Wald's joint test (chi-square) consistent with the first significant lag between 1 and 12. \*, \*\*, \*\*\*, indicate rejection of the null hypothesis at 10 percent, 5 percent and 1 percent, respectively.

The evidence shown in Table 1 indeed suggests cointegration between the real exchange rate and relative prices in Mexico. Consistent with these results, any deviation that these variables may present, in any given moment, with respect to their long-term relation, would tend to be corrected across time by adjustments in at least one of the two variables. The estimated coefficients indicate that an increase in the real exchange rate is associated, in a long term, with an increment of a similar proportion in the relative prices of merchandise with respect to services.

The relative price of merchandise is a variable that is adjusted over time correcting short-term imbalances with respect to the long-term relation with the real exchange rate. Particularly, the speed of adjustment is significant from a statistical point of view for relative prices of merchandise with respect to services, while it is not statistically significant for the real exchange rate. In addition, Granger causality tests also suggest that causality moves from the real exchange rate to relative prices of merchandise, rather than vice versa. It is thus concluded that the variable that is adjusted to reestablish the balance is relative prices.

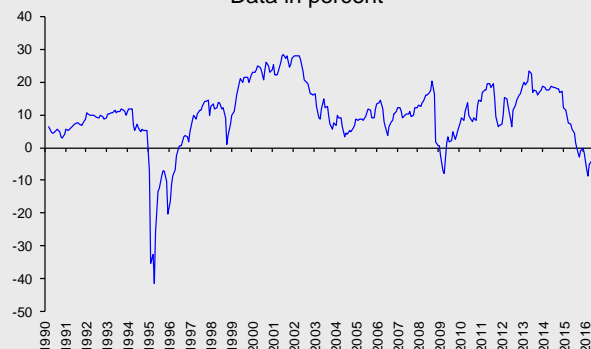
<sup>1</sup> The tests and parameters have the following interpretation: a) Johansen Cointegration Test – It is a procedure to check the number of existing vectors or cointegration relations; b) Elasticity of the Pass-through of the Exchange Rate onto Relative Prices – The parameter describes the relation that variables should maintain in the long term; c) Adjustment Speed – It is a parameter that measures the percentage of the deviation ( $z_{t-1}$ ) that is corrected each month; d) Granger Causality Tests – It is a procedure to establish if one variable causes another. The null hypothesis of the test is defined as absence of causality. Statistically, the procedure tests if a variable has useful information to forecast future variations of another variable.

These results are consistent with the dynamics recently presented by the relative prices of merchandise with respect to services, in light of the shocks in the real exchange rate. In particular, as a result of the depreciation of the real exchange rate (since mid-2014), the relative prices of merchandise with respect to services increased, even though this process was gradual.

Based on the estimation of the model, it is possible to calculate the deviation registered by the relative prices with respect to their long-term equilibrium relation (Chart 3). It is established that the relative prices of merchandise with respect to services are currently below their long-term equilibrium level. In this sense, given the speed of adjustment implied by the model, it suggests that for a relatively long time, in absence of other shocks, inflation of merchandise would be expected to be greater than services, just as it was observed. However, given a very low adjustment speed, this spread would not be very large. Thus, Banco de México's main contribution during this adjustment process, given its mandate, is to help make the change in relative prices orderly, seeking to prevent the adjustment from adversely affecting inflation expectations, so that no second round effects would surge, and negatively affect the price-formation process of the economy.

The previous analysis suggests that there are no changes in the relative prices of the Mexico's main trade partner. It is possible to show that, given a downside trend presented in the relative prices of merchandise with respect to services in the U.S., for the same real exchange rate, it implies even lower pressures on the adjustment in domestic relative prices, reason why, in a certain manner, it could lead to the balance in the economy with an inflation in merchandise prices with respect to services that would be relatively lower than implied in this model.

**Chart 3**  
Percentage Deviation of Relative Prices of Merchandise and Services with respect to their Long-term Level  
Data in percent



Source: Estimated with data from Banco de México and INEGI.

### 3. Final Remarks

This Box analyzes the impact of variations in the Mexican – U.S. bilateral real exchange rate on the dynamics of relative prices of merchandise with respect to services in Mexico. In the first place, evidence is found suggesting that there is a long-term equilibrium relation between the relative prices of merchandise with respect to services and the real exchange rate. In the second place, it is shown that relative prices are the ones that are adjusted to correct for short-term imbalances that may derive from shocks to the real exchange rate. Finally, it is shown that, in view of the depreciation of the real exchange rate, the relative prices of merchandise with respect to services are below the long-term equilibrium level, which implies that for a relatively long time period, in absence of other shocks, inflation of merchandise would be expected to be higher than that of services. However, the estimated speed of adjustment, at which this imbalance is corrected, is very low, which points that the adjustment to the level of equilibrium would be gradual.

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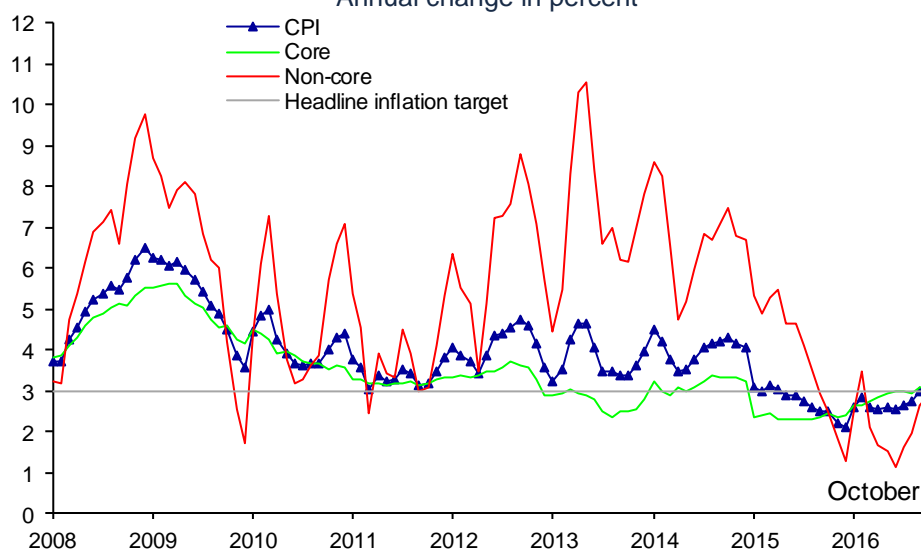


**Table 1**  
**Consumer Price Index, Main Components and Trimmed Mean Indicators**  
 Annual change in percent

	2015			2016			October
	II	III	IV	I	II	III	
<b>CPI</b>	<b>2.94</b>	<b>2.61</b>	<b>2.27</b>	<b>2.69</b>	<b>2.56</b>	<b>2.78</b>	<b>3.06</b>
<b>Core</b>	<b>2.32</b>	<b>2.33</b>	<b>2.40</b>	<b>2.69</b>	<b>2.91</b>	<b>3.00</b>	<b>3.10</b>
<b>Merchandise</b>	<b>2.52</b>	<b>2.46</b>	<b>2.78</b>	<b>3.04</b>	<b>3.51</b>	<b>3.79</b>	<b>3.97</b>
Food, beverages and tobacco	2.56	2.20	2.55	2.88	3.69	3.89	4.17
Non-food merchandise	2.49	2.67	2.98	3.17	3.36	3.71	3.81
<b>Services</b>	<b>2.15</b>	<b>2.22</b>	<b>2.09</b>	<b>2.40</b>	<b>2.41</b>	<b>2.34</b>	<b>2.36</b>
Housing	2.09	2.06	2.00	2.11	2.21	2.32	2.39
Education (tuitions)	4.35	4.37	4.28	4.21	4.13	4.17	4.26
Other services	1.57	1.75	1.52	2.15	2.09	1.80	1.74
<b>Non-core</b>	<b>4.92</b>	<b>3.53</b>	<b>1.87</b>	<b>2.71</b>	<b>1.46</b>	<b>2.10</b>	<b>2.95</b>
<b>Agriculture</b>	<b>8.34</b>	<b>5.33</b>	<b>2.76</b>	<b>6.51</b>	<b>4.48</b>	<b>3.81</b>	<b>5.25</b>
Fruit and vegetables	7.43	7.91	6.33	22.45	13.30	8.58	10.76
Livestock	8.81	4.00	0.84	-1.60	-0.01	1.26	2.23
<b>Energy and government approved fares</b>	<b>2.87</b>	<b>2.42</b>	<b>1.33</b>	<b>0.39</b>	<b>-0.45</b>	<b>1.01</b>	<b>1.52</b>
Energy	3.21	2.43	0.52	-1.10	-1.49	-0.03	1.02
Government approved fares	2.26	2.39	2.86	3.23	1.41	2.83	2.42
<b>Trimmed Mean Indicator <sup>1/</sup></b>							
CPI	2.82	2.60	2.46	2.45	2.61	2.84	3.00
Core	2.70	2.69	2.76	2.85	3.05	3.19	3.22

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

**Chart 1**  
**Consumer Price Index**  
 Annual change in percent

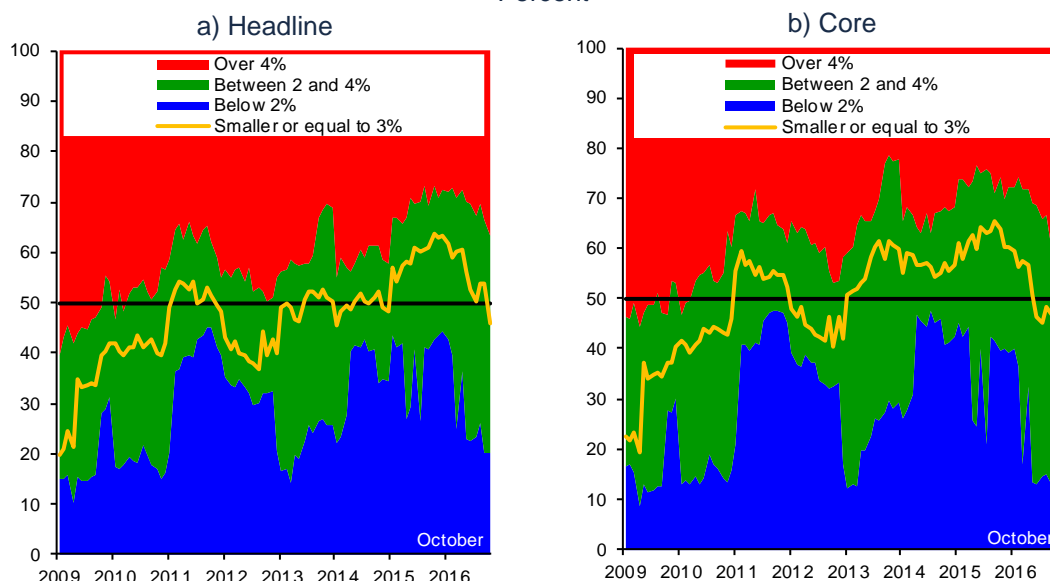


To analyze the performance at the margin and the recent development of the inflation process, first of all, the proportion of the CPI basket is estimated, which presents annual price changes at certain intervals. To do this, generic items of both headline and core inflations are grouped into three categories, depending on the annual growth rate of their price: i) items with an annual price change below 2 percent; ii) between 2 and 4 percent; and iii) over 4 percent. In the same vein, an additional statistical analysis for the CPI and the core component is presented,

which splits generic items into two categories: those with annual price changes lower or equal to 3 percent, and those with changes over 3 percent (Chart 2).

This analysis shows that a high percentage of both baskets presents price increments of less than 4 percent, although at the margin this percentage has been somewhat decreasing. In particular, in the third quarter of 2016, the share of the CPI goods and services' basket with price increments below 4 percent was, on average, 68 percent for the headline index, while in the second quarter of 2016, the share was 71 percent. In the case of core inflation, the proportions were 65 percent in the third quarter of 2016, and 70 percent in the second one. On the other hand, the percentage of the CPI basket with changes lower or equal to 3 percent decreased from 56 to 53 percent between the second and the third quarters of 2016, while in the case of the core component it shifted from 51 to 47 percent in the same time frame. This evolution has principally derived from higher annual changes in merchandise prices.

**Chart 2**  
**Percentage of CPI Basket according to Intervals of Annual Increments**  
 Percent



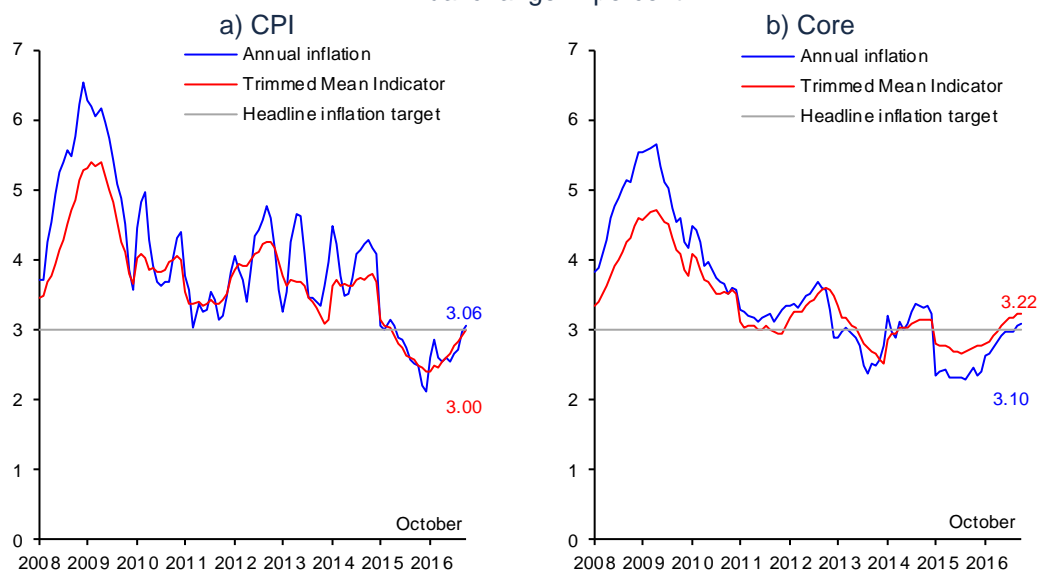
Source: Prepared by Banco de México with own data and data from INEGI.

Secondly, the Trimmed Mean Indicator for headline inflation is illustrated, which shifted from 2.61 to 2.84 percent between the second and the third quarters of 2016, locating at 3.00 percent in October. In turn, the Trimmed Mean Indicator for core inflation went up from 3.05 to 3.19 percent between the second and the third quarters of 2016, and marked 3.22 percent in October. Once again, the gradual increment in these indicators is fundamentally accounted for by the adjustment in relative prices of merchandise with respect to services. On the other hand, both the Trimmed Mean Indicator for headline inflation and that for core inflation lied above the observed inflation levels in the analyzed quarter, which reflects the favorable effect generally produced by the reductions in some particular services' prices, highlighting mobile telephone services (Chart 3 and Table 1).

Thirdly, the evolution of annualized monthly (seasonally adjusted) inflation is analyzed. As can be appreciated, at the margin, once the comparison base effects are discounted, the headline inflation trend increased as a result of increments in

the relative prices of merchandise and gasoline prices at the Northern border. Meanwhile, the core inflation trend gradually increased and persists at levels close to 3 percent (Chart 4).

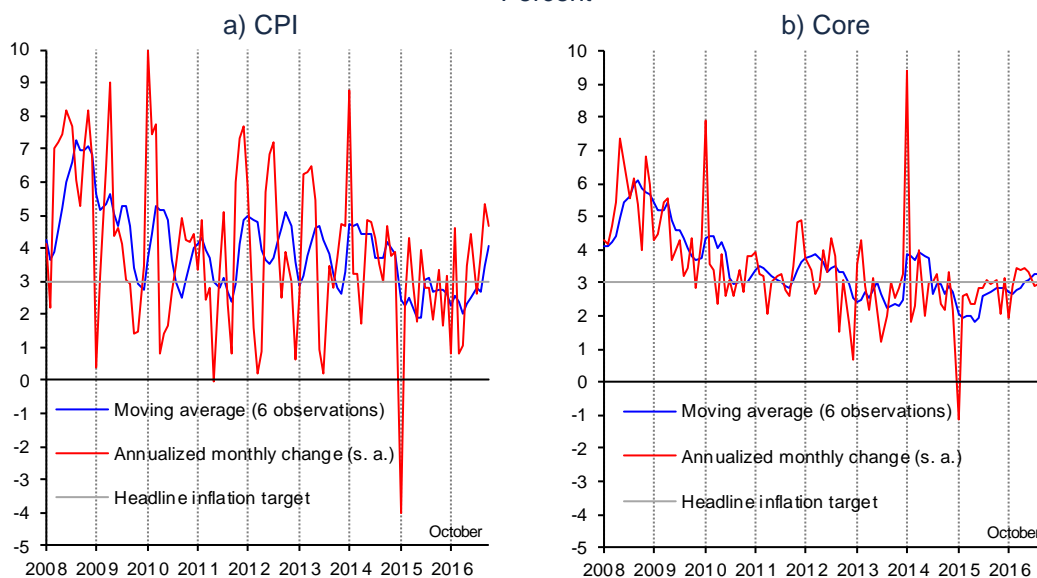
**Chart 3**  
**Price Indices and Trimmed Mean Indicators <sup>1/</sup>**  
 Annual change in percent



<sup>1/</sup> 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) the 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 in the center of the distribution, the Trimmed Mean Indicator is calculated.

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

**Chart 4**  
**Annualized Seasonally Adjusted Monthly Change and Trend**  
 Percent



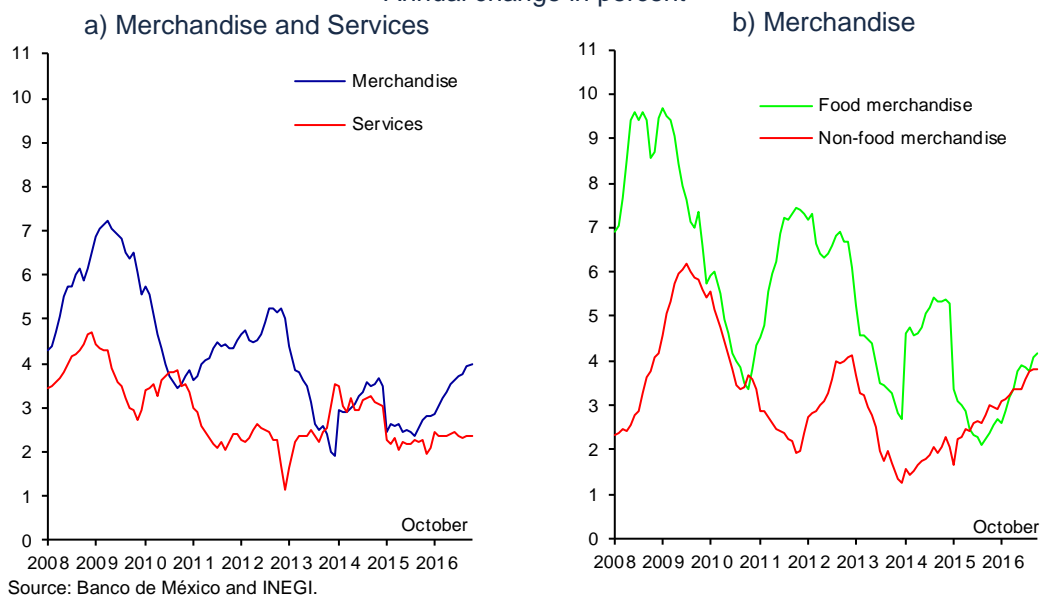
s. a. / Seasonally adjusted data.

Source: Seasonal adjustment prepared by Banco de México with own data and data from INEGI.

Delving in the performance of core inflation, differentiated dynamics in the annual change of merchandise and services' price subindices were observed.

- i. The merchandise price subindex shifted from an average annual change of 3.51 percent in the second quarter of 2016 to 3.79 percent in the third one, marking 3.97 percent in October (Chart 5a). Both food and non-food merchandise prices increased their growth rate, highlighting the acceleration recently registered in the latter. The average annual change of food merchandise increased from 3.69 to 3.89 percent between the second and the third quarters of 2016, reaching 4.17 percent in October. Meanwhile, the average annual change of non-food merchandise prices went up from 3.36 to 3.71 percent in the referred quarters, marking 3.81 percent in October (Chart 5b).
- ii. In contrast, the average annual change of the services' index dropped from 2.41 to 2.34 percent between the second and the third quarters, observing 2.36 percent in October. The average annual changes of the subindices of housing and education slightly increased from 2.21 and 4.13 percent to 2.32 and 4.17 percent, respectively, over the referred quarters. On the other hand, the average annual change of services other than housing and education went down from 2.09 to 1.80 percent in the analyzed quarters. In this last subindex, drops in telecom services' prices, which resulted from the structural reform in the said sector, were noteworthy, reason why its impact on inflation is expected to be relatively lasting (Chart 5a).

**Chart 5**  
**Core Price Index**  
Annual change in percent



The increment in non-core inflation during the reported quarter is largely explained by estimated increases in domestic gasoline prices over the period between July and September, based on the formula used by the Ministry of Finance to set maximum gasoline prices and as a result of increments in this fuel's prices at the

Northern border (Table 1). Additionally, prices of some agricultural products have grown recently, which was partly offset by the domestic L.P. gas, the prices of which dropped, on average, 10 percent starting from August 17. Thus, within the non-core index, the following stands out:

- i. Between the second and the third quarters of 2016, the average annual change of agricultural products' subindex dropped from 4.48 to 3.81 percent, even though it went up again in October and marked 5.25 percent. The average annual change rate of the fruit and vegetables price subindex decreased from 13.30 to 8.58 percent between the second and the third quarters of the year, with the reductions in lemon and onion prices being the most notable. In contrast, the average annual change rate of livestock products grew from -0.01 to 1.26 percent in the referred quarters, lower reductions in egg and chicken prices being noteworthy, as compared to the same period of last year. In October, the fruit and vegetables price index observed an annual change rate of 10.76 percent, while that of livestock products registered 2.23 percent.
- ii. The subindex of energy prices and government approved fares increased its average annual change rate from -0.45 to 1.01 percent between the second and the third quarters. In October, their annual change rate went up to 1.52 percent. The average annual change rate of the energy price subindex shifted from -1.49 to -0.03 percent, marking a level of 1.02 percent in October. Inside this price subindex, the following was observed:
  - The average annual change of low octane gasoline prices increased from -3.16 to 0.51 percent between the second and the third quarters of 2016, while that of high octane gasoline prices went up from -2.44 to 1.31 percent over the same period. Subsequently, in October the annual change rate of low octane gasoline prices marked 3.87 percent, while that of high octane prices lied at a level of 3.73 percent. The evolution of gasoline prices during the third quarter of 2016 derived from increments in domestic prices, the formula used by the Ministry of Finance to determine maximum gasoline prices, as well as the increment in gasoline prices at the Northern border of the country. In October gasoline prices at the Northern border continued growing, while domestic prices remained constant, as they had reached the upper limit of this fuel's maximum price range established by the same Ministry.
  - Structural reforms have contributed to a more favorable performance of domestic gas prices and electricity tariffs since early 2015. However, in the reported quarter, these products' prices observed increments in their annual changes, which was due to the performance of their international counterparts. In particular, the prices of natural gas for domestic use shifted from an average annual change rate of 3.83 to 10.48 percent between the second and the third quarters, marking 16.38 percent in October. In the same sense, high consumption electricity tariffs were adjusted upwards as a result of higher prices of some inputs used to generate electric power, while low consumption electricity

tariffs remained constant. Thus, the average annual change rate of electricity tariffs shifted from -1.58 to -0.91 percent between the second and the third quarters of the year, marking -0.64 percent in October.

