



Financial Stability Report– Second Semester 2023

December 6, 2023



Introduction

The Financial Stability Report describes:

- ✓ The **current state of the Mexican financial system**.
- ✓ The **evolution of the most important risks and vulnerabilities**.
- ✓ The **results of credit and liquidity stress tests**.



- The Mexican financial system maintains a **solid and resilient position** despite the **complex global environment** that continued during the second half of 2023, which has been characterized by:
 - ✓ The risk of **prolonged inflationary pressures** that could lead to a **further tightening of global financial conditions**.
 - ✓ The **increase in risk aversion** due to the escalation of geopolitical tensions.
 - ✓ **Global financial conditions** affected by an **environment of high volatility in financial markets**.

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2 Financial system risks

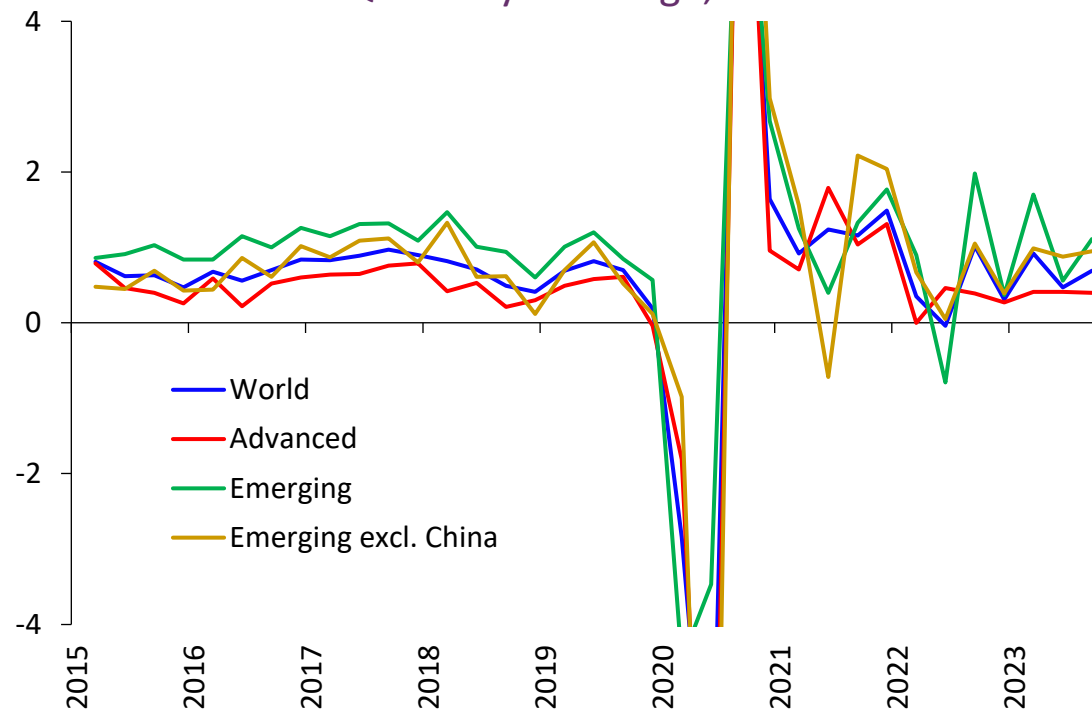
3 Stress tests

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1 Global economic growth

During the first half of 2023, world economic activity grew moderately; however, world economic performance has been heterogeneous across economies and sectors. As a result, global growth forecasts were maintained for 2023 and those for 2024 were revised slightly upwards.

GDP Growth^{1/}
Quarterly % change, s. a.



Datas as of third quarter of 2023.

Source: Banco de México with data from Haver Analytics y J.P. Morgan.

a. e. / seasonally adjusted data

1/ The sample of countries used for the calculation represents 85.4% of world GDP adjusted by purchasing power parity. Forecasts are used for some countries in the sample for Q3-2023. The ranges of the figures were limited for facilitating its visualization. Data observed corresponds to the minimum and maximum levels of the indicators for the sample of indicators that are not visualized on the figure.

Global GDP forecast growth
Percent

	<i>World Economic Outlook</i> Octubre 2023		Change from Julio 2023	
	2023	2024	2023	2024
World	3.0	2.9	0.0	-0.1
Advanced	1.5	1.4	0.0	0.0
United States	2.1	1.5	0.3	0.5
Euro area	0.7	1.2	-0.2	-0.3
Japan	2.0	1.0	0.6	0.0
United Kingdom	0.5	0.6	0.1	-0.4
Emerging	4.0	4.0	0.0	-0.1
Excl. China	3.5	3.9	0.1	0.0
Mexico	3.2	2.1	0.6	0.6
China	5.0	4.2	-0.2	-0.3
India	6.3	6.3	0.2	0.0
Brazil	3.1	1.5	1.0	0.3

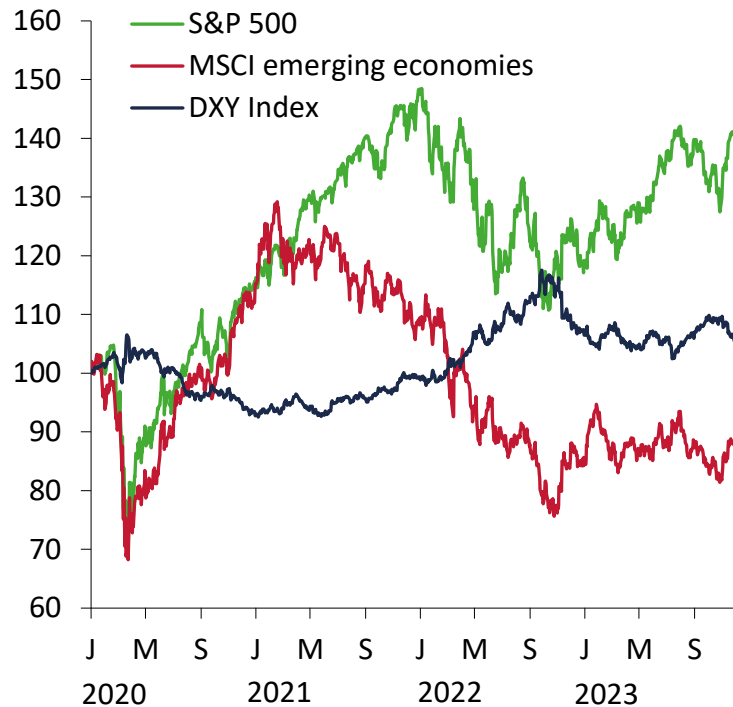
Data as of October 2023.

Source: IMF, World Economic Outlook, July and October 2023.

2 International financial markets

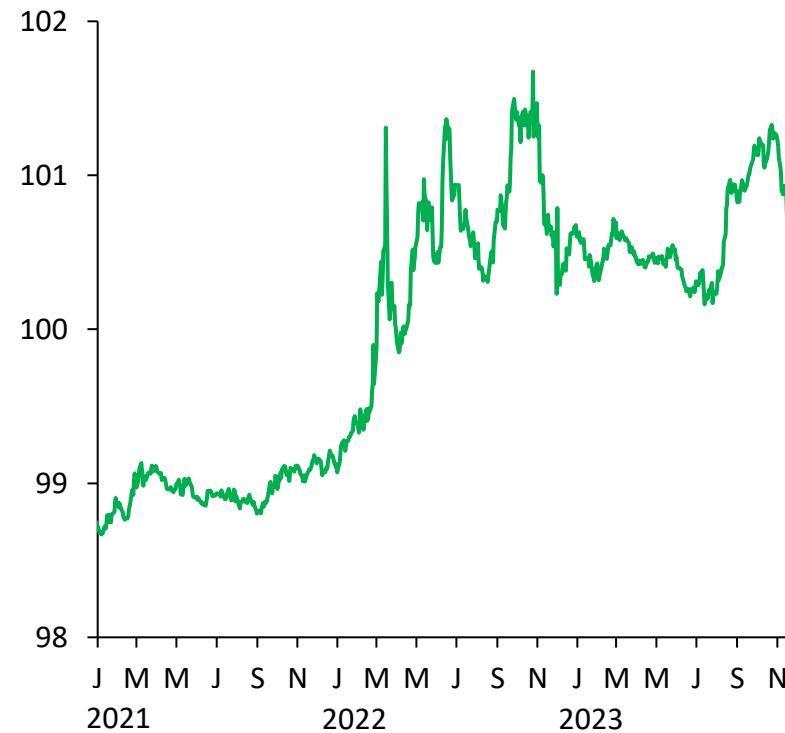
During the second half of 2023, financial markets were subject to higher volatility, in an environment of greater risk aversion, due to the continuation of geopolitical conflicts and the persistence of expectations of restrictive monetary policy stances by the world's central banks for a longer period. However, since November, markets have undergone a correction in response to the publication of economic figures pointing to a greater resilience in global activity.

Stock market and FX indices' performance
Index (January 2020 = 100)



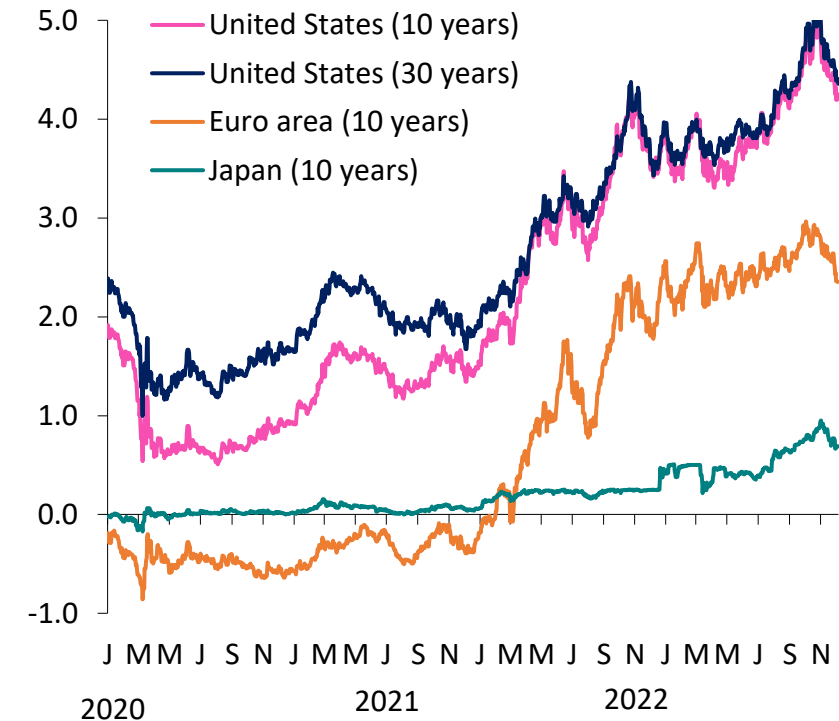
Data as of November 2023.
Source: Calculations from Banco de México with Bloomberg data.

Global Financial Conditions Index
Index



Data as of November 2023.
Source: Goldman Sachs.

Government bonds' interest rates
Percent

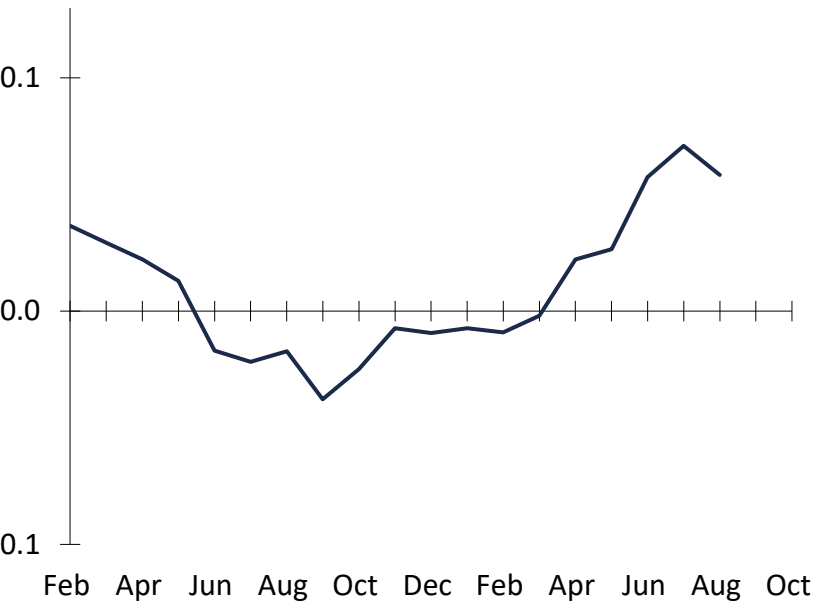


Data as of November 2023.
Source: Bloomberg.