- The maximum prices of L.P. gas dropped on average by 10 percent starting from August 17, as a result of which its average annual change rate went from 2.74 to -2.42 percent in the reference quarters, observing -7.54 percent in October.
- The average annual change rate of government approved fares went up from 1.41 to 2.83 percent between the second and the third quarters of 2016, marking 2.42 percent in October. The increment between the second and the third quarters is mainly accounted for by the conclusion of the period of free-of-charge public transport in Mexico City.

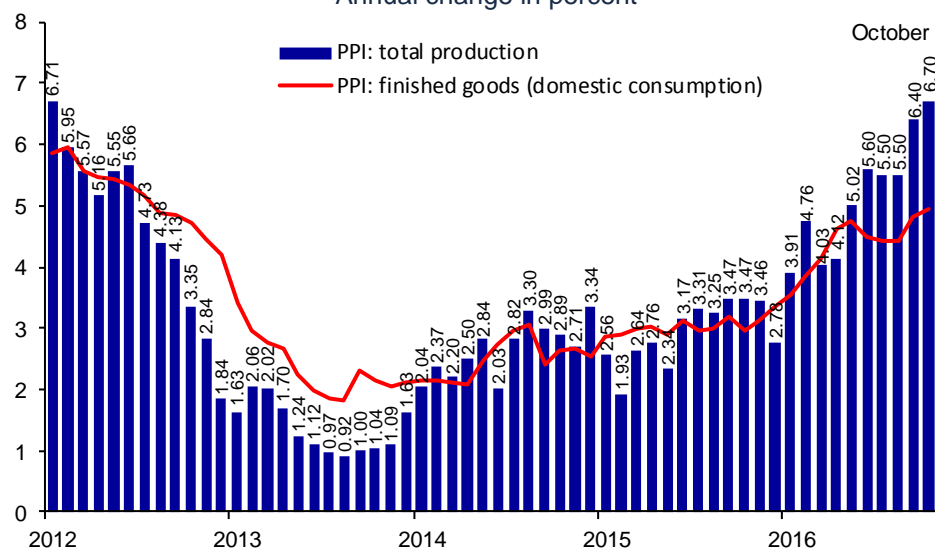
## 2.2. Producer Price Index

Between the second and the third quarters of 2016, the Producer Price Index (PPI) of total production excluding oil registered an increment in the average annual change rate from 4.92 to 5.80 percent, marking 6.70 percent in October (Chart 6). Just like in previous quarters, the subindex of the PPI that presented the highest annual change rates is that of the prices of merchandise destined to exports, which includes goods quoted in USD (10.69 and 10.96 percent in the second and the third quarters of 2016, while in October it observed 10.86 percent). In contrast, the price subindex of finished goods and services for domestic consumption presented more moderate annual change rates (3.68 and 3.82 percent in the second and the third quarters of 2016, while in October it was 4.17 percent). In this regard, it should be recalled that the producer price subindex with the highest predictive power of the performance of core merchandise consumer prices is that of finished merchandise for domestic consumption, while the price subindex of investment and exports' goods has less predictive power of the inflation of the merchandise destined to consumers.<sup>1</sup>

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<sup>1</sup> 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?”.

**Chart 6**  
**Producer Price Index <sup>1/</sup>**  
 Annual change in percent



<sup>1/</sup> Total Producer Price Index, excluding oil.  
 Source: Prepared by Banco de México with data from INEGI.

### 3. Economic and Financial Environment

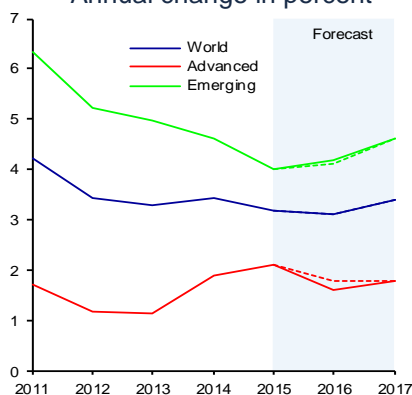
#### 3.1. External Conditions

During the period analyzed in this Report, the outlook for the global economy has become more complex as a consequence of uncertainty related to the process and the outcome of the elections in the U.S. (Chart 7a). Among other factors that also contributed to this adverse international environment, the following can be listed: uncertainty regarding the course of the monetary policy and its effectiveness to stimulate growth, as well as the lack of clarity over the exit of the U.K. from the European Union and its implications for the country's future trade relations. These events caused higher volatility in international financial markets, which reverberated in widespread increments in interest rates and capital outflows from emerging economies. It should be noted that in view of the significant economic and trade links between Mexico and the U.S., national financial markets observed particularly high volatility. Despite that, world economic activity recovered moderately, which can be explained by a greater growth of the U.S. and other advanced economies, and a continuous expansion of some of the main emerging economies (Chart 7b and Chart 7c). Still, a possible implementation of measures that might hinder foreign trade and foreign investment led to a deterioration in the risk balance for global growth.

Chart 7

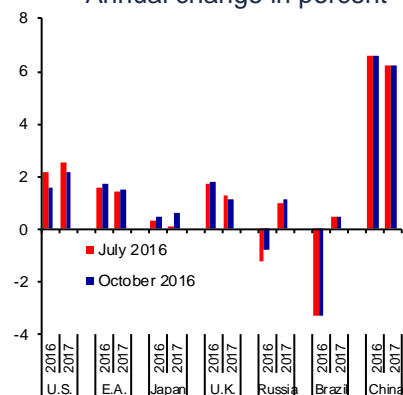
#### World Economic Activity

b) Growth Forecast of World GDP for 2016 and 2017  
Annual change in percent



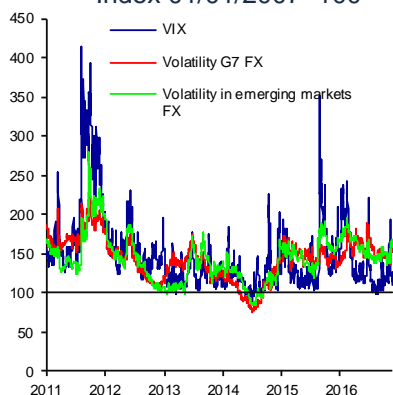
Note: The solid line refers to the October forecast and the dotted line refers to the July forecast.  
Source: IMF, WEO July and October 2016.

c) Growth Forecast of Selected Economies  
Annual change in percent



E. A. / Euro area.  
U. K. / The United Kingdom.  
Source: WEO July and October 2016.

a) Volatility in International Financial Markets  
Index 01/01/2007=100



Source: Bloomberg.

#### 3.1.1. World Economic Activity

Following a deceleration in the first half of the year, GDP growth rebounded in the third quarter in the U.S. The preliminary report indicates a growth of 2.9 percent at an annualized quarterly rate, which is higher than 1.4 percent in the second one. This was in response to a positive contribution of investment in inventories, after a decrease during 5 consecutive quarters, to a lower contraction of fixed private investment and strong growth of net exports, partly explained by transitory factors, such as an increment in soy exports in view of a plunge in this grain's production in other countries. In contrast, the growth rate of private consumption moderated,

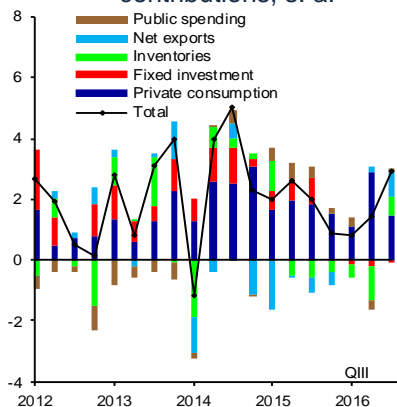


shifting from 4.3 percent in the second quarter to 2.1 percent in the third one (Chart 8a).

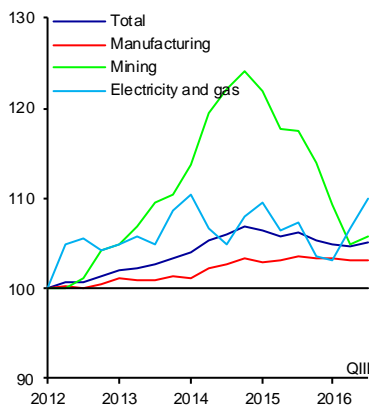
U.S. industrial production recovered slightly in the third quarter, backed by a rebound in the mining sectors, by a continuous strengthening in the activity of electricity and gas generation and by an incipient improvement in manufactures (Chart 8b). Thus, this indicator grew at an annualized quarterly rate of 2.0 percent in the third quarter of 2016, after having contracted for three consecutive quarters. Inside manufactures, the automotive and high technology equipment sectors expanded significantly, and some other sectors increased their exports (Chart 8c). Nonetheless, other sectors, such as machinery and equipment for mining industry, oil and gas, and primary metals remained affected by the strength of the U.S. dollar and low crude oil prices.

**Chart 8**  
**U.S. Economic Activity**  
 b) Industrial Production and Components  
 Index 1Q-2012=100, s. a.

a) Real GDP and Components  
 Annualized quarterly change in percent and percentage point contributions, s. a.

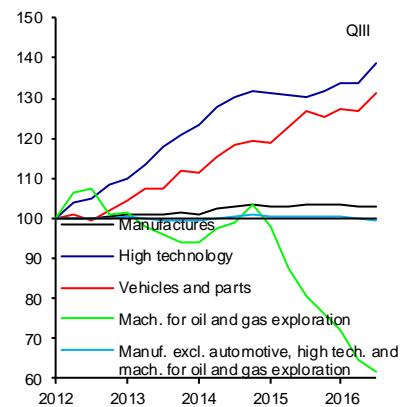


s. a. / Seasonally adjusted data.  
 Source: Bureau of Economic Analysis.



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

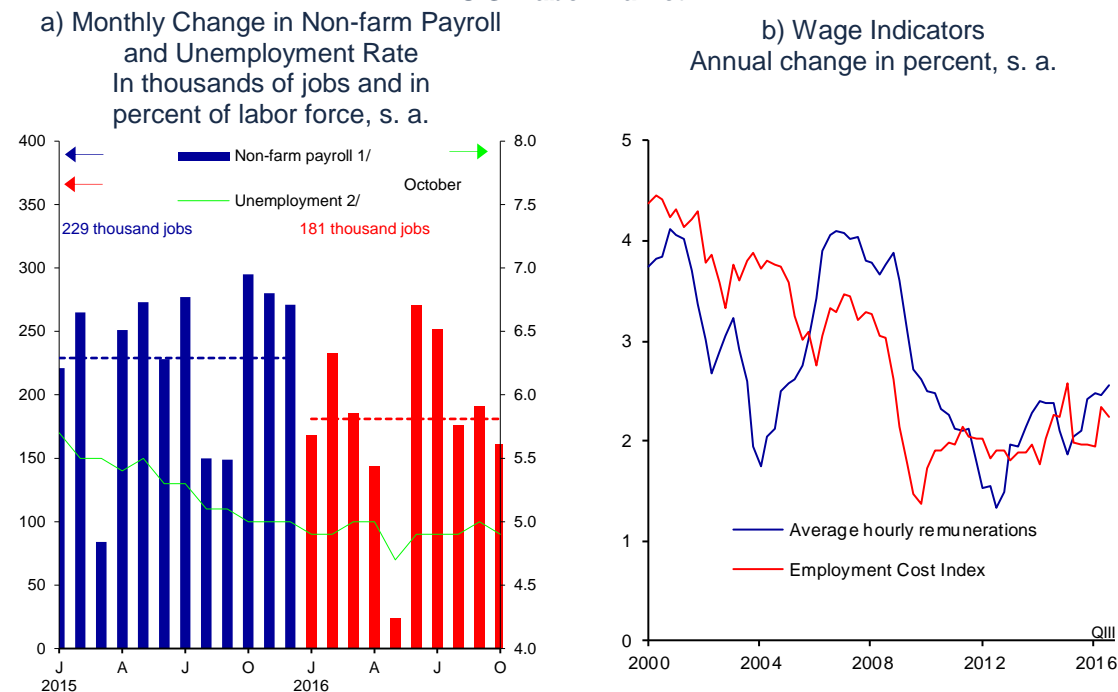
c) Manufacturing Production and Components  
 Index 1Q-2012=100, s. a.



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

Likewise, the U.S. labor market continued recovering gradually. Non-farm payroll kept expanding at a relatively high rate, although it was more moderate than last year. Indeed, on average, 229 thousand jobs were created in 2015 on a monthly basis, while an increment of only 181 thousand jobs was registered over the first ten months of this year (Chart 9a). It is notable that the unemployment rate fluctuated around 5 percent since the end of last year, a level close to that considered as long-term, which was despite a recovery in the labor participation rate. In this context, a moderate acceleration in wages was observed (Chart 9b).

**Chart 9  
U.S. Labor Market**



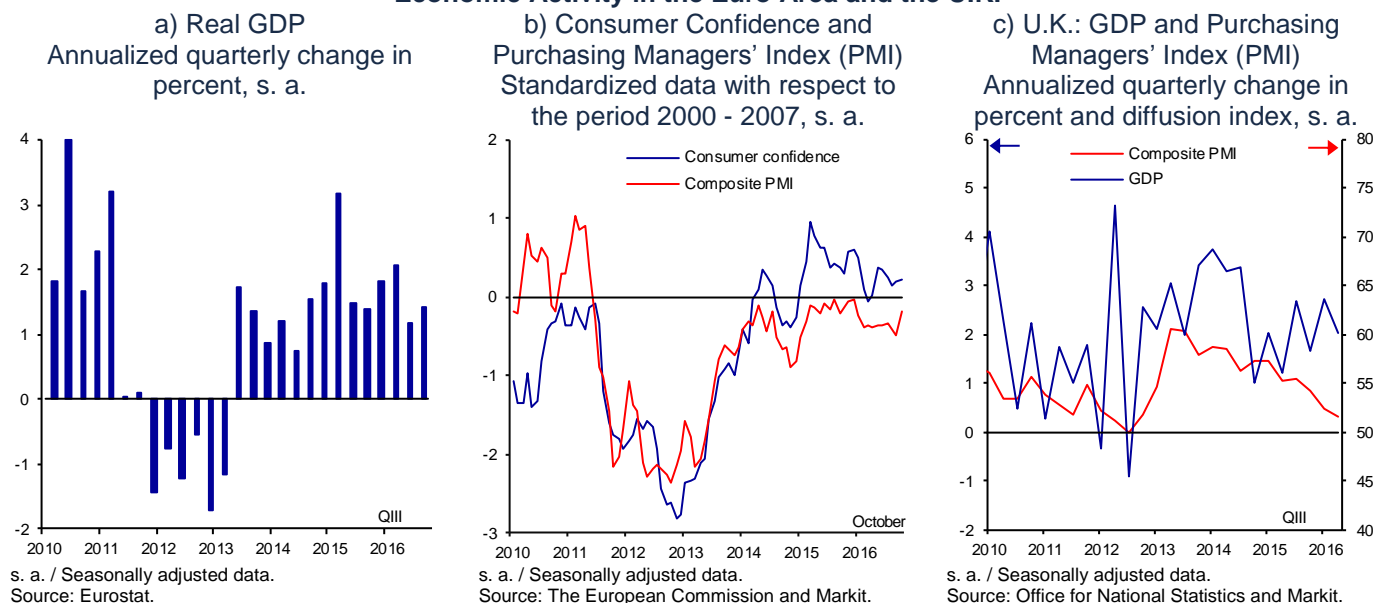
s. a. / Seasonally adjusted data.  
1/ In thousands of jobs.  
2/ In percent of labor force.  
Source: Bureau of Labor Statistics.

s. a. / Seasonally adjusted data.  
Source: Bureau of Labor Statistics.

Although the Euro zone economy rebounded slightly with respect to the second quarter, this region is still facing high risks associated to the uncertainty due to the eventual process of negotiating the U.K. exit from the European Union. GDP in the region expanded at an annualized quarterly rate of 1.4 percent in the third quarter, which compares to 1.2 percent in the second one (Chart 10a). The prospective indicators point to a continuous recovery in the region in the fourth quarter (Chart 10b). Still, in the Euro zone there are doubts regarding the soundness of the balances and profitability of the banking system, as well as regarding the possible effect of the above on the monetary policy transmission and credit recovery. Financial institutions reported an adverse impact generated by negative deposit rates on their credit spreads, which could reduce their capacity to continue expanding their loan volume.

Following the decision to exit the European Union, GDP in the U.K. moderated less than previously estimated, shifting from 2.7 percent at an annualized quarterly rate in the second quarter to 2.0 percent in the third one (Chart 10c). However, in the future, the recovery of the U.K. economic activity could be affected by uncertainty regarding the course of the leaving the European Union.

**Chart 10**  
**Economic Activity in the Euro Area and the U.K.**

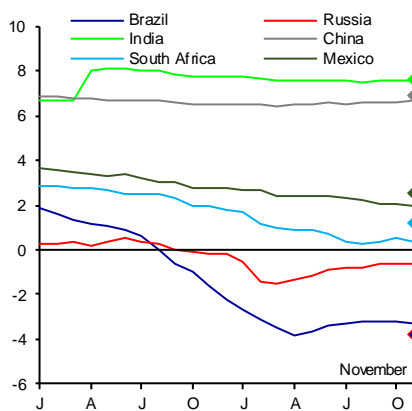


During the third quarter, the economy of Japan expanded at an annualized quarterly rate of 2.2 percent, which was higher than 0.7 percent observed in the second quarter. In this context, the improvement in consumers and businesses' confidence and the impact of the multi-annual fiscal stimulus package announced in August are expected to continue supporting the slow recovery of the Japanese economy.

The activity in emerging economies as a whole recovered during the third quarter, in part reflecting the increment in the primary products' prices this year so far, as well as better external financial conditions at the beginning of the quarter (Chart 11). This result also points to the fact that economies like China and India have maintained their expansion levels, while the growth rate of other countries, such as Brazil and Russia, contracted to a level lower than that shown during the previous quarters.

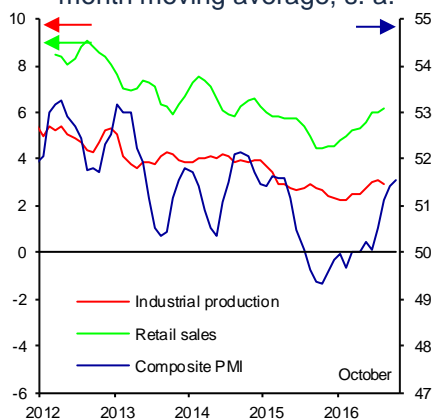
**Chart 11**  
**Economic Indicators of Emerging Economies**

a) Evolution of the Growth Forecast for 2016  
Annual change in percent



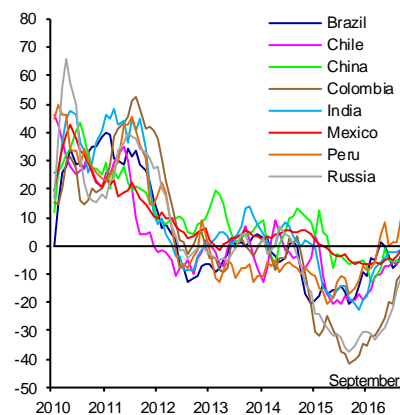
Note: Data in the diamond correspond to GDP growth in 2015.  
Source: Prepared by Banco de México with data from Consensus Forecast.

b) Indicators of Economic Activity  
Diffusion index (50=neutral) and annual change in percent, the 3-month moving average, s. a.



s. a. / Seasonally adjusted data.  
Note: Exports, industrial production and retail sales in volumes.  
Source: Markit, CPB Netherlands, Haver Analytics and FMI.

c) Exports  
Annual change of the 3-month moving average in percent

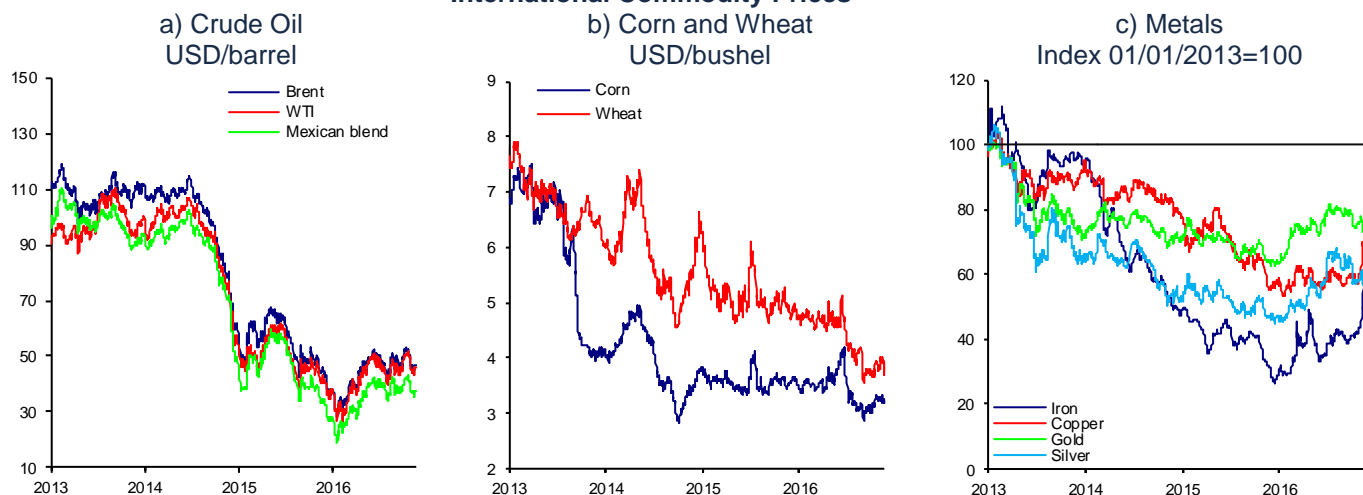


Source: Bloomberg and INEGI.

### 3.1.2. Commodity Prices

International commodity prices observed a mixed performance during the period analyzed in this Report. On the one hand, crude oil prices generally registered a downward trend during most of the third quarter, due to the expectation of an increment in oil production, greater inventories' accumulation in the U.S. and concerns regarding the possible level of demand for crude oil in China. Even though at the end of the quarter prices rebounded following the announcement of the agreement among the OPEC countries to, in principle, cut production for the first time in 8 years, evidence of an increment in production levels among some members and difficulties to solidify the said agreement led to a new fall in crude oil prices at the end of October (Chart 12a). As a result of these adjustments, in mid-November crude oil prices marked levels close to those observed at the end of the second quarter. On the other hand, following a rebound in the previous quarter, grain prices resumed their downward trend, in response to the prospects of historically high production in view of favorable weather conditions (Chart 12b). Meanwhile, after a period of relative stability in the third quarter, industrial metal prices have strongly rebounded recently, derived from an increment in construction activity in China and an expectation that the incoming administration of the U.S. would significantly boost spending on infrastructure over the next years (Chart 12c).

**Chart 12**  
**International Commodity Prices <sup>1/</sup>**



### 3.1.3. Inflation Trends Abroad

In advanced economies, even though greater stability in energy prices contributed to higher headline inflation during the reported quarter, this persisted below the target of the respective central banks. Meanwhile, inflation expectations implicit in market instruments remained particularly low in Japan and in the Euro zone, although in the U.K. and the U.S. they increased strongly (Chart 13a and Chart 13b).

In the U.S., inflation measured through the consumption deflator reached 1.2 percent in September, after remaining at levels slightly below 1 percent throughout the year, reflecting greater stability in energy prices. In contrast, the core deflator has persisted stable around 1.7 percent in recent months. Inflation measured by the consumer price index has evolved similarly to the consumption deflator, presenting a 1.6 percent increment in the headline index and a stabilization of the core index at 2.1 percent in October. On the other hand, inflation expectations derived from market instruments spiked, largely as a response to an outlook of a highly expansionist fiscal policy that, in principle, will be carried out by the incoming administration of the U.S.

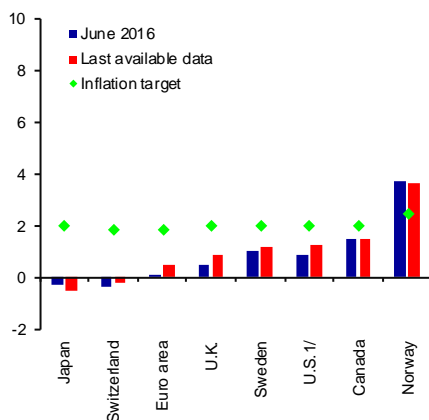
Headline inflation in the Euro zone went up during the quarter, although it still remains at a low level of 0.5 percent in October, supported by a lower negative contribution of the energy sector. In contrast, core inflation remained stable at levels around 0.8 percent throughout the quarter. On the other hand, although the indicators of long-term inflation expectations increased, they are still at very low levels.

The considerable depreciation of the pound sterling contributed to higher inflation in the U.K. during the quarter, which marked 1.0 percent in September, while core inflation increased to 1.5 percent. In Japan inflation maintained its downward trend, observing -0.5 percent in September. Likewise, the growth rate of inflation excluding food and energy items decreased and registered 0.0 percent in the same month, reflecting the effects of the Japanese yen appreciation this year.

In emerging economies, the inflation outlook generally improved during the period covered by this Report. Thus, in most of Latin America inflation went down, as effects of the previous exchange rate depreciations lessened, although in most countries it exceeds the inflation targets. In the case of Asia and Emerging Europe, inflation performed in a differentiated manner, although it is still generally below the central banks' targets (Chart 13c).

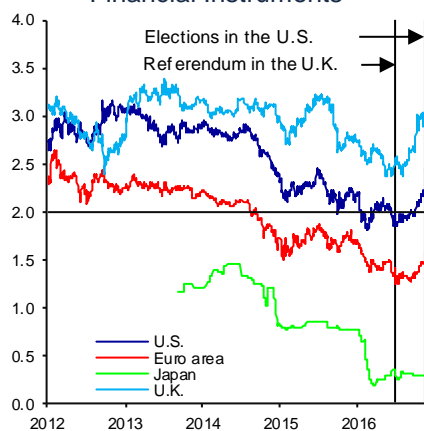
**Chart 13**  
**Annual Headline Inflation and Inflation Expectations in Advanced and Emerging Economies**  
 Percent

a) Advanced Economies: Headline Inflation



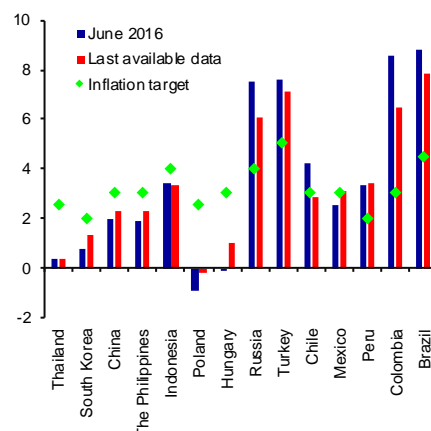
1/ It refers to consumption deflator. Seasonally adjusted data.  
 Source: Haver Analytics.

b) Advanced Economies: Long-term Inflation Expectations Derived from Financial Instruments 1/



1/ Inflation expectation in a 5-year period for the following 5 years. 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: J.P. Morgan.

c) Emerging Economies: Headline Inflation



Source: Haver Analytics.

### 3.1.4. International Monetary Policy and Financial Markets

In this context of the lower growth outlook and low inflation in advanced economies, monetary policy in some of the main central banks is still estimated to remain accommodative for an extended time period. Nonetheless, during the quarter most central banks abstained from providing additional stimuli and, at the same time, there was heightened awareness of the fact that monetary policy in some countries is less effective and that the implementation of additional measures could fail to sufficiently stimulate economic growth and inflation.

In the period covered by this Report, the U.S. Federal Reserve maintained the target range of the federal funds rate of 0.25 to 0.50 percent unchanged. Nevertheless, this Institute noted that arguments for the eventual increment in the reference rate strengthened, and that an increment could be justified relatively soon if there is further evidence of progress regarding the achievement of their goals. At the same time, the Federal Reserve reiterated its expectation that the reference rate will increase gradually and will remain under its long-term levels for a while. Still, given the expected higher inflation as a result of the economic proposals of the incoming U.S. administration, the outlook of the markets points to an increment that is relatively faster and of greater magnitude than the federal funds rate.

Meanwhile, the European Central Bank maintained its reference rates unchanged in its October meeting, and confirmed its expectations that interest rates will prevail at current or lower levels for an extended time period, that will last longer than the current asset purchase program. However, it informed that the central scenario still involves facing downward risks. In this context, the ECB ratified its intention to implement the asset purchase program until late-March 2017 or longer, if necessary, until a sustained upward adjustment in the inflation trajectory can be appreciated, that would be congruent with achieving its target of a figure lower but close to 2 percent in the medium term.

On the other hand, after having adopted a package of new monetary stimuli in its August meeting, which included a 25-basis-point cut in its reference rate, the Bank of England maintained its reference rate unchanged at 0.25 percent and endorsed the continuation of its asset purchase program.<sup>2</sup> The Bank of England pointed out that the outlook for economic activity in the short term improved with respect to the outlook three months ago, when a further reduction in the reference rate was expected to be implemented in the near future, if the forecast available at that moment came to materialize. Still, this Institute indicated that future adjustments in the monetary policy stance could go in any direction.

The Bank of Japan maintained unchanged its deposit rate, as well as the amount of its asset purchase program in its November meeting. This came after announcing a change in implementing its monetary policy in the September meeting, with the purpose to control the government bonds' interest rate curve and, thus, to avoid the impact on banks' profitability and credit granting. This change in its monetary policy framework has two elements. First, controlling the yield curve, maintaining its short-term rate at -0.1 percent and setting the target for 10-year interest rate at a level close to the currently observed level of 0 percent. Second, the central bank's commitment to continue expanding the monetary base until it exceeds the 2 percent inflation target and remains above this level in a sustained manner. It should be noted that in its latest meeting, the Bank of Japan postponed the achievement of the 2 percent inflation target for a year, expecting to reach it in the 2018 fiscal year.

As a result of improved inflation expectations in emerging economies, the monetary stance in most central banks of the referred countries remained unchanged and in some cases even became laxer, as is the case in Brazil, India, Indonesia and Russia.

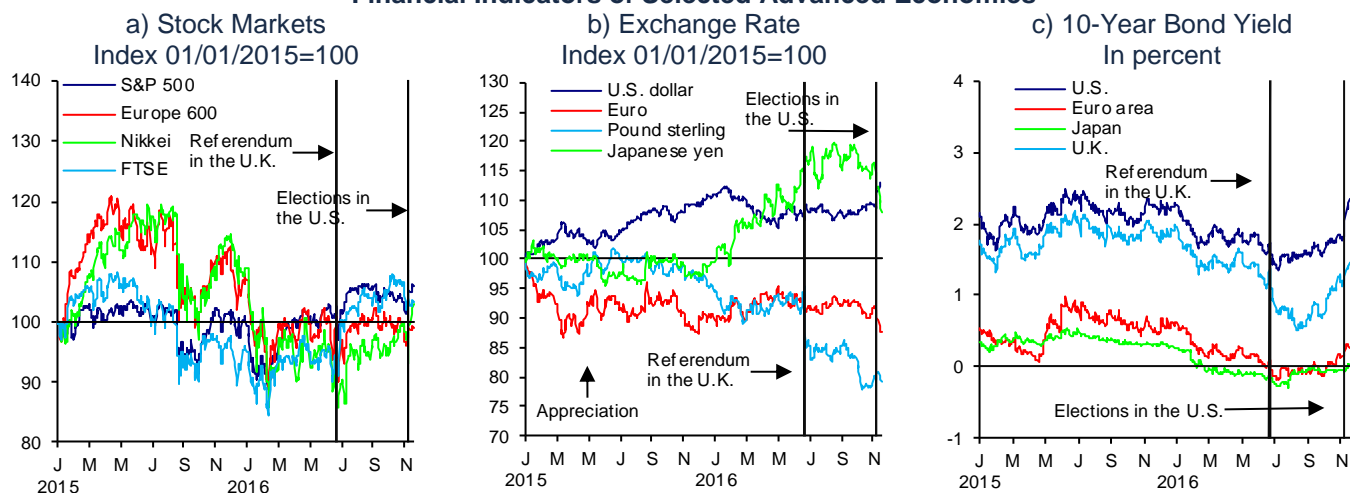
Volatility in financial markets went down over the first two months of the quarter, as price drops of a wide range of assets registered in the period around the referendum in the U.K. reverted (Chart 14 and Chart 15). Thus, stock indices recovered throughout most of the quarter, and reached levels close to their maximum this year. Besides, interest rates in the main advanced economies persisted at lower levels as compared to the previous quarter, although they went up starting from October, indicating an improvement in inflation expectations and inflation risk premia. Nevertheless, since September volatility in international financial markets rebounded again, which was related to the elections in the U.S., and it accentuated once the results of these elections were made public. Thus, capital inflows to emerging economies started to revert starting from November, and were reflected in drops in stock indices and increments in interest rates of these economies. At the

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<sup>2</sup> The package also includes an expansion of the asset purchase scheme for U.K. government bonds of GBP 60 billion, taking the total stock of these asset purchases to GBP 435 billion, the purchase of up to GBP 10 billion of U.K. corporate bonds, and starting a new program of financing to banks.

same time, currencies in the referred economies depreciated, although at differentiated magnitudes, and the Mexican peso was the most affected. In contrast, stock markets in advanced economies expanded and interest rates continued with their upward trend, which had been observed since October. In particular, interest rates spiked in the U.S., as a consequence of possible effects generated by the policies of the incoming administration in the field of public finances, which are expected to lead to higher inflation in that country and to a faster rate and a greater magnitude of the process of the monetary policy normalization. In light of considerable uncertainty regarding the nature and the extent of the economic program of the U.S. incoming government, as well as its implications for the process of its monetary policy normalization, lack of certainty regarding the process of the U.K. leaving the European Union, and risks related to the process of the economic adjustment in China, in the future an upsurge of volatility in international financial markets cannot be ruled out.

**Chart 14**  
**Financial Indicators of Selected Advanced Economies**

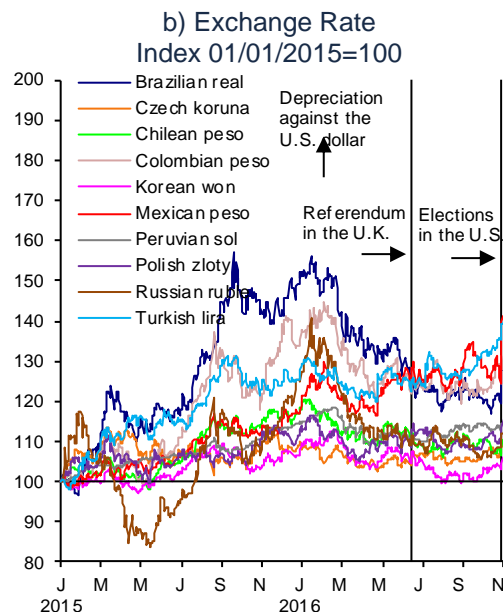
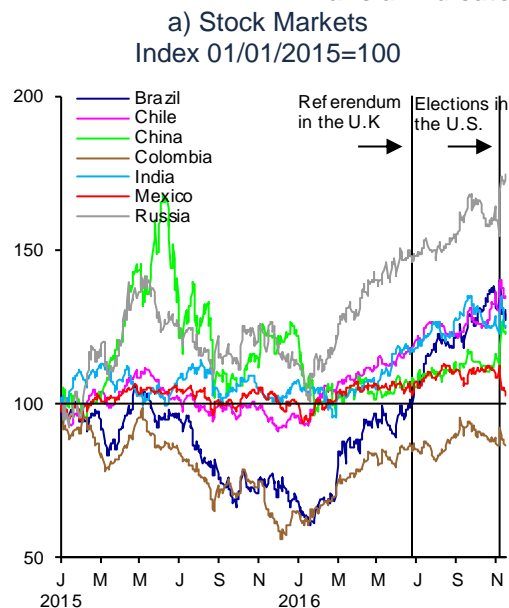


Source: Bloomberg.



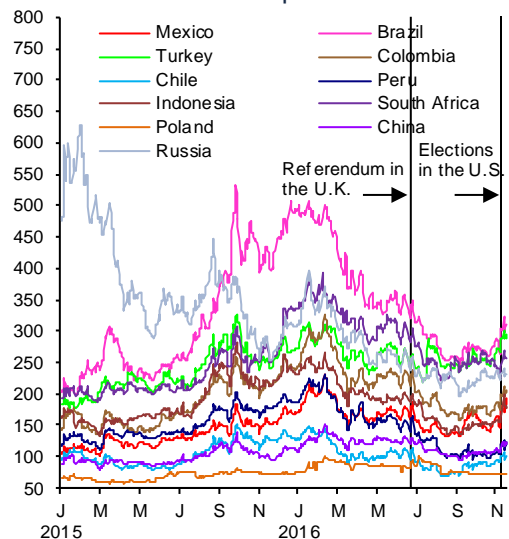
**Chart 15**

**Financial Indicators of Emerging Economies**



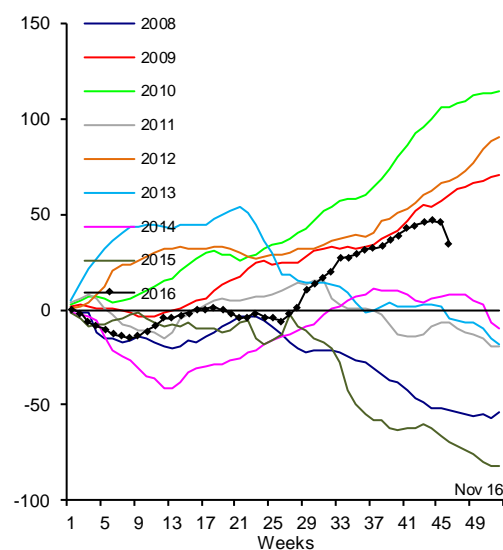
Source: Bloomberg.

c) Sovereign Credit Risk Market Indicators (CDS) In basis points



Source: Bloomberg.

d) Total Capital Flows to Emerging Economies (Debt and Stock) <sup>1/</sup> In USD billion



<sup>1/</sup> The sample includes funds used for emerging economies' stock and bond transactions, registered in advanced economies. The flows exclude the performance of the portfolio and exchange rate movements.  
Source: Emerging Portfolio Fund Research.

**3.2. Evolution of the Mexican Economy**

**3.2.1. Economic Activity**

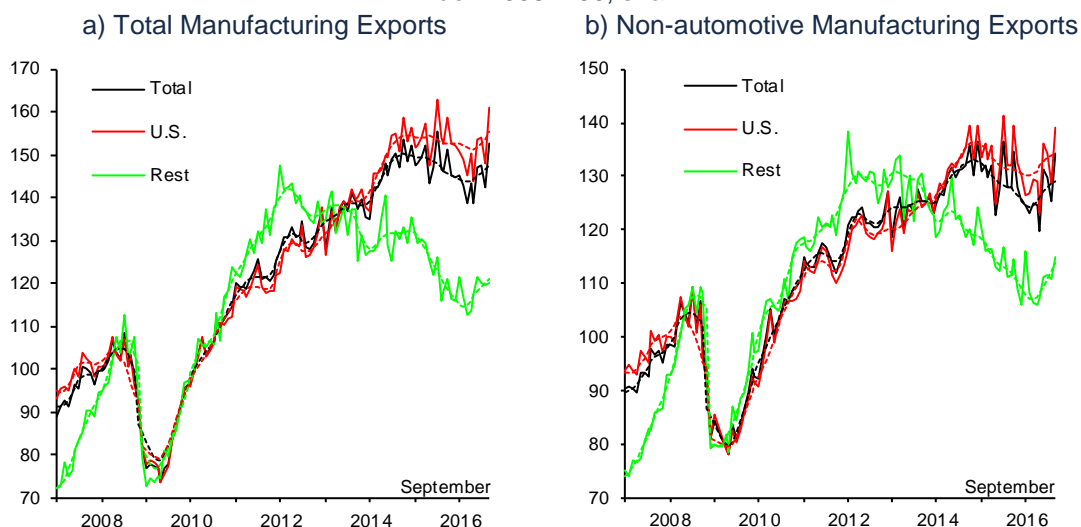
In the third quarter of 2016, the Mexican economy moderately reactivated, following a contraction in the previous quarter. In particular, external demand improved, and

private consumption increased again. In contrast, gross fixed investment maintained a weak performance.

In particular, in the period of July – September, Mexico’s manufacturing exports recovered, after displaying a negative trend during 2015 and in early 2016 (Chart 16a). Indeed, both exports to the U.S. and to the rest of the world performed better. Furthermore, the recovery of exports to the U.S. derived from growth during the quarter of both automotive exports and non-automotive exports. This performance seems to be reflecting the incipient expansion of manufacturing activity and U.S. exports in the quarter, as well as a certain improvement in demand in countries other than the U.S. (Chart 16b and Chart 16c). This result could also have been a consequence of the gradual effect generated by the real exchange rate depreciation.

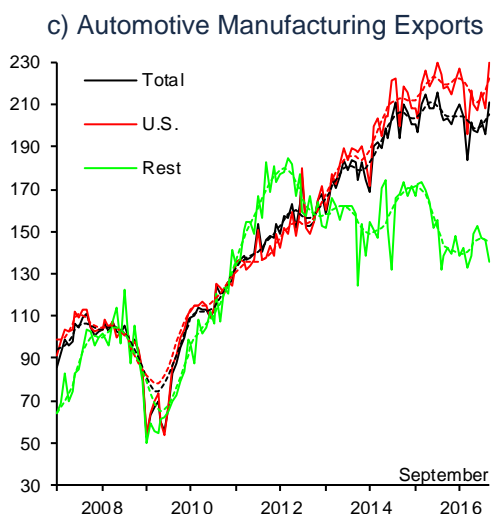
Meanwhile, oil exports increased as well in the quarter being reported, due to both a higher average price of the Mexican blend of oil for export, and a greater volume of exported crude oil (Chart 16d). In particular, the larger exports volume was a consequence of a higher share of oil production being sold to the international market, despite the fact that oil production overall shrank.

**Chart 16**  
**Mexican Exports**  
Index 2008=100, s. a.



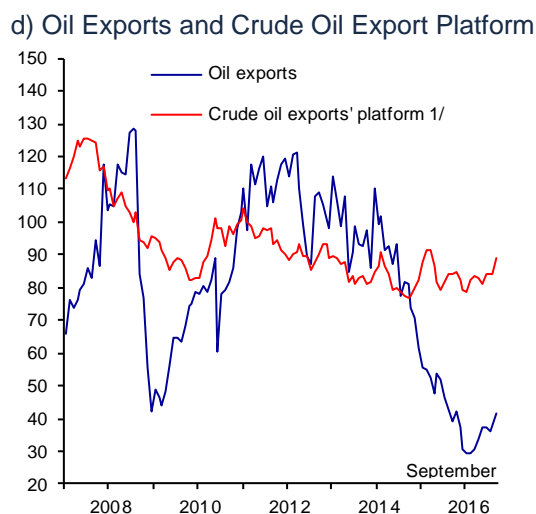
s. a. / Seasonally adjusted and trend data based on information in nominal dollars. The former is represented by a solid line, the latter by a dotted line.

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



s. a. / Seasonally adjusted and trend data based on information in nominal dollars. The former is represented by a solid line, the latter by a dotted line.

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



s. a. / Seasonally adjusted data based on information in nominal dollars.

1/ 3-month moving average of daily barrels of the seasonally adjusted series.

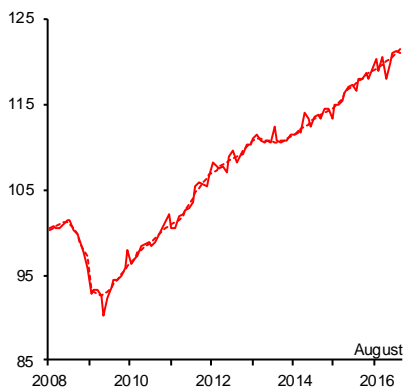
Source: SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest, and Banco de México with data from *PMI Comercio Internacional, S.A. de C.V.*

After the contraction in April, private consumption resumed a growing trend over the following months, which led to an expansion in the third quarter, following the stagnation observed in the previous one (Chart 17a).

- i. The evolution of private consumption derived from the dynamism of national goods and services' consumption, while the imported goods component maintained its declining trend, which had been registered since mid-2015 (Chart 17b). This evolution seems to respond to the real exchange rate depreciation. However, domestic sales of imported vehicles maintained a positive trend (Chart 17c), possibly as a consequence of a wider availability of financing for consumers, which also boosted sales of domestically-produced cars.

**Chart 17  
Consumption Indicators**

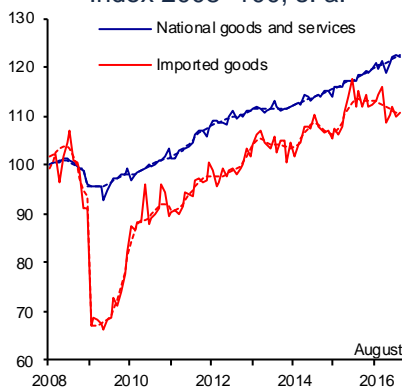
a) Monthly Indicator of Domestic Private Consumption Index 2008=100, s. a.



s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.

Source: INEGI.

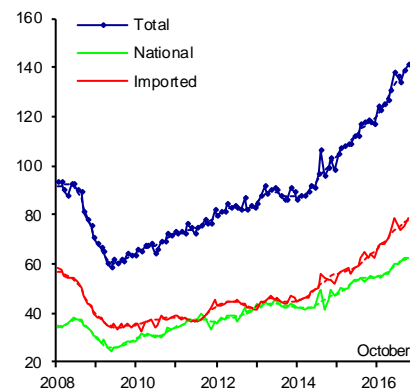
b) Components of the Monthly Indicator of Domestic Private Consumption Index 2008=100, s. a.



s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.

Source: INEGI.

c) Domestic Light Vehicle Retail Sales by Origin Thousands of units, s. a.



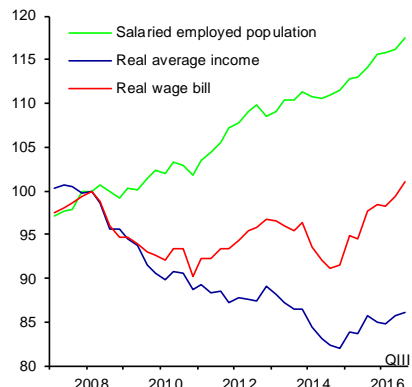
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.

Source: Prepared by Banco de México with data from the Mexican Automotive Industry Association (AMIA).

- ii. The recovery of private consumption is consistent with the improvement in the real wage bill in the reported period, which marked levels similar to those observed prior to the global financial crisis (Chart 18a). Private consumption also benefitted from greater flows of workers' remittances, which attained particularly high levels, and from the fact that consumer credit kept expanding at high rates (Chart 18b and see Section 3.2.3). Conversely, the consumer confidence index, which had already been registering a negative trend, deteriorated more sharply in the period of July – October (Chart 18c).

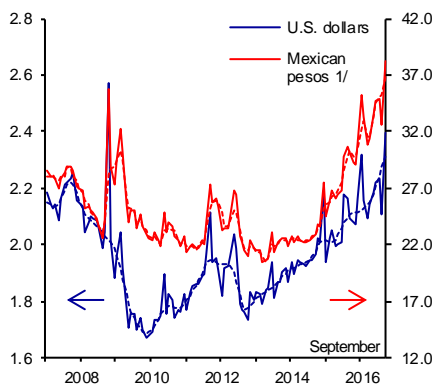
**Chart 18**  
**Consumption Determinants**

a) Total Real Wage Bill  
Index I-2008=100, s. a.