3 Financial markets: emerging market economies

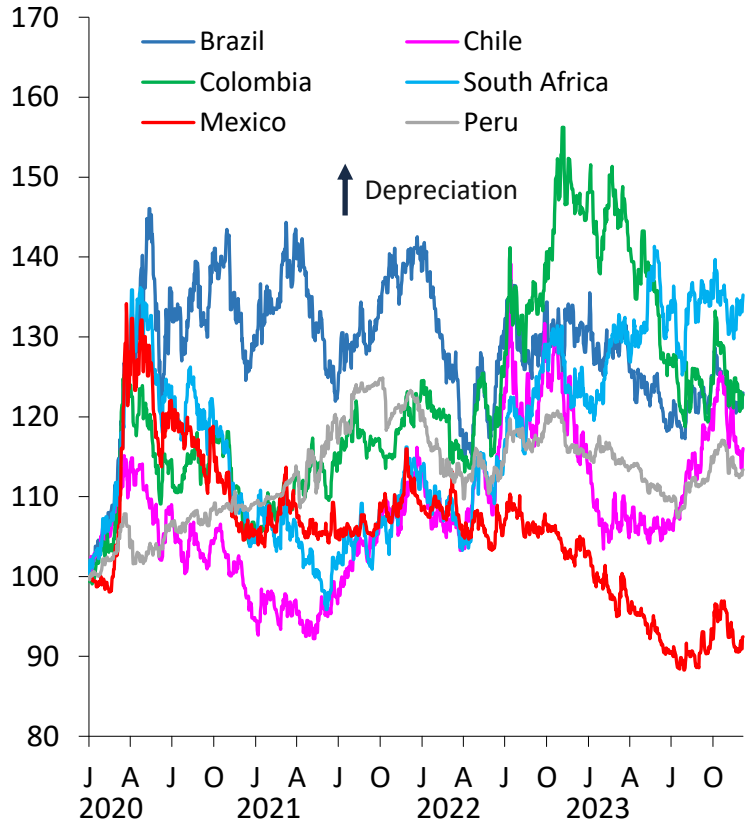
The current context has not had a clear effect on the financial markets of emerging market economies. As a result, since June 2023, the currencies of some countries have been subject to greater volatility and exhibited a marginally negative behavior, while the recovery of capital flows to emerging market economies continued consolidating since October 2022.

Non-resident portfolio flows to Mexico and EMEs^{1/}
Percent of 2022 GDP, 1-year moving average



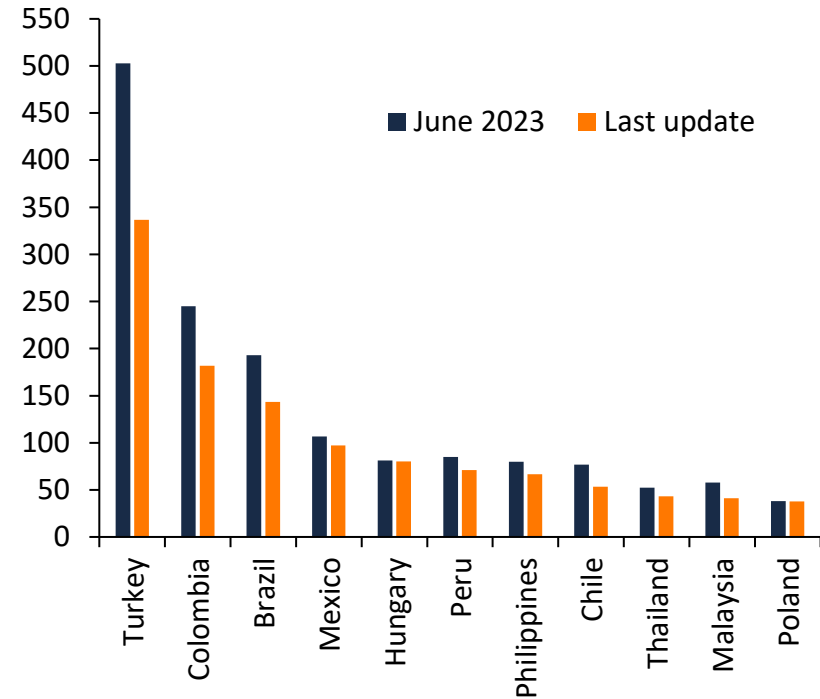
Data as of October 2023.
Source: Institute of International Finance (IIF)
1/ The measure of portfolio flows from emerging economies included those countries considered in the monetary policy and international financial markets sections of the Quarterly Report January-March 2021 for which information was available in the IIF. This measure was obtained by adding the flows of all these economies and dividing the total by the sum of their GDP in 2022.

Nominal Exchange rates against the USD
Index 01-Jan-2020 = 100



Data as of November 2023
Source: Bloomberg.

5 year CDS for selected emerging economies
Basis points

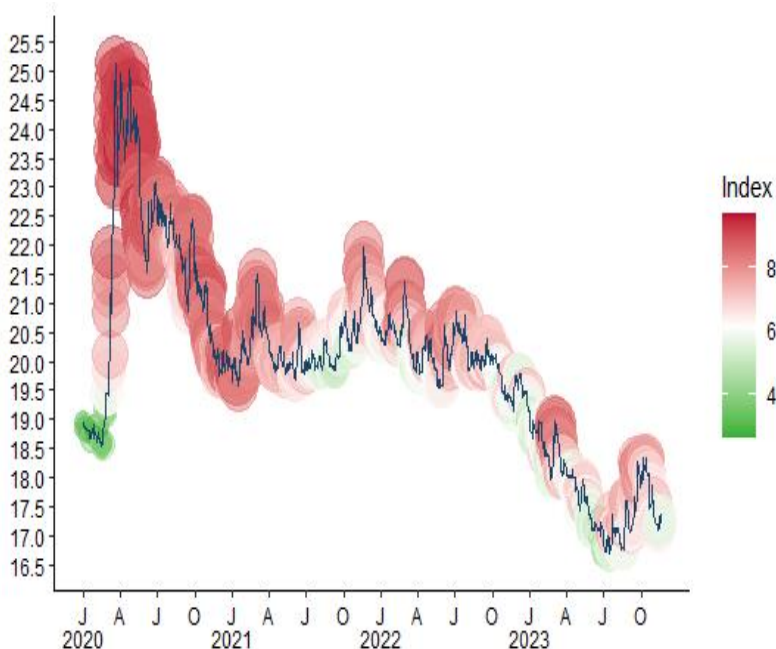


Data as of November 2023.
Source: Calculations of Banco de México with Bloomberg data.

4 Mexican financial markets

Domestic financial markets were influenced by external conditions. The Mexican peso stands out as the second best performing currency of emerging market economies during the year, despite the bouts of volatility during the period. The yield curve of government bonds has increased in its different maturities, while the cumulative performance of stock markets was negative.

Mexican peso trading conditions index ^{1/}
Mexican pesos per US dollar; Index

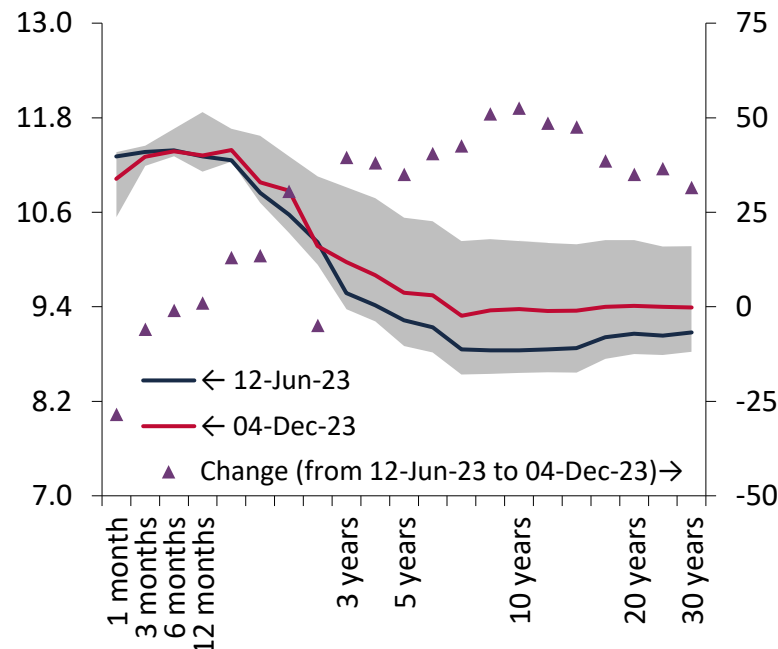


Data as of November 2023.

Source: Calculations by Banco de México with data from Bloomberg and Refinitiv

^{1/} The index is computed as the average of the percentiles of 1-month implicit volatility and skewness, volume and observed spreads. Percentiles are computed since 2018. Red (green) circles mean a greater (lesser) deterioration of the trading conditions in the FX market.

M Bonds' yield curve ^{1/}
Percent

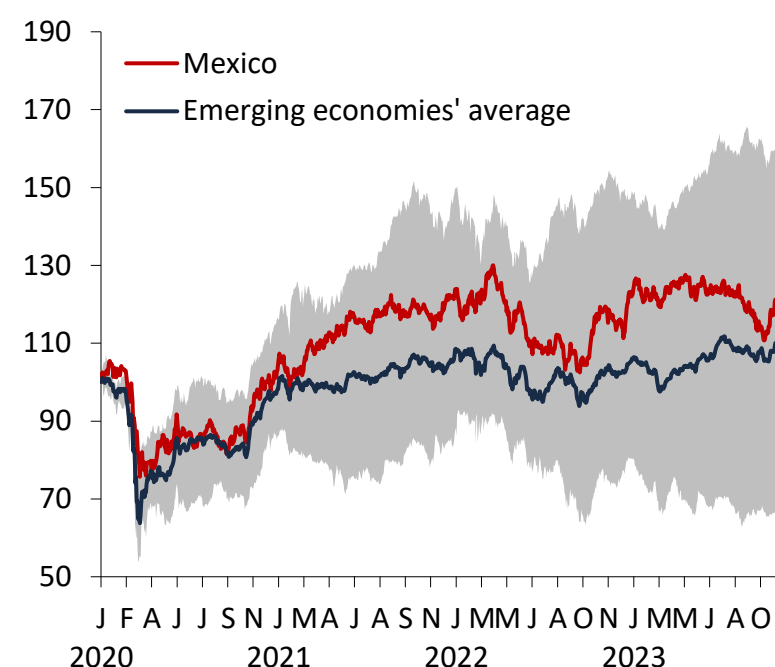


Data as of December 2023

Source: Calculations by Banco de México with data from PIP

^{1/} The grey area is the yield curve range since June 12, 2023

Equity indexes' cumulative performance for selected emerging economies ^{1/}
Index (January 2020 = 100)



Data as of November 2023.

Source: Calculations by Banco de México with data from Bloomberg

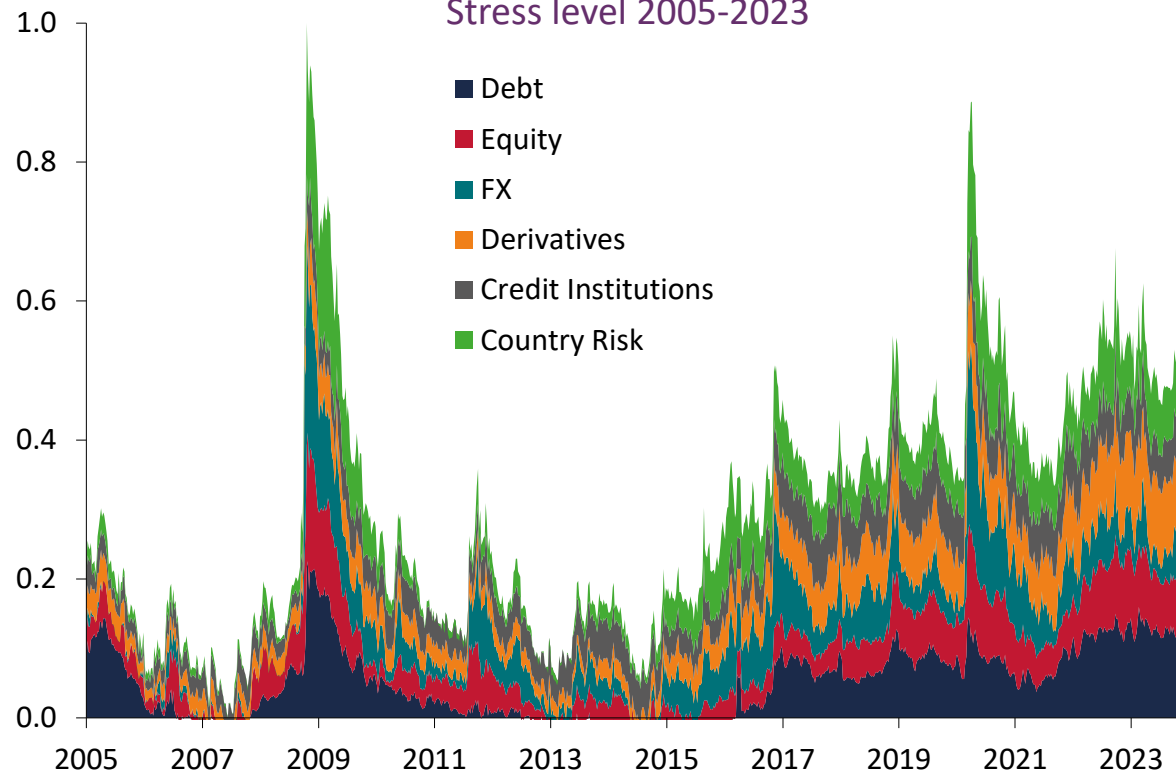
^{1/} The gray area corresponds to the range of emerging countries. The emerging countries included are Brazil, Chile, Colombia, Philippines, Hungary, India, Indonesia, Malaysia, Poland, and South Africa

4 Mexican financial markets

During the second half of 2023, the Mexican Financial Market Stress Index (IEMF) increased slightly in October, in response to greater volatility in the variables associated with the debt and foreign exchange markets, as well as with country risk. At the same time, financial conditions in Mexico, as measured by the Financial Conditions Index (FCI), tightened slightly.