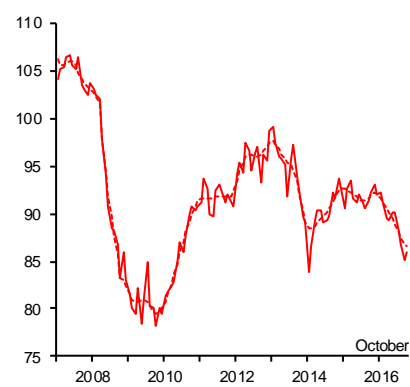
s. a. / Seasonally adjusted data.  
Source: Prepared by Banco de México with data from the National Employment Survey (ENOE), INEGI.

b) Workers' Remittances  
Billion, constant USD and MXN,  
S. a.



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

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

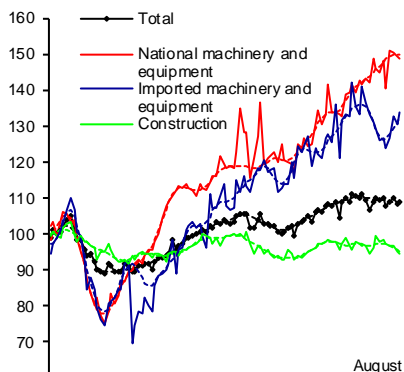


s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
Source: National Consumer Confidence Survey (ENCO), INEGI and Banco de México.

During the quarter under analysis, gross fixed investment remained weak (Chart 19a). Spending on construction went down, driven by a lower volume of work contracted by the public sector. The private sector maintained a growing trend (Chart 19b). On the other hand, investment in machinery and equipment, which to a greater degree responds to the gross formation of fixed capital of the private sector, presented a favorable trend change. In particular, the positive trend that persisted in the national component, was complemented by a marked improvement in the imported one (Chart 19c). The evolution of private investment seems to be reflecting, in part, the impact of structural reforms and a relatively higher utilization of installed capacity in the manufacturing sector.

**Chart 19  
Investment Indicators**

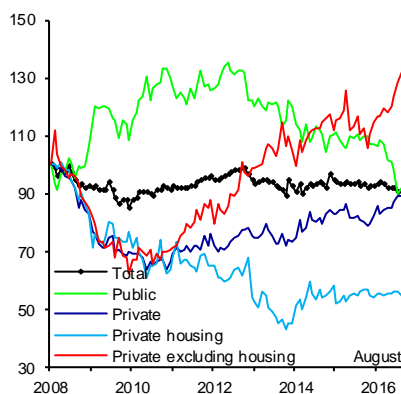
a) Investment and its Components  
Index 2008=100, s. a.



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, INEGI.

b) Real Value of Production in Construction by Contracting Institutional Sector <sup>1/</sup>  
Index January 2008=100, s. a.

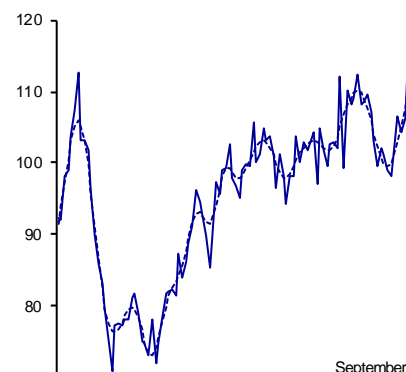


s. a. / Seasonally adjusted data.

<sup>1/</sup> Seasonal adjustment by Banco de México, except for the total.

Source: Prepared by Banco de México with data from ENEC, INEGI.

c) Capital Goods' Imports  
Index 2008=100, s. a.



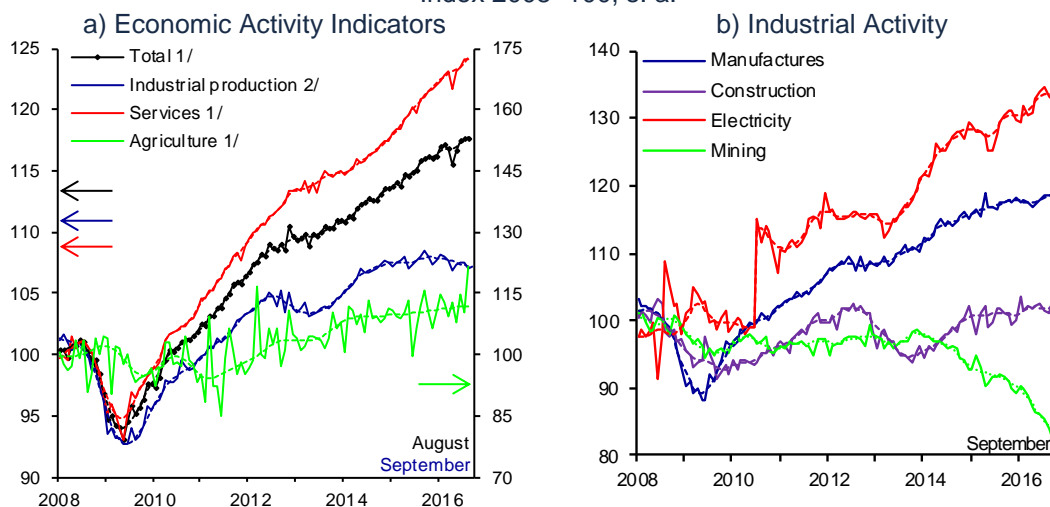
s. a. / Seasonally adjusted and trend data based on information in nominal dollars. The former is represented by a solid line, the latter by a dotted line.

Source: SAT, SE, Banco de México, INEGI. Merchandise Trade Balance. SNIEG. Information of National Interest.

Regarding the performance of economic activity from the production side, there was a moderate recovery in the third quarter of 2016, as a result of the reactivation in the services sector, while industrial production as a whole remained stagnant (Chart 20a).

- i. In the period of July – September 2016, within the industrial activity, mining kept a decreasing trend, which had been registered since early 2014 (Chart 20b), in an environment in which the crude oil production platform continued declining (Chart 21a). Additionally, mining-related services continued falling and are at particularly low levels (Chart 21b). Likewise, as mentioned above, as a result of a lower volume of contracted construction by the public sector, the performance of construction remained weak. On the contrary, in the third quarter the improvement in manufacturing production, which had begun at the end of the previous quarter, persisted. This recovery responded, in part, to the regularization of activities in different automotive plants, as well as the launch of activities in a newly established plant (Chart 22). Indeed, since May 2016 automotive production has presented a positive trend.

**Chart 20**  
**Production Indicators**  
 Index 2008=100, s. a.



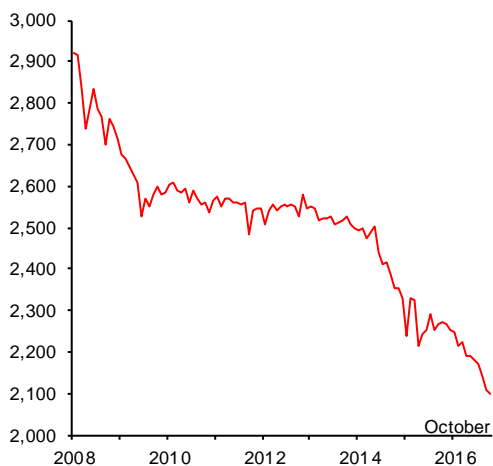
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
 1/ Data as of August 2016.  
 2/ Data as of September 2016 from the Monthly Industrial Activity Indicator.  
 Source: Mexico's National Accounts System, INEGI.

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

**Chart 21**

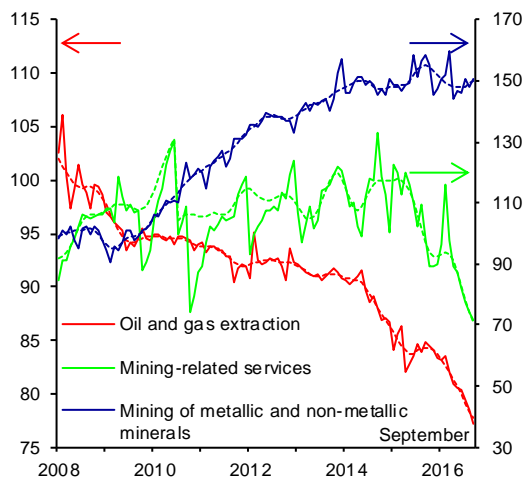
**Crude Oil Production Platform and Mining Sector**

a) Crude Oil Production Platform  
 Thousands of barrels per day, s. a.



s. a. / Seasonally adjusted data.  
 Source: Seasonal adjustment by Banco de México with data from PEMEX Institutional Database and Weekly Report of PEMEX Exploration and Production.

b) Mining Sector  
 Index 2008=100, s. a.

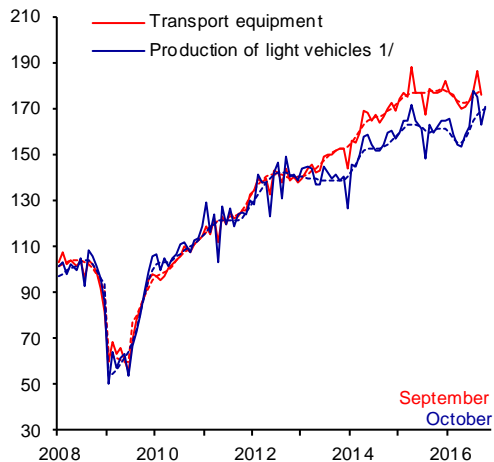


s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
 Source: Monthly Industrial Activity Indicator, Mexico's National Accounts System, INEGI.

**Chart 22**  
**Manufacturing and Automotive Production**

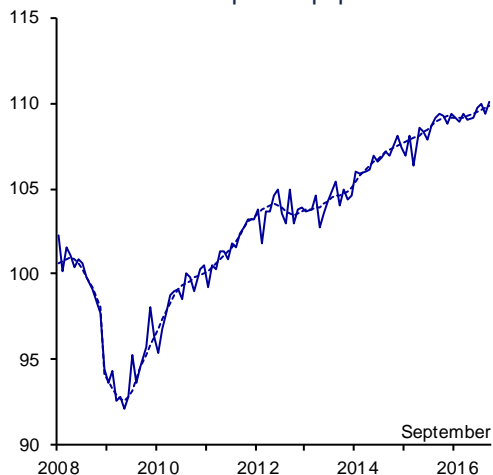
Index 2008=100, s. a.

a) Manufacturing Subsector of Transport Equipment and Produced Vehicles



s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
1/ Seasonal adjustment by Banco de México.  
Source: Mexico's National Accounts System (SCNM), INEGI and the Mexican Automotive Industry Association (AMIA).

b) Manufacturing Sector Excluding Transport Equipment



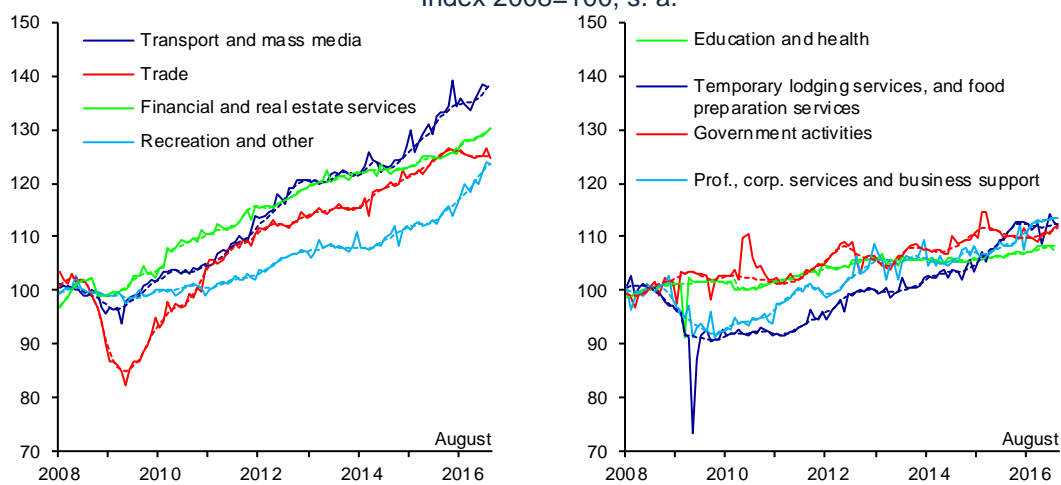
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
Source: Prepared and seasonally adjusted by Banco de México with data from Mexico's National Accounts System (SCNM), INEGI.

- ii. After a strong contraction in April, tertiary activities reactivated in the period of May – August (Chart 23). In this regard, a growing trend in the items of transport services and mass media, of financial and real estate services, and of recreation and other services stands out. On the contrary, the items of trade, education and healthcare services, temporary lodging services and food preparation services decelerated.
- iii. In the third quarter of 2016, primary activities expanded, to a large extent, derived from a larger cultivated area in the spring-summer cycle, as well as from an increment in the harvests of fodder, some perennial crops and greater livestock production.



**Chart 23**  
**Global Economic Activity Indicator: Services**

Index 2008=100, s. a.

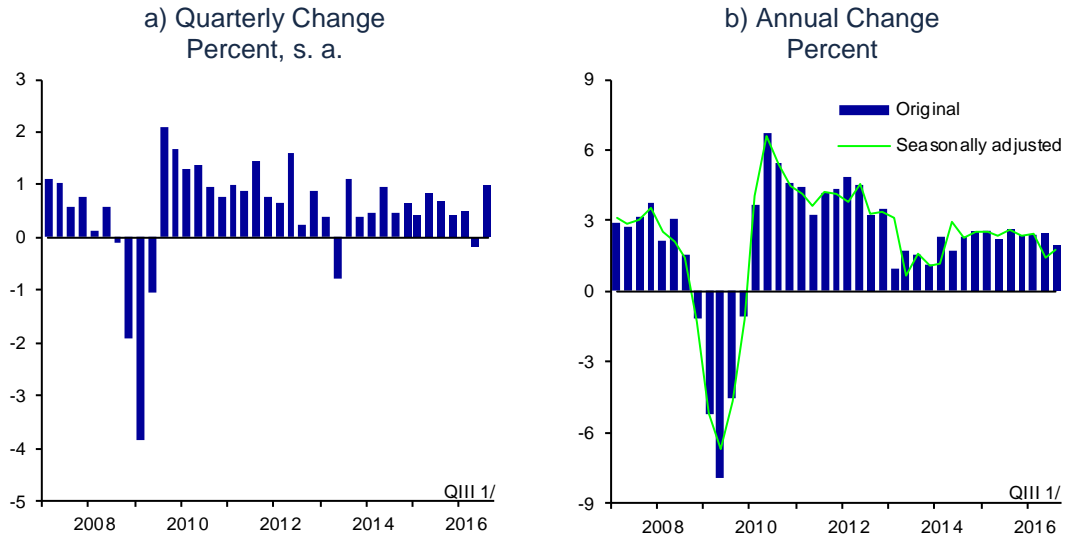


s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.

Source: Mexico's National Accounts System, INEGI.

In this context, in accordance with the timely estimation of GDP released by INEGI, in the third quarter of 2016 economy grew 1.0 percent in seasonally adjusted terms, following a contraction of 0.2 percent observed in the second quarter (Chart 24a). Based on seasonally adjusted data, in line with this estimate, economic activity registered an annual expansion of 1.9 percent in the period of July – September 2016 (compared to 1.5 percent in the previous quarter). Based on non-seasonally adjusted data, GDP in Mexico presented an annual change of 2.0 percent, which compares to the annual growth of 2.5 percent registered in the previous quarter (Chart 24b). Consistent with these results, over the first three quarters of 2016 GDP grew 2.3 percent with respect to the same period of last year, a figure that is below the annual rate corresponding to the same period of 2015, of 2.5 percent.

**Chart 24**  
**Gross Domestic Product**



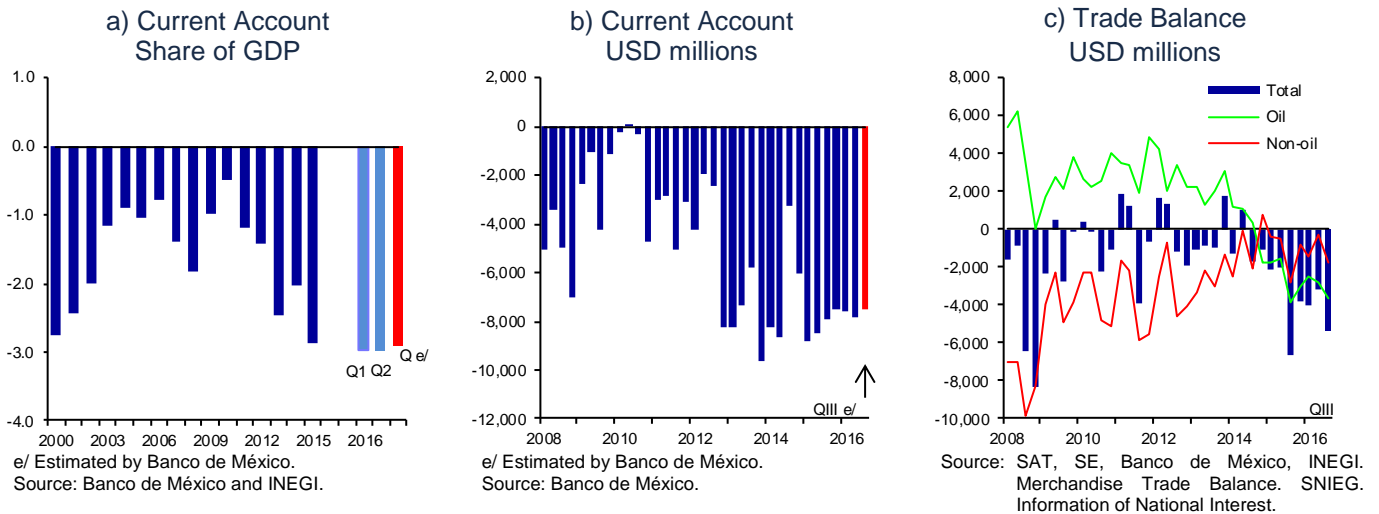
s. a. / Seasonally adjusted data.

1/ The figure corresponding to the third quarter of 2016 refers to the timely estimation of quarterly GDP released by INEGI.

Source: Mexico's National Accounts System, INEGI.

In the third quarter of 2016, the current account deficit is estimated to have lied at levels close to 2.9 percent of GDP (approximately USD 7.5 billion; Chart 25a and Chart 25b). This result is a consequence of a trade deficit of USD 5.3 billion, which includes an oil trade balance deficit of USD 3.6 billion and a non-oil trade balance deficit of USD 1.7 billion (Chart 25c). Based on these results, the non-oil trade balance seems to have started to improve, after its deficit increased in 2015 with respect to 2014. Indeed, in the total of the first three quarters of the year, the deficit of the non-oil trade balance has been the lowest since 1996.

**Chart 25**  
**Trade Balance and Current Account**



e/ Estimated by Banco de México.  
Source: Banco de México and INEGI.

e/ Estimated by Banco de México.  
Source: Banco de México.

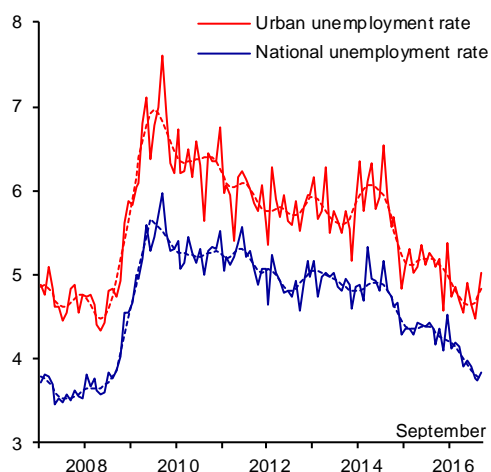
Source: SAT, SE, Banco de México, INEGI.  
Merchandise Trade Balance. SNIEG.  
Information of National Interest.

### 3.2.2. Labor Market

During the third quarter of 2016, general labor market conditions seemed to have continued to improve gradually. In particular, the national unemployment rate kept declining, while the urban unemployment rate persisted at levels close to those observed in the previous quarter (Chart 26a). Additionally, the drop in the national unemployment rate occurred in a context in which the labor participation rate increased during the quarter (Chart 26b). In a related manner, a high dynamism in the growth of the number of IMSS-insured jobs was registered (Chart 26c). Similarly, the labor informality rate maintained a decreasing trend and is below the levels observed prior to the 2009 global financial crisis (Chart 26d).

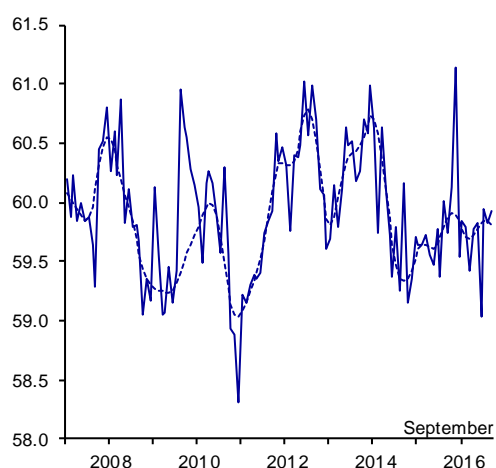
**Chart 26**  
**Labor Market Indicators**

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



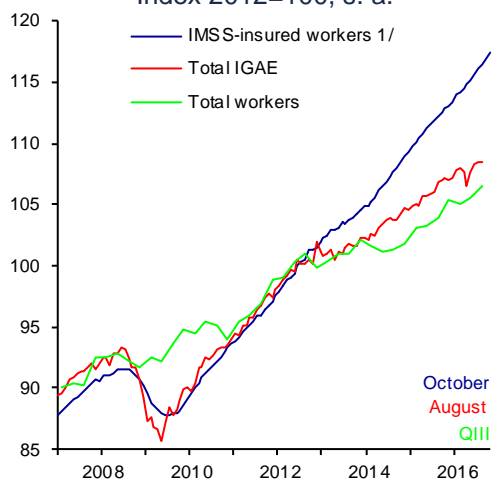
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
Source: National Survey on Occupation and Employment (ENOE), INEGI.

b) National Labor Participation Rate <sup>1/</sup>  
Percent, s. a.



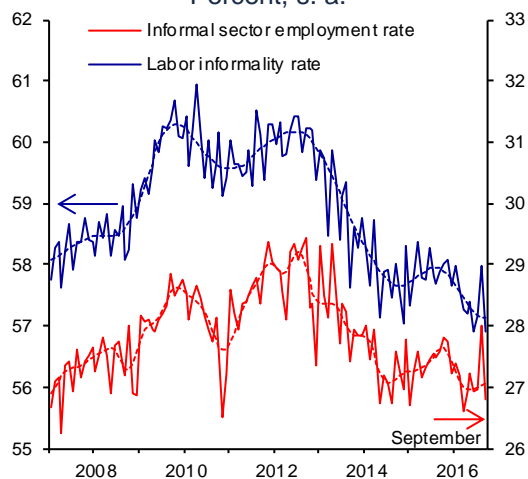
s. a. / Seasonally adjusted and trend data. The former is represented by a solid line, the latter by a dotted line.  
<sup>1/</sup> Percentage of Economically Active Population (EAP) with respect to the population of 15 years and older.  
Source: National Survey on Occupation and Employment (ENOE), INEGI.

c) IMSS-insured Workers, Total IGAE and Working Population Index 2012=100, s. a.



s. a. / Seasonally adjusted data.  
 1/ Permanent and temporary jobs in urban areas. Seasonal adjustment by Banco de México.  
 Source: Prepared by Banco de México with data from IMSS and INEGI (SCNM and ENOE).

d) Informal Sector Employment <sup>1/</sup> and Labor Informality <sup>2/</sup> 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/ It refers to individuals working in non-agricultural economic units, operating with no accounting records and with households' resources.  
 2/ 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: National Survey on Occupation and Employment (ENOE), INEGI.

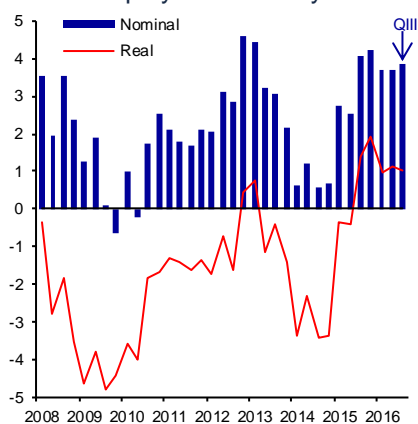
Congruent with the improvement in the labor market, salaries in real terms maintained their gradual recovery during the reported quarter. In particular:

- i. The annual growth rate of the average wage of salaried workers in the economy marked 3.8 percent in the period of July – September, which was slightly above the figure registered in the previous quarter (Chart 27a). In view of the low inflation that has been observed, this expansion meant that positive annual growth rates in real terms persisted.
- ii. Likewise, in the period being reported, as in October, the daily wage of IMSS-insured workers maintained positive rates of annual growth in real terms (Chart 27b).
- iii. In the reference quarter, the growth rate of contractual wages negotiated by firms under federal jurisdiction was below that registered in the same quarter of 2015 (Chart 27c). This reduction is explained by a lower average increment in wages negotiated by public firms when compared to the previous year, as the average rate of increments negotiated by private firms was the same as the one observed in the third quarter of 2015. Similarly, in October the average growth rate of contractual wages was lower than in October 2015.

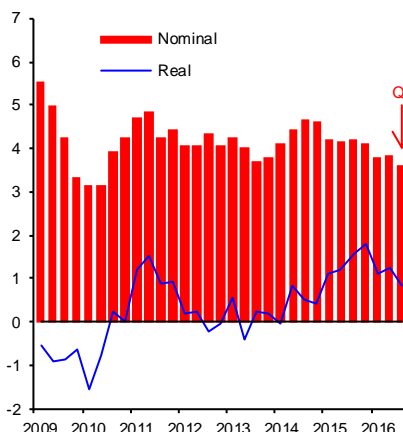
**Chart 27**  
**Wage Indicators**

Annual change in percent

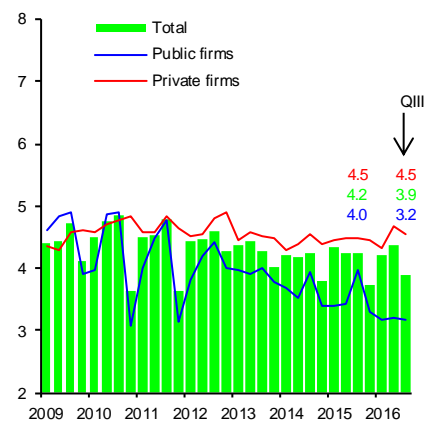
a) Average Wage of Salaried Workers according to National Employment Survey <sup>1/</sup>



b) Daily Wage of IMSS-insured Workers <sup>2/</sup>



c) Nominal Contractual Wage <sup>3/</sup>



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/ During the third quarter of 2016, on average 18.5 million workers were registered with IMSS.

3/ 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 million.

Source: Calculated by Banco de México with data from IMSS, STPS and INEGI (ENOE).

### 3.2.3. Financial Saving and Financing in Mexico <sup>3</sup>

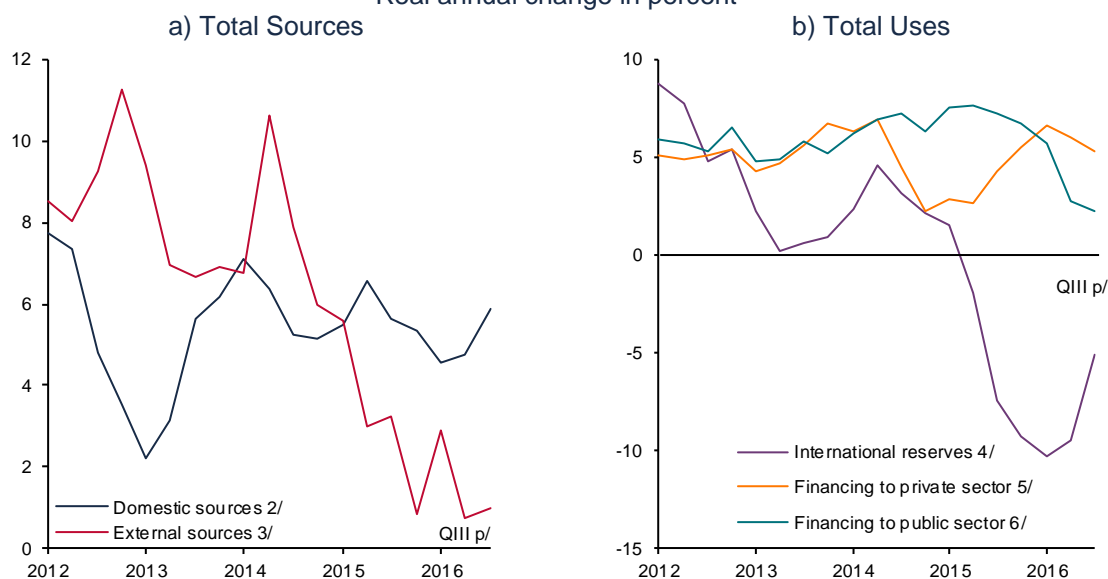
In the environment of recurring volatility episodes prevailing in international financial markets, and as a reflection of the moderation in capital flows from abroad to emerging economies, the sources of financial resources of the Mexican economy have expanded since mid-2015 at lower rates than those registered during the previous years. In particular, their real average annual change between the third quarter of 2015 and the third quarter of 2016 was 3.8 percent, which was lower than that observed between the first quarter of 2014 and the second quarter of 2015, of 6.3 percent. In this context of more moderate growth rates, in the third quarter of 2016 there was a rebound in the sources of financial resources of the economy in relation to the previous quarter, as their real annual change shifted from 3.1 to 3.9 percent. This greater dynamism at the margin derived mainly from the acceleration of domestic sources, while the external ones kept expanding at relatively low rates (Chart 28a and Chart 29a).

As regards domestic sources, their growth rate increased from 4.8 percent in the second quarter of 2016 to 5.9 percent in the reference quarter. This derived from greater domestic financial saving and, in particular, from faster growth of its voluntary component (Chart 29b).<sup>4</sup> Meanwhile, the monetary base maintained a relatively high growth; its real average annual growth rate stood at 13.1 percent in the third quarter, which compares to that of 13.0 percent in the previous one.

<sup>3</sup> In this section, real annual changes are calculated based on balances adjusted due to exchange rate and asset price variations.

<sup>4</sup> Financial saving is defined as the monetary aggregate M4 minus the stock of currency held by the public.

**Chart 28**  
**Total Funding of the Mexican Economy (Sources and Uses)**  
 Real annual change in percent <sup>1/</sup>



p/ Preliminary data.

1/ Real annual changes are calculated based on balances adjusted due to exchange rate and asset price variation.

2/ It includes the monetary aggregate M4 held by residents.

3/ It includes the monetary aggregate M4 held by non-residents, foreign financing for the federal government, public institutions and enterprises, commercial banks' foreign liabilities and external financing to the non-financial private sector.

4/ It is made up by currencies and gold reserves of Banco de México, free of any security rights and the availability of which is not subject to any type of restriction; the position in favor of Mexico with the IMF derived from contributions to the said entity; currency obtained from financing to realize foreign exchange regulation of the IMF and other entities of international financial cooperation or groups of central banks, of central banks and other foreign legal entities that act as financial authorities. Currencies pending to be received for sales transactions against the national currency are not considered, and Banco de México's liabilities in currency and gold are deducted, except for those that are for a term longer than 6 months at the moment of reserves' estimation, and those corresponding to financing obtained to carry out the above mentioned foreign exchange regulation. See Article 19 of Banco de México's Law.

5/ It refers to the total portfolio of financial intermediaries, of the National Housing Fund (*Instituto del Fondo Nacional de la Vivienda para los Trabajadores*, Infonavit), and of the ISSSTE Housing Fund (*Fondo de la Vivienda del ISSSTE*, Fovissste), the issuance of domestic debt and external financing. It includes restructuring programs.

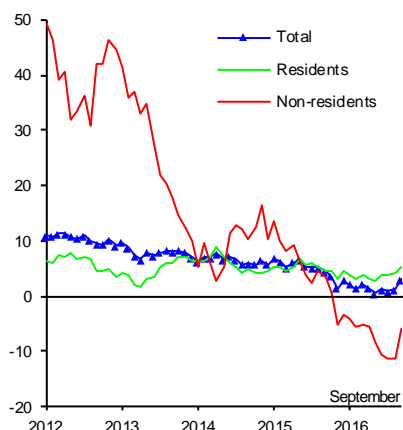
6/ It includes financing to the federal public sector, as well as financing to states and municipalities.

Source: Banco de México.

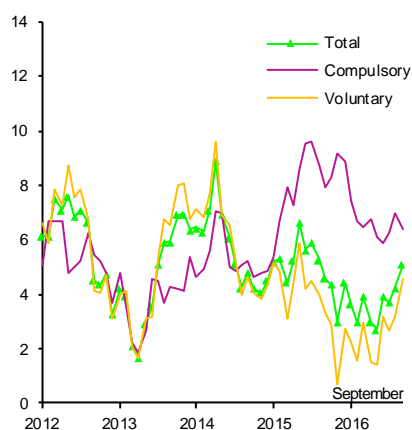
The external sources of financial resources expanded at a rate of 1.0 percent in the reference quarter, which is similar to that registered in the previous one (Chart 28a). However, this indicator's components performed differently. On the one hand, the stock of non-resident financial saving recovered due to a greater investment in short-term government securities, after having declined in three consecutive quarters. Thus, its real annual percent change went from -10.6 in the previous quarter to -6.0 in the third quarter of 2016 (Chart 29a and Chart 29c). In contrast, the growth rates of external sources of resources destined to finance private non-financial firms decreased with respect to the previous quarter, as their real annual change went from -0.1 to -1.6 percent.

**Chart 29**  
**Financial Saving Indicators**

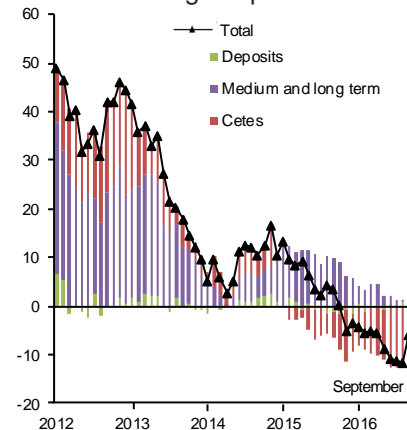
a) Total Financial Saving <sup>1/ 2/</sup>  
Real annual change in percent



b) Resident Financial Saving <sup>2/</sup>  
Real annual change in percent



c) Non-resident Financial Saving  
Contribution to real annual change in percent



1/ It is defined as the monetary aggregate M4 minus the stock of currency held by the public.

2/ Real annual changes are calculated based on balances adjusted due to exchange rate and asset price variations.

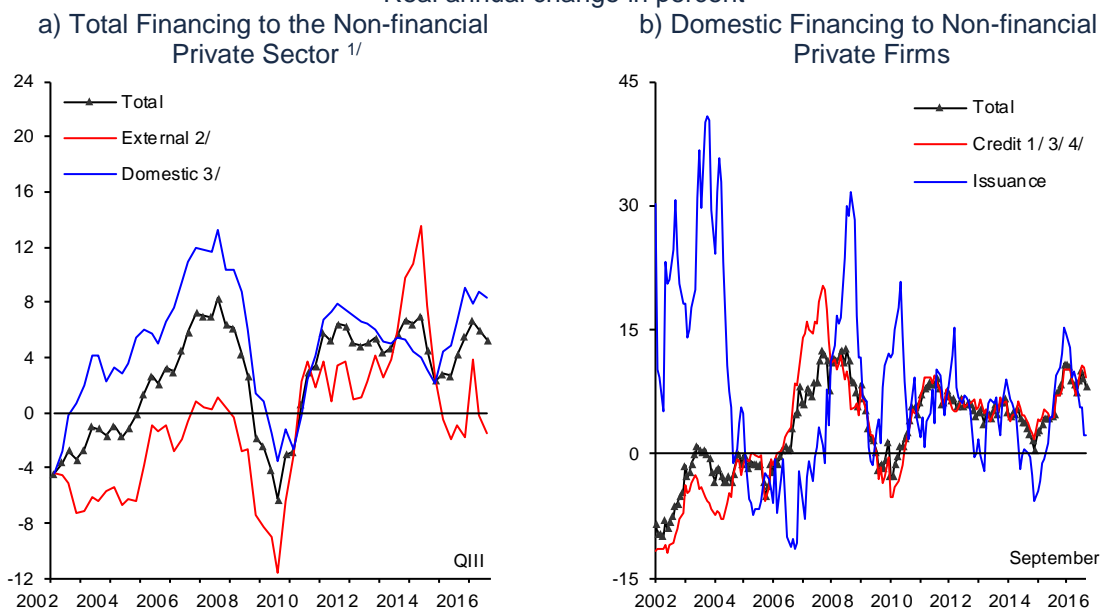
Source: Banco de México.

As regards the use of financial resources, the growth rates of public sector financing and of the international reserves have decreased since mid-2015, which, even in the context of lower sources of financial resources described above, provided room so that financing to the private sector could continue growing at relatively high rates (Chart 28b). Indeed, as it has been observed since mid-2015, in the third quarter of 2016 the growth of financing to the public sector kept moderating, in congruence with the efforts undertaken in terms of the fiscal consolidation announced by the Ministry of Finance. At the same time, the balance of international reserves continued contracting at an annual rate, although at a slower pace as compared to the previous period. Specifically, its real annual growth rate shifted from -9.5 to -5.1 percent between the second and the third quarters of 2016. Thus, financing to the private sector kept expanding at high rates in the third quarter of the year, although at a growth rate that was slightly below that in the previous quarter.

Expanding on the above, in the third quarter of 2016, total financing to the non-financial private sector observed a real annual growth rate of 5.3 percent, as compared to 6.0 percent in the second quarter (Chart 30a). This performance derived, on the one hand, from a contraction of foreign financing and, on the other hand, from a certain moderation in the growth rate of domestic financing.

**Chart 30**  
**Financing to Non-financial Private Sector**

Real annual change in percent



1/ Real annual changes are calculated based on balances adjusted due to exchange rate variations.  
 2/ Data of foreign financing for the third quarter of 2016 are preliminary.  
 3/ These figures are adjusted due to the withdrawal from and incorporation of some financial intermediaries to the credit statistics.  
 4/ It refers to the performing and non-performing portfolios, and includes credit from commercial and development banks, as well as other non-bank financial intermediaries.  
 Source: Banco de México.

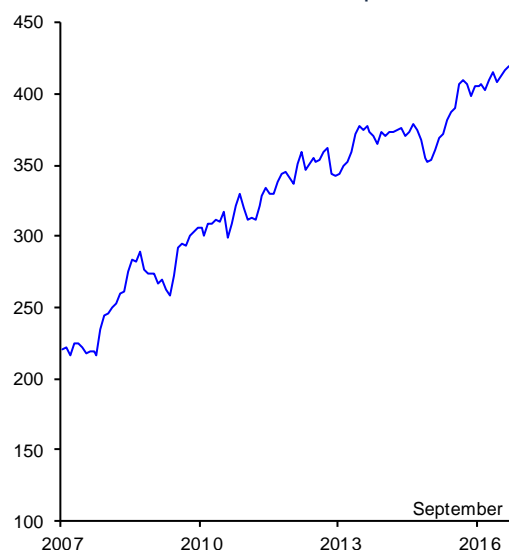
Between the second and the third quarters of 2016, the real annual growth of domestic financing to firms shifted from 9.0 to 8.1 percent. This reflected both a lower expansion of banking credit and a lower dynamism in the domestic debt market (Chart 30b and Chart 31a). Commercial and development banks' performing credit portfolios to non-financial private firms grew at a rate of approximately 9.0 percent in real annual terms (Chart 31b). In this context, financing costs to non-financial private firms kept expanding, consistent with the rise in banks' funding costs in the reference period (Chart 32a and Chart 32b). Moreover, the respective delinquency rates remained at low levels, although the quality of the development banks' credit portfolio somewhat deteriorated for the second consecutive quarter (Chart 32c).



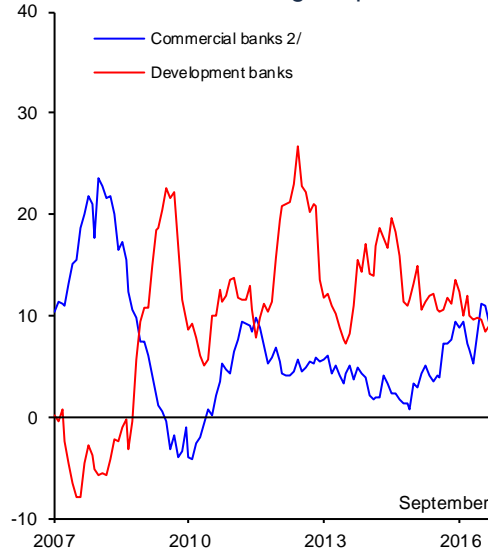
**Chart 31**

**Domestic Financing to Non-financial Private Firms**

a) Securities in Circulation  
Stocks in MXN billion as of September 2016



b) Performing Credit <sup>1/</sup>  
Real annual change in percent

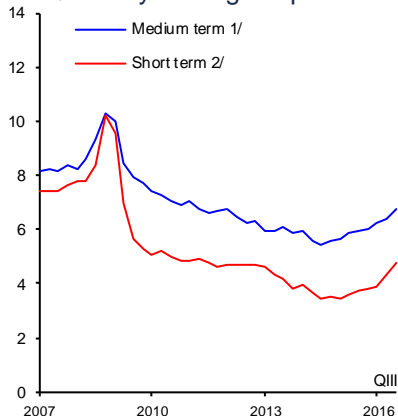


1/ Real annual changes are calculated based on balances adjusted due to exchange rate variations.  
2/ It includes Sofomes ER subsidiaries of bank institutions and financial groups. Data are adjusted so as not to be affected by the transfer of bridge loans.  
Source: Banco de México.

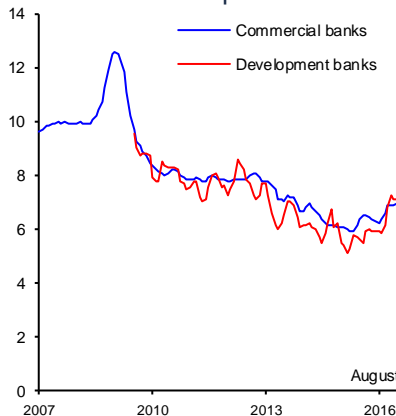
**Chart 32**

**Annual Interest Rates and Delinquency Rates of Non-financial Private Firms**

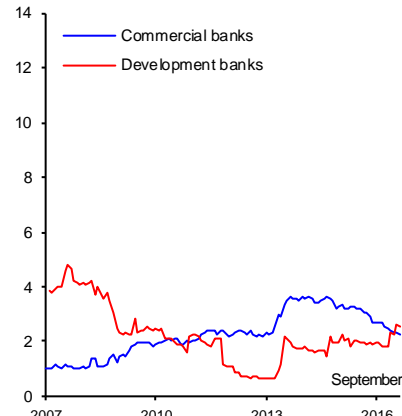
a) Annual Interest Rates of Private Securities  
Quarterly average in percent



b) Annual Interest Rates of New Credits <sup>3/</sup>  
Annual percent



c) Delinquency Rates <sup>4/</sup>  
Percent



1/ Average weighted yield to maturity of issuances in circulation, with a term over 1 year, at the end of the month.  
2/ Average weighted rate of private debt placements, at a term of up to 1 year, expressed in a 28-day curve. It only includes stock exchange certificates.  
3/ It refers to the interest rate of new bank credits to non-financial private firms, weighted by the associated stock of the performing credit and for all credit terms requested. It is presented as a 3-month moving average.  
4/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.  
Source: Banco de México.

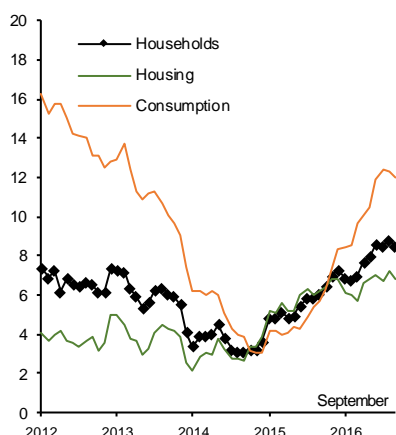
Credit to households expanded at a rate similar to that of the previous quarter, which resulted from both consumer and housing loans maintaining their dynamism. In particular, in the third quarter of 2016 the growth rate of household credit stood

at 8.5 percent in real annual terms, while in the second one it had registered a real annual change of 8.6 percent (Chart 33a). With respect to housing loans, both the commercial bank and the National Housing Fund (Infonavit) portfolios –which together constitute 91 percent of total credit in this segment– continued expanding at a relatively high pace (Chart 33b).<sup>5</sup> Meanwhile, the corresponding interest rates persisted at low and stable levels, while delinquency rates did not change significantly with respect to the previous quarter (Chart 33c).

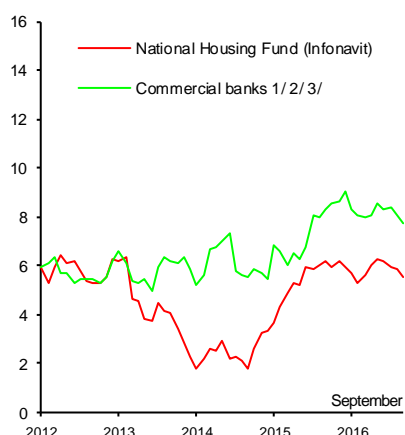
**Chart 33**

**Credit to Households**

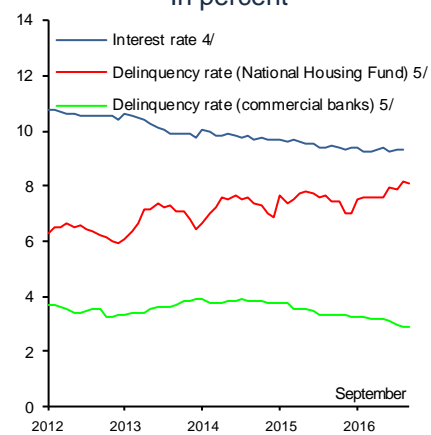
a) Total Credit <sup>1/</sup>  
Real annual change  
in percent



b) Performing Housing Credit  
Real annual change in percent



c) Annual Interest Rate of New Credits and Delinquency Rate of the Housing Credit  
In percent



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

2/ It includes the Sofomes ER subsidiaries of bank institutions and financial groups.

3/ 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.

4/ The interest rate of new housing credits from commercial banks, weighted by stock associated to the performing credit. It includes credit for acquisition of new and used housing. Data as of August.