The Financial Market Stress Index^{1/}

Stress level 2005-2023



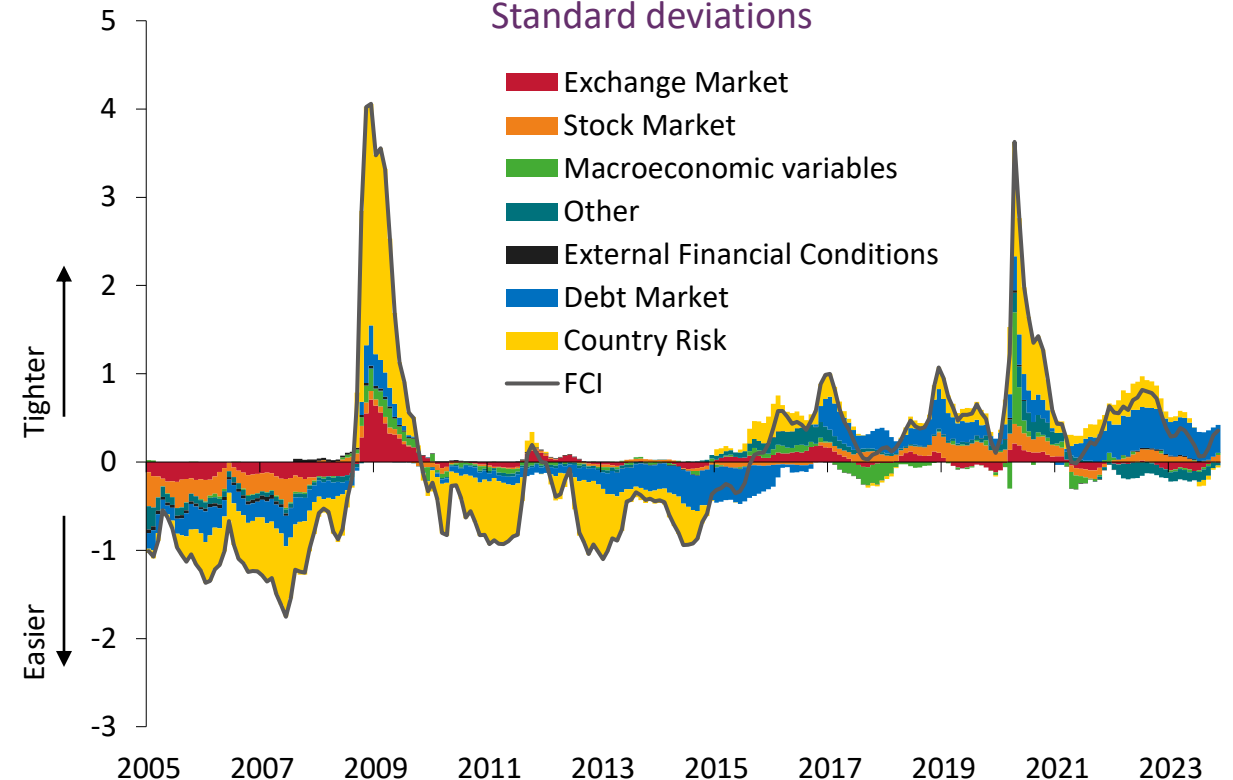
Data as of November 30, 2023

Source: Banco de México.

1/ The index was estimated using a principal component analysis on 36 standard variables of Mexican financial markets grouped into 6 categories (debt market, equity market, FX market, derivatives market, credit institutions and country risk). Total components yields the index scaled at interval [0,1]. A higher number represents higher financial stress.

Financial Conditions Index^{1,2/}

Standard deviations



Data as of November 2023

Source: Banco de México.

1/ For a description of the methodology see Box 2: Financial Conditions and Growth Risk, Financial Stability Report, December 2019.

2/ The contributions of each FCI variable are estimated using Kalman Filter.

5 Macro-financial risks

- Although Mexico's financial system vulnerabilities are contained, there are still some macro-financial risks which, if they were to materialize, could affect the proper functioning of the financial system, such as:
 - 1 A further or more prolonged tightening of financial conditions than expected.
 - 2 A more pronounced or prolonged slowdown in the world economy than anticipated.
 - 3 Occurrence of a systemic event that affects the global financial system.
 - 4 Unexpected adjustments in credit ratings for the sovereign or Pemex.
- These risks are considered in the stress test scenarios.

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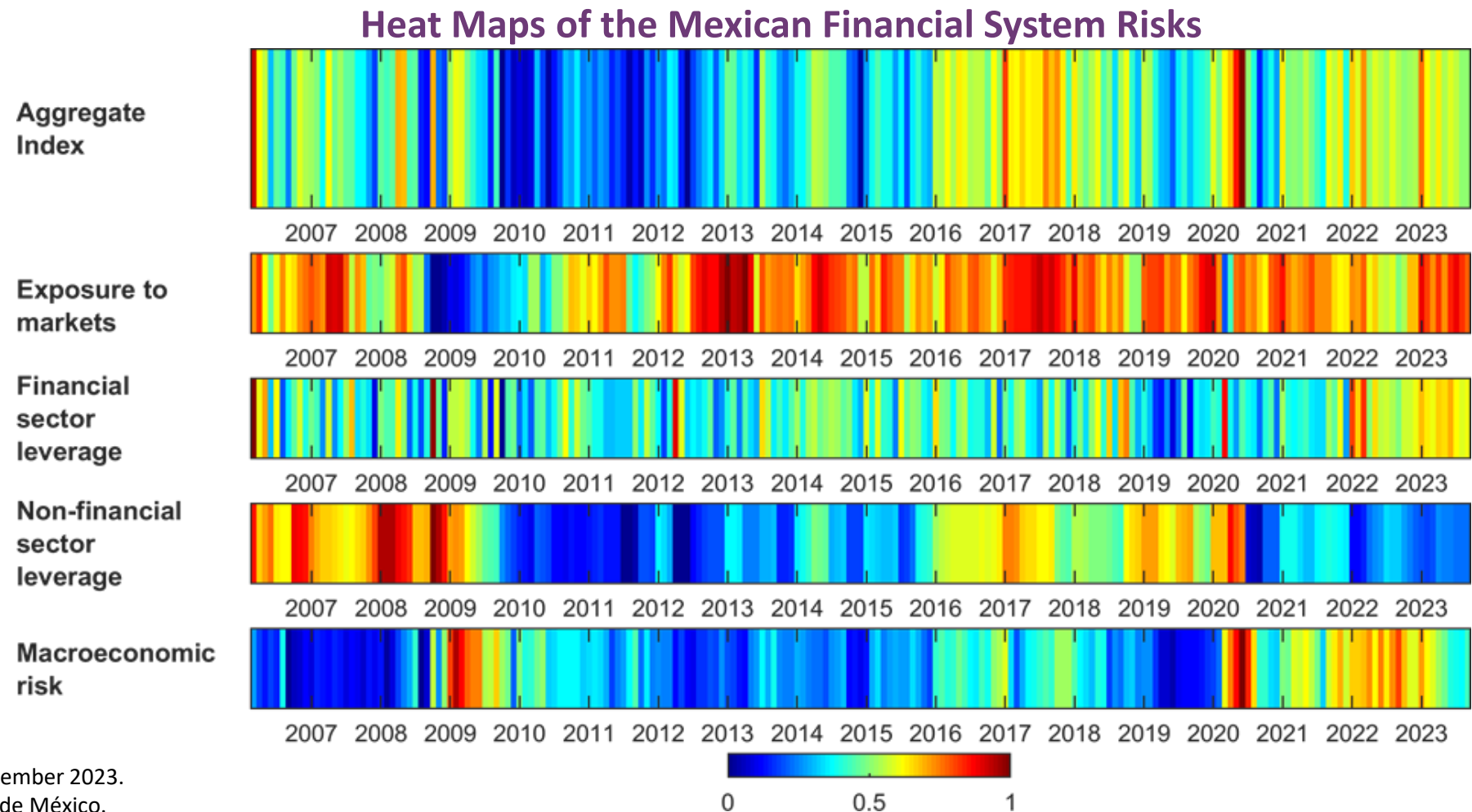
2 Financial system risks

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1 Heat maps of the Mexican financial system risks

As illustrated by the heat map, the aggregate risk of the financial system decreased slightly with respect to the first half of 2023. This is mainly explained by a lower exposure to macroeconomic risks, which is partly due to the observed reduction in inflation and the fact that the other categories remained at similar levels.



Data as of september 2023.
Source: Banco de México.

2 Survey on systemic risk perceptions among financial institutions

The most frequent domestic and external risk mentioned by financial intermediaries is higher-than-expected inflation. Regarding expectations for the main risks over the next 6 months, the decrease in market, liquidity (funding), and operational risks are noteworthy.

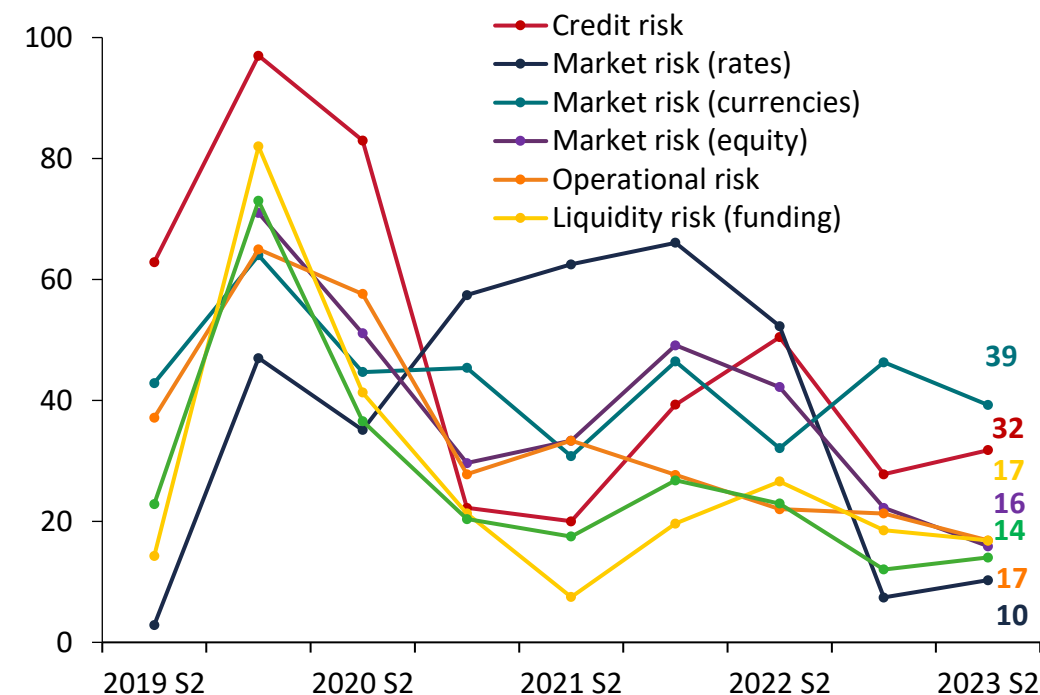
Main sources of financial system risks (6months ahead) ^{1/ 2/} Percent of total institutions

	May 2023 ^{1/}	November 2023 ^{2/}
External financial risks		
Inflation higher than expected	81	86
Deterioration of global economic growth outlook	82	79
Disorderly changes in foreign interest rates	55	71
Volatility in commodity prices	54	54
Deterioration of foreign market conditions*	63	54
Domestic financial risks		
Inflation higher than expected	79	73
Deterioration of public finances	63	71
Deterioration of the domestic economic growth outlook	74	68
Deterioration of sovereign credit rating	53	58
Fiscal, financial and economic policies	60	48
Non-financial risks		
Political, geopolitical and social risks	94	93
Cybersecurity and IT risks	82	79
Violence and insecurity	71	71
Deterioration of the rule of law and impunity	52	49
Climate risk	34	49

1/ In the previous survey 108 institutions participated.