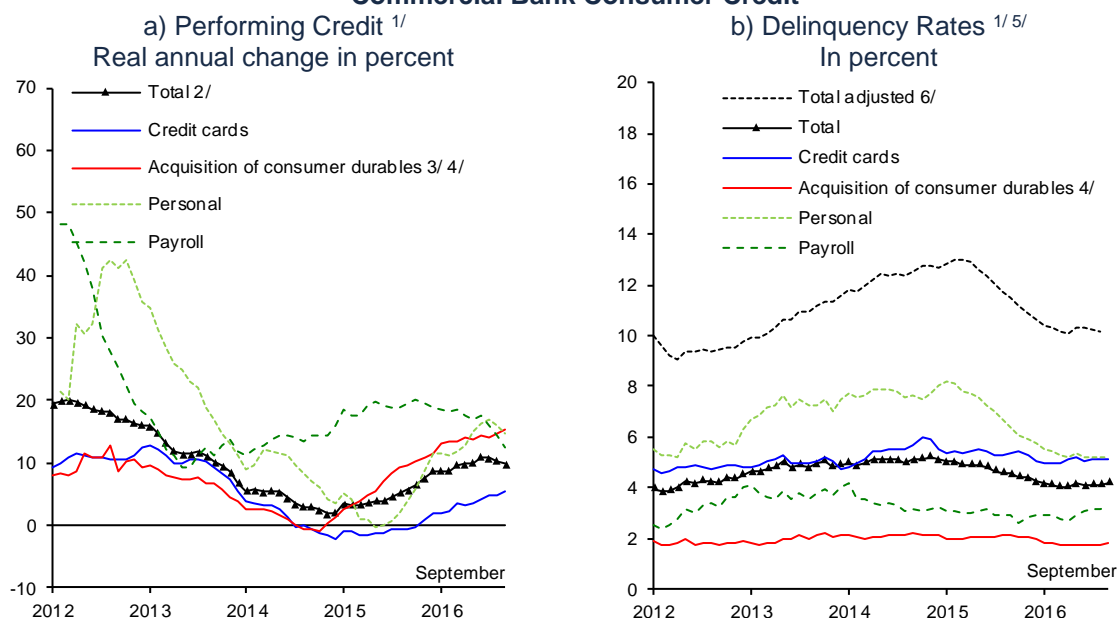
5/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.

Source: Banco de México.

Consumer credit maintained its growth rate, even though the performance of its components was heterogeneous (Chart 33a and Chart 34a). On the one hand, both payroll and personal loans grew at more moderate rates with respect to those in the previous quarter, although those stood at relatively high levels. In contrast, the expansion of consumer durables credit, just like that of credit granted via cards, maintained its upside trajectory. In this environment, the corresponding interest rates remained stable, with the exception of certain increases observed in the credit card segment. Likewise, delinquency rates in general did not show any significant variation either and remained at relatively low levels (Chart 34b).

<sup>5</sup> Commercial banks' housing credit includes that for acquisition of new and used housing, remodeling, payment of mortgage liabilities, credit for liquidity, acquisition of land and construction of own housing.

**Chart 34**  
**Commercial Bank Consumer Credit**



1/ It includes the Sofomes ER subsidiaries of bank institutions and financial groups.

2/ It includes credit for payable leasing operations and other consumer credits.

3/ From July 2011 onwards, figures are adjusted in order to avoid distortions due to the reclassification from acquisition of consumer durables to other consumer credits by one banking institution.

4/ It includes auto loans and credit for acquisition of other movable properties.

5/ The delinquency rate is defined as the stock of non-performing loans divided by the stock of total loans.

6/ 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. For this Report, the data are up to August 2016.

Source: Banco de México.

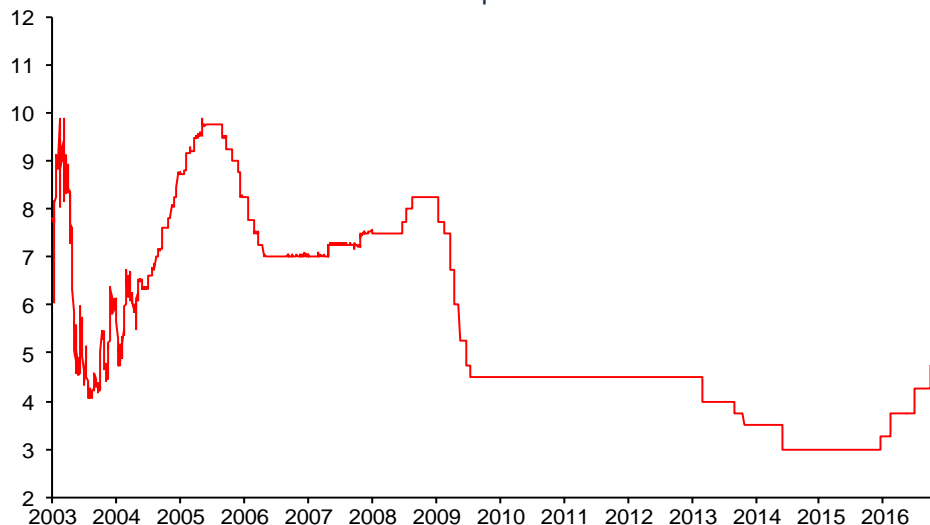
In sum, despite the fact that in 2016 the sources of financial resources expanded at lower rates as compared to previous years, the reduction in the use of financial resources by the public sector contributed to the channeling of resources towards the private sector at a relatively high rate. In the context expected in the future, characterized by high volatility in international financial markets and limited external sources of financial resources, the efforts of fiscal consolidation by the public sector will continue helping to mitigate possible pressures on the market for loanable funds.

#### 4. Monetary Policy and Inflation Determinants

During the period covered by this Report, the conduct of monetary policy faced a difficult environment in which the outlook for the global economy has become more complex, to a large extent, due to the uncertainty related to the elections in the U.S., and, subsequently, to the outcome of the aforementioned elections. Thus, in September, volatility in international financial markets increased and worsened considerably at the end of October and the first half of November. Given that the implications for Mexico stemmed from the outcome of the U.S. elections is particularly relevant for the country, domestic financial markets were strongly affected by it, whereby asset prices declined. In particular, the value of the national currency exhibited both higher volatility and a stronger depreciation as compared to other emerging economies' currencies, additionally interest rates and different risk premia also observed considerable volatility and increases.

Taking this juncture into consideration, even though in its monetary meeting of August 11, the Board of Governors decided to maintain the target for the Overnight Interbank Interest Rate unchanged at 4.25 percent, in its decision of September the Board increased the target rate by 50 basis points to a level of 4.75 percent (Chart 35). This was done because volatility in Mexican financial markets spiked, negatively affecting the national currency dynamics, and, hence, jeopardizing the anchoring of inflation expectations. Subsequently, and in an environment of great uncertainty faced by the national economy, the Board of Governors of this Central Institute continued facing these risks, strengthening the country's macroeconomic fundamentals. Therefore, it decided to increase the referred target rate by 50 basis points to a level of 5.25 percent, in order to offset inflation pressures and maintain inflation expectations anchored.

**Chart 35**  
**Overnight Interbank Interest Rate Target <sup>1/</sup>**  
 Annual percent



<sup>1/</sup> The Overnight Interbank Interest Rate is shown until January 20, 2008.  
 Source: Banco de México.

Considering the above mentioned monetary policy decisions, it is noteworthy that this year the Central Bank has increased its reference rate by 200 basis points, acting in a preemptive manner in light of the external environment that has become

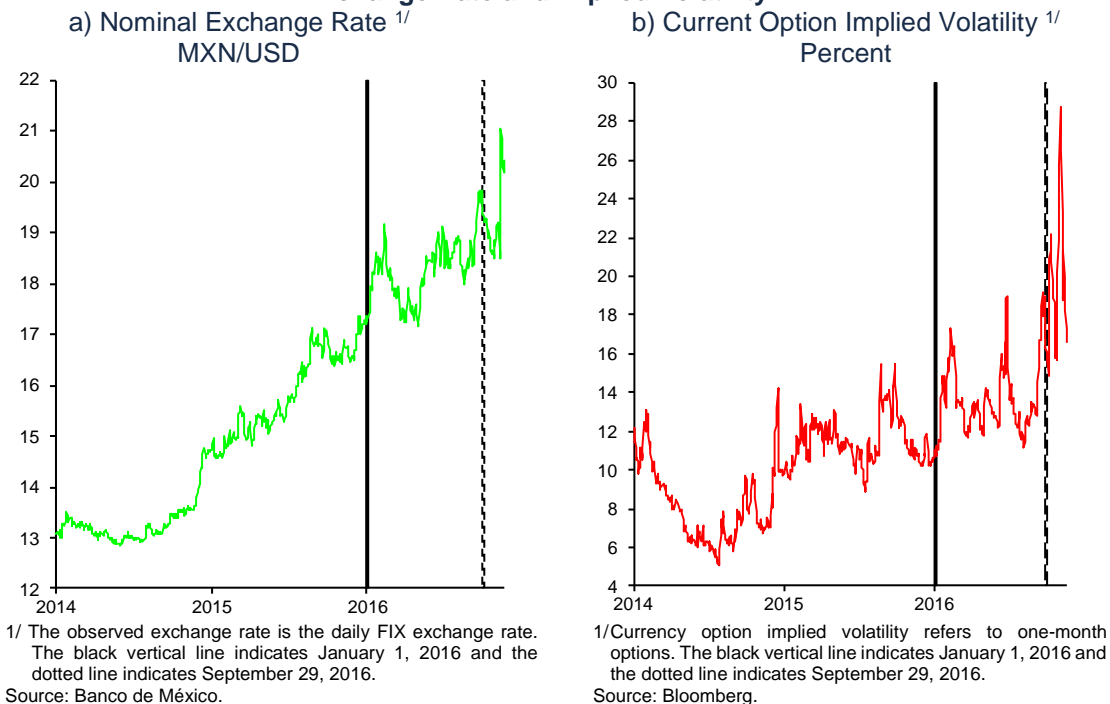
increasingly adverse. It should be pointed out that, consistent with the results of various estimates of the neutral interest rate in Mexico corresponding to short, medium and long terms, the current 5.25 percent level of the reference rate lies within the estimated interval for its short-term neutral level (which is an average range of 3.9 to 5.6 percent from 2009 up to date) and it is also within the range corresponding to the neutral interest rate that is expected to be attained in the long run (with an average range of 4.7 to 6.3 percent; see Box 2 “Considerations on the Evolution of the Neutral Interest Rate in Mexico”). In this respect, it should be noted that the neutral interest rate varies over time, due to the changes in economic factors that can affect it in a structural or transitory manner, besides the fact that its estimation is subject to high uncertainty.

Among the elements considered to justify the monetary policy decisions made in the period analyzed in this Report, the following stood out:

- i. During the period, in general, inflation performed favorably, locating very close to the Central Institute’s target. However, the core component continued registering a gradual upward trend, which is mainly explained by the adjustment in merchandise relative prices with respect to the services’ prices, derived from the depreciation of the national currency. Additionally, the annual growth rate of the non-core component accelerated, as a result of gasoline price increments at the northern border of Mexico, which occurred in this time frame. As a result, the annual rate of headline inflation stood slightly above the 3.0 percent target starting from the second fortnight of September, and marked 3.06 percent in October. In view of this trajectory, headline and core inflations are expected to continue growing gradually and to close the year slightly above the 3.0 percent target. As mentioned before, in 2017, both headline and core inflations are estimated to lie above the inflation target, although within the variability interval, both of these indicators reaching levels close to 3.0 percent at the end of 2018.
- ii. No significant aggregate demand-related pressures on prices in the economy were observed, nor are they anticipated in the near future.
- iii. Even though during July and August the exchange rate fluctuated around levels close to MXN/USD 18.50, as mentioned above, as of September considerable depreciation and high volatility were observed (Chart 36). In this context, even though long-term inflation expectations derived from surveys and from market instruments maintained around 3.0 percent and no second round effects on the price formation process in the economy were registered, there was a risk that, in light of inflation pressures derived from the described exchange rate dynamics, inflation expectations could deanchor eventually.
- iv. During September and until mid-November, interest rates in the national currency for all terms went up, in the first place, those for short terms and, subsequently, for longer terms. Likewise, increments in spreads between Mexican and U.S. interest rates and some indicators of risk premia somewhat deteriorated.
- v. On the other hand, as a consequence of possible relatively short-term effects of the economic program that, in principle, is expected to be

implemented by the incoming U.S. administration regarding the fiscal policy on growth and inflation, financial markets anticipate the rate of the monetary policy normalization by the Federal Reserve to continue gradual, although it is expected to be more accelerated and possibly of a greater magnitude than previously anticipated. These factors exerted considerable pressure on the U.S. long-term interest rates.

**Chart 36**  
**Exchange Rate and Implied Volatility**



## Box 2

### Considerations on the Evolution of the Neutral Interest Rate in Mexico

#### 1. Introduction

To achieve price stability, Banco de México uses the target for the Overnight Interbank Interest Rate as its main monetary policy tool. The Central Bank can set it to influence aggregate demand and credit supply and, in turn, inflation, via different channels of the monetary policy transmission mechanism. Namely, it can stimulate the economy (the accommodative stance) or contain it (the restrictive stance) in order to bring inflation closer to its target level.<sup>1</sup> Accordingly, the nominal neutral interest rate is a relevant concept in the implementation of the monetary policy, as it defines the level of the short-term interest rate that is congruent with an economic activity that is close to its potential level in an environment of stable inflation.<sup>2</sup> In other words, if the target rate matched its neutral level, the monetary authority would be neither stimulating, nor contracting the economic activity, and, therefore, would have a neutral influence on prices. Thus, if the target rate lied above (below) the neutral level, the monetary policy would be restrictive (accommodative), reason why it would gear economic activity and prices downwards (upwards).

Despite its importance, the use of the neutral rate as a reference indicator for the conduct of monetary policy is complex due to the following factors: i) this rate is not directly observable and should be inferred using quantitative methods that are subject to statistical uncertainty; and ii) the neutral rate varies across time due to changes in economic, structural and/or transitory factors.

In the described context, the Box serves two objectives: 1) to give an outlook for the evolution in the short and medium terms of the neutral rate in Mexico over the last years; and 2) to discuss the level to which the nominal neutral rate is expected to converge in the longer term, as the transitory factors affecting it disappear. Due to the uncertainty related to the measurement of the neutral rate, this Box considers different quantitative methods to obtain a more robust estimate and to be able to infer with greater certainty a possible trajectory of this variable in the short, in the medium and in the long terms.

Consistent with the results, transitory economic factors lowered the neutral interest rate in the short and medium terms in Mexico, and in nominal terms it shifted from an average interval of 6.2 to 8.4 percent in the period of 2001 – 2008 to a range of 3.9 to 5.6 percent in the period from 2009 to date, which is a period comprising the global financial crisis, with an average of 4.8 percent

for the latter period. It is notable that the studies conducted by the U.S. and other advanced economies also establish a considerable drop in this rate around the global financial crisis.<sup>3</sup> Meanwhile, the acquired evidence regarding the level of the nominal neutral rate in the longer term suggests that it will lie between 4.7 and 6.3 percent, which is consistent with an average range obtained with different methods, with an average point of 5.5 percent. This value is higher than the neutral rate estimated for the short term, but it is lower than the rate that was estimated to prevail in the long run prior to the financial crisis. Once again, this is a similar result to the one obtained in other economies, including the U.S.

#### 2. Structural and Transitory Factors that Affect the Neutral Rate

The neutral interest rate is subject to structural and transitory factors. These factors affect the equilibrium level of the neutral rate in the loanable funds market, which consists of the desired net saving of the economy (supply of loanable funds) and aggregate demand for investment (demand for loanable funds).

It is generally expected that structural factors, such as demography, access to domestic and international financial markets and potential growth, will gradually change over time, reason why their influence on the neutral rate is in the longer term. For instance, the increment in households' propensity to save, favored by a demographic recomposition or by policies encouraging saving for retirement, would increase the desired saving of the country and would exert downward pressure on the neutral rate. An inflow of international capital seeking greater yield than that offered in its markets of origin would also put downward pressure on the neutral rate. On the other hand, a lower growth of productivity or labor force would discourage demand for investment and the neutral rate would tend to decrease, given that the marginal productivity of the capital and its expected yield would be lower.

On the other hand, transitory factors that affect the neutral rate can be seen as temporary macroeconomic shocks that alter the desired saving and demand for investment in the short and medium terms. For example, higher aggregate uncertainty could temporarily decrease the demand for investment and/or propitiate greater precautionary savings of households, which, in turn, would reduce aggregate demand, leading to a drop in economic activity. To avoid this scenario, the central bank could sufficiently lower its reference interest rate, for a period that is deemed necessary, in order to boost economic activity and to offset the effects of negative

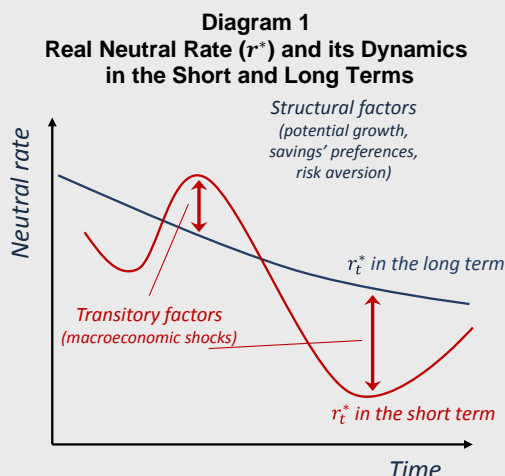
<sup>1</sup> For further detail, see Box 2 of the Quarterly Report January - March 2016.

<sup>2</sup> This is the same definition that is used by the U.S. Federal Reserve Bank. See Brainard (2015, 2016) or Yellen (2015).

<sup>3</sup> See Yellen (2015) and Holston et al. (2016).

shocks. It is notable that despite being temporary, these shocks can be very persistent.

Diagram 1 presents the relation of the real neutral rate  $r^*$ , which discounts inflation expectations from its nominal counterpart, in the short and long terms. It is important to point out that the level of the longest term, that  $r^*$  is expected to converge in the absence of shocks, depends on real determinants, such as productivity, demography or the market structure, reason why the influence of the monetary authority on these determinants is low.



Source: Banco de México.

### 3. Estimates of the Neutral Rate in Mexico

To consider the uncertainty associated with different econometric methods estimating the real neutral rate  $r^*$ , below we present the results of 6 different methodologies to infer a relatively more robust trajectory of this variable for Mexico in the short and medium terms. Likewise, 3 different quantitative methods are considered to infer the level that  $r^*$  is expected to converge in the long term, in the absence of new shocks. All technical details of these tools, along with different robustness checks and complete academic references, can be found in Carrillo et al. (2016).<sup>4</sup>

#### 3.1 The Neutral Rate in the Short and Medium Terms

Chart 1 exhibits the results of the point estimates of each methodology in the short and medium terms.<sup>5</sup> Despite differences among them, all of them suggest a considerable reduction of  $r^*$  in the short and medium terms in the onset of the global financial crisis and a certain increase in these variable as of 2014.

<sup>4</sup> In most presented exercises, the real ex ante short-term interest rate was used, which is calculated as the difference between the nominal overnight interbank lending interest rate and the average expectation of the annual headline inflation for the next 12 months derived from Banco de México's survey among the private sector specialists. The analyzed period spans from January 2000 to September 2016.

- a) Average. A simple indicator of  $r^*$  is the average of the real ex ante rate during the business cycle. For the case of Mexico, the complete cycle comprises from 2001 to late 2008, while it is considered that the current cycle started in 2009 and has not completed yet (Chart 1, orange line).
- b) Trend. By means of time-series filters the real ex ante rate breaks down into two elements: cycle and trend. The latter can be interpreted as an approximate measure of  $r^*$  in the short and medium terms (Chart 1, yellow and blue lines).<sup>6</sup>
- c) Taylor rule. This rule is a tool used to estimate the systematic behavior of the central bank's target rate in view of deviations of inflation from its target and of the output from its potential level. Thus, when the referred deviations are zero, the real neutral rate  $r^*$  is given by the intercept of the rule less the inflation target. One way to infer the value of  $r^*$  across time is via its recursive estimate (see Chart 1, green line).
- d) Affine model. The affine model of Adrian et al. (2013) uses non-arbitrage conditions in the financial market, and we use it to infer the average expectation of bond market investors regarding the ex ante real rate for different terms. This expectation is an approximation of  $r^*$  in the short and medium terms. Changes in the estimated  $r^*$  can be interpreted as investors' revisions regarding the possible trajectory that would be followed by the ex ante real rate over the following years (Chart 1, purple line).
- e) Reduced macroeconomic model. The Laubach and Williams (2003) model is adapted for the Mexican economy.<sup>7</sup> This model consists of a system of equations that contain a representation of the aggregate demand (the IS curve), the aggregate supply (the Phillips curve) and an equation that determines the dynamics of  $r^*$  in terms of the growth of potential output ( $g_t$ ) and other factors that are not modelled explicitly ( $z_t$ ):

$$r_t^* = g_t + z_t. \quad (1)$$

While  $g_t$  is a structural factor that determines the neutral rate,  $z_t$  can contain both structural and transitory factors (brown line in Chart 1). The decrease in the estimated  $r^*$  is mainly explained by a reduction in the latent variable  $z_t$ . The trajectory of variable  $z_t$  shows a high correlation with the Federal Reserve

<sup>5</sup> Confidence intervals, which are relevant, are not shown for each methodology. The importance of uncertainty for each methodology is in line with what has been found in research papers estimating the neutral rate for other economies. For further details see, in Carrillo et al. (2016).

<sup>6</sup> In particular, the Hodrick-Prescott filter with tail correction, and the Christiano-Fitzgerald filter are used.

<sup>7</sup> In its implementation for Mexico, this model is extended to capture the effect of the external sector.

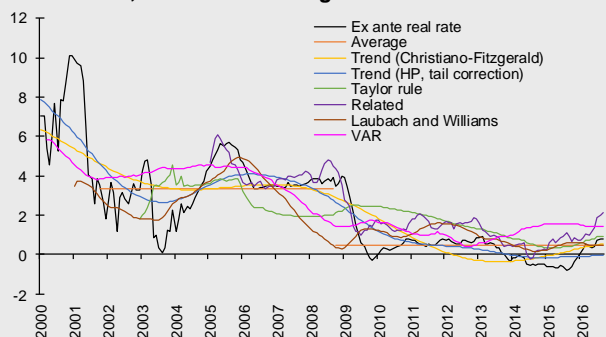


target rate from 2001 to 2008 and the Wu and Xia (2015) measure, which quantifies the effect of non-conventional Federal Reserve policies by means of a negative counterfactual interest rate, from 2009 to 2015.<sup>8</sup> Thus,  $z_t$  seems to capture the effect of conventional and non-conventional monetary policies of the Federal Reserve on  $r^*$  in the short and medium terms in Mexico.

f) VAR model with time-dependent intercepts. The estimate of  $r^*$  is obtained from a joint second order vector autoregressive model (VAR) for Mexico and the U.S.<sup>9</sup> This model estimates the trajectory of  $r^*$  using intercepts that vary across time, considering the joint dynamics of real and monetary variables of both countries.<sup>10</sup> The results of this estimate can be seen in the pink line of Chart 1. The drop in the neutral interest rate can be attributed to excess liquidity in international financial markets. That is, prior to the 2008 crisis, there was a decrease in the sovereign risk of emerging economies, Mexico among them. This fostered a capital inflow, which was reflected in the balance of payments, lower long-term interest rates and term premia. Likewise, an accelerated growth in pension funds was observed as of 2004. All of the above exercised downward pressures on interest rates of different terms.

As can be observed, all methodologies indicate that the real neutral rate  $r^*$  estimated for short and medium terms in Mexico declined around the time of the financial crisis from a level close to 3.4 percent to approximately 1 percent in real terms for the periods indicated in Table 1. This means that the neutral interest rate in nominal terms dropped approximately from 7.4 to 4.8 percent.

**Chart 1**  
Short-, Medium- and Long-term Real Neutral Rate



Source: Banco de México.

<sup>8</sup> It is interpreted in the following manner: the more negative the Wu and Xia rate is, the laxer the Fed's non-conventional policy is.

<sup>9</sup> In particular, consistent with the model, the U.S. dynamics affect those of Mexico, but not vice versa.

<sup>10</sup> In the absence of non-persistent transitory shocks, the variables of the system show a trend to their medium-term equilibrium level, which is in terms of time-dependent intercepts and the rest of coefficients that determine the dynamic interaction of the remaining variables.