2/ In the last survey 107 institutions participated. * Exchange rate volatility, depreciation and lack of liquidity.

Expectations regarding the evolution of risks in the following six months ^{1/} Percent



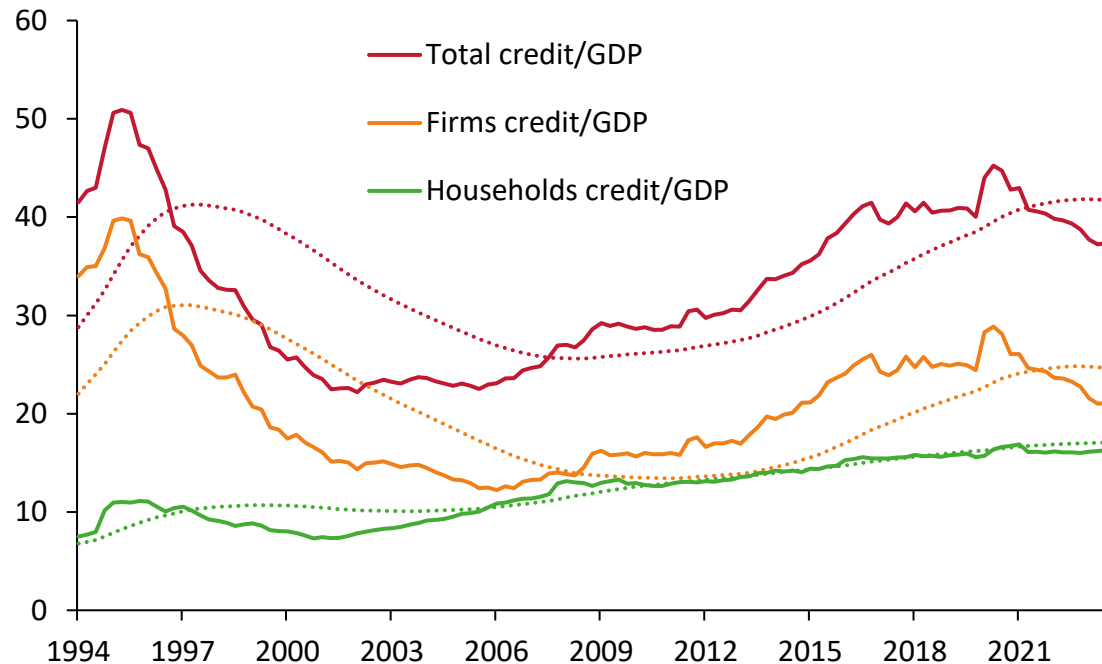
Source: Banco de México.

1/ The chart shows the difference between the percent of institutions that expect the risk increase and the institutions that expect the risk decrease.

3 Total financing to the non-financial private sector

Total financing to the non-financial private sector, measured as a share of GDP, recovered slightly after having trended downwards. Both total financing and the financing granted to businesses remain at similar levels to those of 2015, registering 10 consecutive quarters with a negative credit gap, although the latter has decreased marginally.

Credit to non-financial private sector ^{1/}
Share of GDP in percent

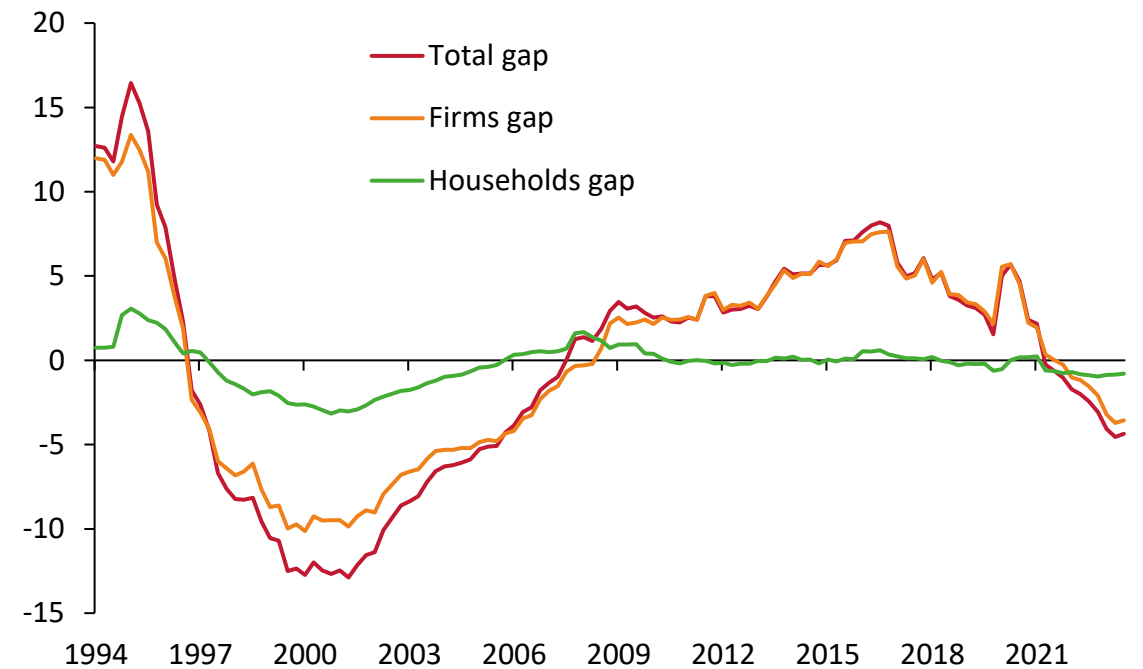


Data as of September 2023.

Source: Banco de México

1/ Dotted lines correspond to long term trend.

Credit-to-GDP gap ^{1/}
Percent



Data as of September 2023.

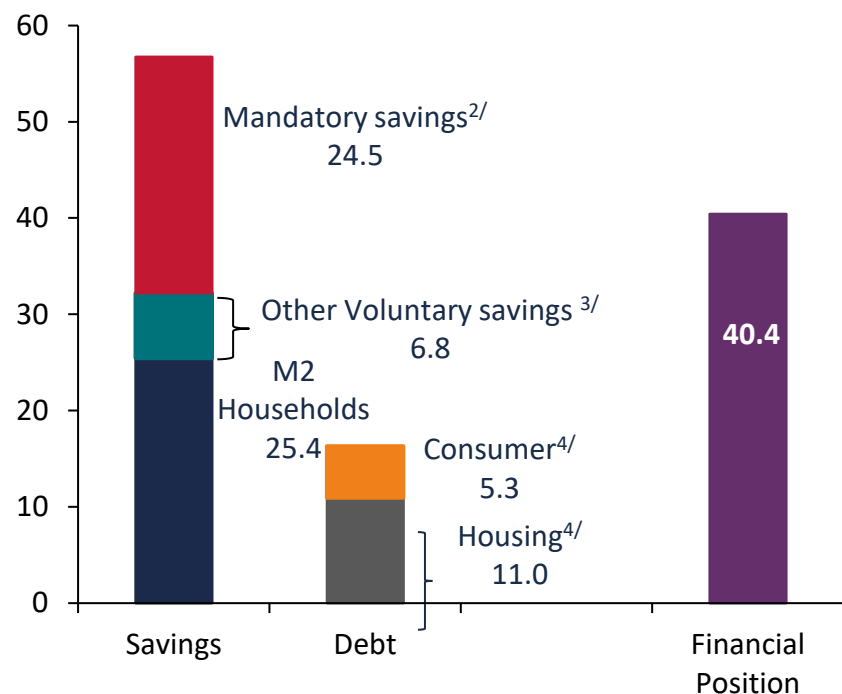
Source: Banco de México.

1/ It's the difference between observed credit-to-GDP ratio and its long term trend

4 Households' financial position

The financial position of households remained at similar levels compared to the previous semester, at around 40% of GDP. The real annual growth rate of total household financing increased, mainly due to consumer credit. Consumer credit granted by commercial banks continued increasing, and there was a notable growth in credit cards and automotive loans.

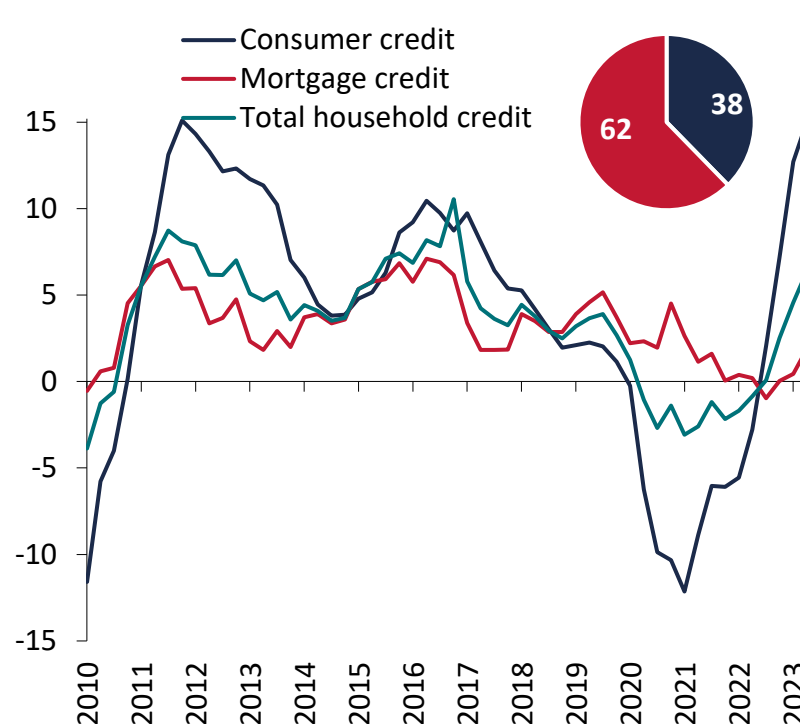
Households financial position^{1/}
Share of GDP



Data as of September 2023. Source: Banco de México

1/ Totals may not add up to 100% due to rounding. Share of four quarters average nominal GDP.
 2/ Includes housing and pension funds. 3/ Includes public securities, private securities, issued by states, municipalities, OYEs and Fonadin, as well as other banks liabilities held by households. 4/ Includes credit granted by commercial banks, development banks, non-bank savings and loans entities, credit unions and regulated financial companies.

Household credit growth^{1/}
Real annual percent change

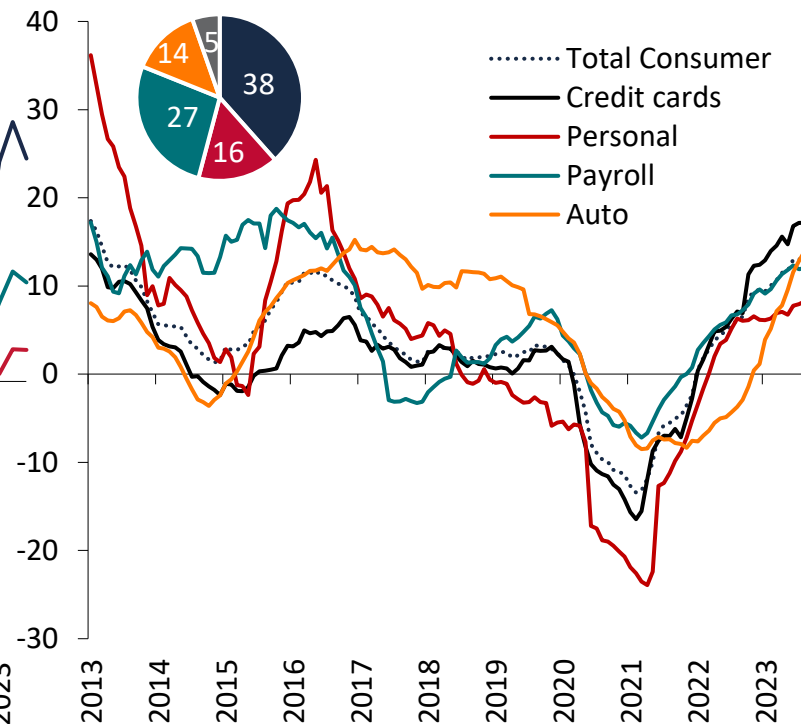


Data as of September 2023

Source: Banco de México, BMV y Condusef.

1/ See the Financial Stability Report for a more detail explanation that comprises each category.