**Table 1**  
Level of the Real Neutral and Nominal Rate  
in the Short and Medium Terms  
Percent

	Real neutral rate		Nominal neutral rate	
	2001Q4 – 2008Q4	2009Q1- 2016Q3	2001Q4 – 2008Q4	2009Q1- 2016Q3
Averages and trends	3.4	0.4	7.5	4.3
Taylor rule	2.8	1.4	6.8	5.2
Related model	4.2	1.2	8.2	5.0
Laubach and Williams model	2.7	0.9	6.7	4.7
TVP-VAR model	3.7	1.2	7.7	5.0
<b>Average</b>	<b>3.4</b>	<b>1.0</b>	<b>7.4</b>	<b>4.8</b>

To calculate the nominal neutral rate, each methodology was complemented by the average of inflation expectations for the next 12 months. For the period from 2001Q1 – 2008Q4, this expectation lied at 4.01 percent, while for the period of 2009Q1 – 2016Q3 it reached 3.83 percent.

These results are consistent with the similar estimates that had been made for the case of the U.S., showing a drop in  $r^*$  during the 2008 financial crisis and remaining at low levels since then. This is related to households' deleveraging and weak economic activity that led to a lower demand for credit and, on the other hand, tighter conditions of credit granting, which reduced supply. It is noteworthy that the decline in aggregate demand produced a greater impact on the level of the neutral rate in the short term. As regards the decline of  $r^*$  in Mexico, it can be attributed to the transitory factors related to: (i) ample monetary liquidity in financial markets, which derived from non-conventional monetary policy measures in advanced economies, such as those carried out by the Federal Reserve; and (ii) persisting slack conditions prevailing in the Mexican economy over the recent years. Insofar as the transitory factors that led to this scenario fade,  $r^*$  is expected to converge to its longer-term level in the absence of shocks.

### 3.2 The Neutral Rate in the Long Run

The long-term level of  $r^*$  depends on structural factors that are relatively beyond the reach of the monetary policy, such as the potential growth (affected, among other things, by the demography and the trend in total factor productivity), and households' and investors' saving preferences and risk aversion, among others. For the case of the U.S. and other advanced economies, the recent studies establish that both the potential growth and the long-term level of  $r^*$  of these economies exhibited a declining trend over the last 25 years. Consistent with the above, the global factors played an important role in the determination of potential growth and the neutral rate at the international level (see Holston et al, 2016).

For the case of Mexico, a heuristic analysis points to the fact that the long-term level of  $r^*$  would be affected by the factors that determine the potential growth level, as well

as the dynamics of the international capital market. The potential growth could be adversely affected by a lower growth of population and labor force.<sup>11</sup> Nonetheless, the structural reforms, that have been recently implemented in Mexico, are expected to entirely compensate for the drop in the growth rate of population. Thus, if the potential growth increases, the long-term level of  $r^*$  of the economy will also go up.

However, as regards the international capital markets, the global long-term real interest rate has diminished gradually over the last 30 years in response to international determinants, which, on the one hand, increased desired global savings, and, on the other hand, decreased the demand for global investment. Likewise, this rate is estimated to stabilize around 1 percent for a long time period.<sup>12</sup> In this context, just like in other emerging economies, the long-term real interest rate of Mexico followed a trend similar to the global rate from 2002 to 2013, although from a higher level.<sup>13</sup> This trend can be accounted for by global capital flows which sought higher yields than those offered in their markets of origin, which generated a downward pressure on the long-term level of  $r^*$  during the referred period. Hence, insofar as capital flows are directed to domestic financial assets seeking higher yields, it could induce the long-term level of  $r^*$  to be lower than that prevailed prior to the global financial crisis, counteracting the effect of a possibly greater potential growth.

Below, three different quantitative methodologies are presented to infer the long-term level of  $r^*$ . Chart 2 exhibits the results obtained from each one of them.

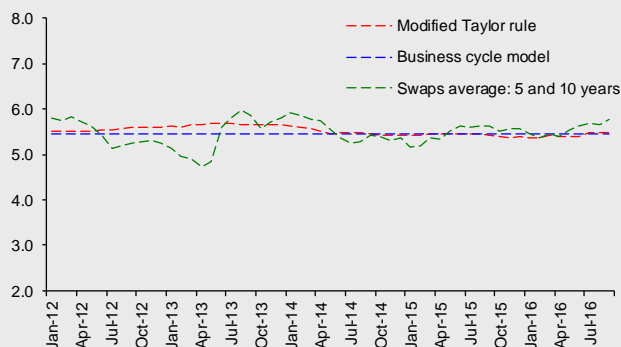
- a) **Modified Taylor rule.** The Federal Reserve monetary policy, above all non-conventional policies that have been implemented since 2009, may have affected the real neutral rate in the long run. To consider this factor, an indicator is included measuring the effect of the said policies on the Taylor rule, which had been previously estimated.<sup>14</sup> The recursive estimation of this rule yields that the estimated long-term level of  $r^*$  remains relatively stable starting from 2008, at around 2.5 percent in real terms and at a level of 5.5 percent in nominal terms (Chart 2, red line).
- b) **Model of real business cycles.** A model of an open economy with flexible prices is proposed to replicate the dynamics of output, consumption, investment

and the working hours in Mexico, consistent with Lama (2011). The model infers a real equilibrium interest rate, which is consistent with these dynamics. The long-term average of this rate can be interpreted as an estimated long-term level of  $r^*$ . Thus, it is 2.4 percent in real terms and 5.4 percent in nominal terms (Chart 2, blue line).

- c) **Financial markets' data.** The derived instruments provide alternatives of financing and flexible hedges. In the particular case of TIEE swaps of different terms, the counterparties exchange the flows at a fixed rate for flows at a floating rate. The fixed rate of this contract can be associated by the participants in the swap contract to the expected level of the TIEE for a determined term. To capture market expectations for the long-term level of  $r^*$ , the average of the fixed rate agreed upon in TIEE swap 5- and 10-year contracts is considered, minus 30 basis points, which is the historical difference between TIEE and the base borrowing rate. Thus, the swap market expectation of the long-term level of  $r^*$  has fluctuated at approximately 5.6 percent since January 2012 (Chart 2, green line).

Table 2 presents the summary of the results of the methodologies estimating the long-term level of  $r^*$ . The range for this variable, calculated by using the average of the minimum and maximum levels obtained in each method, suggests that the long-term level of  $r^*$  would lie between 1.7 and 3.3 percent in real terms and between 4.7 and 6.3 percent in nominal terms, with medium points at 2.5 and 5.5 percent, respectively.

**Chart 2**  
**Long-term Level of the Nominal Neutral Rate**  
Percent



Source: Banco de México

<sup>11</sup> The National Council of Population (CONAPO) estimates that from 2010 to 2030 total population will grow at a lower rate, as its growth rate will moderate from 1.3 to 0.7 percent. For population between 16 and 65 years old, the rate will move from 1.8 to 0.6 percent over the same time frame.

<sup>12</sup> Further details are available in Rachel and Smith (2015).

<sup>13</sup> Starting from this year, a slight increment in the long-term real interest rate can be appreciated, in particular of the 10-year udibonos rate. However, this rate has not reached the levels registered prior to the financial crisis.

<sup>14</sup> This indicator takes the value of 0 when the federal funds' rate is positive (until June 2009), and takes the value "shade" of the federal funds' rate of Wu and Xia (2015) from July 2009 to December 2015.

**Table 2**  
**Level of the Real Neutral and Nominal Rate**  
**in the Long Term**  
 Percent

	Real neutral rate		Nominal neutral rate	
	Central measure	Range	Central measure	Range
Modified Taylor rule	2.5	1.6 – 3.4	5.5	4.6 – 6.4
Model with wedges	2.4	1.3 – 3.6	5.4	4.3 – 6.6
Swap market	2.6	2.2 – 2.9	5.6	5.2 – 5.9
<b>Average</b>	<b>2.5</b>	<b>1.7 – 3.3</b>	<b>5.5</b>	<b>4.7 – 6.3</b>

To calculate the nominal neutral rate, the average of each methodology was complemented by the 3 percent inflation target. The ranges are determined by a standard deviation of each model, with the exception of the swaps market, the range of which corresponds to the minimum and the maximum attained in the period from December 2015 to September 2016.

#### 4. Final Remarks

This Box presents the summary of different estimates of the trend of the real neutral rate for the short and medium terms in Mexico, as well as the level to which this rate is expected to converge in the longer term, in the absence of further macroeconomic shocks.

The analysis for the short and medium terms concludes that the real neutral rate fell around the 2008 global financial crisis and reached its minimum in 2014. The main reasons for this trend are related to abundant liquidity in the financial markets derived from non-conventional policies carried out by advanced economies, as well as from persisting slack conditions that prevailed in the Mexican economy in recent years. On the other hand, it is argued that the dynamics and the demographic composition of the country (i.e. lower rates of population growth and a higher proportion of adults), in addition to the low levels of the global long-term real interest rate, have exercised and will keep exercising a downward impact on the long-term level of the neutral rate. On the contrary, a greater growth of productivity that can be observed in view of structural reforms, could exert an upward pressure on the long-term level of the neutral rate. The quantitative estimates of this variable suggest that it lies within the range of 4.7 and 6.3 percent in nominal terms.

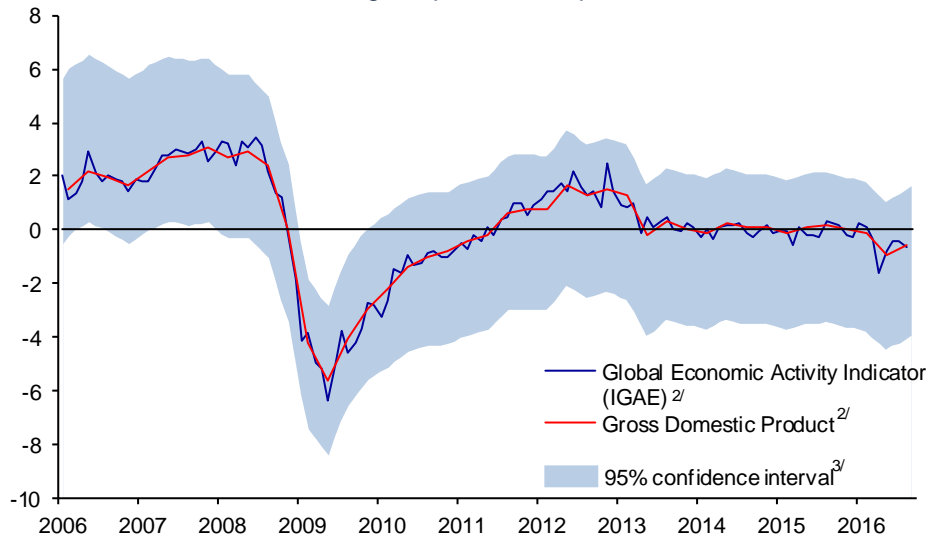
An important restriction of the available quantitative methods to estimate the trajectory of the neutral rate is that they are characterized by considerable uncertainty. This implies that the results presented in this Box should be taken with caution. In addition, it is difficult to conclusively infer the phase of the economic cycle the economy is going through. All of this makes the use of a wide set of variables and indicators necessary, in order to analyze the required monetary stance to achieve the price stability goal.

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Delving into the elements considered by the monetary authority in its decisions, it stands out that, even though productive activity recovered moderately, no aggregate demand-related pressures on the prices in the economy have been observed (Chart 37). However, as previously mentioned, some labor market variables point to a continued improvement in the conditions of this market. In this context, as a result of the gradual growth of real wages, together with a stagnant labor productivity, labor unit costs increased both for the economy as a whole and for the manufacturing sector in particular, even though they remain at levels below those observed prior to the 2009 global financial crisis (Chart 38a and Chart 38b).

**Chart 37**  
**Output Gap Estimate <sup>1/</sup>**  
 Percentage of potential output, s. a.



s. a. / Estimated with seasonally adjusted data.

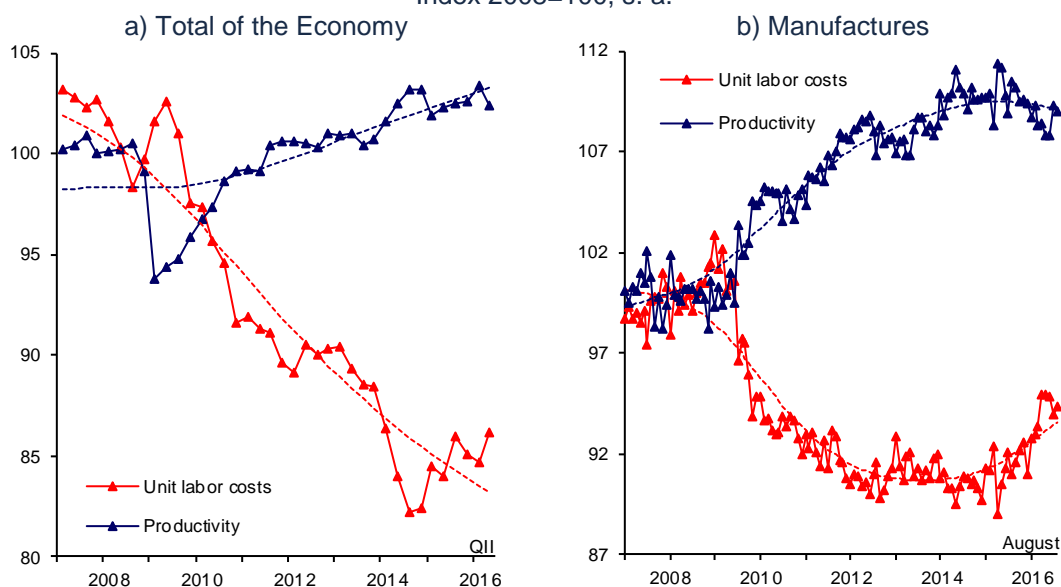
1/ Estimated using the Hodrick-Prescott (HP) filter with tail correction; see Banco de México Inflation Report April-June 2009, p.69.

2/ IGAE figures as of August 2016. GDP figures as of the third quarter of 2016 correspond to the timely estimate released by INEGI.

3/ Confidence interval of the output gap calculated with an unobserved components' method.

Source: Estimated by Banco de México with data from INEGI.

**Chart 38**  
**Productivity and Unit Labor Cost**  
 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. Trends estimated by Banco de México.

Source: Unit cost prepared by Banco de México based on data from INEGI. The Global Index of Labor Productivity in the Economy (IGPLE), as released by INEGI.

s. a. / Seasonally adjusted and trend series. The former is represented with a solid line, the latter, with a dotted line.

Source: Prepared by Banco de México with seasonally adjusted data from the Monthly Manufacturing Business Survey and the Indicator of Industrial Activity of the Mexico's System of National Accounts, INEGI.

Regarding the performance of inflation expectations based on Banco de México's survey among private sector specialists, it is notable that the median corresponding to the end of 2016 increased slightly, shifting from 3.10 to 3.25 percent, between the surveys of June and October 2016.<sup>6</sup> In particular, the median of core inflation expectations went up from 3.2 to 3.3 percent and the corresponding to implicit expectations for the non-core component adjusted from 2.7 to 3.0 percent between the referred surveys, persisting at minimum levels for such expectations (Chart 39a). Similarly, the median of inflation expectations for the end of 2017 increased moderately from 3.4 to 3.5 percent during the same period. Specifically, the median of expectations of the core component went up from 3.3 to 3.4 percent, while implicit expectations of the non-core component adjusted from 3.7 to 3.8 percent between the referred surveys (Chart 39b).<sup>7</sup> Finally, showing certain volatility, longer-term inflation expectations increased marginally from 3.3 to 3.4 percent in the same period, while remaining close to the 3.0 percent target (Chart 39c).<sup>8</sup>

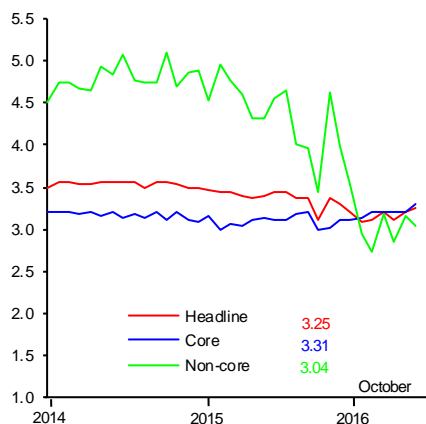
<sup>6</sup> The median of headline inflation expectation for the end of 2016, based on the Citibanamex survey, increased from 3.1 to 3.2 percent between the surveys of June 21 and November 7, 2016.

<sup>7</sup> The median of headline inflation expectation for the end of 2017, based on the Citibanamex survey, went up from 3.3 to 3.5 percent between the surveys of June 21 and November 7, 2016.

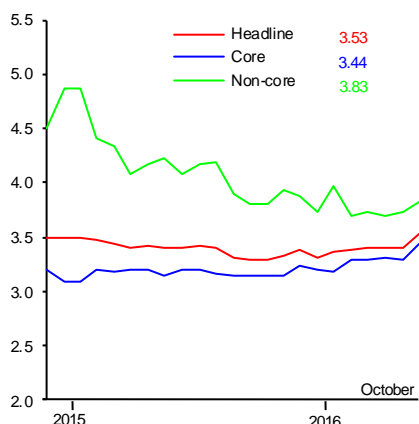
<sup>8</sup> The median of long-term inflation expectations, based on the Citibanamex survey (for the next 3 to 8 years) shifted from 3.3 to 3.4 percent between the surveys of June 21 and November 7, 2016.

**Chart 39**  
**Inflation Expectations**  
Percent

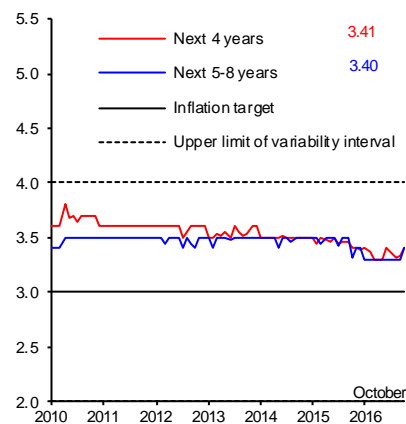
a) Medians of Headline, Core and Non-core Inflation Expectations as of End of 2016



b) Medians of Headline, Core and Non-core Inflation Expectations as of End of 2017



c) Medians of Headline Inflation Expectations for Different Terms

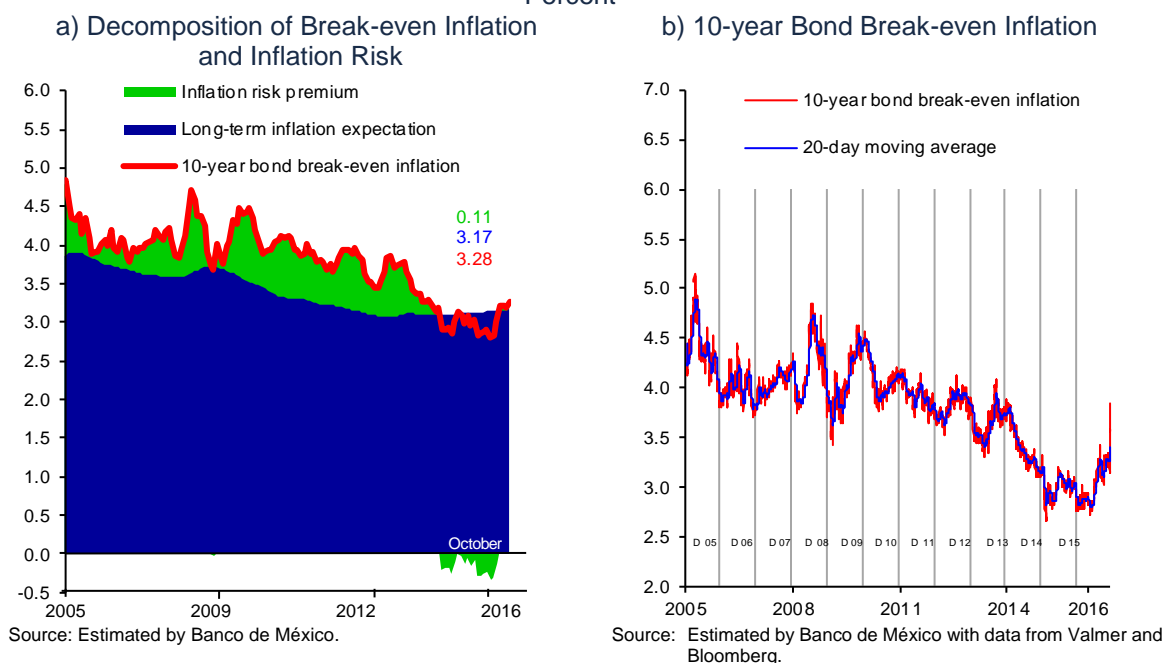


Source: Banco de México's Survey.

Inflation expectations implicit in 10-year market instruments remain stable around 3.0 percent, while the inflation risk premium remained practically unchanged, slightly above zero, after being at negative levels for an extended time period (Chart 40a).<sup>9</sup> Thus, the break-even inflation (the difference between long-term nominal and real interest rates) somewhat increased, although from minimum historical levels that it reached in early 2016 (Chart 40b). It should be noted that the estimation of the long-term inflation expectation and the inflation risk premium derived from these instruments is subject to certain uncertainty, as the presence of different risk premia (e.g. liquidity) could affect the results.

<sup>9</sup> 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. For the current Report, the estimate was updated to include data as of December 2015.

**Chart 40**  
**Inflation Expectations**  
Percent



After an increment in volatility registered in September, in early October there was a temporary improvement in financial markets, partly, due to the changes in the expected outcome of the U.S. electoral process and due to the immediate consequences of the 50-basis-point hike in the reference rate implemented by Banco de México's Board of Governors on September 29. However, as of the end of October, volatility in the referred markets has increasingly intensified due to the uncertainty related to the above mentioned electoral process and, subsequently, to its outcome.

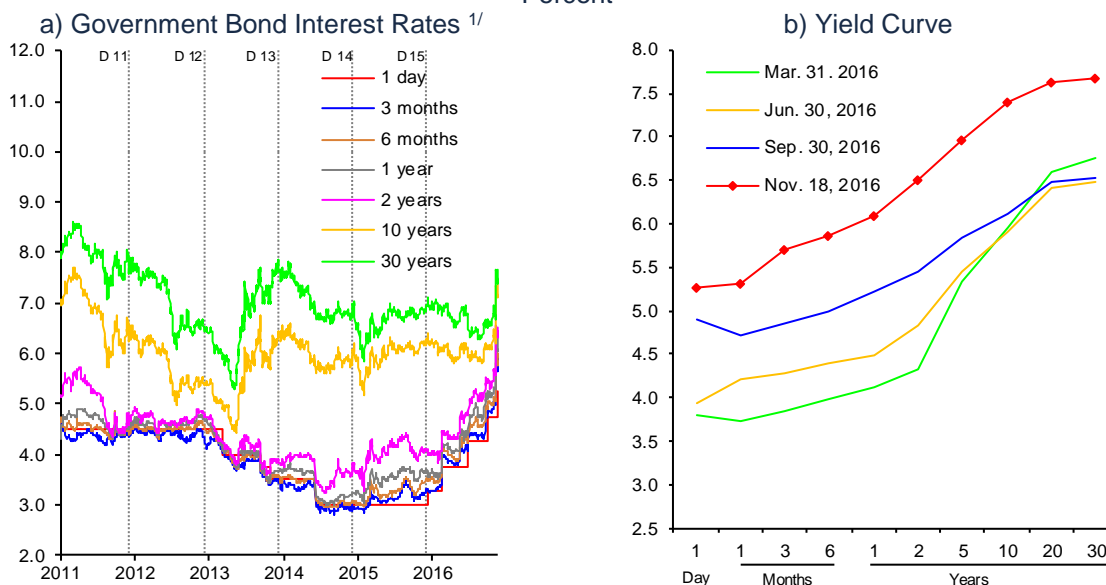
In this context, the exchange rate presented high volatility. Thus, following a strong depreciation of the national currency during September that prompted the exchange rate to reach levels of MXN/USD 19.83 during the last week of September, it appreciated approximately 7 percent to MXN/USD 18.50 in the third week of October. Afterwards, the Mexican peso continued responding to the events related to the electoral process with high volatility and a considerable depreciation close to 10.5 percent over the days following the elections. Hence, the exchange rate marked MXN/USD 21.05 at the end of the week during which the elections took place, attained intraday levels of over MXN/USD 21.30 and subsequently slightly improved by going down to levels of MXN/USD 20.19 in mid-November.

As regards the evolution of the fixed income market, interest rates for all terms increased in the period analyzed in this Report, registering high volatility. Relative to the interest rates' response to the modified monetary policy stance, it is notable that following the adjustment in the reference interest rate in late September, short-term interest rates increased more than long-term ones, leading to the flattening of the slope of the yield curve, just as it had been expected. Afterwards, once the outcome of the U.S. elections became public, the upward trend in interest rates significantly exacerbated for all terms. In response to that, and in light of the

anticipated adjustment of a considerable magnitude in the monetary policy stance among some market participants, short-term interest rates spiked. Thus, the immediate response of short-term rates to a 50-basis-point hike on November 17 was a reduction, while long-term rates remained unchanged, whereby the yield curve steepened. In sum, during the period covered by this Report, 3-month and 10-year interest rates increased from 4.2 to 5.7 percent and from 6.0 to 7.4 percent, respectively. As a result, the slope reduced by 10 basis points, from 180 to 170 basis points (Chart 41a and Chart 41b).

This increment in interest rates occurred in a context in which, as mentioned above, the outlook of the U.S. monetary policy normalization adjusted to a still gradual, but faster rate, characterized by a possibly greater magnitude than previously anticipated. This was likely complemented by the outlook of a greater future indebtedness of that economy, yielding a significant increase in long-term interest rates both in the U.S. (by around 80 basis points during the period analyzed in this Report) and in other advanced economies. Similarly, it stands out that, although the operation conditions in the national fixed income markets deteriorated recently, government securities' holdings by foreign investors remained stable, at recent levels that were close to historical maximum levels.

**Chart 41**  
**Interest Rates in Mexico**  
Percent



1/ Since January 21, 2008, the one-day (overnight) interest rate corresponds to the target for the Overnight Interbank Interest Rate.  
Source: *Proveedor Integral de Precios (PIP)*.

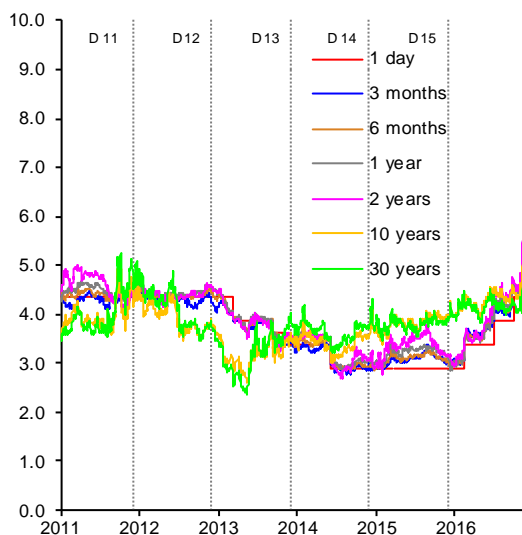
Consistent with the above performance, and despite widespread increments in interest rates in the U.S. in October, the spreads between Mexican and U.S. interest rates closed the quarter with considerable increases (Chart 42a). Additionally, it is worth mentioning that, upon the completion of the U.S. electoral process, a decompression of term premia in different advanced economies (especially in the U.S.) started to be observed, after they remained low during recent years as a result of extraordinary accommodative monetary conditions and high degrees of global liquidity derived from the implementation of non-conventional monetary policies. In particular, the decompression in the U.S. risk premium is notable, which during the



reference period reached levels below 80 basis points and further increased to 125 basis points, which represented the most dramatic increment as of November 9 (Chart 42b). Nonetheless, it stands out that the current level of the term premium in the U.S. still remains low.

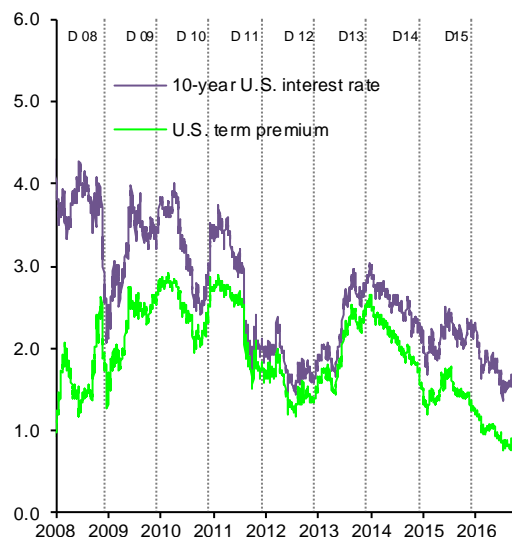
**Chart 42**  
**Spreads between Mexican and U.S. Interest Rates and U.S. Term Premium**  
Percent

a) Spreads between Mexican and U.S. Interest Rates <sup>1/</sup>



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

b) 10-year Government Bond Interest Rate and U.S. Term Premium <sup>1/</sup>



<sup>1/</sup> The term premium refers to the difference between the 10-year interest rate and the 2-year interest rate.  
Source: U.S. Department of the Treasury.

In the future, in addition to the uncertainty faced by the world economy and to the fact that it is still difficult to fully identify the specific elements that will define the economic policy implemented by the U.S., as well as its consequent effects on the bilateral relation between Mexico and the U.S. starting from 2017, new episodes of volatility in international financial markets, which could result from other risks in the world environment, cannot be ruled out. In this regard, even though the country is in a position of strength to tackle this new environment, it is of paramount importance to continue strengthening the macroeconomic fundamentals. In this context, the financial authorities announced that they will continue monitoring the evolution and the sound functioning of domestic financial markets, in order to take the necessary measures, in a coordinated manner, so as to maintain or, if appropriate, reestablish its normal functioning.

Likewise, it stands out that the implementation of fiscal consolidation measures drafted by the Ministry of Finance in the 2017 Economic Package, and approved by the Mexican Congress (in which a primary surplus is expected to be achieved as of this year and public debt to GDP ratio is estimated to decrease as of 2017) will strengthen the macroeconomic framework of the country. The recent release of the 2016-2021 Pemex Business Plan also represents a considerable effort in contributing to lowering the risk of a contingency to public finances. Indeed, in the

referred plan, PEMEX intends to continue adjusting its cost structure and a business strategy consistent with an outlook of low crude oil prices for the next years. In this context, the company will make an effort to use all instruments and flexibility granted by the energy reform (such as alliances and partnerships with third parties) in order to boost its profitability and improve its operational efficiency and effectiveness. This will let it register a primary surplus as early as in 2017 and a surplus in its financial balance in the near future. This is complemented by the anticipated renewal and an increment in the FCL amount for Mexico granted by the IMF on May 27, 2016, which stands out as a mark of confidence of the said institute regarding the soundness of the Mexican economy.

If future circumstances so require, this Central Institute will adjust its monetary stance with opportunity, flexibility and the magnitude needed, aiming to maintain inflation and its expectations well-anchored, thus generating greater financial stability. In this sense, it should be acknowledged that the current shock faced by the Mexican economy is real and permanent, and a depreciation in the real exchange rate is anticipated, which is the most efficient shock-absorber of the Mexican economy in view of this type of shocks. The main contribution of this Central Institute during this adjustment process, considering its constitutional mandate, is to procure that both the change in relative prices (as a result of the real exchange rate depreciation) and the decompression of term premia in the economy are orderly and of the lowest magnitude possible. Thus, these monetary policy actions seek to prevent inflation expectations from being contaminated and the price formation process of the economy from being altered.

## 5. Inflation Forecasts and Balance of Risks

**GDP Growth Rate:** The Mexican economy has continued facing a complex and highly volatile international environment. Indeed, as it was indicated before, despite the moderate recovery of global economic activity in this quarter, its forecast is lower than previously anticipated.<sup>10</sup> Furthermore, consequent on diverse geopolitical events, less world trade is also foreseen in the following years. In this sense, the outcome of the U.S. electoral process heightened the risk of policies that might hamper foreign trade and foreign investment being implemented by our main trading partner. Still, the main growth scenario considers that the adjustment in financial markets in view of such event would remain relatively orderly and that, to a large extent, the trade relation between Mexico and the U.S. will continue to function in a sound manner. On the other hand, domestically, the crude oil production forecasts have been adjusted downwards. This suggests that GDP growth over the next quarters could be lower than anticipated in the previous Report.

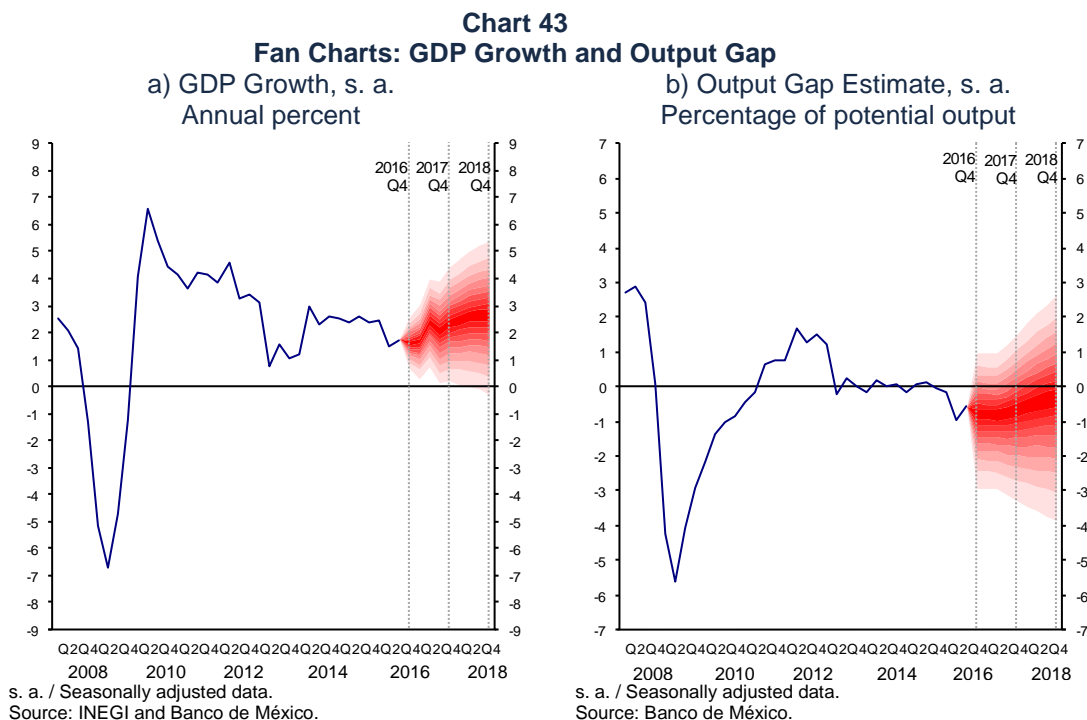
Hence, it is estimated that in 2016, overall, Mexico's GDP will grow between 1.8 and 2.3 percent (between 1.7 and 2.5 percent in the last Report). The forecast interval for GDP growth in 2017 is adjusted to between 1.5 and 2.5 percent (between 2.0 and 3.0 percent in the previous Report). However, for that year and the next, the structural reforms are expected to contribute to the economic growth, and the efforts undertaken by the authorities to strengthen the stability of the macroeconomic framework will also foster a more favorable environment for economic activity. For 2018, a more evident recovery of the U.S. industrial activity is also anticipated. Hence, Mexico's GDP growth rate is estimated to lie between 2.2 and 3.2 percent for that year (Chart 43a). Note that these forecasts should be taken with caution, as insofar as more information regarding the economic policies of the incoming U.S. administration becomes available, growth provisions will be adjusted to incorporate their possible adverse effects. The magnitude of the adjustment will depend on the degree of implementation of the policies hindering the trade relation between Mexico and the U.S. or implying a lower world economic growth.

**Employment:** Given that growth in the number of IMSS-affiliated jobs has recently tended to exceed previous expectations, the 2016 forecast for this indicator has been adjusted upwards. In particular, an increment of between 640 to 710 thousand jobs is expected, higher than the 590 to 690 thousand increase estimated in the previous Report. Still, in line with the downside revision of the economic outlook for 2017, the expected growth in the number of IMSS-affiliated jobs in the same year has also been adjusted downwards from 610 to 710 thousand jobs in the previous Report to 600 to 700 thousand jobs. For 2018, the number of IMSS-affiliated jobs is estimated to grow by 650 to 750 thousand jobs.

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<sup>10</sup> Expectations for the U.S. economy are based on the consensus of analysts surveyed by Blue Chip in November 2016. U.S. industrial production is expected to decrease by 0.9 percent in 2016, which is the same change rate that was estimated in the last Report. Meanwhile, the outlook for 2017 is adjusted downwards, shifting from 2.0 percent in the previous Report to 1.6 percent in the current one. Finally, for 2018, a 2.2 percent growth is expected, in line with the consensus of analysts surveyed by Blue Chip in October 2016.

Considering the growth forecasts described no aggregate-demand related pressures onto prices are expected (Chart 43b).



**Current Account:** Even though the current account's deficit as a share of GDP is anticipated to deteriorate relative to 2014 and 2015, efforts undertaken in terms of fiscal consolidation are estimated to contribute to the stabilization of the current account. For 2016, deficits in the trade balance and the current account of USD 15.2 and 31.5 billion are anticipated, respectively (1.5 and 3.0 percent of GDP, in the same order). For 2017, deficits in the trade balance and the current account are estimated to amount to USD 12.6 and 30.9 billion, respectively (1.2 and 3.0 percent of GDP, in the same order). For 2018, these deficits are expected to be USD 12.3 and 33.9 billion, respectively (1.1 and 3.0 percent of GDP, in the same order).

The balance of risks for growth in Mexico is biased to the downside. Among downward risks, the following stand out:

- i. That the new U.S. administration indeed implements policies, which could hamper the functioning of the shared production chains between Mexico and the U.S., despite the fact that such policies could be contrary to the very interest of the U.S. In this sense, lower Mexican exports and foreign investment can be observed. Likewise, the implementation of policies aiming to reduce the flow of workers' remittances to Mexico could affect private consumption. These shocks would initially tend to put pressure on the current account deficit, even though the subsequent endogenous adjustment of the Mexican economy would offset the referred effects, which could even lead to a net reduction of the deficit.

- ii. The possibility of persisting episodes of high volatility in international financial markets. Such episodes could reduce the sources of financing or foreign investment to Mexico. In the same vein, they could lead to lower growth in countries other than the U.S., which, in turn, would also affect Mexican exports.
- iii. That in this environment, a further deterioration in the consumers' and investors' confidence could also impact consumption and private sector investment.

Among upward risks to growth, these stand out:

- i. That the implementation of the structural reforms has a more favorable effect on economic growth and within a shorter time-frame than anticipated.
- ii. That in view of the recent depreciation of the exchange rate, non-oil exports exhibit a more noticeable and long-lasting reactivation, which would further boost industrial production.

**Inflation:** Annual headline inflation is expected to continue increasing gradually, to reach levels slightly above 3 percent by the end of the year. Core inflation is also forecast to close the year moderately above the aforementioned level. For 2017, both headline and core inflations are anticipated to lie above the inflation target, albeit below the upper limit of the variability interval. Both indicators are expected to register levels close to 3 percent by the end of 2018 (Chart 44 and Chart 45).

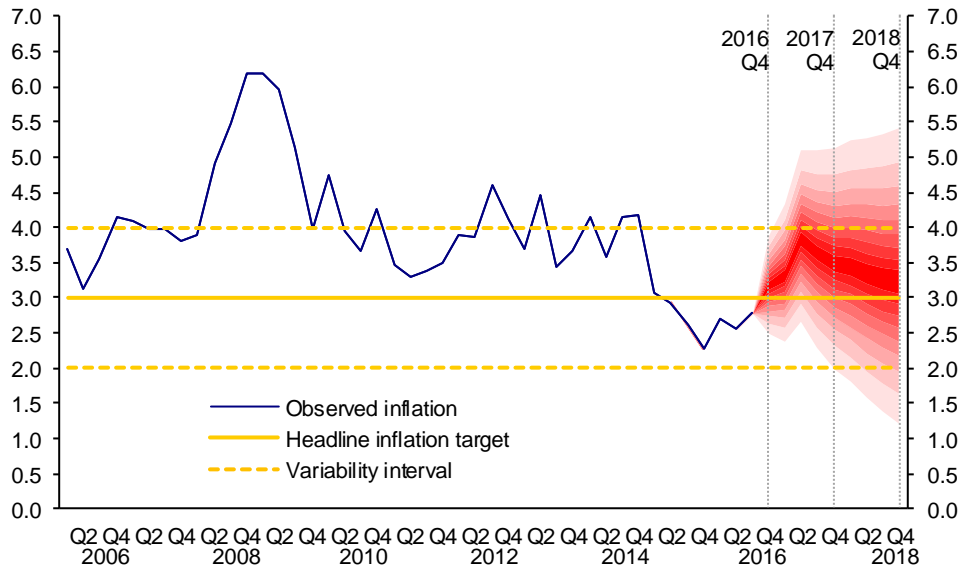
This forecast is not without risks. Among upward risks, the following should be mentioned:

- i. Considering the prevailing uncertainty in the international environment, that the depreciation of the national currency may persist or become accentuated, and, thus, may contaminate inflation expectations and generate second round effects that would negatively impact the price-setting process in the economy.
- ii. Price increases of agricultural goods and gasoline, although their impact onto inflation would tend to be transitory.

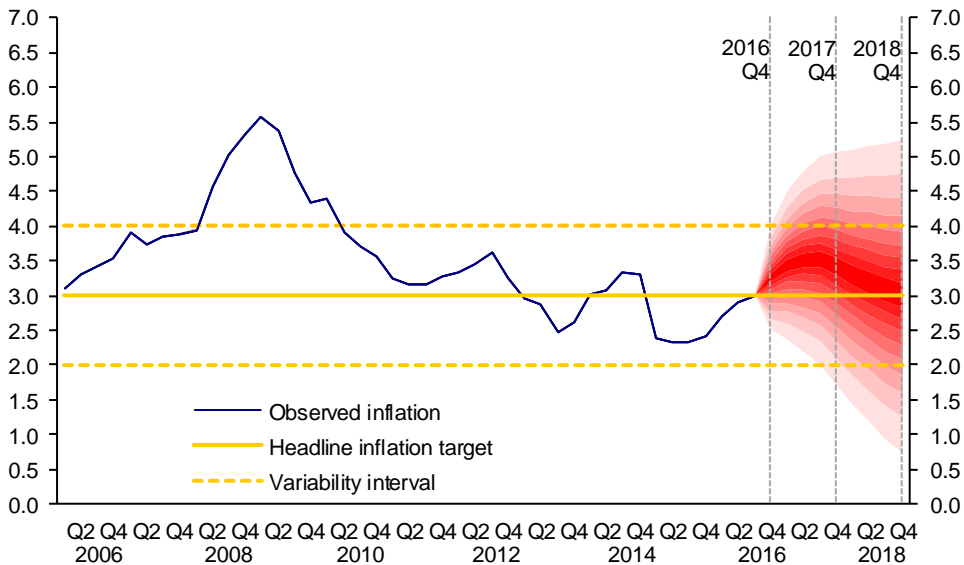
Among downward risks, these should be listed:

- i. Further reductions in prices of some widely used inputs, such as the telecommunication services, as a result of structural reforms.
- ii. An accentuated deceleration in national economic activity, which could reduce the possibility of aggregate demand-related inflation pressure to emerge.

**Chart 44**  
**Fan Chart: Annual Headline Inflation <sup>1/</sup>**  
 Percent



**Chart 45**  
**Fan Chart: Annual Core Inflation <sup>1/</sup>**  
 Percent



It is important to reiterate that the Mexican economy is characterized by the solid macroeconomic stability that has been achieved through many years of enacting responsible, prudent, and timely fiscal and monetary policies. This, along with the unprecedented process of structural reforms implementation currently underway, places the Mexican economy in a privileged position to successfully compete in global markets and to reach solid economic growth. Furthermore, the Mexican government has announced that it will continue to further strengthen the

fundamentals of the economy and will keep implementing structural reforms in a timely and adequate manner, in order to continue boosting economic growth and social welfare.

In the short run, in the current environment of volatility in the financial markets, the Mexican authorities will pay particular attention to their evolution and sound functioning. The Federal Government and Banco de México will take the necessary measures in a coordinated manner, using all available tools, in the scope of their attributions and in line with their respective mandates, to maintain the orderly functioning of the markets.

In this context, and considering what has been presented in this Report, in the future the Board of Governors will closely monitor the evolution of all inflation determinants and its medium- and long-term expectations, especially the possible pass-through of exchange rate adjustments onto prices, without implying that it is established as a goal. Likewise, it will be watchful of Mexico's monetary position relative to that of the U.S., without overlooking the evolution of the output gap. This will be done in order to be able to continue taking the necessary measures to consolidate the efficient convergence of inflation towards its 3.0 percent target, with total flexibility, whenever and to the extent that conditions may demand so.

Even though the close trade and financial links Mexico has established with the U.S. in recent decades have generally been beneficial for our country, they have made Mexico especially sensitive to the economic performance and to the economic policy decisions of the U.S. This is clearly evident in the impact generated by both the global crisis and the electoral process in the U.S. on Mexico. To achieve greater diversification and, more importantly, to reach an accelerated and sustained economic growth, Mexico needs to continue improving its infrastructure, its communications and transportation systems, and other elements that could enhance investments. In the same vein, it is indispensable to continue the adequate and prompt implementation of the structural reforms, as they will boost the country's productivity and will allow a better allocation of resources. In this way, greater competitiveness will allow Mexico to distinguish itself as an investment destination, besides fostering growth in the added value of the Mexican exports, making them more attractive to the rest of the world. These reforms will promote greater and sustained growth of the domestic market, thus offsetting the effects of the adverse external environment currently faced by the Mexican economy.

## Annex

## Calendar of Monetary Policy Decision Announcements, Minutes of the Board of Governors' Meetings regarding Monetary Policy Decisions and Quarterly Reports in 2017

Table 1 of this annex presents the calendar for the year 2017 of the monetary policy announcements, as well as the publication of the Minutes of the Board of Governors' meetings regarding the monetary policy decisions and the Quarterly Reports. It should be noted that the monetary policy decisions will continue to be released on Thursdays at 13:00. Moreover, two weeks after each announcement the corresponding Minutes will be released (except for April, when it falls on Wednesday), as it was done in 2016. The Quarterly Reports will be published on the following dates.

**Table 1**  
Calendar for 2017

	Announcements of Monetary Policy Decisions	Minutes of the Board of Governors' Meetings regarding Monetary Policy Decisions	Quarterly Reports <sup>1/</sup>
January			
February	9	23	
March	30		1
April		12	
May	18		31
June	22	1	
July		6	
August	10	24	30
September	28		
October		12	
November	9	23	29
December	14	28	

<sup>1/</sup> The Quarterly Report that will be published on March 1, 2017 corresponds to the fourth quarter of 2016, the one to be released on May 31, 2017, to the first quarter of 2017, the one of August 30, 2017, to the second quarter of 2017, and finally the one to be presented on November 29, 2017, to the third quarter of 2017.

The calendar considers 8 dates for the announcement of monetary policy decisions in 2017. Nonetheless, as in previous years, Banco de México reserves the right to announce changes in the monetary policy stance at dates different from those previously scheduled, in the case of extraordinary events that may require the Central Bank's intervention.





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