Consumption portfolio of the banking system
Real annual percent change



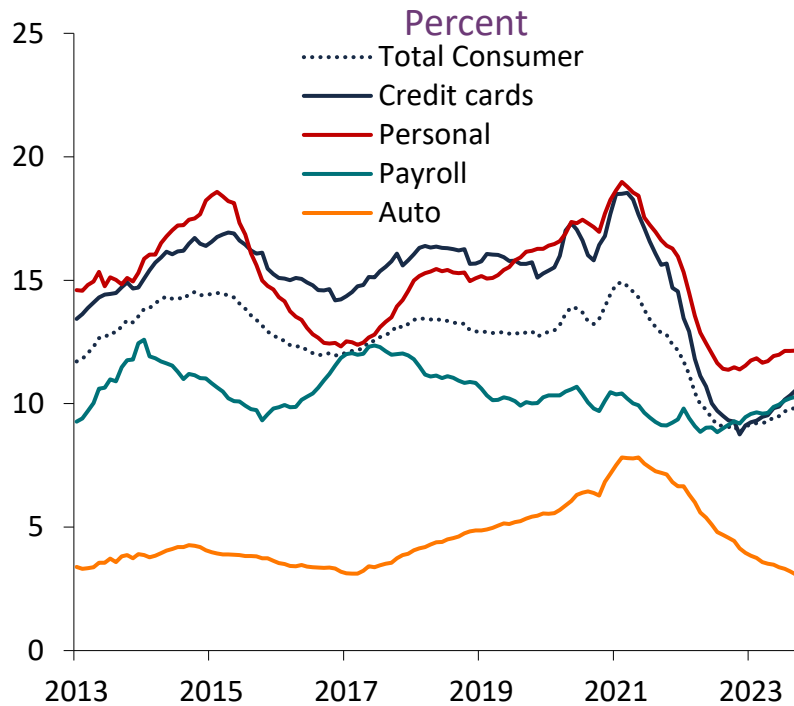
Data as of September 2023

Source: CNBV.

4 Households' financial position

Non-performing loan ratio of consumer bank loan portfolio remained at low levels, although they exhibited an upward trend, mainly attributed to higher non-performing loan rates in credit card portfolio. In addition, non-performing loan rates of other credit lenders has increased slightly since the last Report, while for the mortgage loan portfolio granted by Infonavit decreased.

Non-performing loan ratio and adjusted non-performing loan ratio of consumer loan portfolio ^{1/}

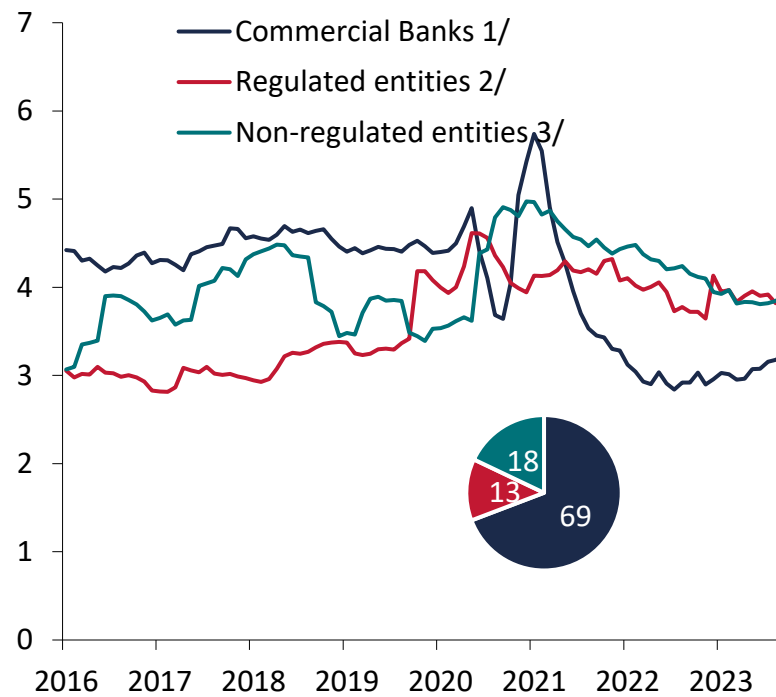


Data as of September 2023

Source: CNBV.

1/ Includes sofomes regulated for having equity links with a bank.

Non-Performing Loan Ratio of Consumer Portfolio

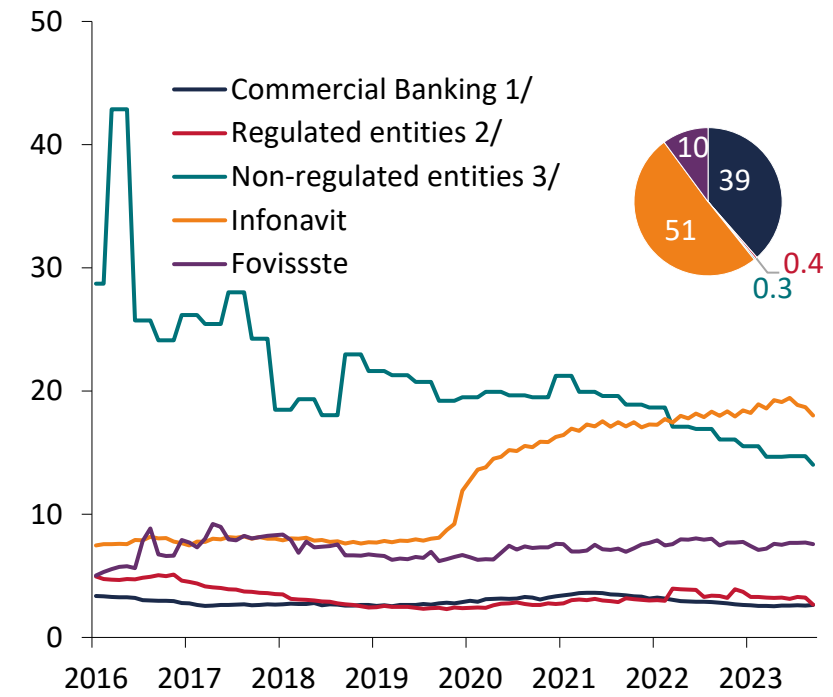


Data as of September 2023.

Source: Banco de México (SIE), CNBV, BMV, and Condusef.

1/ Includes the loan portfolio of regulated sofomes having an equity linked with a bank, whether subsidiaries of the latter or not. 2/ Includes the credit portfolios of the development bank and of non-banking regulated financial intermediaries, such socaps, sofipos and sofomes regulated for issuing debt. 3/ Includes credit portfolio of non-regulated sofomes and debt-issuing financial companies which primarily issue grant credit as part of its business.

Non-Performing Loan Ratio of Mortgage Portfolio



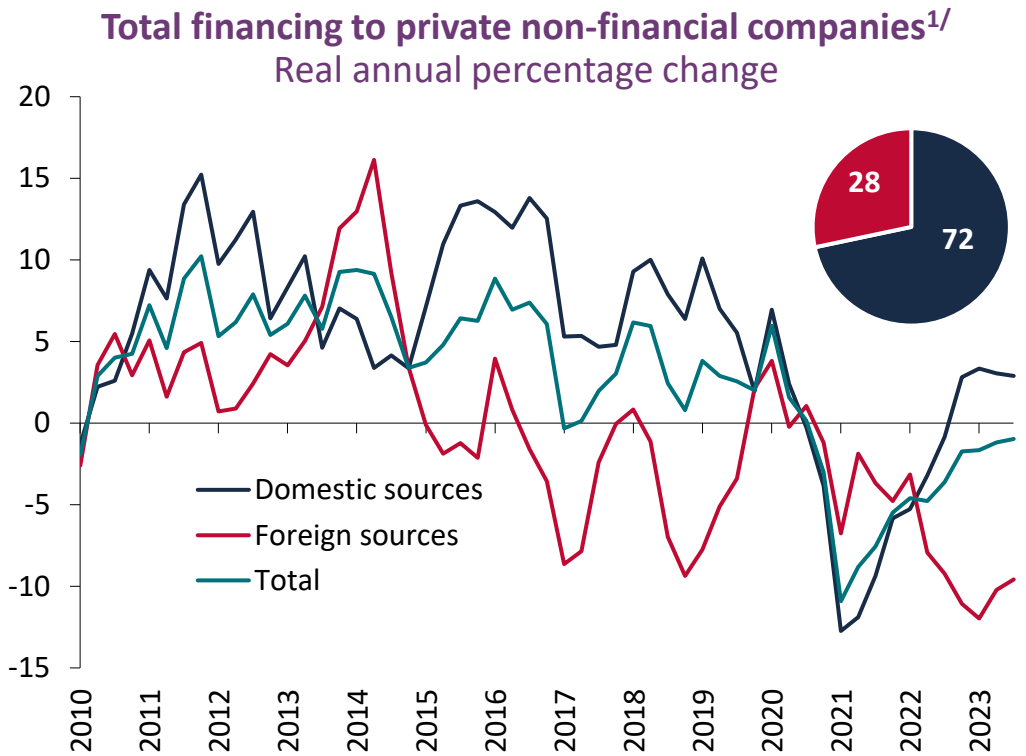
Data as of September 2023.

Source: Banco de México (SIE), CNBV, BMV, and Condusef.

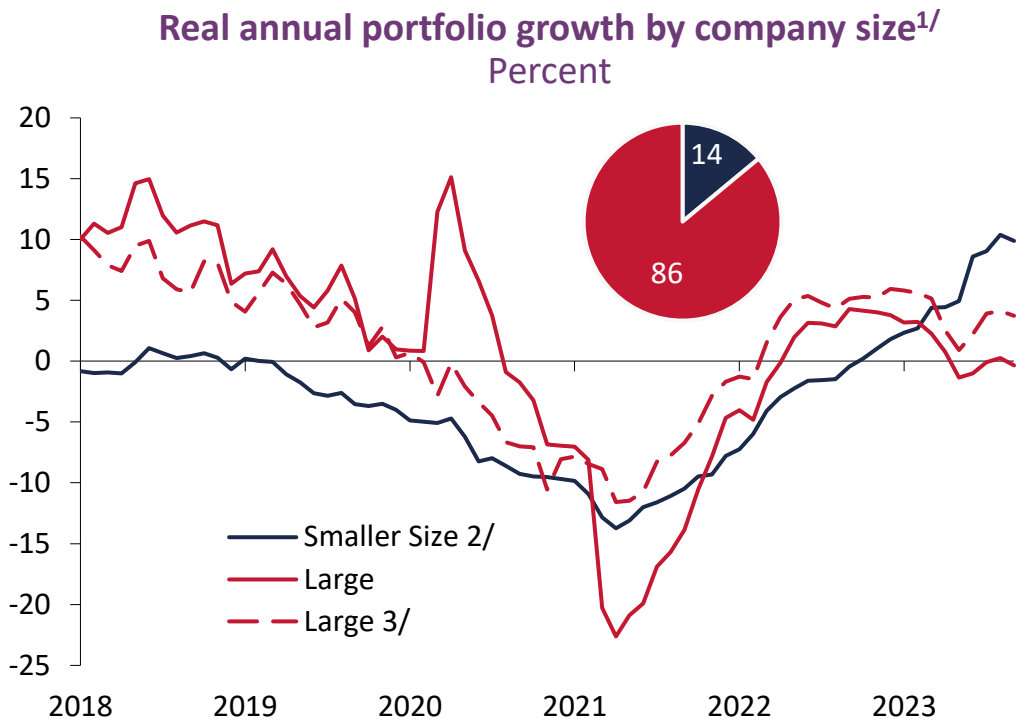
1/ Includes the loan portfolio of regulated sofomes having an equity linked with a bank, whether subsidiaries of the latter or not. 2/ Includes the credit portfolios of the development bank and of non-banking regulated financial intermediaries, such socaps, sofipos and sofomes regulated for issuing debt. 3/ Includes credit portfolio of non-regulated sofomes.

5 Non-financial private firms' financial position

Total lending to non-financial private firms in Mexico continued declining in real terms, although at a slower rate of contraction. The external component shows twelve quarters of contraction, due to the reduced credit from foreign banks and lower debt issuance. Meanwhile, the domestic component registered positive growth in its three sources.



Data as of September 2023
Source: Banco de México, BMV and SHCP.
1/ The percentages shown here consider the figures relating to non-regulated entities that grant financing and that are included at the bottom of Table 2 (Memo); therefore, they differ from those registered in the upper part of the same table.

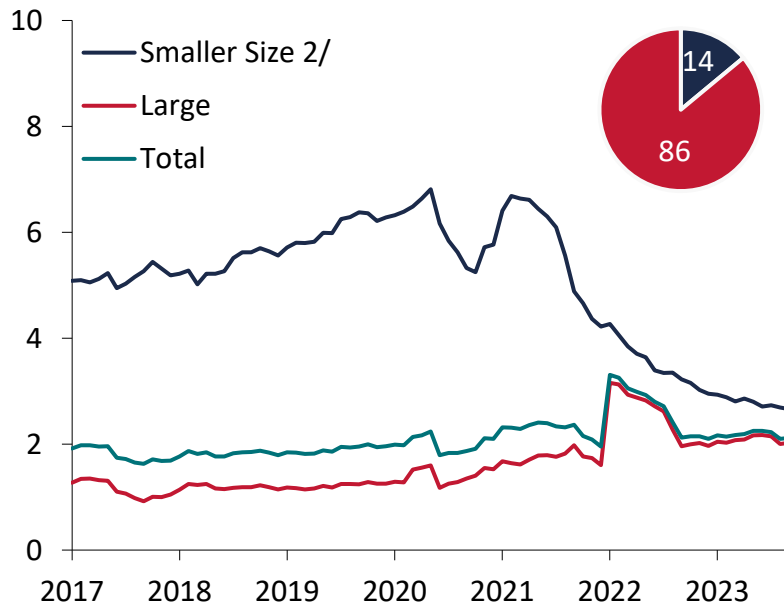


Data as of September 2023
Source: cnbv
1/ The pie chart shows the total percentage of the portfolio of each segment.
2/ Private-non-financial companies not listed on the Mexican Stock Exchange with maximum historical loans less than 100 million Mexican pesos.
3/ Large companies excluding those that had a monthly increase in their balances of greater than 15 % in March 2020.

5 Non-financial private firms' financial position

The non-performing loans ratio of the non-financial private firms banking portfolio remained practically at the same levels as those recorded in the previous Report. In contrast, the non-performing loans ratio of the corporate credit portfolio of unregulated non-bank financial intermediaries increased during the period. The Listed Companies Vulnerability Index (IVEL) continues to be below its historical average, although it has increased slightly due to a deterioration in indicators associated with debt service capacity.

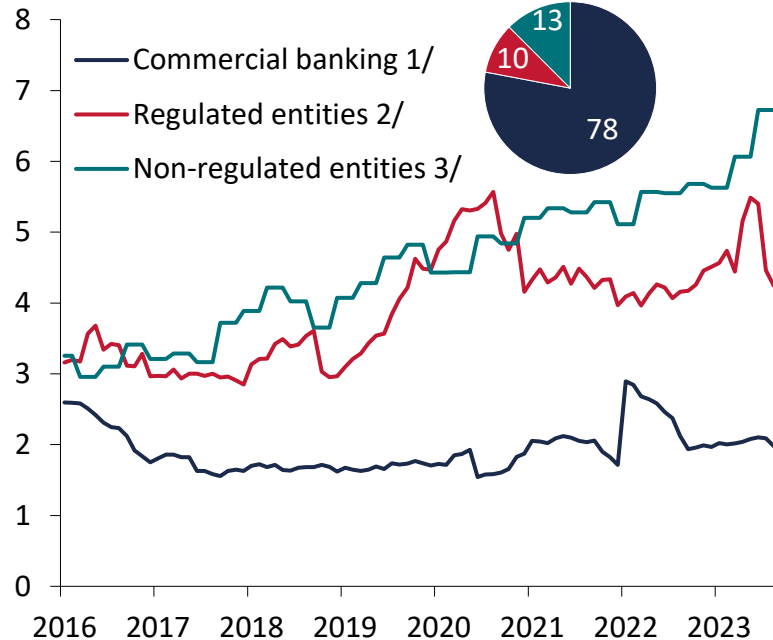
Non-performing loan ratio by company size^{1/}
Percent



Data as of September 2023

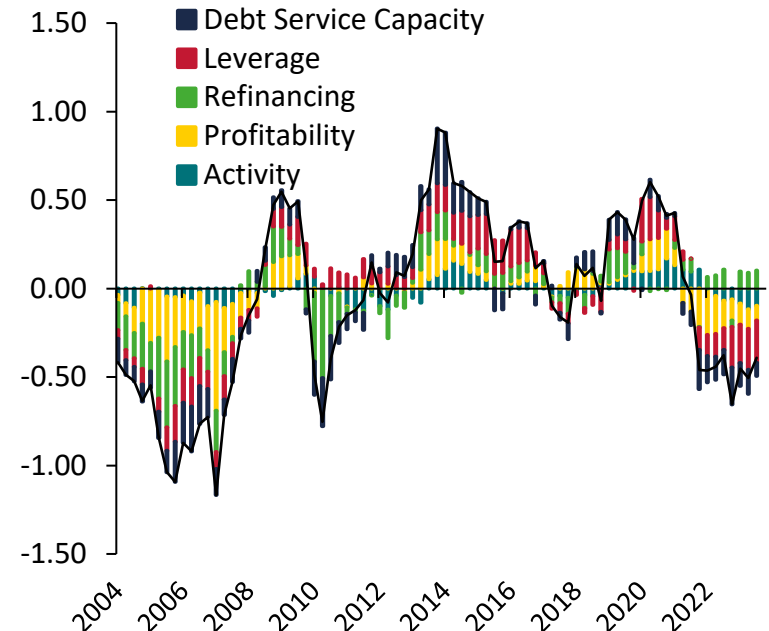
Source: CNBV. 1/ The pie chart shows the total percentage of the portfolio for each segment. 2/ Private-non-financial companies not listed on the Mexican Stock Exchange with maximum historical loans less than 100 million Mexican pesos.

Non-performing ratio of corporate loans portfolio
Percent



Data as of September 2023. Source: Banco de México (SIE), CNBV, BMV, and Condusef. 1/ Includes the credit portfolios granted by regulated sofomes for having an equity linked with a bank, whether subsidiaries of the latter or not. 2/ Includes the credit portfolios of non-banking regulated financial intermediaries, such as socaps, sofipos, credit unions, sofomes regulated for issuing debt, bond warehouses, development public trusts (FIRA, FOVI, FIFOMI) and government agencies (FND). 3/ Includes credit portfolio of non-regulated sofomes and debt-issuing financial companies, such as financial leasing companies or financial arms of automotive companies.

Vulnerability Index for Listed Firms
No units



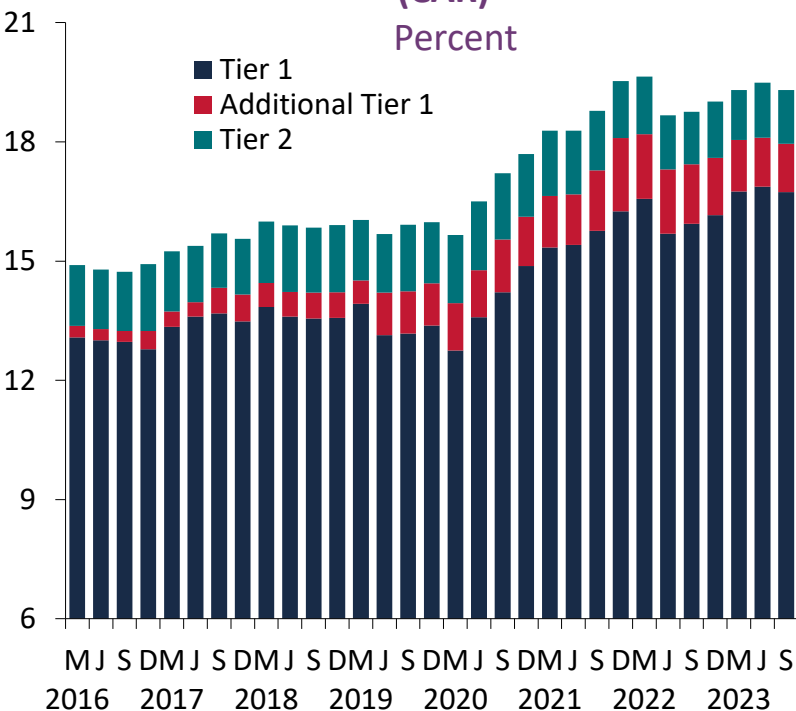
Data as of third quarter of 2023.

Source: Banco de México with data from Bloomberg.

6

The Capital Adequacy Ratio (CAR) of commercial banks remained relatively stable at high levels between March and September. Meanwhile, their credit risk, measured as the Conditional Value at Risk, increased slightly during the period. Likewise, the CAR ratio net of risk decreased, although it still remains at levels above the regulatory minimum. Thus, the sector remains in a solid position to face possible risks associated with the current situation.

Structure of banks' Capital Adequacy Ratio (CAR)^{1/}
Percent



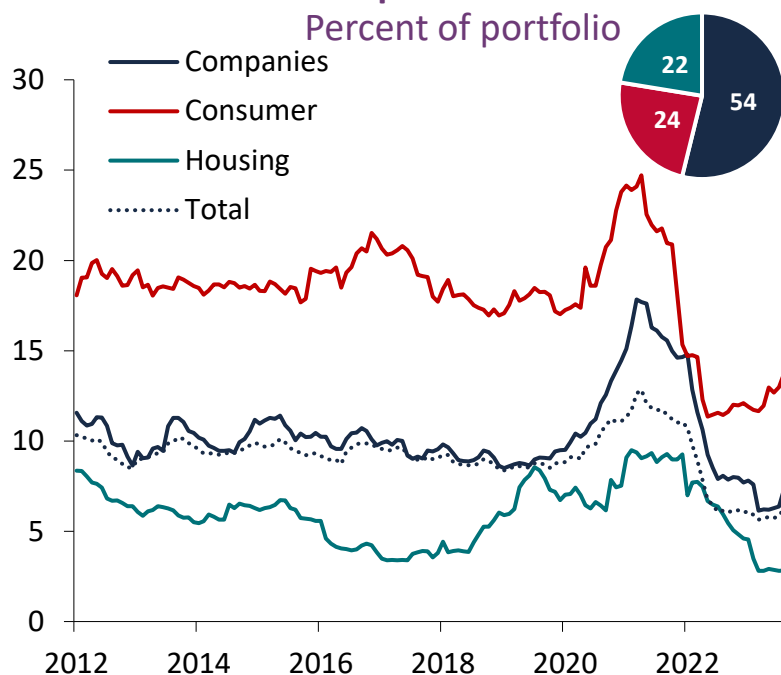
Data as of September 2023

Source: Banco de México

1/ The Capital Adequacy Ratio (CAR) is calculated by dividing net capital by risk weighted assets. Net capital is the regulatory capital that includes the Tier 1, Additional Tier 1, and the Tier 2 capital.

Conditional Value at Risk (CVaR) by type of portfolio^{1/}

Percent of portfolio

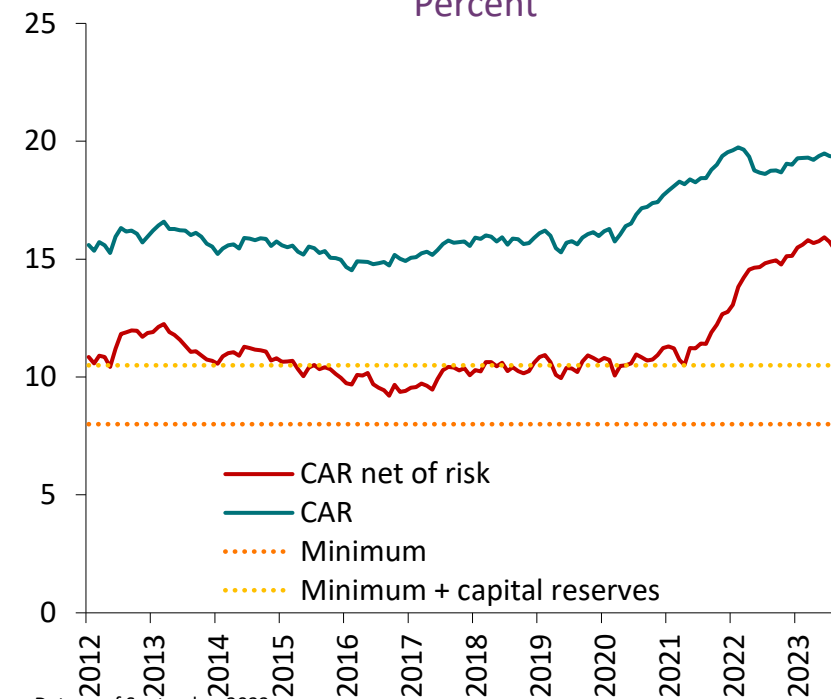


Data as of September 2023

Source: Banco de México, CNBV, and Credit Bureau

1/ Using a time period of one year and a confidence level of 99.9%. The pie chart shows the total percentage of the current balance for each portfolio segment.

CAR net of risk ^{1/}
Percent



Data as of September 2023

Fuente: Banco de México, CNBV, and Credit Bureau 1/ Estimated as the capitalization ratio that results from reducing the CVaR at a 99.9% confidence level, both from the net capital and risk weighted assets. This indicator assumes that the credit portfolio incurs losses in an amount equivalent to a CVaR of 99.9% and such losses are absorbed by the banks and then reflected in their capital levels without affecting reserves, and that this portfolio is weighted at 100% to determine their capital requirements.

6 Institutions: commercial banks

Since the release of the last *Report*, the market risk of commercial banks has increased, while liquidity of the banking system has remained ample, with indicators exceeding regulatory minima.

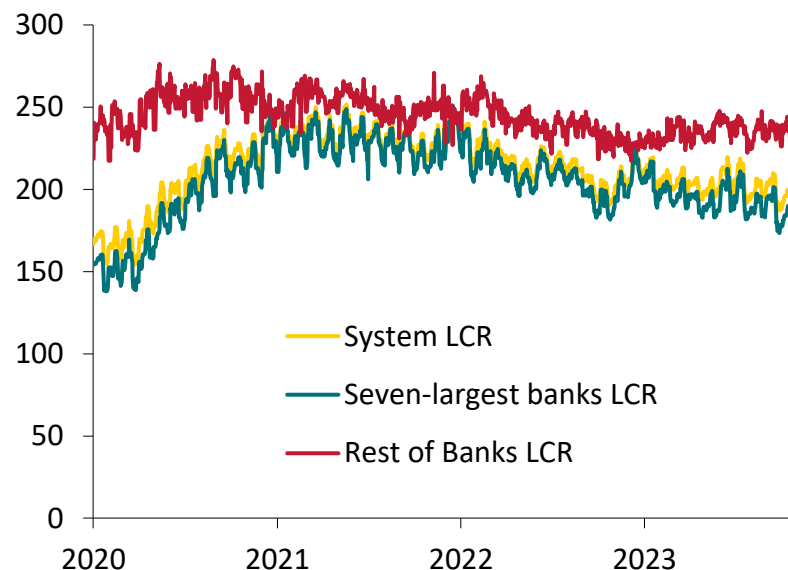
99.9% CVaR for commercial bank's market risk
Share of net capital (percent)



Data as of September 2023

Source: Banco de México, CNBV, BMV, Bloomberg, and Valmer

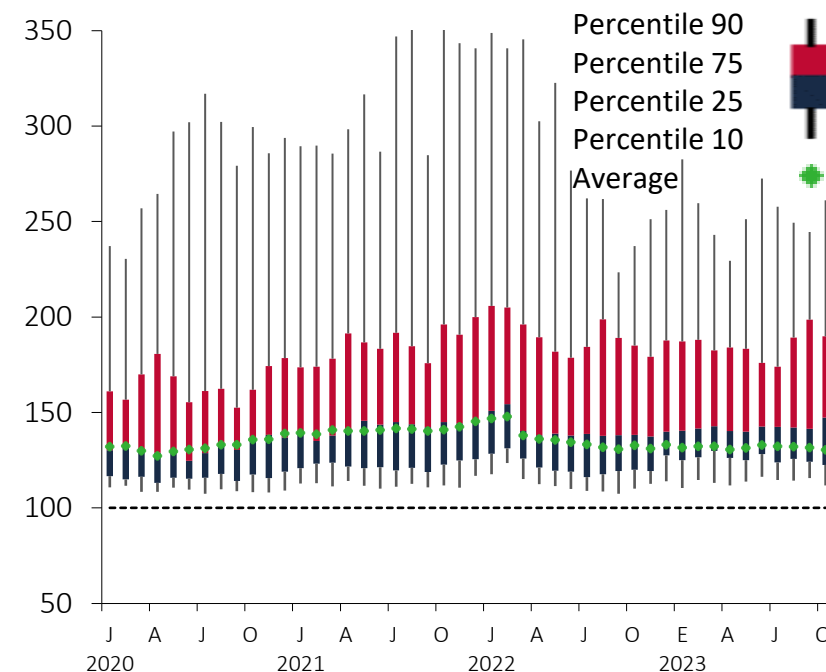
Daily LCR of the banking system and group of banks
Percent



Data as of October 31 2023

Source: Banco de México

NSFR distribution
Percent



Data as of October 2023.

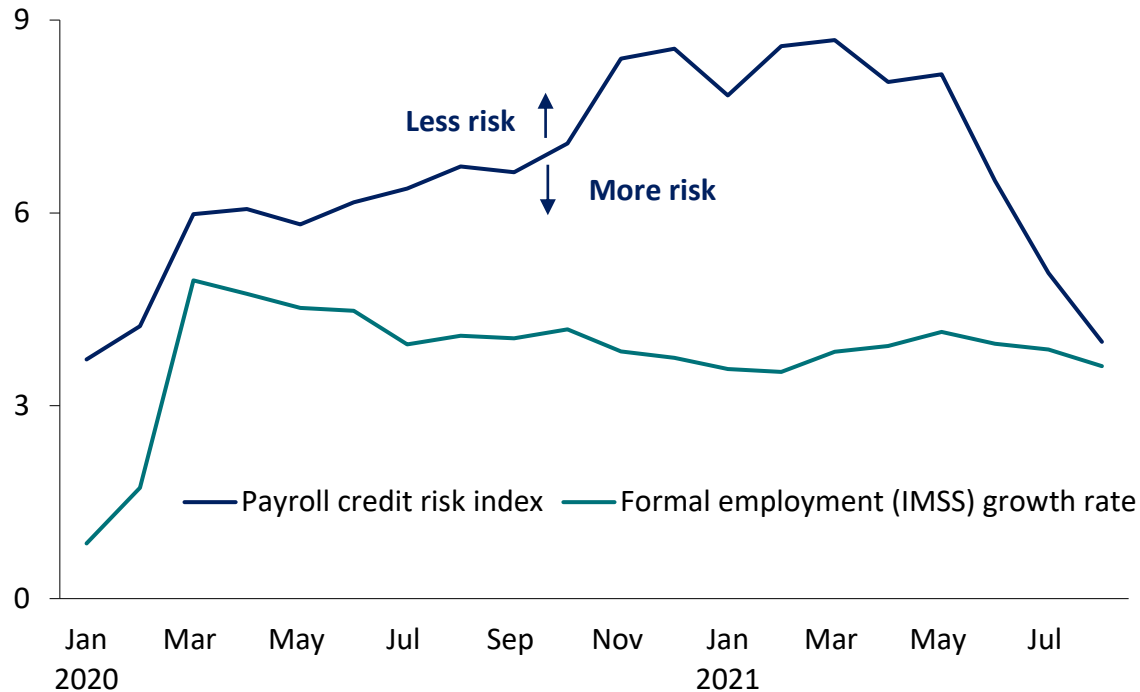
Source: Banco de México.

7 Commercial banks' exposure to changes in economic activity and formal employment

Economic growth and employment dynamics can affect the credit risk faced by the banking sector.

Payroll portfolio credit risk due to changes in formal employment^{1/}

Annual variation in percent



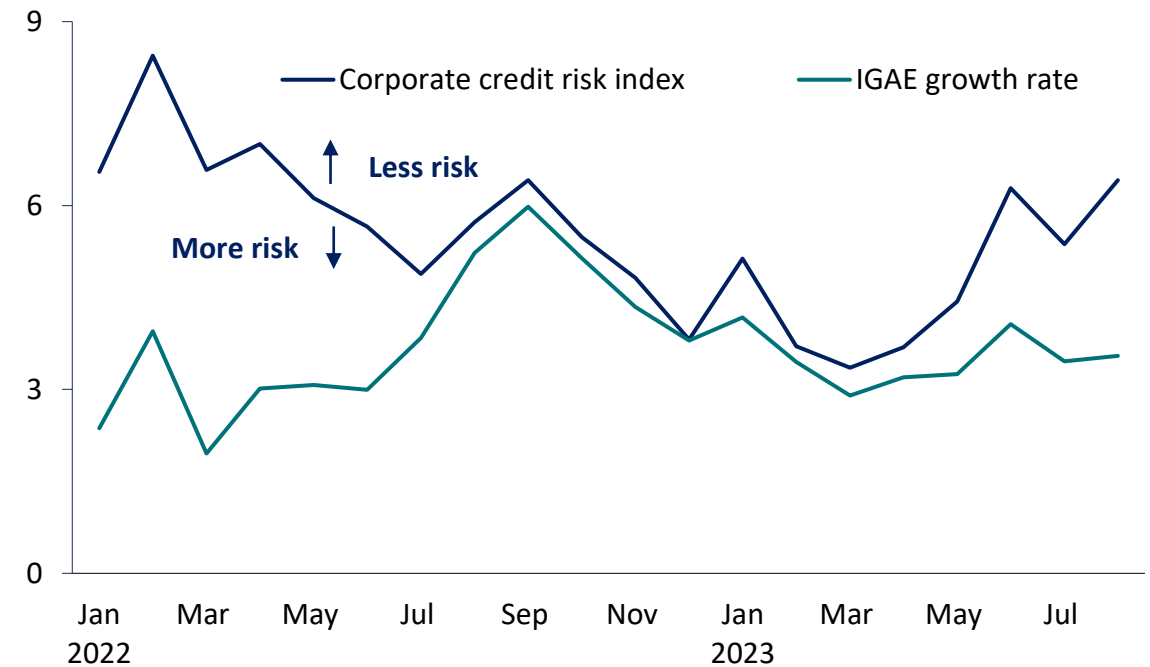
Data as of August 2023

Source: Banco de México, INEGI, and IMSS.

1/ The indicator is constructed as the weighted sum of the growth in formal employment in Mexico's different labor markets. In this sum, the weight received by the labor market corresponding to a state, gender and high or low wage level is equal to its share of payroll credit.

Corporate portfolio credit risk due to changes in economic activity^{1/}

Annual variation in percent



Data as of August 2023.

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

1/ The indicator is constructed as the sum of economic growth in the different sectors. In this sum, the weight of each sector's growth is equal to its share in the corporate loan portfolio. Thus, the indicator captures the risk of aggregate and sectoral changes in economic growth. IGAE was updated with 2018 base.

8 Other risks: cyber risks

- **Cyber risks are still relevant** for the financial system, both domestically and globally.
 - Although some financial institutions in Mexico have reported relevant cyber-incidents during 2023, all have been addressed in accordance with the authorities' protocols, and **none have caused economic damages to the clients of the institutions affected.**
 - However, as a result of the monitoring of cyberattacks originated by the conflicts between Russia and Ukraine and in the Middle East, **the cyber threat alert level for the Mexican financial system has been maintained** at "Yellow".

8 Other risks: cyber risks

- Banco de México has been involved in several actions to encourage both authorities and financial institutions to **continue strengthening their protection and response schemes** in light of these events, for example:

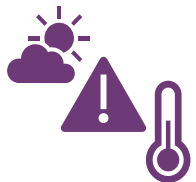


- ✓ In September, in cooperation with some domestic systemically important financial institutions, **a cyber-resilience exercise was carried out.**



- ✓ Among the results, **clear response protocols were identified**, with a multidisciplinary perspective and focused on maintaining the provision of services to its clients.

8 Other risks: environmental risks and sustainable investing



Banco de México has continued working actively to **encourage financial system participants to internalize climate-related risks**, as recently illustrated by Hurricane Otis. It also continues improving and expanding both the tools and the analysis that has been carried out on this matter.



The Sustainable Finance Committee, through Banco de México, continued working on the creation of a **Sustainable Finance Training Hub**. It also developed an online learning tool to enable users of Mexico's Sustainable Taxonomy to understand its objectives, elements, and uses.



Regarding **the issuance of thematic bonds** by domestic parties, both public and private, their continued dynamism so far in 2023 stands out, as they have reached 238 billion pesos through September (22% higher than the amount observed in the same period of 2022).

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Stress tests to commercial banks



The stress tests carried out by Banco de México are simulations performed to **assess the resilience of the Mexican banking system** under extreme adverse economic scenarios, as part of its function to promote and preserve the sound development of the financial system.



The scenarios considered **should not be taken as a forecast** of the expected performance of the economy or be associated with a probability of occurrence.



The purpose of the **credit stress tests** is to assess if, under extreme adverse economic conditions, the banking system could continue performing its financial intermediation functions, with a **capital adequacy ratio** above regulatory minima.

Credit stress tests

Scenarios^{1/}

Assumptions on macro-financial variables

Additional assumptions:

A

Prolonged tight global financial conditions



- Uncertain and highly volatile conditions in international financial markets.
- Exchange rate and interest rate pressures.
- Higher risk premia, increased financing costs for households and firms.
- Lower credit growth and higher non-performing loans rate levels.

B

Slowdown of global economic activity



- The US economy slows down and enters recession. Lower industrial activity and a decline in imports.
- This would be reflected in a lower growth rate of the Mexican economy and greater volatility in the financial markets and the exchange rate.
- Lower credit demand, higher unemployment rates and an increase in non-performing loans rate portfolio.

C

Credit rating adjustment



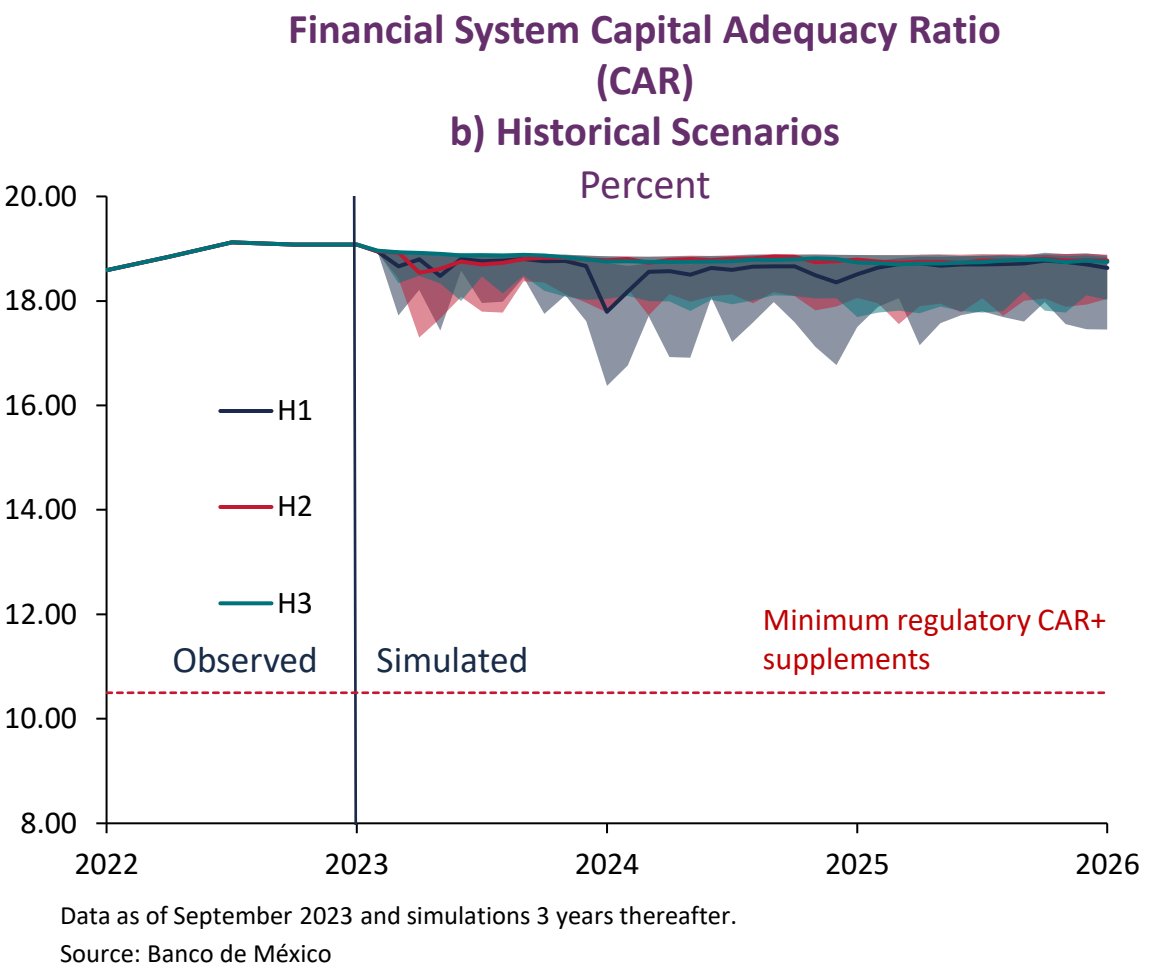
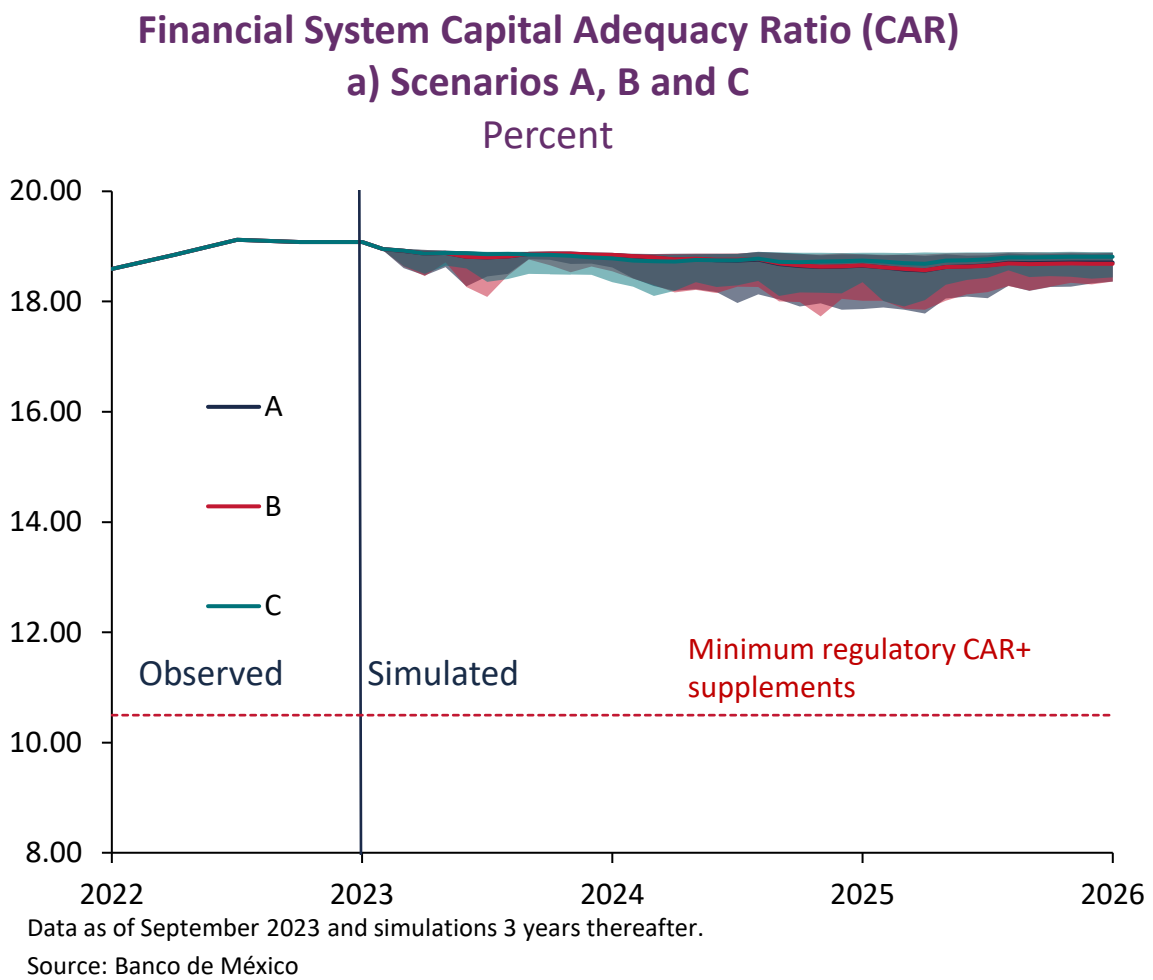
- High volatility in domestic financial markets, a depreciation of the exchange rate, higher risk premia and, therefore, upward pressure on interest rates.
- A contraction in aggregate demand and higher unemployment.
- Credit would decrease, and higher levels of non-performing loans rate would be expected, which would affect bank revenues.

- 1 *This exercise is common to all institutions and does not consider idiosyncratic problems related to loan origination.*
- 2 *It disregards possible mitigation measures that could be implemented by the institutions in the simulation (counterfactual simulation of partial equilibrium rather than general equilibrium).*

1/ For more detailed information on these scenarios, refer to the complete version of this Report.

Credit stress tests

In all simulated scenarios, the results suggest that the Mexican banking system is at levels above the regulatory minimum plus capital supplements. Similarly, three historical scenarios were considered.

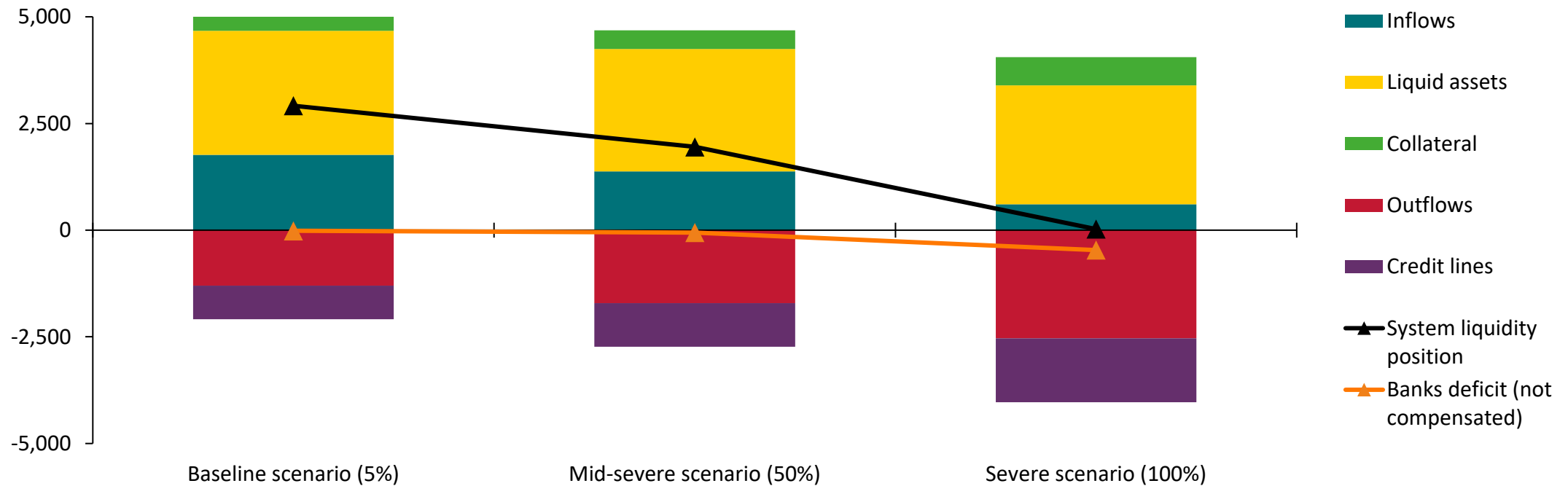


Liquidity stress tests

The results of the liquidity stress tests suggest that its high liquidity position would allow banks, at the aggregate level, to face more severe stress episodes than those experienced in the past and those proposed in the different stress scenarios. With data as of October 2023, the banking sector as a whole would maintain a liquidity surplus under the proposed stress scenarios over a 90-day horizon.

Liquidity stress scenarios over 90-day period^{1/}

Billion of pesos



Data as of October 31, 2023. Source: Banco de México.

1/ In the severe scenario (100% severity), a haircut to liquid assets of around 4% is considered. Repurchase agreements have a lower roll-over of 45% and a haircut for released collateral equal to that of assets is assumed. Inflows from the portfolio are not considered (haircut) of 100%. Wholesale funding (demand and term) has a run-off factor of 20% and retail funding (demand and term) has a run-off factor of 10%. Contingent outflows due to the exercise of credit lines and liquidity have a run-off factor of 40%. The baseline scenario and the mid-severe scenario (scenario similar to the regulatory one) correspond to a severity of 5% and 50% with respect to the severe scenario. The mid-severe scenario considers an aggregate outflow similar in magnitude to the outflow calculated under the liquidity coverage ratio (LCR) (see Box 9 of the FSR December 2022).

Contents

1 Macro-financial conditions

2 Financial system risks

3 Stress tests

4 Final remarks

Final remarks

- 1 During the second half of 2023, the global environment remained complex and uncertain, given that, in addition to persistently high inflation levels and tight financial conditions, risk aversion increased due to the worsening of the military conflict in the Middle East.
- 2 In such an environment, it is even more relevant to monitor the evolution of Mexico's financial system, as Banco de México has done so far.
- 3 In Mexico, the banking sector complies with strict regulatory requirements and, at an aggregate level, has sufficient capital and liquidity to face adverse scenarios, including those considered in the stress tests.
- 4 Thus, the Mexican financial system remains in a solid and resilient position.
- 5 Banco de México will monitor the evolution of Mexican financial markets and will continue taking actions, in compliance with the legal framework.

Boxes

- ① Mexican Government Bond Volatility Index
- ② Common factor of sovereign credit risk in emerging market countries
- ③ Analysis of determinants of the capital structure of listed non-financial Mexican firms
- ④ Capital flows: effects on the government bond yield curve
- ⑤ Large exposure regulation: new regulatory limit in Mexico
- ⑥ Duration and run-off risk of relevant financing counterparties
- ⑦ Comparative analysis of the domestic systemically important banks' recovery plans



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